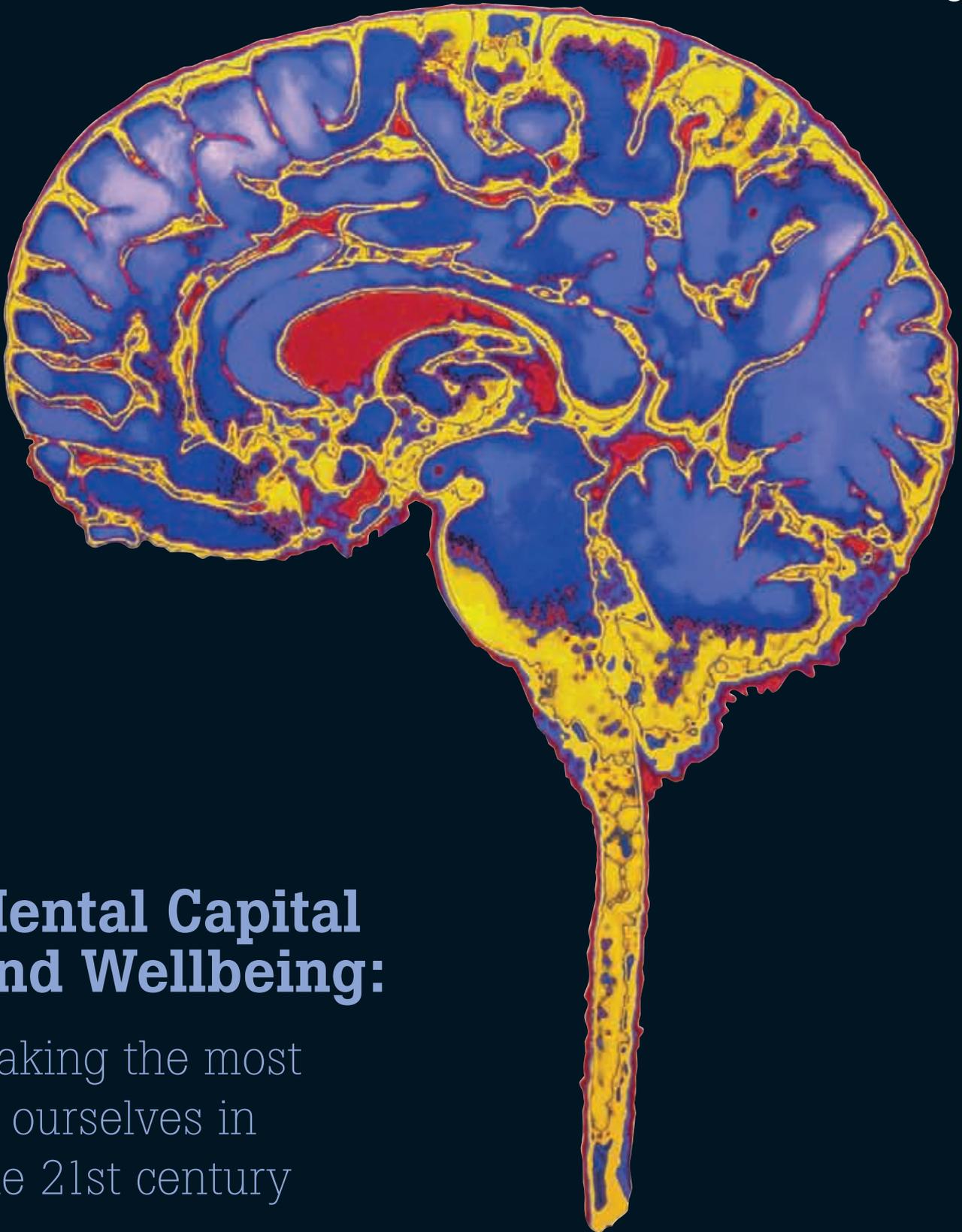




Government  
Office for  
**Science**

••••• Foresight



# Mental Capital and Wellbeing:

Making the most  
of ourselves in  
the 21st century

FINAL PROJECT REPORT

# **Mental Capital and Wellbeing: Making the most of ourselves in the 21st century**

**This report is intended for:**

Policy makers and a wide range of professionals and researchers whose interests relate to mental capital and wellbeing. The report focuses on the UK but is also relevant to the interests of other countries.

**This report should be cited as:**

Foresight Mental Capital and Wellbeing Project (2008).  
Final Project report.  
The Government Office for Science, London.

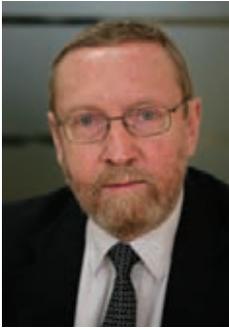
The Government Office for Science (GO-Science) would like to thank the Project's Science Co-ordination Team who oversaw the technical aspects of the Project, who were involved in much of the work, and who were particularly involved in writing this final report. They were led by Professor Cary Cooper, CBE and are Professor John Field, Professor Usha Goswami, Professor Rachel Jenkins and Professor Barbara Sahakian.

GO-Science would also like to thank: Professor Philip Dewe, Professor Eugene Paykel, Professor Felicia Huppert and Mr Chris Riley who also contributed to this final report; Professor Leon Feinstein, Professor Tom Kirkwood and Professor Michiel Kompier who led parts of the first phase of the Project; and the company shiftN who worked on the futures and systems aspects.

Particular thanks are due to the Project's High Level Stakeholder Group and Expert Advisory Group as well as the many experts and stakeholders from the UK and around the world who contributed to the work of this Project, who reviewed the many Project reports and papers, and who generously provided advice and guidance. A full list of those involved is provided in Appendix A.

*The Foresight Programme in the UK Government Office for Science is under the direction of the Chief Scientific Adviser to HM Government. Foresight strengthens strategic policy-making in Government by embedding a futures approach.*

# Foreword



The UK is a small country in a rapidly changing world. Major challenges such as globalisation, the ageing population, the changing nature of work, and changing societal structures are already having profound influences on society and on our place internationally. So, if we are to prosper and flourish in this evolving environment, then it is vital that we make the most of all our resources – and this is as true for our mental resources as material resources. The present Project was therefore conceived to provide a vision of how that can be achieved.

The Project's scope is possibly unparalleled. It has taken an independent look at the best available scientific and other evidence and has considered the factors that influence an individual's mental development and wellbeing from conception until death. It has assessed how these are affected by: the policies of key Government departments; by important stakeholders such as educators, healthcare professionals and employers; and by the diverse environments in which we live – families, communities and our physical surroundings. It has also analysed possible interventions to address the future challenges, drawing upon considerations such as scientific efficacy, economics, governance and ethics.

I am most grateful to my predecessor Professor Sir David King who commissioned this Project, to the group of senior stakeholders who have advised on the work throughout, and to those who have contributed to and who have peer-reviewed the work; over 400 leading experts and stakeholders from countries across the world have been involved. These have been drawn from diverse disciplines including: neuroscience, psychology and psychiatry, economics, genetics, social sciences, learning, development and systems analysis.

The breadth of scope, coupled with the strong use of scientific and other evidence, provides the key added value of the Project, and has enabled it to provide fresh insights and new thinking across a broad front. Nevertheless, a report of this breadth cannot aspire to consider every issue in fine detail, but instead it aims to provide signposts to important future challenges, and how they could be addressed within a coherent and integrated framework.

Through the publication of this final report, I have pleasure in handing over the findings to Government. It is with equal pleasure that I am making all of this work freely available within the UK and worldwide.

A handwritten signature in black ink, appearing to read 'John Beddington'.

**Professor John Beddington CMG, FRS  
Chief Scientific Adviser to HM Government, and  
Head of the Government Office for Science**

# Preface



On behalf of the Department for Innovation, Universities and Skills, I am delighted to receive this final report of the Foresight Mental Capital and Wellbeing Project from Professor Beddington. Mental capital and wellbeing are in many ways very personal concepts, but Government has a role in creating an environment in which everyone has the opportunity to flourish. The future of prosperity and social justice in the UK will be strengthened by drawing on the mental capital and talents of its citizens.

As this report demonstrates, the science that shapes our understanding of the complex functioning of human brains has progressed rapidly in recent decades, and continues to develop. This gives policy makers new insights and creates fresh opportunities to offer support to individuals, families, and organisations in building and sustaining mental capital and good mental health.

The Project has shown that Government is already on the right track in many areas. However, it also demonstrates that there is very considerable scope to go further by adopting a long-term and strategic perspective that spans an individual's lifecourse. Realising the full benefits could have implications for systems of governance of mental capital and wellbeing and for how the decisions on trade-offs for resource allocation are made.

Nevertheless, the report identifies a number of priority areas, where more immediate benefits could be realised, and the work of the Project is already being used to inform a number of important Government initiatives. I am particularly pleased that a wide range of departments and organisations across Government and more widely are committed to taking forward the Project's findings and I will be overseeing the progress of that over the coming year.

I would like to conclude by thanking Professor Beddington for this excellent report, and also the many individuals and stakeholders who have contributed, both inside and outside Government, and from other countries.

A handwritten signature in black ink that reads "John Denham". The signature is written in a cursive, slightly slanted style.

**John Denham MP**  
Secretary of State for Innovation, Universities and Skills



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# Executive summary

## 1 The aims and ambitions of the Project

*A key message is that if we are to prosper and thrive in our changing society and in an increasingly interconnected and competitive world, both our mental and material resources will be vital. Encouraging and enabling everyone to realise their potential throughout their lives will be crucial for our future prosperity and wellbeing.*

### The aim of the Foresight Project on Mental Capital and Wellbeing

This has been to use the best available scientific and other evidence to develop a vision for:

- The opportunities and challenges facing the UK over the next 20 years and beyond, and the implications for everyone's "mental capital" and "mental wellbeing".
- What we all need to do to meet the challenges ahead, so that everyone can realise their potential and flourish in the future.

The Project seeks to highlight where action is most important, and how we can better allocate available resources.

### An independent look

The analysis provides an independent look at the challenges ahead and how they might best be addressed. As such, the findings do not constitute Government policy. Rather, they are intended to inform the strategic and long-term choices facing Government departments, business and society as a whole.

#### **A word of caution**

It is impossible for a broadly-scoped project such as this to consider the range of issues and disciplines in the same detail as the more focused work of individual Government departments.

Rather, its insights should be seen as complementary: providing a fresh look from its unique perspective; challenging existing thinking; and providing signposts to the most important issues and to promising approaches. As such, it presents a framework for more detailed analysis and policy development by stakeholders.

## 2 Mental capital and mental wellbeing explained: their critical importance

*An individual's mental capital and mental wellbeing crucially affect their path through life. Moreover, they are vitally important for the healthy functioning of families, communities and society. Together, they fundamentally affect behaviour, social cohesion, social inclusion, and our prosperity.*

*A key conclusion of the Project is that mental capital and mental wellbeing are intimately linked: measures to address one will often affect the other. This argues for them to be considered together when developing policies and designing interventions.*

### Mental capital<sup>1</sup>

This encompasses a person's cognitive and emotional resources. It includes their cognitive ability, how flexible and efficient they are at learning, and their "emotional intelligence", such as their social skills and resilience in the face of stress. It therefore conditions how well an individual is able to contribute effectively to society, and also to experience a high personal quality of life.

The idea of "capital" naturally sparks association with ideas of financial capital and it is both challenging and natural to think of the mind in this way.

### Mental wellbeing<sup>2</sup>

This is a dynamic state, in which the individual is able to develop their potential, work productively and creatively, build strong and positive relationships with others, and contribute to their community.

It is enhanced when an individual is able to fulfil their personal and social goals and achieve a sense of purpose in society.

*Whilst it is important for Government to address problems that affect the mental development of specific groups, such as learning difficulties and mental disorders, policies and choices also need to nurture the mental capital and wellbeing in the wider population, so that everyone can flourish throughout their lives.*

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<sup>1</sup> See Chapter 2, section 2.1

<sup>2</sup> See Chapter 2, section 2.2; "Wellbeing" in this report refers to "mental wellbeing" unless indicated otherwise

### 3 Why the Project was undertaken: major challenges ahead

*Many important factors will affect the country over the next 20 years and beyond. Some will make demands on our mental capital, requiring new skills and expertise. Some will create substantial threats to our mental health and wellbeing. And some will offer new opportunities for people to develop and flourish. Assessing how to manage these opportunities and threats has been a key aim of this Project.*

Important factors that will drive change include:

#### ● The demographic age-shift<sup>3</sup>

Life expectancy is projected to grow over the next few decades: by 2071 the number of adults over 65 could double to nearly 21.3 million, and those over 80 could more than treble to 9.5 million. Over the same period, our concept of what constitutes “old age” will change, and notions of “career” and “retirement” will shift in response to longer working lives. The number of older people will also increase as a proportion of the working population, thereby creating possible tensions within society.

Two major challenges are:

- How to ensure that the growing number of older people maintain the best possible mental capital, and so preserve their independence and wellbeing. Dementia will be a major problem and will have a substantial and increasing impact on individuals, carers and families. Over the next 30 years in the UK, the number of people affected could double to 1.4 million, and the annual cost to the economy could treble to over £50 billion.
- How to address the massive under-utilisation of the mental capital of older adults, and how to reverse the continued negative stereotyping of older age. Achieving these would benefit everyone: older people themselves, business, and the rest of society. However, failure could result in a spiral of poor wellbeing, mental ill-health and exclusion; and disenchantment in this large and growing sector of the population.

#### ● Changes in the global economy and the world of work<sup>4</sup>

- Economic growth in countries such as China and India, new technologies and globalisation will continue to present major challenges to business, and to our increasingly knowledge- and service-based economy. Skill levels (both high and low) in the UK workforce will be critical to competitiveness and prosperity.
- Increasing numbers of workers will need to compete in a global market for skills. It will be crucial for them to develop their mental capital by training and retraining through their working years in order to compete effectively. Preparing people to meet that challenge will need to start early in life by fostering the best possible “disposition to learn”.

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3 See Chapter 6

4 See Chapter 5

- The relentless demands for increased competitiveness will combine with changing family commitments, such as the two-earner family and the increasing need to care for older adults. These demands will have major implications for work-life balance and the wellbeing of workers, and have knock-on effects for their families and communities.

Overall, a major challenge will be to square the circle of meeting the demands of increasingly intensive work, whilst preserving and nurturing wellbeing.

### ● **The changing nature of UK society**

The evolving mix of cultures, changing family structures, and changing patterns of migration, will drive the need to connect better across cultural groups and across generations. Several aspects of mental capital and wellbeing could contribute to this: for example, learning through life; new approaches to flexible working; and encouraging the involvement of older people in inter-generational activities. Success could create a virtuous cycle of opportunity, social inclusion and social cohesion. However, inequality of opportunity could fuel a cycle of tensions between different cultural and age groups, fragmentation of society, and social exclusion.

### ● **Changing attitudes, new values and expectations of society<sup>5</sup>**

Increasingly, we expect more from life than living healthier and longer; “wellbeing” has become one of today’s buzzwords. A major issue will be to decide on the values and expectations we are aiming to meet; and also to determine the balance of responsibility for action – between the State, employers, families and individuals.

### ● **The changing nature of public services**

The trend in recent years has been towards a model of public services based on greater levels of personal choice, active citizenship, personal responsibility, and “co-production”. This is set to continue. To work most effectively, these models of service/client relationship require the greatest number of the public to be equipped with the mental capital and disposition to participate. This calls for a policy mindset that aims to foster mental capital and wellbeing across the whole population.

### ● **New science and technology**

These will create substantial opportunities for improving how we develop our mental capital and promote mental wellbeing. For example: new understanding is already leading to new ways of addressing learning difficulties and mental disorders; advances in new technology for learning has the potential to play an important role in personalisation of education; and new technology could help everyone to flourish by changing how we socialise, work, learn and communicate.

However, arguably the biggest challenge will not be the development and implementation of these new technologies, but rather, in ensuring equality of access to the benefits. This will be critical if they are to reduce social inequalities in the future, rather than fuelling further divisions.

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5 Appendix B outlines three future scenarios that have been used to explore different possible futures for the UK.

## 4 How the Project adds value over previous work

*The Project combines a uniquely broad vision to take an independent look far into the future. In so doing, it sets out to challenge existing thinking.*

The Project's analysis has:

- Drawn upon the advice of over 400<sup>6</sup> leading experts and stakeholders from across the world, and from diverse disciplines such as: economics; modelling and systems analysis; social sciences and ethics; neuroscience, genetics and mental development; psychology and psychiatry; and sciences relating to education, work and wellbeing.
- Looked across the lifecourse: it has considered how experiences and interventions at one stage of life can affect an individual's mental capital and wellbeing for years and even decades.
- Spanned the interests of key departments across Whitehall, and of diverse stakeholders outside of Government.

The state-of-the-art in 80 areas of science have been reviewed<sup>7</sup> to develop an understanding of how mental capital and wellbeing evolve through the lifecourse, and to identify which aspects are most critical for meeting future challenges. The following sections summarise what is important at successive stages of life.

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<sup>6</sup> See Appendix A for details of those involved in the Project.

<sup>7</sup> Appendix E provides a list of the main Project reports and the 80 reviews of the state-of-the-art of science. These reports, along with a number of other Project discussion papers, workshop reports and analysis papers will be made available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

## 5 Children<sup>8</sup>

*Today's children will shape the future of the country, and their childhood is critical in setting a course for their trajectories through life. Early interventions to address learning difficulties and to help children flourish are particularly promising: for improving outcomes for children, and for offering good value for money.*

*New science has transformed our understanding of child development, learning and learning difficulties. We need to capitalise on these developments for all children: by placing more emphasis on starting early, even from birth; improving parenting, and home and nursery care environments; and combining interventions in different settings – the family, nursery care, and school. The benefits would be improved pro-social behaviour, improved attitudes to independent learning through life, and better resilience in terms of coping with the challenges of their future lives.*

*Learning difficulties are a particular problem, affecting up to 10% of children<sup>9</sup>. Yet too often they remain unidentified, or are treated only when advanced. The result can be under-achievement in school and disengagement by the child, sometimes leading to a long-term cycle of anti-social behaviour, exclusion and even criminality. Improvements in early detection combined with focused interventions could prevent problems developing and create broad and lasting benefits for the child and society.*

### 5.1 Interventions to promote the best possible mental development need to start as early as possible – mental development starts in the womb<sup>10</sup>:

- **Addressing maternal stress, diet, and smoking should be high priorities**, as these three factors are particularly crucial. Also, similar concerns exist in regard to mothers abusing illegal substances, such as stimulant drugs e.g. methamphetamine, cocaine.
- **Avoidance of alcohol exposure during pre-natal development is also potentially important**, since “foetal alcohol syndrome” (FAS) is the most common environmental cause of learning difficulties, affecting from one to seven per 1,000 live-born infants. However, a continuing controversy involves the degree to which the deficits observed in FAS conditions derive from brain damage in the womb or from the neglectful and/or non-stimulating environments provided by alcoholic mothers who continue to drink.

### 5.2 Enabling the best possible family, social and physical environments in which children are nurtured should be a priority<sup>11</sup>:

- **Parents should be offered coaching in skills, particularly those who have not experienced effective parenting skills in their own upbringing.** Early family and nursery environments are crucial, as they provide the learning environments that can nurture the social and self-regulation skills that will enable children to

<sup>8</sup> See Chapter 3

<sup>9</sup> Note: learning difficulties such as dyslexia are not the same as Special Educational Needs, which include physical difficulties and generalised intellectual disabilities. Learning difficulties are considered in the Project report: Goswami. *Learning difficulties: Future challenges*; and in the Project science reviews – Appendix E refers

<sup>10</sup> See Chapter 2, section 2.1

<sup>11</sup> See Chapter 3, section 3.4

flourish: warm and contingent caretaking, rich language, and avoiding directiveness<sup>12</sup> and punitiveness are all important and should be promoted. Conversely, adverse experiences in the post-natal period can lead to cognitive impairments: environmental risk factors include low socio-economic status, and also trauma such as childhood sexual abuse.

- **Ensuring good housing quality is likely to be important – poor housing is a key factor associated with children’s mental development, although it is not known whether the association is causal.** Housing quality could be a good proxy measure for the quality of the home learning environment e.g. lack of resources, disruptive family circumstances, lower-quality social support networks. Children living in poorer-quality housing have also been shown to have higher levels of stress hormones and behavioural problems.

### 5.3 Early identification and prompt treatment of learning difficulties in children are vital<sup>13</sup>:

Increasing effort here could substantially help to address long-term social and economic consequences for the child and for society. Two particularly important types of learning difficulty have been considered by the Project:

- **Developmental dyslexia.** This affects the literacy skills of between 4-8% of children: it can reduce lifetime earnings by £81,000, and reduce the probability of achieving five or more GCSEs (A\*-C) by 3-12 percentage points. A range of possible interventions has been identified by the Project – for both home and school.
- **Developmental dyscalculia – because of its low profile but high impacts, its priority should be raised.** Dyscalculia relates to numeracy and affects between 4-7% of children. It has a much lower profile than dyslexia but can also have substantial impacts: it can reduce lifetime earnings by £114,000 and reduce the probability of achieving five or more GCSEs (A\*-C) by 7–20 percentage points. Home and school interventions have again been identified by the Project. Also, technological interventions are extremely promising, offering individualised instruction and help, although these need more development.

### 5.4 Teachers and front-line childcare professionals should be given scientifically accredited training in fields relating to how children learn and develop, and also learning difficulties<sup>14</sup>:

The training would capitalise on the new scientific understanding in these fields. It would empower the professionals to better address the needs of individual children, and to improve learning and development trajectories. For example, there is a need to foster wider recognition that most learning difficulties in children such as dyslexia and dyscalculia are genetically transmitted, with genes subsequently interacting with environments to affect developmental trajectories.

12 “Directiveness” is ignoring the child’s focus of attention and instead directing them to focus elsewhere – see glossary of terms in Appendix D.

13 See Chapter 3, sections 3.1 – 3.3

14 See Chapter 3, section 3.5

### Looked-after children<sup>15</sup>

**Much more could be done to enable looked-after children to realise their future potential.** Only 2% of looked-after children are so placed because of their unacceptable behaviour. The majority are in care because they have been the victims of abuse, neglect and family dysfunction. Yet they are stigmatised as though they themselves are at fault, and they also experience difficulties in accessing services.

It is estimated that 45% of looked-after children have a mental health disorder; that they are 10 times more likely to have a statement of special educational need, and that their educational attainment is considerably worse than that of other children (for example, 41% attain five GCSEs [A\* to G] compared to 91% of children overall). Also, these disadvantages follow them through their lives: for example, unemployment on leaving school is four times more likely; and around one-third of prisoners were in care as children. Moreover, children who are in residential care show even more severely disadvantaged trajectories.

**This argues strongly for the need to:**

- **Increase the priority and nature of their support** with a view to improving: the promotion of good mental health; better prevention of mental disorders; and more effective help for those affected. Strengthened and systematic educational support is also needed to reduce the major inequality of educational attainment for all looked-after children.
- **Provide training to enable carers to improve developmental trajectories for looked-after children, while also supporting families.** Of particular importance are: investment in the education and skills of foster carers, adopters and residential staff; and attaching a higher value to the caring professions.
- **Foster the better use of the science and evidence base to identify the causes of these disadvantages.**

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<sup>15</sup> See Chapter 3, section 3.9

## 6 Adolescence<sup>16</sup>

*The adolescent brain has been compared to a car with a strong engine but poor steering. Science helps us to understand what is happening during this crucial period of development.*

*A “Year 8 dip” (age 12-13) in academic performance has been reported and might correspond, at least in part, to the reorganisation of the brain around puberty so that it can learn more efficiently. However, a number of important environmental factors, for example, alcohol and substance abuse, can combine to disrupt this neural reorganisation, making the brain particularly vulnerable during this critical time.*

*A key message is the need to address substance and alcohol abuse in adolescents. However, the science shows us that the changing adolescent brain specifically makes teenagers vulnerable to poor decision-making. Therefore, we need to use science to inform interventions to help adolescents to navigate their way through this difficult time.*

### 6.1 Several important factors can contribute to alcohol and substance abuse:

- There is evidence that adolescents may process reward differently to adults: immediate positive outcomes, such as peer approval, may outweigh potential, long-term, negative consequences. This difference in the anticipation of outcomes may help explain why some young people gravitate toward risky behaviours such as substance abuse.
- Other conditions such as mood disorders may predispose adolescents to substance abuse.
- Youngsters subjected to familial risk, those with affective disturbance, conduct problems, and neurotic or disinhibited personalities all appear to be at risk of escalating substance abuse.

Neuroimaging and neuropsychological studies indicate that adolescent substance use is associated with neural disadvantages, particularly in neural networks involved in learning, attention, and executive function<sup>17</sup>. Also, heavy use of cannabis during adolescence may adversely affect brain development and lead to decrements in attention, learning and memory.

Within a strategy to address the problem of alcohol and substance abuse, action to reduce availability should form an important element. This is because rates of consumption of alcohol and other substances, and hence hazardous consumption and dependence, are directly related to availability (price relative to earnings, and distribution).

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<sup>16</sup> See Chapter 2, section 2.1

<sup>17</sup> See Appendix D for a glossary of terms

### **The growing use of drugs for cognitive enhancement<sup>18</sup>**

These drugs can prove useful for healthy people, for example, in times of stress such as sleep deprivation; or for the elderly (see below). They can help combat fatigue and jet-lag, and improve attention and other forms of cognition. They are therefore becoming more widely used by people in a variety of settings including: shift workers; international travellers in business or academia; and students for studying and exams.

However, careful and critical evaluation is needed concerning possible long-term risks, which are presently unknown. In particular, their potential effect on the developing brains of children is a cause for concern. A cautious approach to their availability and use is therefore warranted.

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<sup>18</sup> See Chapter 2, section 2.1

## 7 Adults and children: mental ill-health<sup>19</sup>

*Mental ill-health can have diverse and long-term effects on individuals, families and society. Estimates place the costs at about £77 billion per year for England when wider impacts on wellbeing are included, and £49 billion for economic costs alone. The pervasive importance and long-term costs of mental ill-health in society suggest the need to reappraise the resources devoted to it: currently only about 13% of the NHS budget.*

*Many people experience mental ill-health: for example, about 16% of adults and 10% of children are affected by common mental disorders such as depression and anxiety at any one time. However, whilst all disorders are best detected and treated early, many go undiagnosed or are only treated when advanced, and when the impacts are severe for the individual and families.*

*Mental disorders are influenced by diverse biological and social risk factors, including: genetic factors; biographic characteristics (age, sex); family and socio-economic characteristics (marital status, number of children, employment); individual circumstances (life events, social supports, immigrant status, debt); household characteristics (accommodation type, housing tenure); geography (urban/rural, region); and societal factors (crime, deprivation index).*

*These diverse social factors may change over the coming years in a variety of ways, and so it is not possible to make general predictions of the prevalence of disorders. (Dementia is a notable exception – see below). Therefore, a challenge will be to develop policies that are robust to future uncertainties. A strategy that is flexible and adaptable should emphasise the following:*

### 7.1 Addressing the risk factors associated with mental disorders:

Examples include:

- Debt<sup>20</sup>. There is a strong case for Government to work with financial organisations and utility companies to break the cycle between debt and mental illness. Recent research has indicated that debt is a much stronger risk factor for mental disorder than low income. A range of possible interventions are suggested: beginning with better training for teenagers in managing finance; greater awareness of the link between mental health and debt by banks and financial institutions; and measures by utility companies to handle arrears better.
- Harnessing wider policies in Government. Common mental disorders affect 16% of the population and are affected by a wide range of issues such as employment, housing, urbanisation, exposure to crime, and debt. When policies are developed in areas such as these, there is a clear case for taking more account of the implications for mental health, as is generally the case for physical health and safety.

<sup>19</sup> See Chapter 3, section 3.8; Chapter 4

<sup>20</sup> See Chapter 4, section 4.6

## 7.2 Diagnosing early and treating promptly<sup>21</sup>:

- **Realising the considerable scope for the primary care setting to play a pivotal role in providing more integrated access to appropriate sources of help, such as social, psychological and occupational care<sup>22</sup>.** An estimated 30% of GP consultations have an underlying mental-health cause, many of which have a socio-economic basis, e.g. debt, family breakdown, trauma, bullying at work, etc. However, many GPs do not currently feel it is their job to help patients seek support to address those social risk factors. Promoting referral from primary care to social, psychological and occupational professionals could therefore be win-win: individuals would benefit from earlier and more effective treatments; GPs would have fewer repeat visits; and there could be net savings to the care budget.
- **Improving access to treatments.** This has the potential to offer particularly good value for money. As an example, the Project has considered the specific case of depression. From data in the recent King's Fund report and the 2000 Psychiatric Morbidity Survey, it is estimated that there are 828,000 people with moderate to severe depression in England, yet in 2007, for example, only 10% of guidance produced by NICE related to mental health. **Extending NICE-recommended treatment to all sufferers would deliver economic benefits well in excess of £1 billion each year, and the extra treatment costs would be vastly outweighed by higher Government revenues and reduced benefit payments. Benefits to individual wellbeing would add very substantially to this figure.**

## 7.3 Addressing important mediating factors:

For example:

- **Addressing stigma associated with mental ill-health<sup>23</sup>.** Stigma and discrimination relating to mental ill-health is widespread. It affects people's willingness to undergo diagnosis and treatment, and it can itself exacerbate some disorders. Analysis commissioned by this Project has shown that a sustained and integrated approach involving a range of different stakeholders (such as the family, employers, schools, the media) is needed.
- **Well-designed work placement, support and intervention programmes to help those with mental health problems.** Better access to work for those with mental health problems is known to offer both clinical and economic benefits; such schemes offer good value for money.

## 7.4 Targeting high-risk groups:

- **These include looked-after children, drug users, and prisoners.** Crucially, mental illnesses often go unrecognised and/or untreated in these groups, and the behaviours associated with the disorders go unrecognised and misconstrued. The individuals can then easily fall into a cycle of exclusion, inappropriate responses by the authorities, and subsequent deprivation. Breaking this cycle is a major challenge, but failure to do so will lead to substantial and long-term costs in the future.

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<sup>21</sup> See Chapter 4, sections 4.2 – 4.5

<sup>22</sup> See Chapter 4, section 4.3

<sup>23</sup> See Chapter 4, section 4.7

## Promoting positive mental health and wellbeing<sup>24</sup>

The importance of promoting positive mental health for the general population has been a consistent message throughout the work of this Project. **It is proposed that achieving a small change in the average level of wellbeing across the population would produce a large decrease in the percentage with mental disorder, and also in the percentage who have sub-clinical disorder (those “languishing”).**

Throughout this report, interventions are proposed to promote positive mental health and wellbeing for many groups, for example:

- Promoting flourishing in children.
- Fostering mental wellbeing for workers.
- Unlocking the mental capital in older people and promoting their wellbeing so that they can flourish.
- Promoting wellbeing in key front-line professions, such as teachers and doctors.

### Five ways to mental wellbeing

In addition, the Project has commissioned work to identify the wellbeing equivalent of “five fruit and vegetables a day”. The suggestions for individual action, based on an extensive review of the evidence are:

1. **Connect...** With the people around you. With family, friends, colleagues and neighbours. At home, work, school or in your local community. Think of these as the cornerstones of your life and invest time in developing them. Building these connections will support and enrich you every day.
2. **Be active...** Go for a walk or run. Step outside. Cycle. Play a game. Garden. Dance. Exercising makes you feel good. Most importantly, discover a physical activity you enjoy and that suits your level of mobility and fitness.
3. **Take notice...** Be curious. Catch sight of the beautiful. Remark on the unusual. Notice the changing seasons. Savour the moment, whether you are walking to work, eating lunch or talking to friends. Be aware of the world around you and what you are feeling. Reflecting on your experiences will help you appreciate what matters to you.
4. **Keep learning...** Try something new. Rediscover an old interest. Sign up for that course. Take on a different responsibility at work. Fix a bike. Learn to play an instrument or how to cook your favourite food. Set a challenge you enjoy achieving. Learning new things will make you more confident as well as being fun.
5. **Give ...** Do something nice for a friend, or a stranger. Thank someone. Smile. Volunteer your time. Join a community group. Look out, as well as in. Seeing yourself, and your happiness, as linked to the wider community can be incredibly rewarding and creates connections with the people around you.

<sup>24</sup> See Chapter 2, section 2.2

## 8 Adults: learning<sup>25</sup>

*Learning in adult life should not be seen in isolation, but as part of a continuum which begins in childhood and extends into old age.*

*Workers at all levels will increasingly need to be self-motivated and empowered to take personal responsibility to train and develop through their working life. This will be vital if they are to compete at all levels in the global marketplace for skills.*

*Government is already implementing important initiatives in this area; however, these could be amplified by further efforts to:*

- *Stimulate demand for learning and skills development in individuals and employers.*
- *Empower individuals to learn, through strengthening information, advice and guidance.*
- *Improve levels of basic skills.*
- *Realise the considerable potential of new technologies for learning.*

Workers will increasingly need to compete at all levels in the global marketplace for skills. However, the growth in that marketplace, together with a trend towards shorter-term jobs, will reduce the incentive for firms to continuously develop their existing workforce, thereby creating a market failure. Starting early will be crucial: it will be important to create experiences for young learners that promote their motivation and capacity to engage in learning throughout their lives i.e. promoting their “disposition to learn”.

### 8.1 Stimulating the demand for skills:

A range of possible approaches are suggested for consideration by stakeholders:

- **Targeted awareness-raising.** This could be achieved through a series of high-quality campaigns for lifelong learning. These would be targeted at specific groups within the adult population that have particular needs, or that do not engage strongly in learning e.g. people with specific English language requirements, or those towards the end of their working lives.
- **Locally-led and focused schemes using loans or financial incentives to motivate and empower individual demand.** Evidence shows that these could offer substantial potential.
- **Incentive systems for employers, building on Train to Gain.** The evidence shows that such incentives work best when embedded in a wider structure and culture of collaboration on skills.
- **The role of trade unions in raising employer demand for skills, as well as promoting learning to their members, could be developed;** particularly for types of employee that are often under-represented in education and training.

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<sup>25</sup> See Chapter 5, section 5.1

## 8.2 Empowering individuals to learn:

- **The strategic economic role of career guidance needs to be reconsidered and emphasised.** This is because the nature of careers is changing for a large proportion of the population, and because the provision of learning for adults is becoming more demand-led and more complex.
- **As careers, career expectations and opportunities change in the future, it will be important to develop new markers of career success and different criteria that reflect the diversity of the workforce and the changing aspirations of individuals.**

The announcement of the planned creation of the Adult Advancement and Careers Service from 2010/2011 is a welcome development. Importantly, the Department for Innovation, Universities and Skills (DIUS) has announced that it will be available to all adults; including those experiencing mental ill-health, who are likely to require special targeting.

## 8.3 Addressing the gap in basic skills:

Basic skills will be vital to meet the challenges of the 21<sup>st</sup> century global economy:

- Rapid changes in the job market mean that within the next 15-20 years, the prospects for employment for those with few qualifications and limited literacy and numeracy will become substantially reduced.
- Longitudinal cohort studies have repeatedly shown that poor basic skills significantly increase the probabilities that people will experience unemployment, imprisonment, and poor health – and reduce the probabilities of civic engagement.

These factors underline the need to address the gap in basic skills. However, whilst there has been some progress in recent years, around five million adults in the UK remain functionally illiterate, and almost seven million functionally innumerate.

It will be important to build upon existing progress and strategies, rather than launching entirely new initiatives. In particular, it is important for providers to engage consistently with stakeholders who represent the groups the initiatives are targeting e.g. union learning representatives.

## 8.4 Realising the considerable potential of new technologies for learning should be a priority:

These could play a major role in the personalisation of learning, promoting social inclusion for learners, and increasing productivity for both learner and teacher.

Two messages are particularly important:

- **New technologies should be driven by the needs of learners** – rather than trying to adjust learners to technologies developed for other purposes (such as the leisure or business markets). Only then are the full benefits likely to be realised.

- **Ensuring equality of access will be vital.** For example, it will be important to address the digital divide. This is still marked; people from lower socio-economic strata are less likely to have internet access than people from professional and managerial backgrounds. Also, rates of access to technology remain strongly contingent on age.

The Project has identified a number of technologies that are already making an impact on education and training, and others with potential to do so in the future. The latter category includes: ubiquitous and mobile technologies; artificial intelligence; assessment technologies; and tools to support teachers in designing and exchanging learning activities.

## 9 Adults: working life<sup>26</sup>

*People can benefit from work not only financially, but also in their general fulfilment and wellbeing. It should therefore be a priority to ensure that these benefits are available to everyone, including those with mental health problems. There is strong evidence that programmes to encourage and support people with mental health problems into work offer very high economic and social returns: these programmes should be expanded and intensified.*

*The world of work is changing, with far-reaching consequences: globalisation and the growing intensification of work will combine to increase workers' levels of stress and anxiety, and affect their health and efficiency. Changes in the nature of work will also interact with changes at home, such as growing numbers of two-earner households and increased need for care for older relatives, thereby creating pressures on families. Maintaining and improving wellbeing in the face of these trends will be a major challenge. The Project therefore proposes a range of interventions to encourage employers to promote wellbeing in their workforces.*

*A Government lead in promoting wellbeing in its own workforce would be win-win: besides benefiting the considerable number of public sector employees and the performance of its own business, it would set an important example to the private sector.*

### 9.1 There is a strong case for expanding activities to improve access to work for those with mental health problems:

There is a great deal of evidence that interesting and fulfilling work can be generally beneficial for mental health, and that measures to help people with mental health problems into work offer high returns. Supported employment schemes such as Individual Placement and Support have been shown to deliver both long-lasting economic benefits and clinical improvements.

### 9.2 Ensuring mental health in the workplace:

Poor conditions in the workplace can cause stress and exacerbate mental health problems, and so limit the benefits of working. Also, in the future, changes in the economy and increasing global competition may increase these dangers, with substantial risks to the wellbeing of individuals and their families, competitiveness, levels of employment, and benefit payments.

Employers should be encouraged to foster work environments that are conducive to good mental wellbeing and the enhancement of mental capital. Following consultation with key stakeholders, promising suggestions are set out below. Economic benefits are difficult to quantify, but analysis of the first three suggest they may be very cost-effective due to reductions in the costs of presenteeism<sup>27</sup>, labour turnover, recruitment and absenteeism.

<sup>26</sup> See Chapter 5, section 5.2

<sup>27</sup> "Presenteeism" is defined as the potential lost productivity that occurs as a result of an individual being less than totally productive while being at work.

- **The collection of wellbeing data against Key Performance Indicators and the undertaking and implementation of annual wellbeing audits.** There is clear evidence that once people fall out of work due to mental disorders, they can lapse into long-term absences, or may never return to work. However, this initiative would help prevent this, and enable people to remain in work. Employers in both the public and private sectors should therefore be encouraged to carry out an annual stress and wellbeing audit, and to act on its findings. Standardised auditing instruments of the Health and Safety Executive (HSE) or others should be used to identify if there is a problem, and if so, the source of the problem.
- **Integration of occupational health professionals with primary care.** This is a subset of the primary-care intervention mentioned above (see Section 7 on mental ill-health). Here it would have two components:
  - The co-ordination of employment advisors/occupational health professionals and clinical psychologists with GP practices to facilitate the early identification of workplace stress and mental ill-health in patients (such co-ordination need not include physical co-location).
  - The employment advisors/occupational health professional would, with the agreement of the patient, approach the relevant employers and work with them to address those aspects of the workplace environment that are affecting mental health.

Importantly, this intervention would seek to address the underlying problems in the work environment, thereby potentially also benefiting co-workers.

- **Extension of flexible working arrangements.** Two possible variants have been considered:
  - The extension of the right of all employees with children at or below the age of 18 to request flexible working arrangements, and the duty of employers to consider these requests. This would build on the recent legislation that has extended the right to request flexible working arrangements for all working parents of children at or below the age of 16.
  - A second variant would grant all working people this right.

Economic analysis of these options suggests that better rates of return could be obtained and the economy strengthened, particularly if the right to request was extended to all.

### 9.3 Other suggested interventions (for which economic analysis has not been performed):

- **Better training for managers so they understand the impact they can have on mental capital and wellbeing.** A possible way to promote the training for managers in social and interpersonal skills would be to extend the Train to Gain programme so that employers, particularly small and medium-sized enterprises (SMEs), can obtain partial funding for this.
- **Raising the profile of the importance of mental health and wellbeing at work.** This addresses the concern, which is supported by evidence, that levels of mental ill-health and mental wellbeing in the workplace are insufficiently recognised by employers. One possibility would be to encourage companies to include wellbeing indicators in their annual reports – thereby benchmarking their performance for shareholders, and showcasing any improvements.
- **The establishment of a Workplace Commission.** This would: raise awareness of the importance of mental capital and wellbeing at work; promote stress audits; and help SMEs to act on the findings of those audits.

## 10 Older adults<sup>28</sup>

*By 2071, the number of people over 65 could double to nearly 21.3 million, while the number of people aged 80 and over could more than treble to 9.5 million. However, this expanding group will be beset by two major challenges:*

- *The increasing prevalence of cognitive decline, particularly due to dementia will be critical. However, other mental disorders, notably depression and anxiety will also be important: addressing the relatively poor access of older adults to treatment (compared with younger adults) should be an immediate priority.*
- *The need to reverse the continued negative stereotyping and massive under-utilisation of their mental capital: this is crucial so that the considerable mental resources of older people are recognised and unlocked for the benefit of themselves and society.*

*A new mindset is needed: involving a rethink of “older age”, and addressing the stigma associated with it.*

*At a strategic level, there is a strong case for a step-change in the governance of older people in order to promote their wellbeing and unlock their mental capital. In particular, a high-level lead within Government will be important to ensure sustainable long-term action that is integrated across Government and which adopts a lifecourse perspective.*

### 10.1 Addressing cognitive decline should be high priority<sup>29</sup>:

This is set to rise substantially with the ageing population, and dementia will be a particular problem, as age is a key risk factor. Over the next 30 years, the number of people with dementia in the UK could double to 1.4 million, with major impacts on those affected, their families and carers. It also constitutes an expenditure time bomb; over the same period, costs to the UK economy could treble from £17 billion a year today, to over £50 billion a year. For these reasons, the current development of a national strategy for dementia is particularly welcome. However, in view of the magnitude of the challenge, a high-level commitment to resource its findings will be crucial.

A review of evidence in this Project suggests that such a strategy should include:

- **Starting early in life.** It would be a mistake only to address the risk factors of cognitive decline when they occur in old age. Examples would include encouraging exercise in middle age in order to promote a healthy cardiovascular system, and encouraging education and learning through the lifecourse to promote cognitive reserve.
- **The development and use of new methods for early diagnosis (biomarkers) of cognitive decline and dementia.** Biomarkers will facilitate the development, testing and use of new treatments; however, they are costly and risky to develop. A more focused approach to research, involving a partnership between the research

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<sup>28</sup> See Chapter 6

<sup>29</sup> See Chapter 6, section 6.2

community and industry, would help to focus effort and realise efficiency savings, both in terms of research effort and development costs.

- **The effective and timely use of new treatments to arrest the progression of dementia.** A priority should be to develop and use treatments to slow or arrest decline *in the early stages*, before quality of life suffers substantially, and before sufferers become dependent on families and state. Also, there is a case for reviewing how we make decisions on the provision of new treatments.
- **Consideration should be given to the development and use of pharmacological and other types of cognitive enhancers for older people experiencing decline.** The benefits could be considerable for this age group in the future. Moreover, in the case of pharmacological enhancers, the balance of risks and benefits when used by older adults could be quite different compared with their use by children (see above).

## 10.2 Addressing other forms of mental ill-health in older adults will also be important<sup>30</sup>:

As mentioned above, mental disorders such as depression and anxiety will continue to be particular problems for older people, particularly since they can be associated with factors associated with older age, such as physical and mental decline.

Targeted action is needed now to improve access to treatments for these and other mental disorders, so that long-term impacts are avoided. Such action will be a critical component in a wider strategy to improve mental wellbeing in older adults (see below). Pharmacological and psychological treatments that are matched to the needs of older people are likely to be important.

## 10.3 There is a strong case to develop a strengthened strategy for promoting the mental capital and wellbeing of older people<sup>31</sup>:

Here, unlocking the mental capital in older people and promoting their wellbeing are considered together since they are intimately linked: many interventions that target one, will also improve the other. This Project has identified a large number of possible initiatives that should be considered. Older people themselves have helped to refine these ideas through a consultation exercise. The initiatives are too numerous to list in this Executive Summary, but are grouped into the following categories:

- **Promoting social networking.** Scientific and other evidence shows the importance of social networking in promoting mental capital and wellbeing in older adults, and indicates three specific types of intervention that are successful:
  - Group interventions involving educational and social activity, targeting social isolation and loneliness.
  - Volunteering.

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<sup>30</sup> See Chapter 6, section 6.3

<sup>31</sup> See Chapter 6, section 6.4

- Interventions that promote trusting relationships, frequent contacts with friends, and which seek to improve the quality of social relationships.
- **Encouraging and empowering older people to engage better in learning.** Evidence shows that learning can help to promote wellbeing, as well as protecting against normal age-related cognitive decline. Furthermore, when learning takes place in social settings, it can promote wellbeing indirectly through social networking. As elsewhere, initiatives that take account of the particular needs of older people will be important.
- **Promoting valued and valuable engagement, enabling people to work if they wish. There is a case for Government to review the right of older adults to continue working.** This could yield a quick win: both the wellbeing and the mental capital of older workers would be promoted, with consequential benefits to wider society.

*A key message is that unlocking the mental capital of older people need not incur net costs: interventions could benefit families, business, wider society, and Government, as well as older people themselves. Older people should be a key resource used for planning and implementing new interventions.*

#### 10.4 Promoting environments to enable older people to flourish<sup>32</sup>:

If older people are to flourish sustainably, then the various environments in which they live, learn, socialise and work need to support this aim. The policies of many parts of Government will be critical in achieving this:

- **Achieving a physical environment that meets the needs of older people.** Because it can take decades rather than years to substantially change the built environment, the needs of the growing number of older people need to be at the heart of long-term plans being developed now. A range of different scales need to be considered – houses, open spaces and town planning. Examples of initiatives could include:
  - Improving the design of homes and towns to meet the needs of older people; older people themselves are a key resource to advise on this.
  - Improving access and “reach-ability” to public spaces.
  - Better provision of training for decision-makers who influence the physical environment.
- **Promoting good work environments.** Employers could benefit considerably from the skills of older people, and realise savings due to reduced “churn” in employees. The following will be important in promoting the right work environments:
  - Education of employers will be critical so that they understand the benefits of older workers, and understand how to match work and working environments to the needs and capabilities of older adults.

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32 See Chapter 6, section 6.5

- The extension and development of “middle years” and “pre-retirement” training.
  - Helping employers to recognise the importance of investing in the training of older workers and to understand better their training needs. This could contribute substantially to making lifelong learning a reality.
  - Encourage “employment centres” (physical and online) to advise older people on work opportunities, training and retraining.
- **Harnessing the considerable potential of information and communications technology (ICT).** The development of new products and services should be encouraged to: enable the elderly to remain socially and economically active for longer; create new opportunities for learning; and to promote their wellbeing. However, promoting equality of access and opportunity will be vital to counter a possible “digital divide” and to enable all older people to benefit. Older people could themselves provide a valuable resource in helping to design and trial applications specifically for older users, and in promoting their uptake.
  - **Addressing the stigma associated with older age, both within older people themselves, and also within wider society.** Substantial and sustained efforts over many years will be needed to reverse the negative stereotyping of older people in society. However, this will be vital within a wider strategy to improve their wellbeing. Methods developed by the Project (for addressing stigma associated with mental disorders) could be adapted and used to develop an integrated approach involving teachers, families, the media, Government, and older people themselves.

## 11 Key choices for policy makers<sup>33</sup>

*The Project has identified a number of fundamental issues and choices that cut across Government and its decision-making process: these are outlined below. However, whilst the resolution of some of these is outside of the scope of the present Project, they will nevertheless condition how best to proceed, and will need to be addressed if the full benefits are to be realised from this report. They are therefore provided here as a stimulus to further debate.*

### *Who needs to act?*

*The picture is mixed: there is a clear rationale for action by Government in some areas, and for companies and individuals elsewhere. But in many cases, it will be important for different parties to work together in concert. Overall, it will be crucial to be clear about the balance of action, and to ensure adequate information and incentives to make action happen.*

### Government

The analysis suggests that action to improve mental capital and wellbeing could have very high economic and social returns. The high costs, for example of mental illness and learning difficulties, are not sufficient in themselves to establish the case for further intervention. However, the final Project report demonstrates a clear economic case for Government intervention and, importantly, that there are cost-effective measures it can take where the economic and social benefits are likely to significantly exceed the costs involved.

The economic rationale for Government intervention to improve mental capital and wellbeing is based on a combination of equity and efficiency arguments. Equity considerations suggest that those who are particularly prone to suffer from stigma, reduced wellbeing, and economic loss because of mental health problems or learning difficulties should not be required to bear those losses without support for themselves or for their informal (often family) carers. Such people are often among the poorer in society. The main efficiency arguments relate to the wider social and economic benefits of action, which go well beyond those accruing to the people directly affected, and the need for better information about impacts and potential remedies.

### Personal and corporate responsibility

Despite the rationale for action by Government, the analysis has made it clear that companies and individuals may also need to act and have clear incentives to do so. Three examples are provided:

- In the field of learning, individuals can substantially increase their employability and earnings potential by improving their skills and mental capital, and companies can benefit from helping their employees to train and retrain through their working lives. However, there is a wider social and economic case for Government to help individuals to recognise and take advantage of these benefits, supporting them in childhood and empowering them to take control of their own learning and

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33 See Chapter 7

retraining in later years; and to provide companies with stronger incentives which take full account of the wider benefits involved.

- People have clear incentives to adopt lifestyles in mid-adulthood that will prepare them for older age, and protect them against mental decline. An example here is exercise, which helps to stimulate the cardiovascular system and confer protection against normal cognitive decline. However, people apparently tend to discount these long-term benefits rather heavily, and there is a good case on wider economic and social grounds for Government encouragement and incentives so that they are accorded a higher priority.
- Companies have a strong incentive to adopt working practices that look after the mental health and wellbeing of their employees. It makes them more productive and increases the company's competitiveness. However, provision of Government support and advice may be needed to ensure that companies also factor in the wider benefits for individuals and society.

### Diverse players acting in concert

In general, the greatest benefits will be obtained when concerted actions are taken by a range of different stakeholders in particular contexts. The Project has identified a number of instances where an integrated approach will be vital. Two examples are:

- Early child development: as indicated above, there is a case for interventions that adopt basic principles (such as responsiveness and warmth), to be integrated in different settings – in the family, school, and inter-generationally.
- In addressing the stigma of mental health, an integrated approach is needed involving a range of stakeholders: parts of Government, the media (such as television and radio), mental health professionals, and educators.

***What criteria should underpin policy development in a situation where resources are inevitably constrained?<sup>34</sup>***

***Choices concerning interventions, and the amount of resources assigned to them, will need to be made against a background of evolving public expectations, and the values to which society will aspire over the next 20 years. There is a strong case for Government to consider these further as part of its consideration of this report.***

For example:

- How should we balance resources between: helping those with the most chronic or acute problems; preventing problems developing; and shifting the overall level of wellbeing for the entire population? This latter option, for example, could substantially transform the outlook for a large proportion of the population, but care would be needed to ensure that it was not at the expense of providing the right level of treatment and support for those with disorders.

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34 See Chapter 7, section 7.1

- How should we allocate resources between different life stages? There is a strong case to invest in young people as this will set the course for their future wellbeing and productivity. However, it also makes sense to fully use the mental capital that exists already in people of older ages. Since most people in today's society have a high likelihood of reaching advanced age, investing at later life stages has the potential to benefit many.
- In deciding priorities, appropriate weight needs to be given to factors such as social inclusion, social cohesion and individual wellbeing, as well as to economic prosperity. This will be particularly important for allocating resources for mental capital and wellbeing policies across different age groups, though the general case for acting early in the lifecourse will remain. However, more work is needed to understand and quantify the value of such benefits in the assessment of particular courses of action.

*When Government allocates resources for interventions relating to mental capital and wellbeing, how broadly should it value impacts across society, and how should it value very long-term benefits?<sup>35</sup>*

For example:

- There is a common tendency for people to discount unduly heavily the (known) long-term effects on their future mental capital and wellbeing of lifestyle choices such as: failing to exercise; taking drugs and the excessive use of alcohol; and of failing to enhance skills and take advantage of training opportunities over the lifecourse. Government policy should adopt measures which help correct for that tendency, and give greater weight to longer-term benefits, using the standard approach to social discounting.
- Interventions that enhance the learning, development and resilience of children could have substantial economic and social implications over many decades: reducing later costs for the criminal justice system, the social and healthcare systems, mental health at work, improving lifetime earnings, and even in protecting against cognitive decline in old age. These need to be taken fully into account.
- There is also a very strong case for more intensive adoption of best-practice treatments for common mental disorders; and well-tested programmes for helping those with mental illnesses into work which offer the prospect of high returns over many years.
- Early identification of mental health risks and conditions, for example, through biomarkers, has the potential to enable earlier and more effective interventions which deliver benefits over longer periods. This potential needs to be given full weight in the allocation of research funding.

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35 See Chapter 7, section 7.2

*To what extent should wider policy choices across Government take account of mental capital and wellbeing?<sup>36</sup>*

*The pervasive impacts of socio-economic, cultural and environmental conditions on mental capital and wellbeing illustrate the need to widen the range of circumstances in which impacts on mental health are factored into economic appraisals of public sector policies and projects. However, more evidence is needed to do this effectively.*

Several examples illustrate the need to take better account of implications for mental capital and wellbeing when developing policies across Government:

- Common mental disorders are extremely costly e.g. depression in England accounts for about £9 billion per year; mainly in lost productivity. However, the evidence shows that they are crucially affected by factors which are influenced by policies in diverse areas unrelated to mental healthcare e.g. employment and the economy; housing; welfare; and criminal justice.
- There is a good case to intervene in areas such as personal debt and financial literacy, specifically to break the cycle with mental ill-health. Similarly, interventions to improve the physical environment could offer benefits to mental health. However, such cases offer particular challenges, since the principal benefiting Government department would be different from the departments that would resource the intervention.
- New evidence confirms that early child-parent and child-carer relationships are particularly important to later flourishing, both socially and cognitively. It has also informed understanding of causal mechanisms. However, these relationships are affected by many factors, including lack of knowledge by some parents and teachers regarding effective parenting and child development, teenage parenting, sub-optimal child care settings and low pay levels for childcare workers.

*There is a need to improve coordination and to align better incentives in the implementation of policies for mental capital and wellbeing<sup>37</sup>. For example, the incentives facing different departments (at present through the Public Sector Agreement system) need to be aligned as far as possible to embody a consistent and comprehensive approach in this context.*

*Crucially, success in managing this agenda and delivering real improvements in mental capital and wellbeing will require strong political leadership and coordination at the centre of Government.*

At the level of central Government, at least half of the 30 departmental Public Sector Agreements (PSAs), led by eight separate departments, have potential implications for mental capital and wellbeing, but not all of them recognise this explicitly. Inclusion of mental capital and wellbeing explicitly in these PSAs, supported by appropriate Key Performance Indicators and monitoring frameworks, should be considered.

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<sup>36</sup> See Chapter 7, section 7.3

<sup>37</sup> Ibid

More radical possibilities that should be explored include:

- The development of a joint PSA across Government geared to improving mental health and wellbeing; and
- The development of an over-arching mental capital and wellbeing measure, akin to the Communities and Local Government Index of Multiple Deprivation.

*How might we address future challenges in those cases where today's science does not provide clear advice?*

In general, interventions need to be evidence-based and include a careful appraisal of costs and benefits. However, whilst science tells us a great deal, many uncertainties remain. In particular, evidence on the cost-effectiveness of mental capital and wellbeing interventions is generally sparse, certainly for the UK. A very high priority should therefore be assigned to improving that evidence base.

Where uncertainties remain, it is often desirable to trial new approaches in ways that further understanding. Also, more emphasis on rigorous evaluation of existing and proposed new interventions is required. Both will require a high-level commitment to careful planning and, where relevant, a step-by-step roll out.

## 12 Conclusion: next steps for Government<sup>38</sup>

*Promoting mental capital and mental wellbeing for everyone will be vital in meeting diverse future challenges facing our changing society. This report and its supporting papers identify a large number of evidence-based suggestions for new policies and interventions. The findings have already begun to inform a number of Government reviews and activities: the Project's Stakeholder Engagement document<sup>39</sup> provides a list and includes others that are planned.*

*However, the full benefits offered by this report cannot be realised by a piecemeal approach by individual parts of Government. Instead, a step change in both social and economic outcomes could be achieved through a more strategic and visionary approach involving:*

- *Better use of scientific and other evidence to plan and link interventions that affect mental capital and wellbeing through the lifecourse.*
- *Better decision making, drawing upon better economic analysis of interventions, to take account of wider and longer-term benefits.*
- *Improving the promotion of cross-Government action and central coordination.*

Realising this new approach and the full benefits from this Project will not be easy. There will be substantial difficulties that would need to be overcome, particularly relating to the three areas listed above. For this reason, the following suggests a number of practical steps that constitute a roadmap for further action by Government:

*a. There needs to be a high level commitment and lead in Government to oversee the development and effective implementation of this new approach.*

This will be vital to integrate policies and interventions effectively across the lifecourse, and across the interests of delivery departments. It will also be important to mesh this over-arching approach with the many existing initiatives and policies. The intention would not necessarily be to require new resources, but rather to bring the many existing initiatives together within a common vision and framework, to reassess the balance of priorities, and to identify and address gaps.

*b. Government needs to act now to prepare society for future challenges, and to prevent problems affecting individuals becoming long-term<sup>40</sup>.*

For example:

- We need to prepare today's children so that they are set on the best possible trajectories to meet the challenges ahead. The early years of development are critical.
- In some areas where the situation is set to worsen, such as the growing number of older people at risk of dementia, we need to act decisively – new treatments could take years to become available, and protective lifestyles need to be established now for those in middle age.

38 See Chapter 8

39 The Stakeholder Engagement document will be made publicly available through [www.foresight.gov.uk](http://www.foresight.gov.uk)

40 See Chapters 3 – 6

- We need to address problems affecting people's mental capital and wellbeing (e.g. relating to learning difficulties and mental health), so that they do not become entrenched and so that we avoid their impact over coming decades.

**c. *The new strategic approach needs to be informed by an early debate to decide its breadth, and the values and expectations of society that it will seek to address*<sup>41</sup>.**

For example, issues such as the balance of roles and responsibilities between the State, the individual and employers will be important. Also, there is a case for Government to engage with the wider society to agree priorities. For example, it will be important to be clear about the relative value of issues such as economic prosperity, wellbeing, social cohesion and inclusion – so that clear principles for the division of resources can be determined.

**d. *Work should be commissioned to provide economic assessments of potentially worthwhile interventions*<sup>42</sup>.**

This will be crucial so that benefits of policies and interventions are maximised – both across society (for example, to include the impacts on carers and business), and across the lifecourse. This may require the development of new economic evidence relating to the values that the strategy will target (see above).

**e. *New ways of incentivising Government departments need to be worked out, so that effective and sustained action results*<sup>43</sup>.**

In particular, it will be important to build upon the existing Public Sector Agreement framework to better address the issue of a given department resourcing interventions that address the priorities and interests of other departments.

**f. *Where possible, the development and implementation of the new approach should be inclusive.***

This suggestion recognises the trend towards more active citizenship. A particular example concerns older adults: they should play a central role in developing and implementing the components of the strategy that affects them.

**g. *A mechanism should be adopted to oversee the rigorous use of science and other evidence.***

This would be important to inform choices made within the new approach; and to promote the effective use of economic analysis and randomised control trials to assess interventions.

**h. *When new policies and interventions are developed for optimising mental capital and wellbeing, their implications for social equity and social inclusion should be systematically assessed.***

For example, the promotion of mental capital and mental wellbeing could be used explicitly as a tool to reduce divisions and exclusion in society. However, it could have the opposite effect if only certain groups were able to benefit. Access to new technology for learning is a clear example: if available to all, it could unlock opportunities for the disadvantaged, but if only available to the privileged, it could widen social divisions.

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41 See Chapter 7, section 7.1

42 See Chapter 7, section 7.2

43 See Chapter 7, section 7.3

- i. *There should be a long-term commitment to build upon the existing scientific and other evidence base<sup>44</sup>.*

Addressing gaps and uncertainties will be important and specific areas of further research are suggested in the final report. However, a strategic need that cuts across Government would be to update and strengthen the long-term strategy for large-scale, longitudinal studies.

*In conclusion, when a Foresight project is started, it is not known where the scientific and other evidence will lead. Here, it has provided a vision of a future that is beset with many major challenges and uncertainties. However, two consistent themes have emerged throughout: on the one hand the considerable vulnerability of our mental resources and mental wellbeing to those challenges; but on the other hand, the potential of those same resources to adapt and meet those challenges, and indeed to thrive. This central importance of mental capital and mental wellbeing to the future of individuals and to wider UK society argues strongly for them to be considered at the heart of policy development in Government.*

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44 See Chapter 7, section 7.4

# 1 Introduction

1.1 Project aims and ambitions

1.2 Why the Project was needed

1.3 Definitions of important terms used in this report

1.4 The technical approach to the work



# 1 Introduction

Chapter 1 explains why the Project was undertaken, and sets out its aims and ambitions. It explains how the Project adds value over other work, both in the UK and abroad.

The technical approach to the work is outlined, including who was involved, and how the work was structured. In so doing, the subsequent chapters of this report are introduced.

# 1 Introduction

## 1.1 Project aims and ambitions

The aim of the Foresight Project on Mental Capital<sup>45</sup> and Wellbeing<sup>46</sup> has been to use the best available scientific and other evidence to develop a vision for:

- The opportunities and challenges facing the UK over the next 20 years and beyond, and the implications for everyone's mental capital and mental wellbeing.
- Signposts to what we all need to do to meet the challenges ahead – Government, parents, individuals and business.

In so doing, the Project has considered:

- How everyone can realise their greatest mental potential and wellbeing and flourish throughout life – what is most important at different ages.
- How to realise the substantial benefits offered by new approaches to the prevention, early detection, and early treatment of learning difficulties and mental disorders.
- How to better address chronic and acute problems associated with our mental capital and wellbeing.

The implications are far reaching, relating to: economic competitiveness and prosperity, social cohesion and inclusion, mental health, levels of behaviour and criminality, and the wellbeing of individuals and society.

The Project provides an independent analysis of the challenges over the next 20 years and beyond, and how they might best be addressed. As such the findings do not constitute Government policy. Rather, they are intended to inform the strategic and long-term choices facing Government departments.

The Project adds value over existing studies in three important ways:

- Its breadth of scope is possibly unique: it has combined the advice of around 400 leading experts and stakeholders from across the world<sup>47</sup> and from diverse disciplines, including: economics and social sciences; ethics; neuroscience and genetics; psychology and psychiatry; systems analysis and futures analysis; as well as sciences relating to learning, work and wellbeing.
- Looked across the lifecourse: it has considered how experiences and interventions at one stage of life can affect an individual's mental capital and wellbeing for years and even decades.

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45 "Mental capital" refers to the totality of an individual's cognitive and emotional resources, including their cognitive capability, flexibility and efficiency of learning, emotional intelligence (e.g. empathy and social cognition), and resilience in the face of stress. The extent of an individual's resources reflects his/her basic endowment (genes and early biological programming), and their experiences and education, which take place throughout the lifecourse; see Appendix D for a glossary of terms.

46 "Wellbeing" in this report refers to "mental wellbeing" unless indicated otherwise. It is a dynamic state in which the individual is able to develop their potential, work productively and creatively, build strong and positive relationships with others, and contribute to their community. It is enhanced when an individual is able to fulfil their personal and social goals and achieve a sense of purpose in society.

47 See Appendix A for a list of experts and stakeholder who have been involved in the Project.

- Spanned the interests of key departments across Whitehall, and of diverse stakeholders outside of Government. In particular, the Project has developed a proposal for a new cross-Government strategy for mental capital and wellbeing.

Before describing the Project, a word of caution should be noted. It is impossible for such a broadly scoped project to consider the range of issues and disciplines in the same detail as the more focused work of individual Government departments. Rather its insights should be seen as complementary: looking further into the future, challenging existing thinking, and providing signposts to important issues and to promising approaches.

## 1.2 Why the Project was needed

A number of major drivers of change will affect the UK over the next 20 years and beyond – see below. These will create substantial challenges for the country, and the contention at the start of the Project was that our individual and collective mental capital and wellbeing will be critical for addressing them. This has proved correct. The drivers are:

- **The demographic age-shift**

Life expectancy is projected to grow over coming decades: by 2071 the number of adults over 65 could double to nearly 21.3 million, and those over 80 could more than treble to 9.5 million. The number of older people will also increase as a proportion of the working population, creating substantial tensions within the wider society.

Two major challenges will result:

- How to ensure that the growing population of older people maintain the best possible mental capital, and so preserve their independence and wellbeing. Dementia will be a substantial problem and will have a major and increasing impact on individuals, carers and families. Over the next 30 years, the number of individuals affected in the UK could double to 1.4 million, and the annual cost to the economy could treble to over £50 billion.
  - How to address the continued negative stereotyping of older people, and the massive under-utilisation of their mental capital. Meeting this challenge would benefit everyone: the wellbeing and prosperity of older people, business, the rest of society, and the Exchequer. However, failure could result in a spiral of poor wellbeing and mental health and exclusion; and disenchantment in this large and growing sector of the population.
- **Changes in the global economy and the world of work**
  - Economic growth in countries such as China and India, new technologies, and globalisation already present major challenges to the competitiveness and ways of working of business and our increasingly knowledge- and service-based economy. Skill levels (both high and low) in the UK workforce will be critical to competitiveness and prosperity.
  - Many employees will increasingly need to compete in a global market for skills. Training and retraining through the working years will be crucial to compete effectively.

- The intensification of work will combine with the changing nature of family commitments, such as the two-earner family and increased need to care for the elderly. This will present major challenges to work-life balance and the wellbeing of workers – with knock-on effects in their families and communities.

A major challenge will be to square the circle of meeting the demands of increasingly intensive work, whilst preserving and nurturing mental wellbeing.

- **The changing nature of public services**

The trend in recent years has been towards a model of public services based on greater levels of personal choice, active citizenship, personal responsibility, and “co-production”. This is set to continue. These models of service/client relationship presuppose a public equipped with the mental capital and disposition to participate. This calls for a policy mindset that aims to foster mental capital and wellbeing across the whole population.

- **The changing nature of UK society**

The evolving mix of cultures, changing family structures, and changing patterns of migration will drive the need to connect better across cultural groups and across generations. This report has identified several aspects of mental capital and wellbeing (MCW) that could contribute to this: for example, learning through life; new approaches to flexible working at work; and encouraging the involvement of older people in inter-generational activities. However, equality of opportunity will be key. Success could create a virtuous cycle of equality of opportunity, social inclusion and social cohesion. However, failure could fuel a cycle of tensions between different cultural and age groups, fragmentation of society, and social exclusion.

- **Changing attitudes, values and expectations of society**

We increasingly expect more from life than living healthier and longer – “wellbeing” has become one of today’s buzzwords. A major issue will be how to balance responsibility for meeting our changing expectations – between the state, employers, families and individuals.

- **New science and technology**

These will create both substantial challenges and opportunities associated with the development of our mental capital and wellbeing. For example: they are already leading to new ways to address learning difficulties and mental disorders; advances in the technology for learning have the potential to play an important role in personalisation of education; and new science and technology could help everyone to flourish by changing how we socialise, work, learn and communicate. However, these new developments will also create challenges; for example, ethical concerns, and issues surrounding equality of access to the developments. An important challenge will therefore be to exploit these advances across the field of mental capital and wellbeing, whilst managing these concerns and issues.

Looking across the above drivers of change, the Project has shown that if UK citizens are to meet the above challenges and thrive in this increasingly competitive and dynamic world, then we cannot afford to waste resources: and this is as true for our mental capital as for material resources. Encouraging and enabling everyone to realise their potential will be crucial.

### 1.3 Definitions of important terms used in this report

Because the Project has involved diverse experts from countries across the world, it has been essential to establish an agreed body of definitions which underpin the analysis. These are described in the glossary of terms (see Appendix D). Two are particularly important and are defined as follows:

- **Mental capital** refers to the totality of an individual's cognitive and emotional resources, including their cognitive capability, flexibility and efficiency of learning, emotional intelligence (e.g. empathy and social cognition), and resilience in the face of stress. The extent of an individual's resources reflects his/her basic endowment (genes and early biological programming), and their experiences and education, which take place throughout the lifecourse.
- **Wellbeing** in this report refers to "mental wellbeing" unless indicated otherwise. It is a dynamic state in which the individual is able to develop their potential, work productively and creatively, build strong and positive relationships with others, and contribute to their community. It is enhanced when an individual is able to fulfil their personal and social goals and achieve a sense of purpose in society.

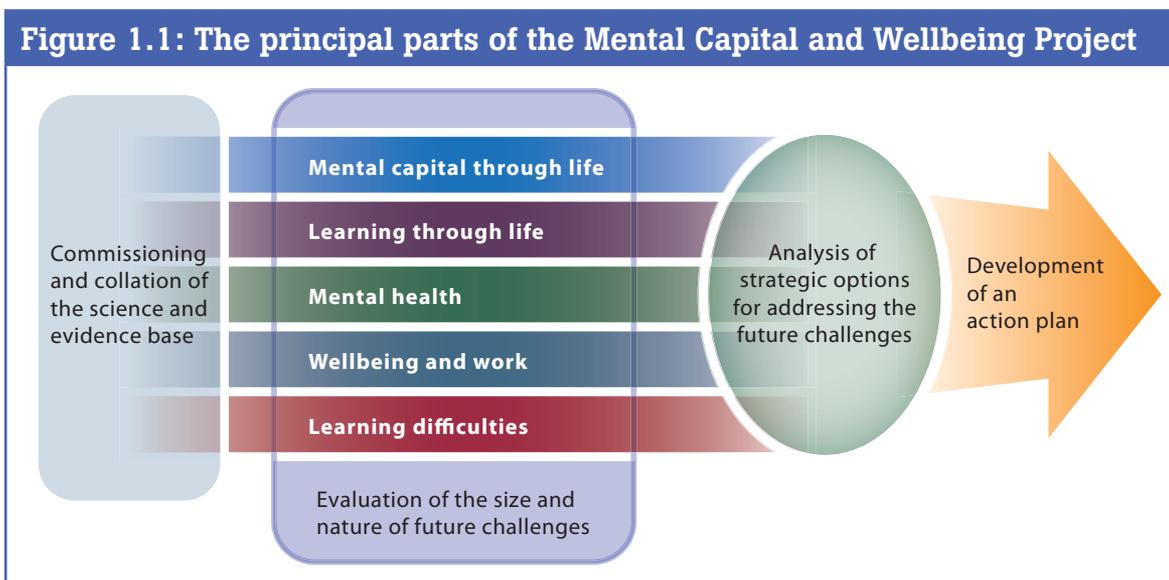
These two terms are closely linked; each affecting the other (see Chapter 2 where they are discussed more fully).

In addition, the term "**future**" has been used as follows:

- When considering socio-economic factors that affect mental capital and wellbeing, the Project has generally looked ahead 20 years; it was felt that in most cases, looking beyond that timescale would lack credibility. An exception to this is the demographic shift in the age of the population, for which projections beyond 20 years are considered robust.
- In contrast, when considering the benefits of possible interventions, the analysis has looked up to 100 years ahead. This is because interventions affecting a foetus or young child may have implications through the lifecourse. On this basis, a lifespan of up to 100 years for children born now was not considered unreasonable.

## 1.4 The technical approach to the work

The principal parts of the Project are set out in Figure 1.1.



### 1.4.1 Analysis of future challenges – Phase 1

The starting point for the work was to generate an understanding of how mental capital and wellbeing (MCW) can change through life, and to develop a vision for how the size and nature of the challenges to MCW could evolve over the next 20 years. This analysis was predicated on the assumption that existing policies and overall expenditure remain broadly unchanged. To make this analysis tractable, it was initially divided into broad areas that mapped onto the interests of relevant Government departments (second box from the left in Figure 1.1). Each was headed by leading experts in their respective fields. The five areas were<sup>48</sup>:

- Mental capital through life.
- Learning through life.
- Mental health.
- Wellbeing and work.
- Learning difficulties.

A summary of the key findings from each of these areas, as well as important aspects that cut across them, is provided in Chapter 2. An important observation from Phase 1 was that each of the five interact intimately with each other.

In order to inform the Phase 1 work, the lead experts commissioned approximately 80 short papers from acknowledged experts worldwide. These papers mostly reviewed the state-of-science in their respective fields and, where appropriate, also commented on possible future developments. A small number considered specific developments in science that were considered to be of particular interest, and some addressed cross-cutting issues, such as the economic costs of mental ill-health and aspects of wellbeing. Together, all of these papers constitute a series of relatively short peer-reviewed papers that are comprehensible to the non-specialist reader and which provide an up-to-date

<sup>48</sup> Project reports were written summarising the findings for each of these five areas; Appendix E refers.

overview of relevant research. The structure and topics of the Project reports and papers are provided in Appendix E and on the Foresight website ([www.foresight.gov.uk](http://www.foresight.gov.uk)).

A company, shiftN, which specialises in systems analysis, also worked closely with the lead experts to capture key aspects of each of the five areas in a range of graphical visualisations<sup>49</sup>.

#### 1.4.2 Analysis of possible interventions – Phase 2

The second phase of the work analysed interventions which related to particularly important challenges identified in Phase 1; these challenges were chosen in close consultation with a range of stakeholders, both within and outside of Government.

An important finding was that many of the possible interventions at one stage in an individual's lifecourse could have long-lasting impacts, possibly for several decades. Therefore the possible interventions presented in Chapters 3 – 6 are arranged according to successive stages of the lifecourse.

The work of Phase 2 drew on several lines of activity:

- International workshops that helped to ensure the most recent research was incorporated into the work.
- Further systems analysis related to specific interventions.
- A review of existing Government initiatives and activities (see Appendix F).
- Economic analysis of the costs and benefits of interventions.
- Consideration of the viability and practicability of interventions; for example, the case for Government action, and implications for systems of governance.

Besides considering specific interventions, the Project also identified a number of important issues that should underpin consideration of this report (see Chapter 7). In particular, these relate to the changing values and expectations of society, and will therefore influence the relative importance of different interventions.

#### 1.4.3 Development of an action plan – Phase 3

Following Phase 2, the Project team consulted extensively with stakeholders in order to agree a comprehensive plan of actions to take the work forward: some of these relate to individual departments; some to cross-Government working and decision-making, and some to other stakeholders. The detail of this stakeholder engagement has been published in a separate document<sup>50</sup> and is considered in Chapter 8.

#### 1.4.4 How the Project has addressed future uncertainties

Over the next 20 years, the mental capital and wellbeing of individuals in the UK will be affected by diverse factors, as shown in section 1.2 above. Some of these “drivers of change” can be predicted with reasonable certainty, for such as the demographic shift in the age of the population. However, many others are much less predicable. In addition, the unpredictability of such factors is compounded by changing interactions

49 A summary of the resulting visual diagrams is available in hard copy (see Appendix E) or to download from [www.foresight.gov.uk](http://www.foresight.gov.uk). A more comprehensive document detailing the diagrams will also be made available through the Foresight website.

50 Available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

between them. A fundamental issue for any futures project is therefore how to address such future uncertainty. In the Project, several techniques have been used:

- The company shiftN has worked with experts to develop three possible, and equally plausible, future scenarios<sup>51</sup>. These have been used to explore how the challenges of mental capital and wellbeing could evolve in different ways. They also constitute a tool for stakeholders when assessing the robustness of new policies against future uncertainty. Appendix B provides an outline of these scenarios, and narrative vignettes for each.
- The Project has made use of expert opinion to assess what might happen in the future. For example, many of the authors of the state-of-science reviews have commented on the possibility and timing of future scientific advances. Also, the experts involved in the analysis relating to the changing nature of work have conducted a small international consultation exercise.
- Finally, future developments in drivers and interventions were recurrent topics in the international workshops involving experts and stakeholders in Phase 2 of the Project (as mentioned above).

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51 A full description of the three scenarios and their application to each of the five areas considered in Phase 1 is available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

## 2 Future challenges to mental capital and wellbeing

2.1 The trajectory of mental capital through life

2.2 Mental wellbeing through life

2.3 Learning through life

2.4 Mental health

2.5 Wellbeing and work

2.6 Learning difficulties

2.7 Cross-cutting issues – informing the analysis of choices and interventions



## 2 Future challenges to mental capital and wellbeing

A starting point for the Project was to review the state-of-the-art of relevant fields of science and also the wider evidence base, and to identify major challenges ahead which relate to mental capital and wellbeing. This chapter summarises the main findings from this phase of the work.

Firstly, the concepts mental capital and mental wellbeing are discussed as they are central to this report. Next, four important topics are considered: learning through life; mental ill-health; wellbeing and work; and learning difficulties. These were chosen as they closely interact with mental capital and wellbeing, and because they are of particular interest to key stakeholders.

Finally, the foregoing discussion is drawn together in Section 2.7. In so doing, the structure and approach to the subsequent work of the Project is explained. This work considered possible choices and interventions for addressing the future challenges, and is the subject of the remaining chapters of this report.

## 2 Future challenges to mental capital and wellbeing

The focus of this chapter is to develop an understanding of how “mental capital” and “wellbeing” (MCW) can change through life, and in particular, how the challenges associated with MCW could evolve over the next 20 years. Subsequent chapters assess how to address those challenges, particularly through the opportunities offered by developments in scientific understanding.

Because mental capital and wellbeing are the focus of this report, these two concepts are first explored in Sections 2.1 and 2.2. Next, Sections 2.3 – 2.6 explore issues surrounding important aspects of MCW in the future<sup>52</sup>:

- Learning through life (Section 2.3).
- Mental health (Section 2.4).
- Wellbeing and work (Section 2.5).
- Learning difficulties (Section 2.6).

These were selected because of their close relationship to mental capital and wellbeing, and because they were of substantial interest to key stakeholders. Section 2.7 looks across all of the above areas and explains how the subsequent work (which concerned choices and interventions for meeting the future challenges) was structured.

### 2.1 The trajectory of mental capital through life<sup>53</sup>

An important aspect of mental capital is cognitive ability which evolves through life. It follows a trajectory that rises during an individual’s early years, reaches a plateau during middle life, and finally declines through intrinsic, age-related changes (see Figure 2.1). Environments in the early years play a critical role in nurturing cognitive ability, with the home learning environment playing a larger role in determining future mental capital than socio-economic status or parental education<sup>54</sup>.

Many factors affect mental capital through the lifecourse and are explored below: Figure 2.2 places these within the structure of Figure 2.1. These factors provide important indications of where interventions could usefully be considered.

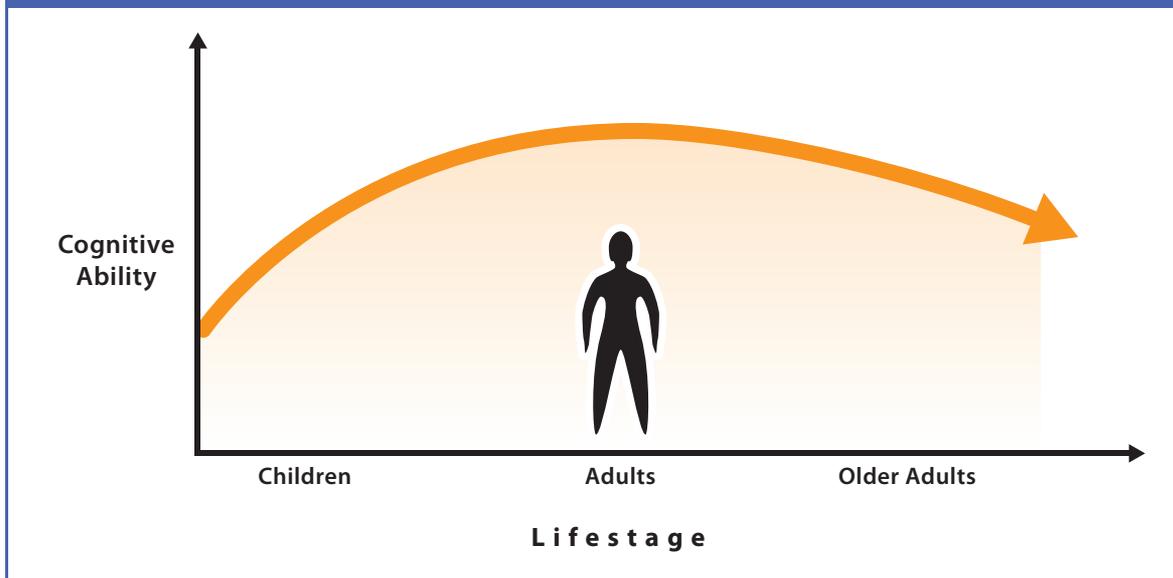
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52 For more detail about the challenges associated with these four areas, and also mental capital and wellbeing, see science reviews that have been commissioned by the Project, and the five reports that provide a synthesis. See also the Project report Huppert (SR-X2); Appendix E refers

53 For further details of how mental capital is affected by different factors through life, see the Project report: Kirkwood et al. *Mental capital through life: Future challenges*; Appendix E refers

54 Melhuish et al. (2008)

**Figure 2.1: Simplified model of the trajectory of cognitive ability through life showing how it typically builds and then declines through the lifecycle**



### 2.1.1 Pre-natal and childhood

Both nature (genetics) and our nurture (environment) substantially affect the development of our mental capital through life:

- An individual's genetic make-up is determined at conception and remains essentially constant throughout life, although there is growing evidence that environmental factors can have long-term impacts on which genes are expressed and which are silent through processes of "epigenetic" modification. In terms of "broad-sense heritability", the genetic contribution to cognitive ability has been estimated to rise from well below 50% in childhood to over 60% in adulthood, and is still probably at least this level in old age<sup>55</sup>.
- However, an individual's genetic make-up can also affect the mental capital trajectory in far-reaching ways. For example, a gene has been found which is associated with a greatly reduced risk of anti-social behaviour in abused children, suggesting that the gene may confer a degree of resilience<sup>56</sup>.
- The quality of the home learning environment, including parenting practices such as reading to children, using complex language, and responsiveness and warmth in interactions, are all associated with better developmental outcomes.

The health and lifestyle of pregnant women can have important effects via processes that are not presently well understood, but which are often described as "*in utero* programming". Here, particularly important factors include maternal diet, smoking and stress, all of which can affect foetal brain development and have a deleterious impact on the baby's biological systems and cognition. The socio-economic status of the mother is an associated factor, although underlying mechanisms are not well understood.

<sup>55</sup> Deary and Gow (SR-E14); Appendix E refers

<sup>56</sup> Kim-Cohen et al. (2006); "Resilience" is an individual's successful adaptation and functioning in the face of stress or trauma. Psychological resilience is that feature of personality that allows an individual to bounce back from stress or adversity – see the glossary of terms in Appendix D.

Avoidance of alcohol exposure during pre-natal development is particularly important since “foetal alcohol syndrome” (FAS) is currently recognised as the most common environmental cause of learning difficulties, affecting from one to seven per 1,000 live-born infants. However, a continuing controversy involves the degree to which the deficits observed in FAS conditions derive from brain damage *in utero* or from the neglectful and/or non-stimulating environments provided by alcoholic mothers who continue to drink.

### 2.1.2 Infants and toddlers (0-4 years)

Clearly, the family environments experienced by infants play a major role in early epigenetic modification, and these early modifications will affect mental capital, and possibly wellbeing, trajectories throughout the individual's life. Families that provide warm and consistent parenting and that are embedded in larger social networks appear to provide early environments more conducive to positive developmental trajectories. Families that provide inconsistent, punitive or even hostile parenting and that lack social support appear to provide early environments more conducive to maladaptive developmental trajectories. In extreme cases children may need to be removed from such environments. Looked-after children tend to have particularly poor developmental trajectories. Family environments that are less optimal for child development tend to be associated with factors such as poverty, low educational attainment, mental ill-health and substance abuse. High-quality day care can play an important role in providing high-quality environments.

Significant factors include:

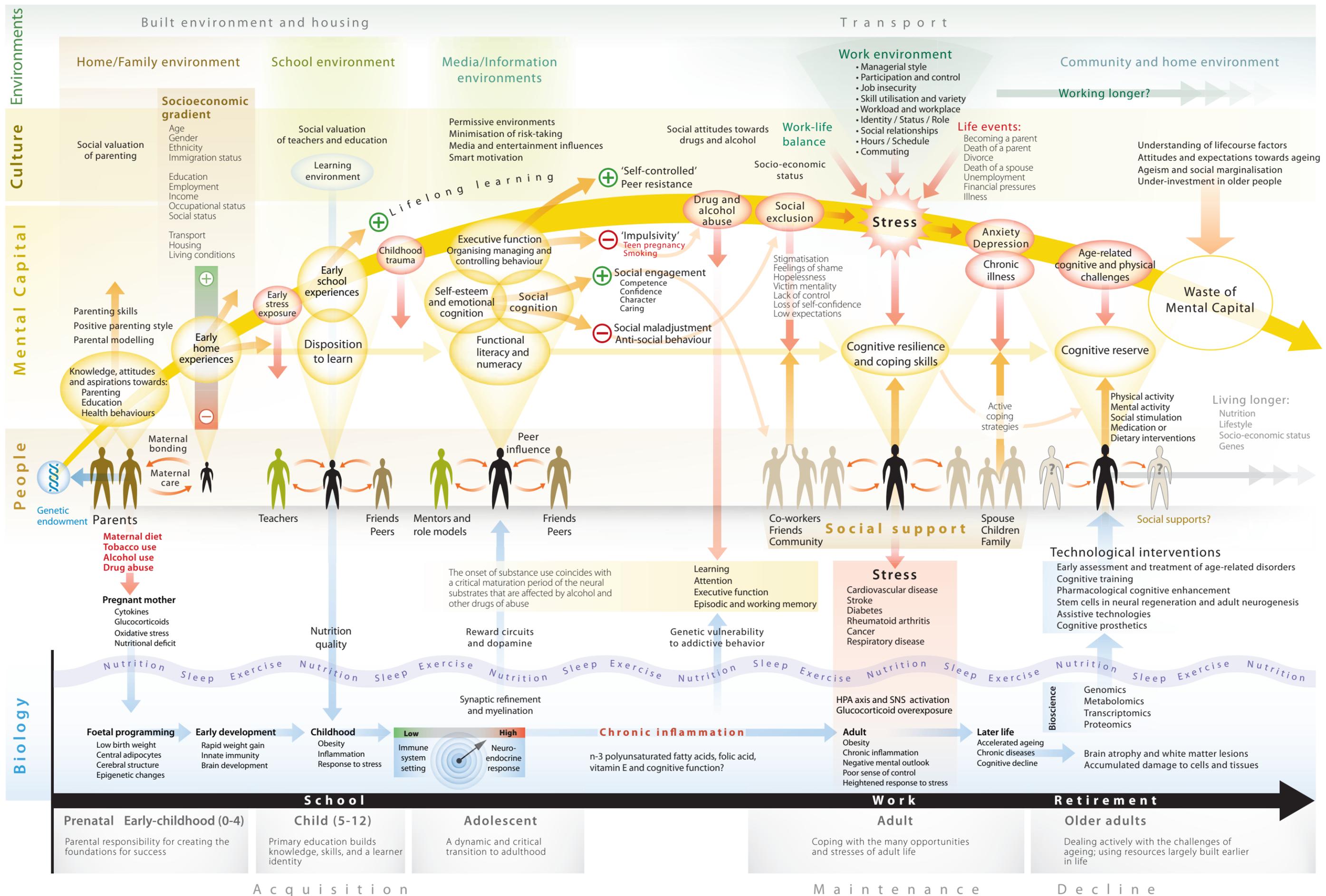
- Housing quality: this is firmly associated with children's mental development. Children living in poorer-quality housing have also been shown to have higher levels of stress hormones and behavioural problems.
- Adverse experiences in the post-natal period are associated with cognitive impairments. Such experiences include general disadvantages such as low socio-economic status, and specific trauma such as childhood sexual abuse.
- But conversely, families that provide high-quality learning environments tend to be families that promote the cognitive, language and social development of their children. These parenting skills can be taught by coaching programmes that show parents how to be non-directive, contingent (working from the child's focus of attention) and non-restrictive, and how to enrich the language they use with children.

Children who grow up in families where the parents take drugs, are violent, or suffer from a mental illness will develop in ways to match the complex demands of these situations. The developmental trajectories resulting from such disadvantaged early environments are likely to be maladaptive for the child, and indeed, for society.

### 2.1.3 Children (5-12 years)

The threats to the mental capital trajectory in this age range are similar in nature to those in earlier stages. For example, if a child experiences a home environment lacking in responsiveness and warmth, or is deprived of essential nutrition, sleep, warmth, exercise and mental stimulus, then learning and the development of life skills may suffer. It is particularly important during this stage of the lifecourse that any intrinsic learning difficulties are detected as early as possible and appropriate measures taken to minimise their impacts (see Section 2.6 and Chapter 3).

Figure 2.2: The trajectory of mental capital through life, detailing some of the many factors that influence mental capital and how they are connected across the lifecourse



Most children begin formal education during these years, and the significant advances in the developmental and brain sciences of the past decade offer the prospect of substantially improving the education and development of all children (see Chapter 3).

American cost-benefit analyses considered in Chapter 7 suggest that high-quality pre-school interventions show particularly strong returns on investment. Early learning is crucially embedded in the social contexts provided by parents and teachers, and a combination of child-directed discovery and direct instruction appear optimal for developing children's mental capital.

Scientific evidence discussed in Chapter 3 suggests that the development of self-regulation (the ability to plan and manage one's own behaviour) occurs without formal instruction, via appropriate teacher guidance in social situations such as play, sharing and conflict resolution. Therefore, child-centred educational practices are important.

Classroom environments depend on the teacher, and so teacher wellbeing is also of importance during this age range. For children's wellbeing, ensuring that educational experiences provide opportunities for individual engagement in tasks considered fulfilling and worthwhile appears to be critical (see also *The Good Childhood Enquiry*<sup>57</sup>).

#### 2.1.4 Adolescents

Adolescence is a decisive phase in the mental capital trajectory. Although a "Year 8 dip" (12-13 years) in academic performance has been reported, this might correspond, at least in part, to the reorganisation of the brain so that it can learn more efficiently. However, a number of important factors centred around alcohol and substance abuse can combine to disrupt this reorganisation, making the brain particularly vulnerable during this crucial period:

- Evidence has shown that adolescents may process reward differently than adults: immediate positive outcomes, such as peer approval, may outweigh potential, long-term, negative consequences. This shift in the anticipation of outcomes is associated with some young people gravitating toward risky behaviours such as substance use.
- Other conditions such as mood disorders may predispose adolescents to substance abuse.
- Also, young people subjected to adverse family environments, and those with affective disturbance, conduct problems, and neurotic or disinhibited personalities all appear to be at risk of escalating substance abuse.

Neuroimaging and neuropsychological studies indicate that adolescent substance use is associated with neural disadvantages, particularly in networks involved in learning, attention, and executive function. Heavy use of cannabis during adolescence may adversely affect brain development and lead to decrements in attention, learning and memory.

Rates of consumption of alcohol and other substances, and hence hazardous consumption and dependence, are directly related to availability (price relative to earnings, and distribution). Therefore, action to reduce availability will be critical in preventing further rises<sup>58</sup>.

57 *The Good Childhood Enquiry Briefing Paper-Lifestyle*

58 See Project report: Jenkins et al. *Mental health: Future challenges*; Appendix E refers

New knowledge about the maturation and plasticity of the adolescent brain has led to the development of effective interventions to encourage positive engagement and social functioning in young people. The Positive Youth Development (PYD) model, for example, emphasises the role of contextual factors such as parental warmth and involvement in school, the presence of role models in the community, and initiatives targeting cognitive and affective abilities. It also highlights the importance of the “Five Cs” of Competence, Confidence, Connection, Character, and Caring<sup>59</sup>.

It is in adolescence that crucial patterns of motivation appear to be established, and where failure of motivation has the potential for the greatest long-term threat to mental capital. Social approval, acceptance, and inclusion, for example, are powerful motivators of behaviour. While increasing pleasure is derived from social interaction with peers, adolescents may become more sensitive to the pain of social exclusion. These changes are associated with increased sensitivity to peer pressure.

Social maladjustment can generate a negative, self-reinforcing spiral, but equally, there is evidence of a protective effect from social “lifestyle components” against the threat to mental capital. A close, supportive family or a strong social network may serve to encourage cognitive stimulation via increased contact and engagement.

Finally, some forms of social marginalisation tend to originate during adolescence, especially when coupled with a significant degree of maladjustment. Those who are marginalised can experience lack of access to economic, educational or social support, with powerful effects on their mental capital, including emotional abilities. Effects on wellbeing include stigmatisation, feelings of shame, hopelessness, victim mentality, stress, lack of control, loss of self-confidence, and low expectations.

### 2.1.5 Adults

Provided extremes are avoided, and as long as essential nutrients (vitamins and other micronutrients) are available, nutrition seems to make little extra contribution to brain development and to the acquisition of mental capital. Nevertheless, nutrition does appear to be important through its impact on long-term trajectories of health in adulthood and into old age. For example, a higher intake of most “healthy” food categories, including those forming part of a Mediterranean diet, is associated with better cognition. Although it is never too early to adopt healthy eating preferences, it is during adulthood that such choices may be most important.

Physical activity can have beneficial effects through the lifecourse<sup>60</sup>, but evidence suggests that it merits particular attention in adulthood. In middle and old age, it can slow or prevent age-related cognitive decline and is associated with a lower risk of dementia. Fitness training exerts its greatest cognitive effects on executive control tasks (planning, working memory, concentration), accompanied by structural changes in the brain. Exercise need not be particularly vigorous to offer protection of mental capital. If taken regularly, it protects against the development of depression and anxiety. There is also promising preliminary evidence that exercise programmes may be useful in helping to treat anxiety. However, not enough is known about optimal parameters of physical activity. For example, what type (aerobic or anaerobic), frequency, intensity and duration of exercise are most appropriate? Also, it will be a major challenge to achieve change in the general population so that exercising becomes a sustained behaviour.

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59 Lerner et al. (2005)

60 Barry and Friedli (SR-B3); Hendrickx and van der Ouderaa (SR-E24); Appendix E refers

Adults exposed to stress over extended periods of time (e.g. shift workers, aircrew, soldiers), may suffer cognitive deficits in several domains such as working memory and declarative memory. Also, a study of carers showed that their telomeres (the protective tips at the ends of the chromosomes) were prematurely shortened<sup>61</sup>. This discovery is of profound significance, since telomere shortening is associated with biological ageing, increased risk of mortality and a range of age-associated diseases. Because of its importance, it will be seen that stress is a recurrent topic in several parts of this report.

Cognitive reserve<sup>62</sup> can be manipulated in adult life. However, its development in early life may also be important. Recent evidence suggests that cognitive reserve is not fixed. It can be increased through education, physical or mental activity, social stimulation, and potentially also through pharmacological or dietary interventions. It can also be affected by environmental factors acting during adulthood.

### 2.1.6 Older adults: two challenges

The demographic age shift in the population means that older adults will become an increasingly substantial segment of society in the future. This raises two principal challenges.

- The first is how to ensure that the considerable resource which older adults offer (particularly through their mental capital) is recognised and valued by society, and able to be used by the individual. In the absence of specific diseases that have an impact on cognitive performance, the adverse effects of ageing on memory and on an older person's capacity for intellectual work are greatly exaggerated in the popular mind. Persistent negative stereotyping of older adults is responsible for a massive waste of mental capital in later life; to the detriment of the individual, society, and the Exchequer.
- The second major challenge is how to enable the greatest number of older adults to maintain the best possible mental capital, and so preserve their independence and wellbeing, both for their own benefit and also to minimise their need for support. This is a profound challenge for society as a whole, and possible approaches are considered in detail in Chapter 6. Suffice to say here that critical factors that affect mental capital and wellbeing in older adults, and which therefore suggest avenues of interventions, include:
  - Determinants of the brain's white matter lesions which have a relatively large effect on cognitive ageing e.g. vascular risk factors such as hypertension and diabetes.
  - Chronic exposure to stress: this is implicated in poorer cognitive ageing.
  - Physical fitness.
  - Social engagement.
  - Education.

Overall, personal behaviour and motivation are likely to play a crucial role if individuals are to take personal responsibility for proactive steps to ensure cognitive vitality in later life.

61 Epel et al. (2004)

62 "Cognitive reserve" describes an individual's resistance to impairment in cognitive ("thinking") processes such as memory, reasoning and attention, which may arise as a consequence of brain injury, neuro-psychiatric disorder, disease or the normal ageing process. Thus, a person with more cognitive reserve or capital starts from a better position when it comes to ageing (or other forms of impairment); they have some buffering against its effects.

### Prospects for cognitive enhancement

There are a number of ways in which mental capital and wellbeing might be maintained and sustained using some form of cognitive enhancement:

- **Pharmacological cognitive enhancers (PCEs).** A range of these are currently available, as well as many novel ones in development<sup>63</sup>. PCEs are important for the treatment of cognitive impairment in neuropsychiatric disorders such as Alzheimer's disease and schizophrenia, and in brain injury. Those presently available are sometimes taken by the healthy population in order to combat fatigue, jet lag and even temporary sleep deprivation, along with continuous stress. However, the magnitude and chronicity of the benefits of current PCEs in the normal healthy population still require evaluation and their use raises ethical considerations, which have been recently reviewed<sup>64, 65</sup>. Also, the long-term risks are not known, especially for the developing brains of children, and there remain many uncertainties about their side effects. This suggests a need for careful and critical evaluation – and as such, PCEs for the healthy population constitute a key challenge to policy-makers and regulators. Nonetheless, novel PCEs may prove of great benefit in the future, particularly given the rapidly developing field of pharmacogenomics and the ageing population.
- **Specific kinds of cognitive training** appear to have a beneficial effect on some functions, but generally the benefits are limited to the targeted cognitive domain, and no other. Also, to reap rewards from cognitive training programmes, these may have to be tailored to individual requirements, as their effects seem not to be generally transferable.
- **Cognitive memory aids** are now available to help address shortcomings and deficits in human cognition, action and communication. Examples of their use by cognitively-impaired individuals in everyday settings include: access to large repositories of personal data and records of personal experience; the provision of information about future commitments and activities; timed reminders for daily activities; and cognitive support at specified intervals from telephone calls or Personal Digital Assistants (PDAs). Non-technological interventions, such as “stimulus control” relying on associations between actions, or “visual cues” and training, have also been used to help the cognitively-impaired.
- **Education and learning** are well established forms of cognitive enhancement and can offer protection against cognitive decline with age. Here, new developments such as in personalisation of learning, and in the use of new technology (see Section 5.1.4) offer substantial potential for further improvements.
- **Physical activity** has beneficial effects throughout the lifecourse, but particularly in adulthood (see Section 2.1.5).

Although the impetus for several of the above applications has been to support those with severe cognitive impairment, the coming years are likely to bring a growing convergence with technologies to support everyday functions for normal individuals – thereby, potentially, promoting optimal mental capital trajectories through life.

63 Sahakian and Morein-Zamir (2007); The Academy of Medical Sciences (2008)

64 Ethical considerations relevant to important classes of interventions throughout this report have been considered more fully in an international Project workshop involving experts in ethics: see Morein-Zamir and Brownsword (ER-1) – Appendix E refers

65 British Medical Association (2007)

## 2.2 Mental wellbeing through life

The focus of this section is specifically on the promotion of “positive mental health”<sup>66</sup> – also referred to as “mental flourishing” and “mental wellbeing”. This requires an understanding that to be mentally healthy means much more than the absence of symptoms of mental illness; and that the alleviation and control of symptoms does not in itself bring health.

Mental wellbeing is concerned with how people experience their lives, rather than the objective facts of their lives such as their external circumstances or specific capabilities. Some people have a sense of wellbeing even when their objective circumstances are harsh, while others feel their lives are empty or stagnant despite very favourable circumstances. Moreover, there may also be cultural differences in concepts of wellbeing which can condition the level of wellbeing experienced by different individuals under similar circumstances<sup>67</sup>.

The scientific evidence reviewed in the Project<sup>68</sup> clearly shows that a high level of wellbeing is associated with positive functioning, which includes creative thinking, productivity, good interpersonal relationships and resilience in the face of adversity, as well as good physical health and life expectancy. Conversely, people with a low level of wellbeing, even if they do not have a mental disorder, function far less well and have poorer health and life expectancy. This latter group is unlikely to come to the attention of specialist mental health services, but constitutes a large part of the population who are neither flourishing nor disordered, yet could benefit greatly from having access to interventions to improve their wellbeing. They are frequently seen in GP surgeries, primary care settings, social work departments and many other front-line public services.

Within clinical populations, the prevention and treatment of mental disorders is, of course, a critical element in improving the wellbeing of the individual and those around them (family, friends, work colleagues). However, from the perspective of positive mental health, the aim is not simply to reduce the prevalence and severity of disorder; but to enable individuals to move towards flourishing, through the development and implementation of policies to improve mental health and wellbeing for the whole population. It is important that healthy individuals, particularly children, can benefit from the promotion of positive mental health, as well as in clinical populations. Just as we know that a small reduction in the average consumption of alcohol among the whole population results in a reduction in alcohol-related harm, so a small improvement in the population level of wellbeing could reduce the prevalence of common mental disorders, as well as conferring the benefits associated with positive mental health (see section 2.2.4 below).

### *Relationships between mental capital and wellbeing*

There are close links between mental capital and mental wellbeing; aspects of a person’s mental capital can influence mental wellbeing, and vice versa. For example, positive emotional states or a generally positive approach to life are associated with greater curiosity, flexible thinking and openness to learning, which are particularly

66 “Positive mental health” refers to a state of “mental flourishing”, which is a combination of feeling good and functioning effectively most of the time; see Appendix D for a glossary of terms. Also, the concepts of mental wellbeing, positive mental health and mental ill-health are described more fully in the Project report: Jenkins et al. *Mental health: Future challenges*; Appendix E refers.

67 The Project commissioned a review specifically to compare how concepts of wellbeing can differ between people of different cultural backgrounds: see Littlewood (SR-X5); Appendix E refers

68 See Huppert (SR-X2); Barry and Friedli (SR-B3); Cooper et al. (DR-2); Appendix E refers

important during the development of mental capital in childhood and adolescence. Executive function (EF) is an aspect of mental capital that is particularly closely linked to wellbeing. It refers to a set of self-regulation skills, namely organising, managing and controlling our behaviour. Good EF skills are important for academic achievement and success in the workplace, and are equally important for personal development and good interpersonal relationships. At older ages, it has been shown that individuals who report higher levels of wellbeing also have better cognitive function, even when adjustment has been made for other possible explanatory factors e.g. socio-demographic variables, health and lifestyle<sup>69</sup>.

### 2.2.1 Characteristics and causes of mental wellbeing

Evidence concerning the characteristics and causes of mental wellbeing can be found in the Project's science reviews and in this chapter. In some cases it is tacitly assumed that the characteristics of wellbeing are primarily the absence of disorder and the causes of wellbeing are the absence of the risk factors for disorder or the presence of protective factors. However, several reviews specifically address the positive end of the mental health and wellbeing spectrum, focusing on the nature and determinants of flourishing<sup>70</sup>. A high level of mental wellbeing is characterised by frequent positive emotions (such as happiness, contentment, interest and affection), positive attitudes towards oneself, others, and events (optimism, self-efficacy, empathy, openness to experience) and positive behaviours (pursuing valued goals, healthy lifestyle, pro-social behaviour).

Wellbeing is not a static construct but rather a *dynamic process*, as depicted in Figure 2.3. The different domains of an individual's life constitute the *external conditions*, which together provide a variety of challenges and opportunities. *Psychological resources* are a relatively stable feature of an individual – their general approach to life – that influences how they respond to and interact with the external world. Together, external conditions of life and psychological resources either support or detract from the fulfilment of needs, and can thus lead to good functioning. In turn, good functioning and fulfilment of needs lead to positive feelings and thus to a further increase in psychological resources.

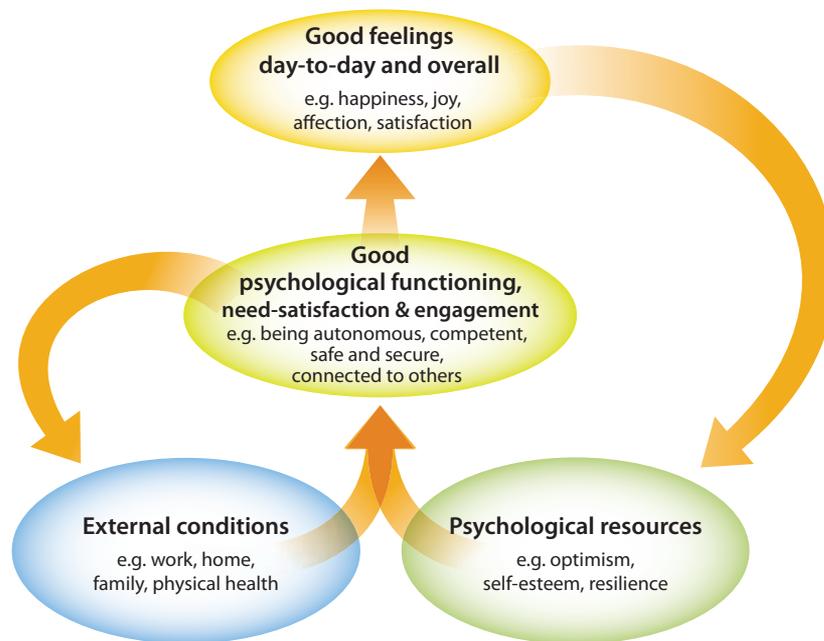
As a concrete example, much research shows that feeling close to, and valued by, other people is a fundamental human need and a defining characteristic of people who demonstrably function well in the world. The need for connection to others can be supported through various *external conditions* of a person's life: at work, through the respect and friendship of colleagues; at home, through the love and support of close family; and so on. Additionally across all of these domains of life, a person who has the *psychological resources* of self-confidence and optimism may be more likely to make friends and to form relationships. Thus, the extent to which the need for connection to others is satisfied is likely to be a function of both external conditions and internal psychological resources.

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69 Llewellyn et al. (2008)

70 See Huppert (SR-X2); Barry and Friedli (SR-B3); Cooper et al. (DR-2); Appendix E refers

**Figure 2.3: Wellbeing is a dynamic process that can be fed by virtuous circles of feedback between its component parts**



Based on a figure in nef (2008)<sup>71</sup>.

### *Development of mental wellbeing<sup>72</sup>*

An individual's mental wellbeing can be quite variable over time, since everyone experiences both pleasant and painful events. Sustainable wellbeing involves a characteristically positive style of thinking and responding, along with the ability to manage distressing experiences effectively (resilience). A person's characteristic ways of perceiving and responding tend to be fairly stable across the lifecourse. While there is undoubtedly a genetic component of our characteristic level of wellbeing (as in all physical and mental attributes), the evidence reviewed in the Project suggests that the early environment (pre-natal, infancy and toddlerhood) plays a crucial role. The mother's health during pregnancy (physical health, stress, nutrition and substance use) and the quality of nurturing that the infant and young child receives programme the brain biology of the developing child, making the child more or less vulnerable to stress, mental health disorders and physical diseases later in life. This programming works by regulating the expression of genes which are involved in emotional responding, as well as in learning and memory. The quality of parental care has lifelong effects on mental wellbeing. A parenting style that combines warmth and responsiveness confers the greatest benefit on later mental wellbeing as well as mental capital.

Evidence shows that while our characteristic level of mental wellbeing tends to be fairly stable across the lifecourse, it can be changed as a result of learning or experiences at any stage. Specific forms of training such as Cognitive Behavioural Therapy (CBT) or mindfulness meditation can have long-term benefits on the way people think and respond, and these effects are accompanied by beneficial neurobiological changes.

71 nef (2008). *Measuring well-being in policy: Issues and applications*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk)

72 This section draws in particular on Huppert (SR-X2), which in turn draws upon the extensive literature on wellbeing; Appendix E refers

### *Influence of the social and physical environment on wellbeing*

Wellbeing is also influenced by the circumstances of people's lives, including employment, income and the physical environment. In general, being employed is beneficial for mental health<sup>73</sup>, although the nature and quality of work and the workplace have a major impact on the level of wellbeing<sup>74</sup>. Higher income is associated with greater levels of wellbeing, but the effect diminishes at progressively higher income levels. Recent analyses have indicated that out-of-control debts are the crucial mediating variable between low income and mental ill-health<sup>75</sup>, and it may be that financial control is also a critical factor in mental wellbeing (see Section 2.4 below). Higher income inequality is linked to lower wellbeing as well as a higher prevalence of mental disorder. A recent UNICEF report<sup>76</sup> found that children's wellbeing scores across a range of measures were worst in the most unequal countries (UK and US). It should be noted that income inequality is at a historically high level in the UK<sup>77</sup> with no evidence that this situation is changing. However, the causal mechanisms are not well understood; the most unequal countries also appear to be the most materialistic and to have the most individualistic values (based on self-interest rather than a more community focus), and these characteristics are known to be associated with lower psychological wellbeing<sup>78</sup>.

The quality of the physical environment also plays an important role in mental wellbeing<sup>79</sup>. Among the significant factors are noise and light levels, building layouts and way-finding, access to nature, and the design of everyday products, buildings, transport systems and information/communication devices, all of which contribute to levels of stress or contentedness, and a sense of inadequacy or self-efficacy and of isolation or connection to others.

There is a growing body of evidence for the beneficial effects of the arts in mental wellbeing as well as physical health and recovery. The visual arts, music, literature and poetry, and the performing arts have reported benefits in schools, hospitals, workplaces and communities. However, little is known about the relative effects of arts interventions compared to other interventions, or the effects of the early environment. Wellbeing is also influenced by broader social and cultural trends, including individualism, levels and patterns of alcohol consumption, declining civic engagement (e.g. volunteering, voting), concerns about behaviour, and, in some areas, marked tensions between existing and newly-arrived communities and other indicators of divided communities e.g. gated estates and widespread use of surveillance equipment.

## 2.2.2 Policy framework for improving mental wellbeing

### *Different levels of policy*

The promotion of mental wellbeing (and mental capital) raises important ethical considerations – see box at the end of sub-section 2.2.3. There are also different levels at which Government policies to promote wellbeing or positive mental health can be directed<sup>80</sup>. These are evidenced by the range of existing and past Government initiatives (see Appendix F). The levels include:

73 See Project report: Jenkins et al. *Mental health: Future challenges*; Appendix E refers

74 See Project report: Dewe and Kompier. *Wellbeing and work: Future challenges*; Appendix E refers

75 Jenkins et al. (2008a; 2008b)

76 UNICEF (2007)

77 Orton and Rowlingson (2007)

78 Kasser (2002)

79 Cooper et al. (DR-2); Appendix E refers

80 Barry and Friedli (SR-B3); Cooper et al. (DR-2) – Appendix E refers; Sheldon et al. (2005)

**Strengthening individuals.** Broadly, this could be accomplished through practices designed to promote self-efficacy; emotional/social skills and resilience; intrinsic motivation and sense of purpose; empathy and pro-social behaviour; and lifestyles that enhance and protect mental health, such as physical activity, nutrition, drinking moderately, and maintaining social networks:

- For children, channelling energy into productive activities, giving them responsibility, and helping them see beyond the self (for example, engagement with less fortunate groups or developing countries) could be particularly valuable.
- Since families and teachers have critical roles in helping children to flourish, the wellbeing of parents and teachers needs to be prioritised, along with opportunities to learn about the factors that contribute to positive child development. For instance parenting programmes could be offered during pregnancy, and “Every teacher matters” programmes could become more widespread (see Chapter 3).
- During working life, wellbeing could be further promoted through family-friendly policies, by encouraging social and physical environments conducive to flourishing, such as providing frequent positive feedback, worker input into job and office design, and by implementing wellbeing audits of the workplace (see Chapter 5).
- Flourishing in the post-retirement years could be enhanced by creating positive images of ageing and opportunities for older adults to mentor younger people and engage in their communities for mutual benefit of the individuals and those they engage with (see Chapter 6).

**Strengthening communities.** Approaches would include increasing social inclusion and participation, improving community safety and neighbourhood environments, promoting childcare and self-help networks, developing health and social services to support mental health, and improving mental health within schools and workplaces e.g. through co-operative and anti-bullying strategies, work-life balance and other stress-reduction policies.

**Reducing structural barriers to mental health.** Strategies could include initiatives to reduce poverty, discrimination and inequalities, and to promote access to education, good-quality employment and housing, as well as services and support for those who are vulnerable (see Chapter 4).

**Improving the quality of the physical environment.** Approaches include facilitating access to the natural environment and better design of products, buildings, cities and transportation systems using evidence-based design principles known to enhance wellbeing.

Achieving a balance between these different options for policy will not be easy, particularly since evidence is lacking on the relative contribution to mental wellbeing of individual psychological skills and attributes compared with the circumstances of people’s lives. For example, is it better to allocate resources to building new schools, enhancing the wellbeing of teachers, or providing lessons on wellbeing to pupils? Evidence from research in positive psychology shows there is substantial leverage in improving individual psychosocial skills, but sustainable improvements in wellbeing are likely to be greater if supported by stronger communities, improved social structures and a better-quality physical environment. There is an urgent need for research on the relative contribution to mental wellbeing of these different levels of intervention, as a guide to developing effective policy.

### **Five ways to enhance individual wellbeing**

Whatever the relative contribution of the different approaches outlined above, it is clear that individual responsibility for mental wellbeing must be an integral part of the policy framework. Methods of disseminating information and training techniques for improving wellbeing using the internet and mobile phones are becoming more widespread, and will increasingly be tailored to the individual's particular preferences and needs.

The Foresight Project commissioned a review to produce the wellbeing equivalent of "five fruit and vegetables a day" from the new economics foundation (nef)<sup>81</sup>. Five suggestions for individual action, based on an extensive review of the evidence, were identified (see box and Figure 2.4). These could be used to promote public understanding of factors associated with wellbeing, and for engaging individuals in improving the wellbeing of themselves and of those around them.

#### **Five ways to wellbeing**

##### **Connect...**

With the people around you. With family, friends, colleagues and neighbours. At home, work, school or in your local community. Think of these as the cornerstones of your life and invest time in developing them. Building these connections will support and enrich you every day.

##### **Be active...**

Go for a walk or run. Step outside. Cycle. Play a game. Garden. Dance. Exercising makes you feel good. Most importantly, discover a physical activity you enjoy and that suits your level of mobility and fitness.

##### **Take notice...**

Be curious. Catch sight of the beautiful. Remark on the unusual. Notice the changing seasons. Savour the moment, whether you are walking to work, eating lunch or talking to friends. Be aware of the world around you and what you are feeling. Reflecting on your experiences will help you appreciate what matters to you.

##### **Keep learning...**

Try something new. Rediscover an old interest. Sign up for that course. Take on a different responsibility at work. Fix a bike. Learn to play an instrument or how to cook your favourite food. Set a challenge you enjoy achieving. Learning new things will make you more confident as well as being fun.

##### **Give ...**

Do something nice for a friend, or a stranger. Thank someone. Smile. Volunteer your time. Join a community group. Look out, as well as in. Seeing yourself, and your happiness, as linked to the wider community can be incredibly rewarding and creates connections with the people around you.

81 nef (2008). *Five ways to well-being: the evidence*. Available on request through [www.foresight.gov.uk](http://www.foresight.gov.uk)

**Figure 2.4: Behaviours that can work together to enhance wellbeing and mental capital**



Based on a figure in nef (2008). *Five ways to wellbeing: the evidence.*

### 2.2.3 The measurement of mental wellbeing

Since mental wellbeing refers to the way in which people experience their lives, the most appropriate form of measurement, at least for older children and adults, is self-report. This contrasts with the objective measures (performance on various tests of cognitive function) that are used to estimate mental capital (or at least cognitive capital). Large population surveys have for a long time used single-item questions about overall life satisfaction or happiness as a measure of wellbeing, but such questions can provide only a superficial estimate of wellbeing and of how it is distributed within or between countries. Moreover, these single-item measures are not very sensitive to change. Multi-item measures of life satisfaction are also popular in large-scale surveys and provide more detailed information about different aspects or domains of life and how each of these contributes to overall satisfaction e.g. Diener's Satisfaction with Life Scale<sup>82</sup>; Cummins' Personal Wellbeing Index<sup>83</sup>. However, caution should be exercised in equating mental wellbeing with reported life satisfaction, since responding to questions about life satisfaction requires an implicit judgement about the match between experience and expectations. Thus, a person might have a high score on a life satisfaction scale because they genuinely have a sense of life going well, or because life is not going so well, but their expectations are low.

Another approach to the measurement of wellbeing has been to use questionnaires designed to measure psychological distress; low scores on these scales are regarded as being indicative of high wellbeing. In fact, low scores on such scales indicate the absence of symptoms rather than the presence of flourishing. What is needed is more direct measures of positive feelings and positive functioning. The recognition that mental wellbeing needs to be measured as an entity in its own right has led to the development of a number of questionnaires specifically designed to measure positive

82 Diener (1985)

83 Cummins et al. (2003)

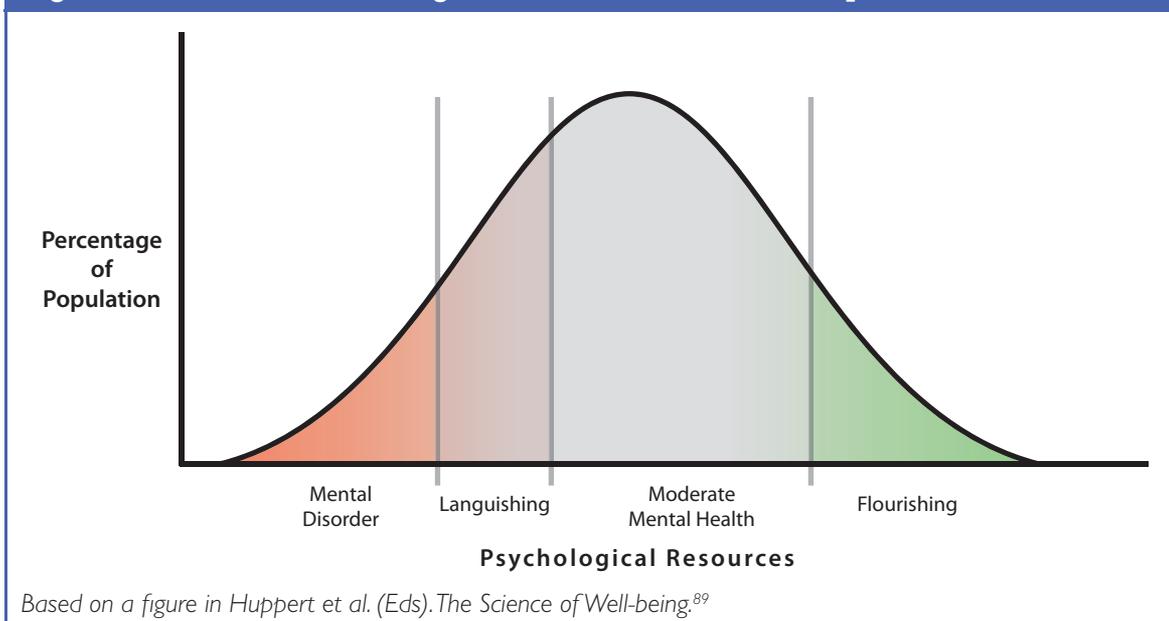
aspects of wellbeing. These have been extensively reviewed in a Foresight paper specifically considering the measurement of wellbeing<sup>84</sup>.

The distinction between measuring mental illness and measuring mental health is thus well recognised, and most recently, a 14-item measure, the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS), has been validated for use in the UK<sup>85</sup>. This will be very useful, because while surveys of adult psychiatric morbidity over the past 15 years do not show any change in prevalence (although the actual numbers of people with certain disorders are increasing with demographic change), a range of other indicators suggest that there may be growing levels of malaise that may influence cognitive capability, productivity, health and other outcomes. Use of such a scale in national surveys will also enable the monitoring of trends in flourishing following the implementation of specific policies to promote wellbeing. Scales of positive psychological functioning such as the WEMWBS can be used in conjunction with headline wellbeing indicators and measures of wellbeing in specific life domains, depending on the particular policy issue being addressed; for more detail, see the Project report on this topic<sup>86</sup>.

#### 2.2.4 The population perspective on mental wellbeing

It is estimated that at any one time, one-sixth of the UK population has some form of mental health problem<sup>87</sup>. But what percentage is mentally flourishing i.e. has a high level of mental wellbeing? Data from the US suggest that only around 17% of adults are flourishing, while 11% are described as “languishing”<sup>88</sup>. There are no UK data at present on the prevalence of either flourishing or languishing. The spectrum of mental health ranging from mental disorder to mental flourishing is illustrated in Figure 2.5.

**Figure 2.5: A schematic diagram of the mental health spectrum**



84 nef (2008). *Measuring well-being in policy: Issues and applications*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk)

85 Parkinson (2006); Tennant et al. (2007)

86 nef (2008). *Measuring well-being in policy: Issues and applications*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk)

87 See Project report: Jenkins et al. *Mental health: Future challenges*; Appendix E refers

88 Keyes (2002)

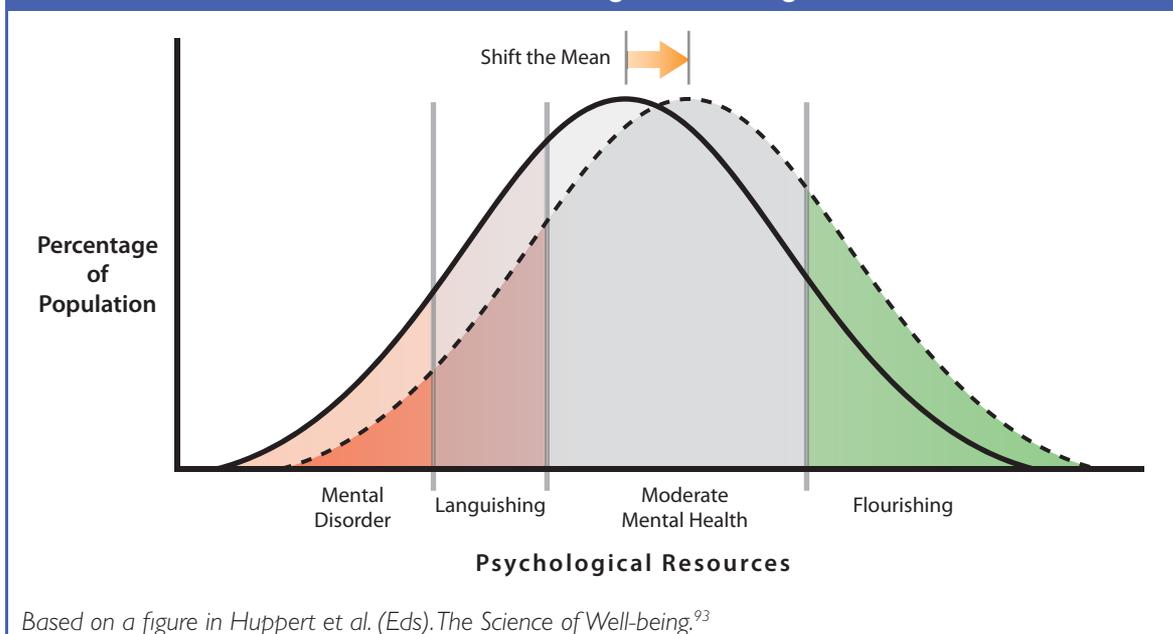
89 Huppert et al. (2005)

Understandably, the balance of current medical practice relating to mental health is still largely focused on the treatment of those with mental disorders. However, there is also a substantial history of efforts to promote good mental health and prevent disorder<sup>90</sup> using a variety of approaches that are universal (targeting the whole population), selective (focusing on a sub-group such as pregnant mothers) and indicated (directed at people with high risk factors e.g. child abuse).

As well as the emphasis on treatment rather than prevention, there has been a specific emphasis on highly-targeted rather than more widespread or universal prevention. Rose<sup>91</sup> argued, using the example of hypertension, that if only the highly-targeted approach is employed, there will always be many new cases of disorder, since the majority who develop disorder come from the general population rather than the high-risk group. For example, there is encouraging new evidence from the PONDER trial<sup>92</sup> that retraining health visitors in psychologically-based approaches to identifying and responding to the mental health needs of all women after childbirth prevents the development of depression, as well as improving the outcome of those who are already depressed post-natally.

Figure 2.6 shows how a small change in the average level of symptoms in the population (or sub-group) could produce a large decrease in the percentage with disorder and in the percentage with sub-clinical disorder (the languishing group). At the same time, this small shift can produce a large increase in the percentage that are flourishing.

**Figure 2.6: The mental health spectrum – illustrating how shifting the mean of the population may have a substantial impact on the tails e.g. decreasing levels of mental disorder and increasing flourishing**



90 e.g. Mrazek and Haggerty (1994); Paykel and Jenkins (1994); Barry and Jenkins (2006)

91 Rose (1992), (2007)

92 NIHR Health Technology Assessment Programme. *Psychological interventions for postnatal depression – randomised controlled trial and economic evaluation (PONDER)* – see <http://www.hta.ac.uk/1336>.

93 Huppert et al. (2005)

At present, most randomised controlled trials (RCTs) for interventions in this field have considered highly-targeted prevention. These have been relatively expensive and hence challenging to implement widely. There is therefore an urgent need for longitudinal studies of universal interventions to identify those able to reduce the overall distribution of psychological symptoms through the general population, and hence the incidence and prevalence of common mental disorders. It is possible that a universal approach to prevention may be far more cost-effective in the longer term than a more targeted approach, since it has the potential to enhance the lives of everyone as well as reducing the total number of people who develop a common mental disorder. However, to deliver these benefits, we need to understand more about the active ingredients in such interventions, and to develop promising inexpensive versions with parallel long-term evaluations.

There may also be an optimal balance of universal, selected and indicated prevention strategies, combined with effective treatment services for people who are already ill, which may have the greatest impact on the mental health of the population. The proposed studies would use long-term RCTs to evaluate the cost benefits of specific separate and combined approaches in both children and adults, to: establish the optimal approach or the optimal combination of approaches; triangulate qualitative and quantitative methods; and to improve the measures used. There are some circumstances in which RCTs cannot be carried out, and here other designs, such as comparisons with matched controls, may be necessary. However, these need to be interpreted with care, as selecting groups in an unbiased manner is very difficult to achieve. Qualitative approaches can also be a valuable supplement to quantitative approaches in this area.

### **The role of the State for improving mental capital and wellbeing<sup>94</sup>**

An important issue concerns where responsibility lies for promoting a person's mental capital and mental wellbeing. Most would agree that any Government support for efforts to improve mental capital and mental wellbeing through life, needs to be held to be distinct from promoting any notion of perfectionism, or a "best possible" life.

The notion of the State "enhancing" mental capital is problematic in that it raises the controversial question of what would be a normal baseline. An alternative approach which was used in the Project is for the State to focus on helping people to optimise their mental capital and wellbeing by equipping and supporting people to enhance particular aspects to help them realise their potential<sup>95</sup>.

There are a number of ethical concerns that might be made with regard to the State's treatment of those who fall outside the normal range of competence (whether the unborn, young children, or those who lack mental capacity). In none of these cases is it possible to invite those directly concerned to endorse the State's proposed interventions. They are in no position to consent and alternative strategies – whether relying on the consent given by third parties or on the advancement of the affected party's "best interest" – are highly problematic<sup>96</sup>.

The responsibility of Government for mental capital and wellbeing is likely to depend on the exact age and state of the individuals. In the case of adults, the State can encourage, discourage, provide options, educate, fund research and disseminate information. It can act indirectly to "tilt the playing field" to promote mental capital and mental wellbeing by providing subsidies and tax breaks.

Some people may refuse opportunities that are offered to increase their mental capital and mental wellbeing. In addition, in practice, structural factors, such as inequality, poverty, and discrimination, might limit opportunities for improvement being taken up by some.

For children, the State holds more responsibility than for adults. The State can play, and should play, an important role in nurturing and improving the mental capital and wellbeing of children. Similar issues arise in old age.

## **2.3 Learning through life<sup>97</sup>**

Education and learning have a critical role in unlocking a wide range of lasting benefits, both for individuals of all ages, and for society. They affect employability and earnings, and they raise the likelihood that people will be involved in the wider community. Evidence shows that both formal and informal learning have a direct impact on wellbeing, protect against conditions such as depression and cognitive decline in old age, and help to confer resilience to stress and adverse life events. Moreover, they also promote social inclusion and cohesion within society.

Conversely, poor education, and low levels of basic literacy, numeracy and English language skills in particular, can have negative outcomes. People with the weakest basic skills are much more likely to experience unemployment, find themselves in poorly-

94 For a more detailed discussion of a range of ethical issues associated with interventions to promote mental capital and wellbeing, see Morein-Zamir and Brownsword (ER-1); Appendix E refers

95 Mental capital and wellbeing has for example cognitive, social and emotional dimensions; see footnotes to Chapter 1, Section 1.1

96 Brownsword (2008)

97 For a more detailed consideration, see Project report: Feinstein et al. *Learning through life: Future challenges*; Appendix E refers. This section draws upon that report.

paid dead-end jobs, and to have more limited and smaller social networks. People in prison are also likely to have lower levels of literacy: 50% of prisoners are functionally illiterate compared with about 16% for the general population<sup>98</sup>.

The importance of education and learning to wellbeing is already widely recognised in the UK. Wellbeing is one of the goals of the public education system, at least for the schools system. The National Curriculum for England defines education explicitly as “a route to the wellbeing and development of the individual”<sup>99</sup>, whose purpose is to enable young people to become “confident individuals who are able to live safe, healthy and fulfilling lives”<sup>100</sup>. The Scottish Curriculum for Excellence also prioritises health and wellbeing, and again sets out the aim of enabling young people to become “confident individuals”, “effective contributors” and “responsible citizens” as well as “successful learners”<sup>101</sup>. Wellbeing complements and supports other, related goals such as employability and responsible citizenship; and these in turn help promote wellbeing, thereby creating a virtuous circle.

The first phase of the Project concluded that: “The principal feature of policy that will strongly influence the success or failure of the UK to develop a competitive, productive and cohesive society will be its ability to enhance the skills levels of the UK population”. Government’s response to the Leitch Review of Skills<sup>102</sup> confirms the importance of skills and learning to its policies for competitiveness and inclusion. An important challenge to policy-makers is therefore to determine how education and learning can make a more effective contribution to both mental capital and wellbeing at all stages of the lifecourse: this is a major consideration in this final report.

### 2.3.1 A gap in basic skills – recent trends

The UK has a wide range of education and training provision, and yet it is estimated that about five million adults are functionally illiterate, and almost seven million are functionally innumerate.

Statutory test data have been available for primary schools in England since 1995. The Key Stage 2 data for Year 6 pupils show steady rises in attainment in both English and maths between 1995 and 2000, then a levelling out of attainment until 2006. The 2007 results show a rise in attainment in English, but little change in Maths. However, these assessments have attracted some dispute, relating to changes in the tests applied and the possibility that teachers may be “teaching to the test”<sup>103</sup>.

The Progress in International Reading Literacy Survey (PIRLS)<sup>104</sup> suggests that reading literacy achievement rates among Year 5 pupils in England had fallen between 2001 and 2006; there were declines among both boys and girls though England remained above the OECD average in 2006. Similar declines were reported for several other countries such as Sweden and the Netherlands that, like England, had performed well in the 2001 survey. Data from the Trends in International Mathematics and Science Study (TIMSS) provide internationally benchmarked evidence on numeracy. TIMSS results for 2003

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98 For a more detailed consideration, see Project report: Feinstein et al. *Learning through life: Future challenges*; Appendix E refers. This section draws upon that report.

99 QCA (1999)

100 QCA (2008)

101 Learning and Teaching Scotland (2007)

102 Leitch (2006)

103 Tymms (2004)

104 Twist et al. (2007)

suggest significant improvements in mathematics in England and Scotland; the results of the most recent survey in 2007 will be made available in December 2008.

Despite recent improvements in the proportion of school leavers who gain at least the equivalent of a 16+ school-leaving certificate, about 4.8 million people in the UK of working age have no formal qualifications at all<sup>105</sup>; more than one-third of all adults having no basic qualifications on leaving school. However, the information available on adult rates of literacy and numeracy is variable in quality, and does not allow for confident judgements on trends. Here there is a strong case for internationally benchmarked measurement of adults' skills, and the four UK administrations will benefit considerably from full participation in the OECD's planned Programme of International Assessment of Adult Competences (PIAAC), which will be administered for the first time in 2011.

There are many reasons for this gap. However, a substantial body of research shows that educational progress at all levels is closely associated with socio-economic inequalities<sup>106</sup>, and recent analysis of the Millennium Cohort Survey shows that by the age of three, there are already significant gaps in aspects of cognitive development such as language between children with similar levels of intelligence who come from different backgrounds<sup>107</sup>.

### 2.3.2 A wider skills gap for tomorrow

The UK is faced with a basic skills problem. The job market is changing so quickly<sup>108</sup> that, within the next 15-20 years, the prospects for employment for the many individuals with few qualifications and limited literacy and numeracy will become substantially reduced.

Low-skilled people are less likely than professional and non-manual workers to participate in adult learning programmes. This unequal distribution of participation in learning mirrors the experiences of UK children. Progress in school achievement is heavily influenced by family background as measured by social and economic status. Also, in the face of increased migration into the UK, differences between ethnic groups are also significant.

Today's (and tomorrow's) working practices increasingly require an ability to manipulate quantitative and symbolic data using information and communications technology. Until recently, there has been a decline in the numbers of students participating in mathematics and the sciences that develop the necessary technical skills needed for these kinds of activity. However, since 2005 these trends appear to have been reversed, particularly in mathematics. This will have important consequences both for employability of the individuals concerned, and for the future skills base in the UK.

As well as scientific and technological competencies, the relative success of individuals in the workplace and more generally through life, also depends increasingly on social, emotional and communications skills. Poor social and self-management (or "executive function"; see Appendix D) skills are also strongly predictive of risky outcomes such as poor sexual health, anti-social behaviour, criminality and drug misuse. A UNICEF international league table examining the physical and emotional wellbeing of young

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<sup>105</sup> DCSF (2007a)

<sup>106</sup> Lannelli and Paterson (2007)

<sup>107</sup> Hansen and Joshi (2007)

<sup>108</sup> See Section 2.5

people in industrialised countries<sup>109</sup> ranks British children at or very near the bottom. Pro-social and executive function skills are of central importance in the learning trajectory and are therefore a key consideration in Chapter 3, which covers childhood.

In his review of the UK system for science and innovation<sup>110</sup>, Lord Sainsbury urged stakeholders to join a “race to the top” with the emerging economies, warning against the risks of a “race to the bottom”. The type of high value, high performance organisations that Lord Sainsbury praised require an across-the-board rise in skills levels of all kinds if the UK is to face up to growing competition, and leave the low-cost end of the market to others.

### 2.3.3 The disposition to learn

The Phase I report on learning through life<sup>111</sup> considered the learning process and identified the individual’s “disposition to learn” as the central factor in driving an individual’s decision to engage in learning throughout his or her life. Indeed, it will be seen in Section 2.5 that in the changing world of work, personal motivation to train and retrain through life is likely to be increasingly important.

A person’s disposition to learn shows both some stability and a capacity for change throughout the lifecourse. Genetic predisposition, experiences in the family, experiences of school, life events, and access to technology all play a part in shaping it. Particularly powerful influences – both positive and negative – are the contexts within which people develop and within which they live and work. Take-up of learning depends on a number of complex interactions between demand for learning and supply of opportunities.

Although the disposition to learn is an individual propensity, it has many, far-reaching consequences for families, communities, companies, society, and the economy at large. Therefore, it is essential to understand what motivates learning, intrinsically and extrinsically, if Government, employers, voluntary organisations and social networks are to invest properly in our human capital and exploit it fully in a competitive environment. The origins of the disposition to learn are considered further in Chapter 3.

### 2.3.4 Future challenges and choices

A number of important capabilities and factors could affect learning through life over the next 20 years. As these develop they could cause substantial changes in the provision and uptake of learning, and have a resounding impact on the size and nature of the resulting benefits.

- The diverse, pervasive and long-lasting effects of learning through life (see above) argue strongly for taking a broad perspective when developing policy and considering strategic choices.
- Ensuring the best possible disposition to learn is a major challenge for the future because of its central importance in motivating individuals to learn through life. One crucial mechanism is how parents and teachers interact with young children, and the relevant evidence is considered in Chapter 3.

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<sup>109</sup> UNICEF (2007)

<sup>110</sup> Sainsbury (2007)

<sup>111</sup> See Project report: Feinstein et al. *Learning through life: Future challenges*; Appendix E refers

- To remain competitive and productive, the UK needs to enhance its skill levels across the board. Basic skills as much as technological and scientific expertise will be equally important. However, promoting non-cognitive skills (such as social and emotional skills) will also be vital as these are closely linked to a wide range of other benefits such as social cohesion and inclusion, good functioning of families, and in reducing behaviour. Indeed, there is creative and innovative synergy to be gained from the dynamic interaction of improved skills throughout the population.
- Quality teaching and learning are essential to drive increased skills levels, especially in the workplace – a critical environment for learning through life. New scientific insights of the brain, learning and development could help teachers substantially in improving their effectiveness (Chapter 3).
- Personalised education is central to successful delivery: individual needs, aspirations and capabilities will need to be matched by appropriate support for learning and teaching. No one method or strategy is appropriate for every individual child or adult, although this report will highlight certain exciting new areas (such as new technology for learning) that offer substantial potential.
- It will be important to tackle the causes of the skills gap, if it is to be addressed in an effective and sustainable way. This will involve action outside of the direct sphere of education. In particular, it will be important to address social inequalities, specifically where these affect educational access.

## 2.4 Mental health<sup>112</sup>

### 2.4.1 An important distinction

Mental health is a positive state, not simply the absence of symptoms of ill-health or distress. It is characterised by a sense of wellbeing, self-esteem, optimism, mastery over one's circumstances and the ability to initiate, develop and sustain satisfying personal relationships. Positive mental health implies the capacity to make a contribution to family, community and societal networks, and also implies resilience, which is a capacity for coping with adversity. Thus, it forms a cornerstone of our ability to cope with changing life events, both positive and adverse, by enabling us to understand and adapt to the rich diversity of circumstances throughout the lifecourse. The importance of the promotion of positive mental health has already been considered in 2.2. The rest of this section therefore concentrates on mental ill-health.

Many experience psychological distress when faced with life's setbacks and problems. But mental ill-health goes beyond. It embraces specific, recognisable mental illnesses and disorders such as depression and anxiety in adults, and emotional and conduct disorders in children and young people. It also includes severe disturbances such as psychoses, along with substance abuse and addictions, abnormal personality traits and neurodegenerative diseases such as dementias.

With the advent of greater understanding of the biological basis of mental health, there is some blurring of the distinction between *physical ill-health* and *mental ill-health*. This is not to say that physical illness and mental illness should be treated as like cases for all purposes; but it is to say that mental illness should be treated no less seriously than physical illness. Thus, we may infer that there needs to be equal concern and respect for those who are experiencing mental ill-health as for those who are suffering from

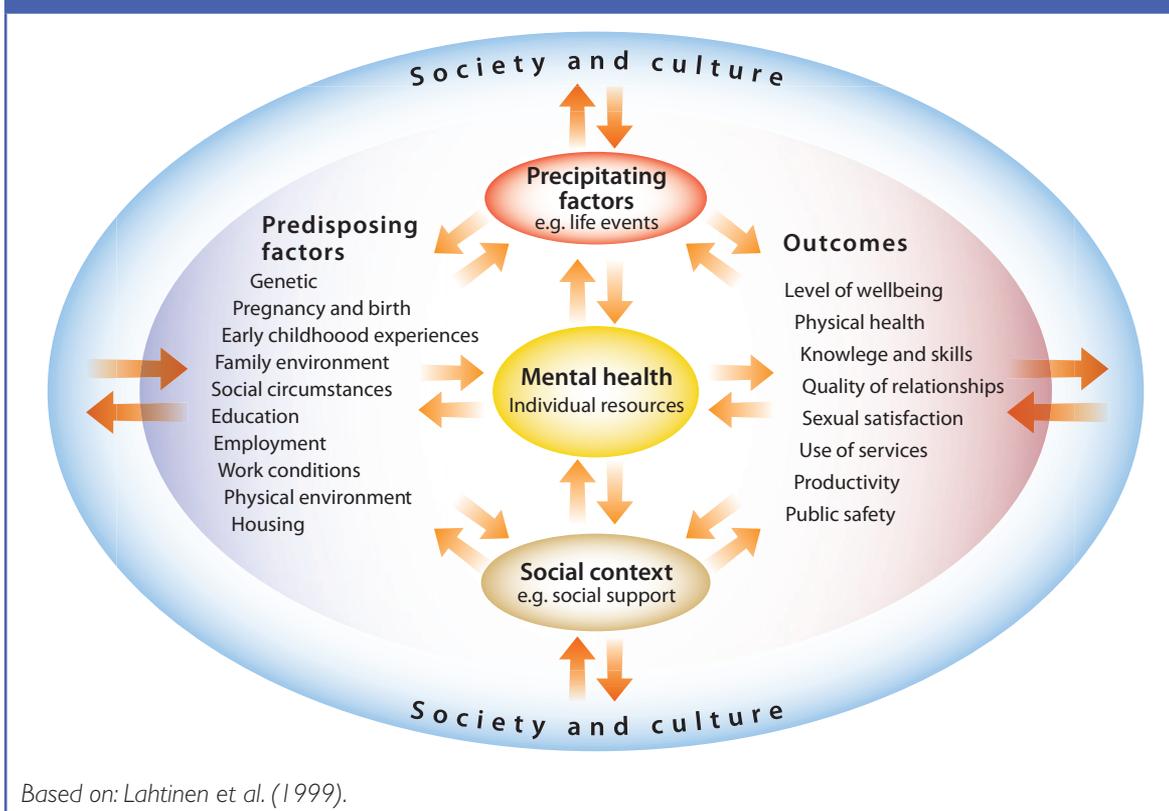
<sup>112</sup> For a more detailed summary of the future challenges relating to mental health, see the Project report: Jenkins et al. *Mental health: Future challenges*; Appendix E refers. This section draws on that report.

physical ill-health. Moreover, at present, the law distinguishes between cases of physical and mental disorders in competent people, not requiring that people take protective measures with regard to their physical health (leaving patients to decide whether they will accept a treatment), and yet sometimes imposing treatments on those who are suffering from mental illness.

#### 2.4.2 Key challenges for the future: general considerations

Importantly, many interrelated factors affect and interact with mental health and ill-health. For example, they may be of a personal, circumstantial or social nature. The principal factors and their inter-relationships are set out in Figure 2.7a; Figure 2.7b provides a more comprehensive visualisation. Consideration of these factors and how they could evolve in the future has informed the Project's analysis of future challenges.

**Figure 2.7a: The causal factors and the outcomes associated with mental health**



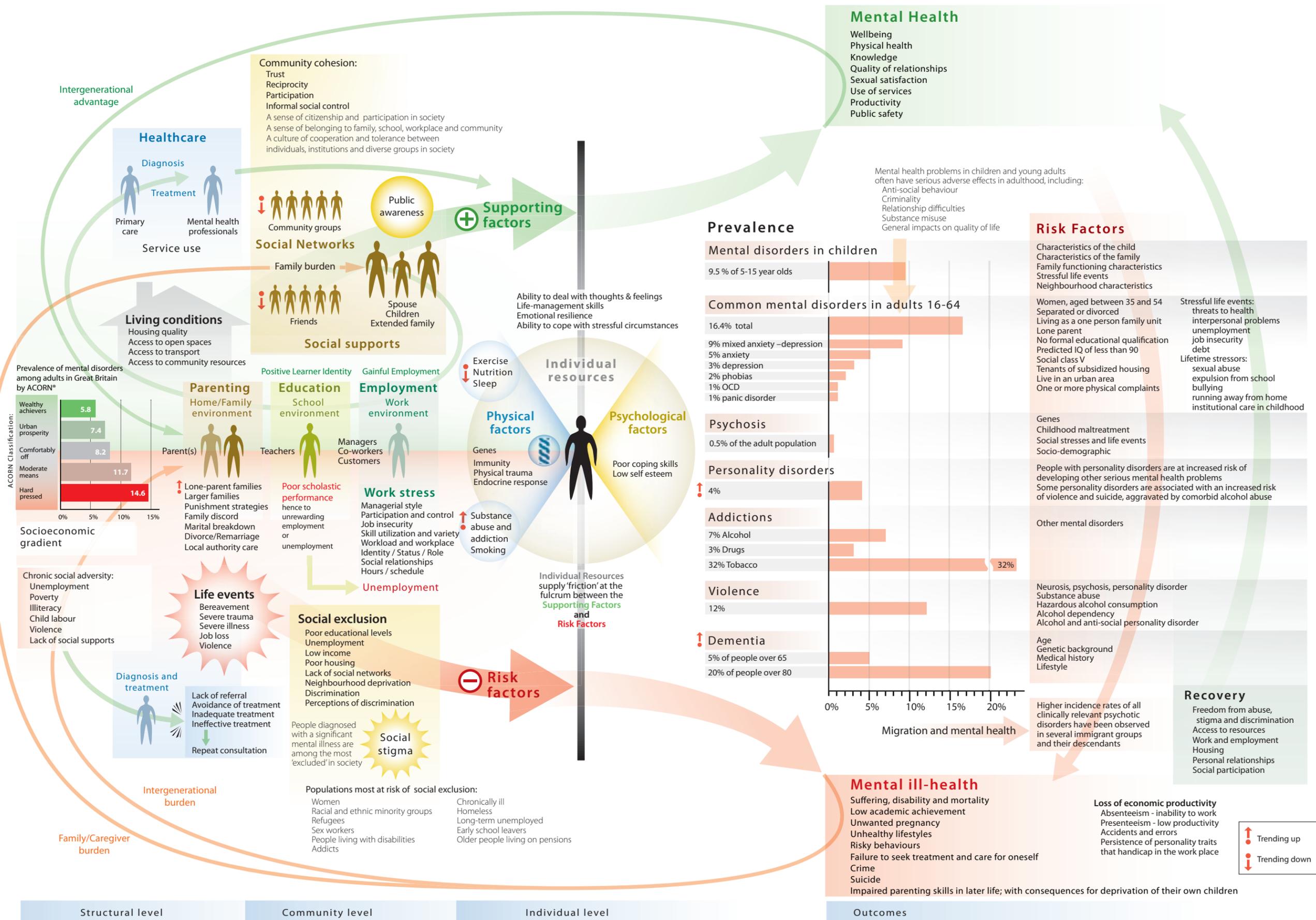
The general conclusions are:

- Looking to the future, mental illness is expected to continue to have substantial social and economic costs at many levels: for individuals, families, communities, society, business and the economy. Recent estimates for the annual impact of mental ill-health are around £77 billion for England<sup>113</sup> when wider impacts on wellbeing are included, and £49 billion<sup>114</sup> for economic costs alone.
- Some mental disorders are set to grow substantially in the future, as they are strongly linked to trends in important drivers of change: in so doing, they could place considerable strain on health and social services, and also on family carers. A prime example is dementias, which are set to rise substantially with the ageing

<sup>113</sup> Sainsbury Centre for Mental Health (2003)

<sup>114</sup> See Project report: Jenkins et al. *Mental health: Future challenges*; Appendix E refers

**Figure 2.7b: An overview of the risk factors and supporting factors that weigh upon the 'fulcrum' of a person's individual resources and tip the balance towards mental health or mental ill-health. Also showing the kinds of mental disorders, their prevalence, and associated risk factors.**



population: over the next 30 years, the number of people with dementia in the UK could double to 1.4 million, and costs to the UK economy could treble from £17 billion a year today, to over £50 billion a year<sup>115</sup>.

- However, the future prevalence of many other disorders is much more uncertain, since they are strongly influenced by a wide range of factors that could evolve and interact in unpredictable ways. For example, common mental disorders such as depression, anxiety, phobias and obsessive compulsive disorder, are linked to life events (such as bereavement, unemployment, homelessness), lack of social supports, family structures, housing, low income, debt, and the workplace environment. This presents two major challenges:
  - How to develop new strategies and new interventions that are robust to this future uncertainty.
  - How to harness policy development in diverse areas across Government, to reduce the prevalence, and costs, of mental disorders.
- Many high-risk groups have been identified for different mental illnesses, including: children in care; drug users; prisoners; people in debt; and some immigrant populations. Crucially, mental illnesses often go undiagnosed and/or untreated. As a result, the consequential behaviours associated with mental disorders can be misconstrued, leading to inappropriate responses by the authorities. Individuals in these high-risk groups are then particularly at risk of falling into a cycle of exclusion and deprivation, rather than receiving effective health and social interventions. Breaking this cycle will be a major challenge for the future, but failure to do so will store up significant long-term costs, possibly over decades.
- Some disorders remain under-diagnosed and under-treated. Examples include: childhood disorders; adult common mental disorders; addictions; and personality disorders. However, there is now good understanding and evidence for some social risk and protective factors for illness as well as biological factors – and many of these can be modified. Therefore, much could be done to address these underlying factors, and so promote good mental health and prevent disorders developing.
- Early diagnosis and treatment also have considerable potential for improving the long-term outcomes for those with mental disorders. For example, in the case of psychosis, early intervention is considered justified, as it ensures that evidence-based treatment to reduce distress and disability is made available at as early a stage as possible. However, for other disorders, more evaluative research is needed to quantify the extent to which early intervention impacts on long-term prognosis, and to assess any long-term side effects, such as reductions of resilience and self-reliance; more longitudinal research is needed to clarify these issues.
- Whilst it is accepted that a relatively small proportion of people suffering from mental illness pose a risk to society and need to be treated in appropriate secure environments, the dangers of mental illness are greatly exaggerated in the public mind. For example, the main source of serious violence at population level is hazardous drinking, and the vast majority of those suffering from mental illness such as neurosis or psychosis are not a danger to others<sup>116</sup>. Indeed, many people experience mental ill-health: for example, about 16% of adults and 10% of children are affected by common mental disorders such as depression and anxiety at any one time. Nevertheless, prejudice and discrimination continue to be pervasive

115 Knapp et al. (2007)

116 See Project report: Jenkins et al. *Mental health: Future challenges*, section 2.8; Appendix E refers

throughout society, exacerbate many mental health problems, and have a negative impact on lives and wellbeing. Major benefits could result if a step-change in attitudes to mental ill-health could be achieved.

### 2.4.3 Some findings relating to specific forms of mental disorder

- **Childhood mental disorders.** These include clinically significant conduct disorders, emotional disturbances such as anxiety and depression, and Attention Deficit Hyperactivity Disorder (ADHD). They are estimated to affect nearly 10% of children<sup>117</sup>. In many cases they have identifiable and preventable risk factors, yet they often remain unrecognised and untreated. A failure to tackle these disorders early in children can store up diverse problems which will affect the individual, many parts of society, and Government, over many future years.
- **Common mental disorders (CMDs).** Taken together, depression, anxiety, phobias and obsessive compulsive disorder are very common problems in adults: for example, in the most recent national survey<sup>118</sup>, estimates of common mental disorder suggested a prevalence rate of over 16% at that time. CMDs are often disabling, with considerable social impact on families and the workplace: half last for longer than a year. There are a number of diverse social and demographic risk factors such as: marital separation and divorce; low educational attainment; unemployment; low income and debt; as well as recent life events, lack of social networks, painful or disabling physical illness, and a previous history of experiencing violence or sexual abuse. Strong social networks and perceived social support confer protection in the face of these multiple risk factors.
- Around half affected by CMDs are not diagnosed by a GP<sup>119</sup>, and those that are diagnosed are often inadequately treated. Economic costs can be very substantial, but are not necessarily borne by the NHS. For example, for depression, easily the biggest impact is on productivity, which at about £8 billion in 2000, was 23 times larger than the estimated costs falling to the NHS.

Predicting changes in the future burden of CMDs is extremely difficult because CMDs are affected by many risk factors (as mentioned above), and those risk factors may themselves evolve in uncertain ways. The situation is further confused because, while accurate prevalence (and trends) rates need to be estimated from epidemiological studies of populations (whether household populations, working populations, schools, prisons etc.), other data are also available from sickness absence figures and from health service treatment figures. However, these latter data cannot be used to estimate underlying prevalence (and trends) of disorder because they are affected by people's reluctance to admit to having a disorder, and their likelihood of taking sickness absence, visiting a doctor, and of being diagnosed by the doctor. These factors all change over time, and are variable between different people with CMDs.

Thus, while national sickness absence data over the last few decades show an increase in people taking time off work for CMDs, this evidence cannot be used to argue that CMDs have increased over that time. For example, a study of the relationship between CMD and sickness absence in civil servants in the 1980s showed that CMD was common, and was associated with sickness absence.

<sup>117</sup> Meltzer et al. (2001); Green et al. (2005)

<sup>118</sup> Singleton et al. (2001); the next survey is due to report at the end of 2008

<sup>119</sup> See Project report: Jenkins et al. *Mental health: Future challenges*; Appendix E refers

However, certificates for sickness absence at that time cited physical illnesses such as backache, rather than CMD.

- **Psychosis.** The prevalence of psychosis in the general adult population is relatively low (0.45%), although considerably higher in some population groups e.g. 7% in male and 15% in female sentenced prisoners and 11% in male and 15% in female remand prisoners. Overall, the prevalence remained steady between the 1993 and 2000 national surveys; results from the 2008 survey are not available at the time of publication, but will become available later in 2008.

However, despite its generally low prevalence, psychosis is often very severe and very disabling, with major impact on families and use of health and social services. The current societal costs of schizophrenia alone are estimated to be about £6.7 billion per year in England<sup>120</sup>.

Most people with psychosis are in receipt of treatment, but adequacy of treatment and community support remains variable, with only a third having seen a community psychiatric nurse in the last year. Psychosis rates are expected to rise with increases in rates of marital separation and divorce, difficulties in home ownership, urbanisation, drug abuse (including cannabis), and immigration.

- **Addictions.** These are common, especially in young people: a quarter of adults report heavy drinking and 5% report illegal drug use in the UK<sup>121</sup>. However, addictions are not well or widely treated. They may also be associated with other mental disorders. Addictions have substantial consequences for physical health, families, communities, society and the economy. Also, addictions associated with certain legal drugs (alcohol and tobacco in particular) can have high impacts. Indeed, alcohol consumption can be particularly damaging in adolescence as the brain is still developing at this stage (see Section 2.1.4). Rates of consumption and hence hazardous consumption and dependence are directly related to availability (price relative to earnings, distribution etc.), and so rates could rise with any decrease in price relative to earnings, and with increased ease of access. However, factors such as changed public attitudes to the acceptability of drinking over safe limits, and of under-age drinking, may reduce rates.
- **Personality disorders.** One survey has suggested that 4% of the British population is affected by these disordered patterns of thought, feelings and behaviours<sup>122</sup>. This is equivalent to 2.4 million people (although the prevalence of clinically significant problems within this subpopulation is likely to be smaller). However, personality disorders are less well understood compared to other disorders, and more research is needed into causation, prevention and treatment. People with personality disorders are at increased risk of developing other serious mental health problems. Some personality disorders are also associated with an increased risk of violence and suicide, aggravated by co-morbid alcohol or drug misuse.

<sup>120</sup> Figures for 2004/05 – Mangalore and Knapp (2007)

<sup>121</sup> See Project report: Jenkins et al. *Mental health: Future challenges* – Appendix E refers; Singleton et al. (2001)

<sup>122</sup> Singleton et al. (2001)

## 2.5 Wellbeing and work<sup>123</sup>

Increasingly, wellbeing and stress in the workplace have become a concern for employees, employers, professional bodies and Government. Each year stress from work is estimated to cost employers an estimated £3.7 billion<sup>124</sup>, and around 13 million working days are lost<sup>125</sup>. Also, nearly 40% of people drawing incapacity benefits have a mental health condition; the total annual cost of these benefits is now approximately £12 billion, and the proportion of recipients has increased from 3% in the 1960s to 7% today<sup>126</sup>. The cost of stress in the workplace arises from a wide range of sources, such as: sickness absence; turnover in labour; premature retirement; health insurance; and treatment of the consequences of stress. Although only a significant minority of mental health problems experienced at work can be attributed directly to workplace conditions, it is nevertheless important that potential causes are identified and mitigated.

### 2.5.1 The changing nature of work

Figure 2.8 overleaf shows that wellbeing and stress are intimately influenced by a wide range of factors associated with the changing landscape of work: for example, globalisation; managerial competence; changing careers; the introduction of new technology; and the shift of developed economies from manufacturing to services and knowledge – the so called “weightless economy”<sup>127</sup>. (Figure 2.9 provides a more comprehensive version of Figure 2.8).

Today, almost 81% of jobs in the UK are in the service sector, and the UK now sells more “knowledge services” as a proportion of our total exports than any other major economy<sup>128</sup>. These shifts are also influencing critical issues that strongly affect wellbeing, such as work security, the intensification of work, work-life balance and stress. In one survey, 40% of respondents indicated that they worked long hours because they feared losing their jobs<sup>129</sup>. Further, the shift to services has also increased the emotional content of work as employees interact more with clients and the public. Several of these factors interact with poor health and wellbeing in a vicious circle – with both employers and employees losing out.

The composition of the workforce is also changing. First, there is an increasing number of women at work: women now fill 70% of jobs in the service industries, mainly in public administration, education and health. Also, the employment rate of mothers with dependent children has risen from 57% in 1990 to 65% in 2000, significantly closing the gap with fathers: it is therefore unsurprising that an estimated 82% of extra jobs created between 1998 and 2011 will be taken by women<sup>130</sup>. A second trend concerns the changing age-structure of the workforce – particularly the increasing numbers of older workers: by 2020, the number of people working beyond 65 is expected to increase by about 33% compared with 2005<sup>131</sup>. In the case of younger workers, changing aspirations and expectations are creating a generation gap. There are also increasing numbers of immigrant workers, many of whom are filling skills shortages in

<sup>123</sup> For a more detailed summary of the future challenges relating to wellbeing and work see the Project report: Dewe and Kompier. *Wellbeing and work: Future challenges*; Appendix E refers. This section draws on that report.

<sup>124</sup> CBI (2005)

<sup>125</sup> Health and Safety Commission (2004)

<sup>126</sup> Department for Work and Pensions (2006)

<sup>127</sup> Coyle et al. (2002)

<sup>128</sup> Brinkley (2007)

<sup>129</sup> Isles (2005)

<sup>130</sup> Williams and Jones (2005)

<sup>131</sup> Madouros (2006)

Figure 2.8: An overview of the key factors that influence wellbeing at work

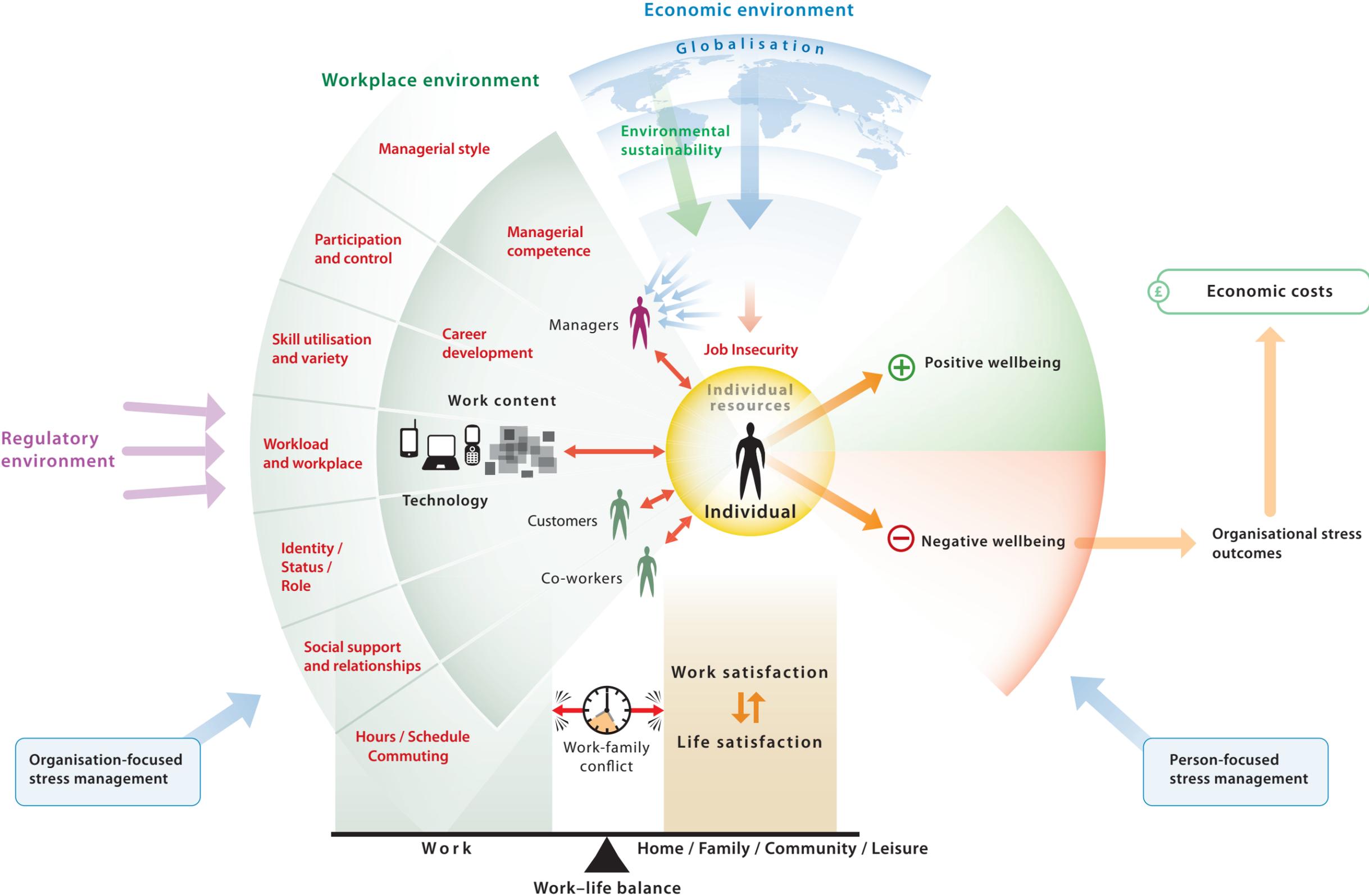
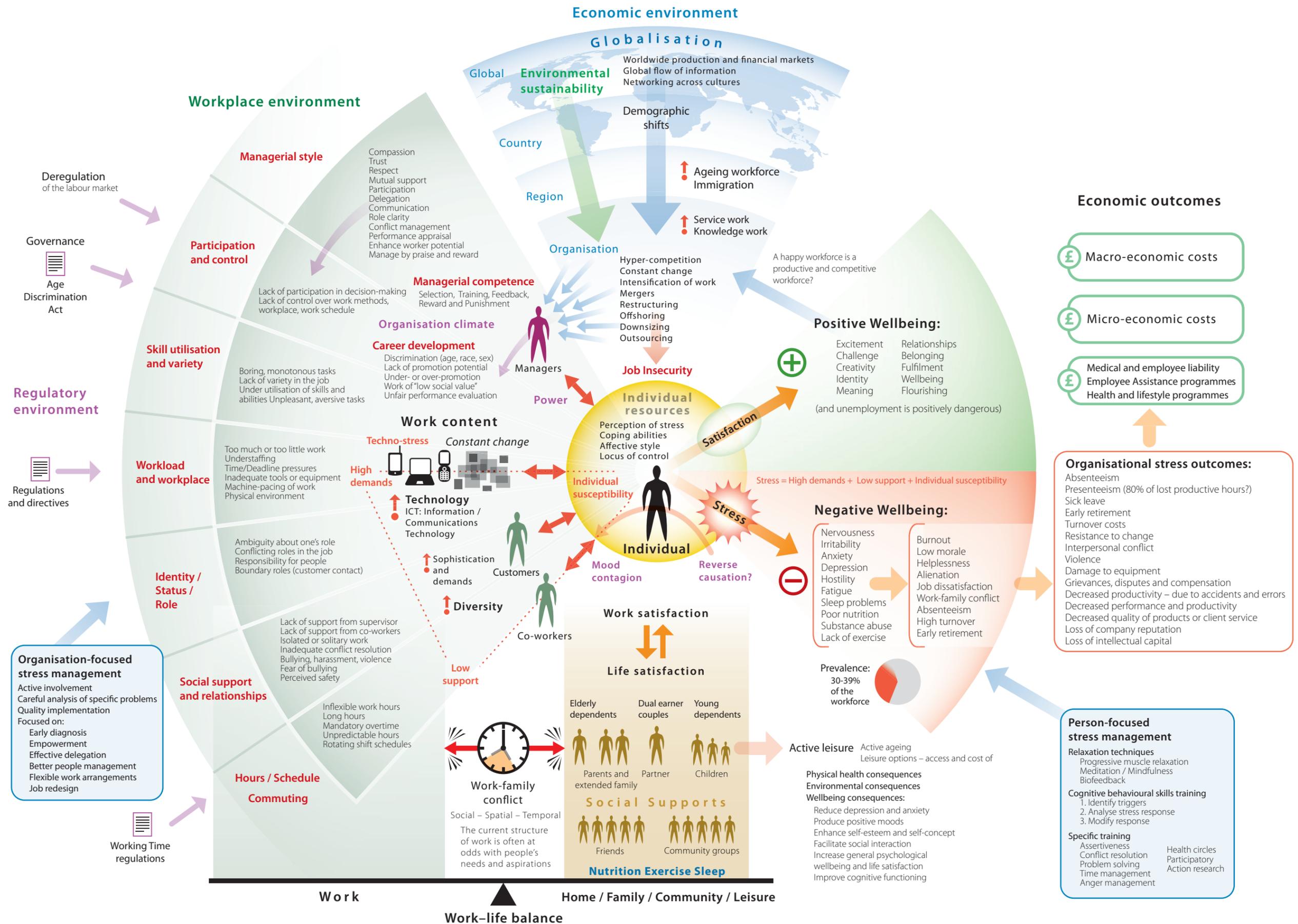


Figure 2.9: A more detailed look at the factors that affect wellbeing at work and the associated positive and negative outcomes of healthy versus unhealthy workplace environments



critical sectors such as healthcare. By 2005, there were 1.5 million migrants working in the UK, representing 5.4% of the employed population<sup>132</sup>.

### 2.5.2 Important future challenges in the workplace

Looking 20 years into the future, the level of mental ill-health and wellbeing in the workplace will be influenced by the degree of progress towards meeting Government targets which seek to improve the current situation, as well as by the important drivers of change mentioned above. Against this backdrop, a number of major challenges lie ahead:

- The drive for “fulfilling employment”: levels of job satisfaction are growing<sup>133</sup>, but they are accompanied by growth in employee expectations and demands – for example, for interesting, varied and useful work; more control over the pace of work; more autonomy; and more control over their working arrangements.
- The continuing problem of bullying at work, which costs upwards of £2 billion per year in the UK<sup>134</sup> and covers a wide range of behaviours such as harassment, mistreatment, hostility and aversive behaviours<sup>135</sup>.
- The threat of violence at work – one in 14 workers surveyed in 2006 were “quite” or “very” concerned about being physically attacked or threatened by a member of the public while at work<sup>136</sup>.
- The challenge of managing people well, so that the potential of the workforce is released, workers are able to flourish, and their contribution to the evolving economy is optimised.
- Increasing pressures for flexible working<sup>137</sup> and the need for more sophisticated approaches in order to balance the demands of work with family and non-work time. For example, many people will need not just flexibility based on time, but also with regard to location, type of activity and family demands.
- The challenge of coping with stress in an increasingly intensive work environment.
- The critical need for the UK workforce to have the skills, resilience and flexibility to compete in a world where the nature of work is dramatically changing. Associated with this is the important issue of who has responsibility for the continual development of an increasingly mobile workforce. In particular, the globalisation of the market for skills, coupled with a trend towards jobs with shorter duration, could act to shift the balance of responsibility for continuing training towards the individual and away from the employer.
- The need to rethink careers which are becoming “boundaryless”<sup>138</sup>.
- The central role of management in achieving competitiveness and/or value for money, and in ensuring wellbeing.
- The growth of employment in the service sector has introduced a greater emotional content into the workplace. Employees are now expected to interact

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132 Salt et al. (2006)

133 Brown et al. (2006)

134 CIPD (2005)

135 Beswick et al. (2006)

136 Hodgson et al. (2006)

137 CBI (2006)

138 Kidd (SR-C10); Appendix E refers

more frequently with clients and customers, expressing certain emotions regardless of how they themselves may be feeling. Emotional exhaustion and burn-out are commonplace, accompanied by feelings of disengagement; all of which can reduce productivity and the wellbeing of workers.

- Despite the potential importance of work to those with mental disorders, this group experiences particularly low rates of employment: 21% for people with long-term mental illness compared to 47% for all people with a disability, and 74% for the UK working-age population<sup>139</sup>. Whilst incapacity can be a factor in this particularly low rate of employment, prejudice and discrimination by employers can also play an important role<sup>140</sup>.

A key conclusion is the need to balance the relentless demands for increased competitiveness in a changing world with the needs of the workforce to adapt to change, to cope with increasing pressures, but also to flourish. These seemingly conflicting requirements are addressed in this report (see Chapter 5 in particular).

### **The challenges facing the ageing of the workforce**

The distinctive feature about the ageing of the workforce is “that older workers will, in time, constitute a larger share of the labour force than in recent history”<sup>141</sup>. The main issues facing the labour market arising from this shift include<sup>142</sup>: the need to sustain the employability of older workers, particularly those who want to remain in work or who cannot afford to “retire early”; the need to ensure that the skill levels of older workers remain relevant; and the need for organisations to recognise the importance of investing in the training of older workers so that lifelong learning becomes a reality rather than a mantra; and ensuring that mobility levels of older workers are capable of adjusting to future changes in the job market.

Organisations will also need to explore how flexible work patterns for older workers (relating both to time and place) can be managed to maintain the reservoir of experience that would be difficult to replace, and which has been “developed and perfected over time” by these workers<sup>143</sup>. Part of the solution may lie in “fitting the job” to older workers through a changed conception of work itself and the promotion of occupational health and work-life balance. The consequences of ignoring the older worker, their match with the market and their power as consumers, may be an equally high-risk strategy as ignoring their skills and knowledge and the contribution they can make to organisational performance<sup>144</sup>.

## **2.6 Learning difficulties<sup>145</sup>**

Overall, learning difficulties affect up to 10% of children. Children with learning difficulties run the risk of mental ill-health, social exclusion, unemployment and criminal behaviour. Yet specific difficulties – in reading or arithmetic, for example – are rarely identified until relatively late in childhood. Parents and teachers are usually ill-informed about these problems, and specialised support is often inadequate or simply

<sup>139</sup> Labour Force Survey (2006)

<sup>140</sup> Addressing stigma associated with mental ill-health is considered further in Section 4.7

<sup>141</sup> Dixon (2003) p. 74

<sup>142</sup> Dixon (2003) p. 75

<sup>143</sup> Turner and Williams (2005) p. 28

<sup>144</sup> Turner and Williams (2005)

<sup>145</sup> For a more detailed summary of the future challenges relating to learning difficulties, see the Project report: Goswami. *Learning difficulties: Future challenges*; Appendix E refers. This section draws on that report.

unavailable. Quite apart from the contribution of learning difficulties to undesirable and anti-social behaviour, there is no doubting their negative impact at the individual level of wellbeing, mental capital, self-efficacy, cognitive resilience and reserve. Therefore, since the impacts on the child and the costs to society can be considerable and last many decades, addressing these learning difficulties more effectively will be a key challenge for the future.

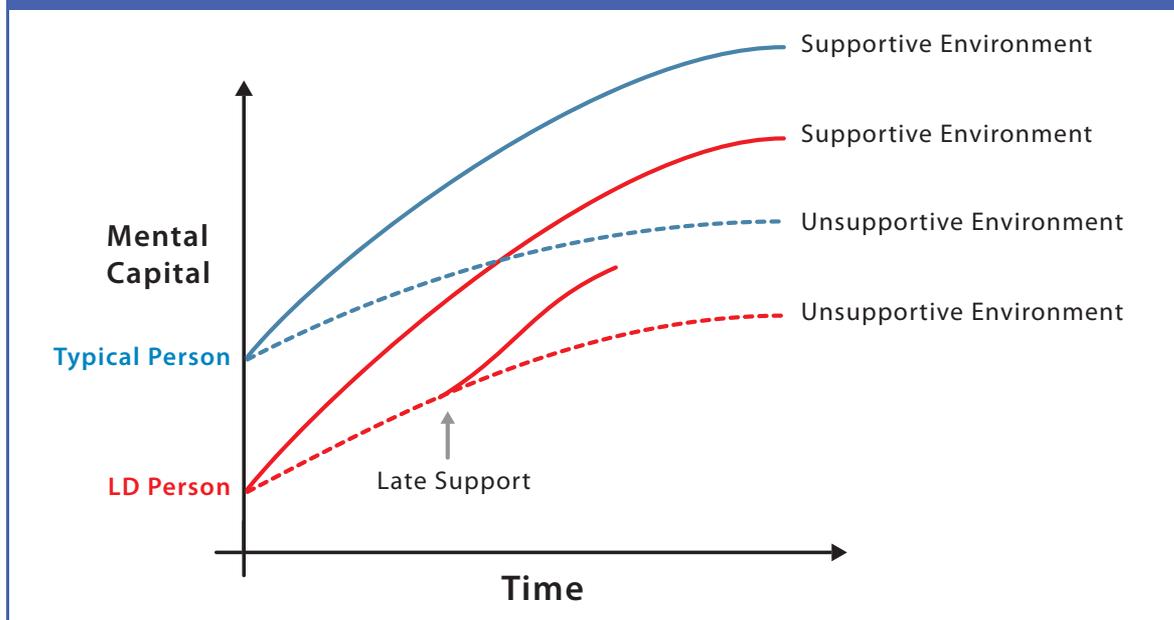
### 2.6.1 A developmental issue

Most childhood learning difficulties are genetically transmitted but as environments and genes interact, this co-action affects developmental trajectories. Recent advances in genetics and neuroscience have opened up many powerful new insights into the mechanisms involved.

In general, brains with learning difficulties are less efficient in the way they process certain kinds of information. A child does not, simplistically, “lack the ability to learn”; rather he or she has a neural circuitry that is less efficient at processing particular aspects of sensory, emotional or social input, appropriately and effectively.

Although genetic in origin, these difficulties are best thought of as “neurodevelopmental”. That is, the degree to which an inherited biological vulnerability becomes problematical depends crucially on the environment in which the young child develops. Figure 2.10 shows how supportive or non-supportive environments – family, community, school and so on – can influence the developmental trajectory for individuals with, and without, an inherited vulnerability to learning difficulties. In particular, this diagram suggests that in time, a hypothetical person with learning difficulties who develops in a supportive environment could potentially attain greater mental capital than a “typical” person (i.e. one without learning difficulties) in an unsupportive environment. However, whether this would happen in practice would depend on the severity of the learning difficulty, and the precise nature of the supportive and unsupportive environments.

**Figure 2.10: The influence of environments on the developmental trajectory for individuals with, and without, an inherited vulnerability to learning difficulties**



Developmental trajectories are easier to intercept than to reverse. Initial differences between children may be small. Yet even a small initial difference in basic processing can end up having large cognitive consequences. For example, a small difference in how the brain processes auditory information may lead eventually to a specific reading difficulty. This may then have a serious impact on the development of mental capital, because reading is key to accessing the entire educational curriculum and to later participation in a skills-based economy.

As children get older, their cognitive difficulties affect their self-concept, motivation to learn, and emotional development, with erosive effects on wellbeing and an increased risk of social exclusion and unemployment. As the learning difficulty is genetic in origin, it may be passed to the next generation.

However, biology simply confers a probabilistic risk to having a particular learning difficulty. It is the environment that determines the effect of that potential risk.

### 2.6.2 Common difficulties

The common learning difficulties (dyslexia; dyscalculia; Attention Deficit Hyperactivity Disorder; and Specific Language Impairment, SLI) affect between 3-8% of children. Children affected with learning difficulties can also show more than one disorder. For example, between 10-50% of children with SLI may also have developmental dyslexia<sup>146</sup>. These children are essentially at the low end of the continuum of ability for reading, mathematics, attention or language. All these learning difficulties are inherited and therefore tend to run in families.

Less common inherited learning difficulties such as the autism spectrum disorders also manifest themselves with problems on a developmental continuum. Thus, children who do not have autism but do have appreciable difficulties with social cognition (such as an impaired ability to read the feelings and intentions of others) may still experience severe effects on their mental capital. For example, some children excluded from school for apparently wilful, disruptive activities may have unidentified autism spectrum conditions. As stated above, overall, learning difficulties affect around 10% of children.

### 2.6.3 Processing deficits

The common learning difficulties of childhood may be grouped under two headings: symbolic systems, and social cognition and executive function. Both have profound and important impacts on a child's wellbeing and the mental capital trajectory.

#### **Symbolic systems:**

These comprise developmental dyslexia (difficulties with reading and writing), developmental dyscalculia (number difficulties), SLI, and deafness. There are significant gender differences: boys are more often affected in developmental dyslexia and SLI than girls. However, in developmental dyscalculia and deafness (which can give rise to developmental language and literacy difficulties), there are no gender differences.

Developmental dyslexia and SLI are associated with subtle problems in auditory processing, and impaired acquisition of grammar and phonology<sup>147</sup>. Sensory disorders such as deafness, in which the input system for auditory information is defective, cause

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<sup>146</sup> McArthur et al. (2000)

<sup>147</sup> Phonology relates to the sound structure of a language (e.g. syllable structure, rhyme) – see Appendix D

similar language-based problems, with consequent effects for social cognition (understanding the feelings and intentions of others).

Developmental dyscalculia is associated with impairment to the neural representation for magnitude – the core of our “number sense”.

Each disorder of symbolic learning requires a different, specific intervention. This may either target the impaired system (such as phonology for developmental dyslexia), or seek to further boost systems that are already well-functioning (for example, so-called “speech-reading” or lip-reading for deaf children).

#### *Social cognition and executive function:*

These relate to an individual's impaired ability to intuit the psychological states, such as thoughts, attitudes, beliefs and emotions, of other people. Problems with executive function can lead to difficulties in organising, managing and controlling behaviour. For example, the child may be poor at regulating their own mental states, for example, having difficulty in sustaining attention or controlling impulsive behaviour or anger.

The typically-developing child very quickly develops a working “Theory of Mind”<sup>148</sup>, with an understanding of intentional states beginning to emerge during the second year. It is a key ability that underpins all social, interactive, co-operative behaviour, and it lays down the roots of human reciprocity. Thus, in autism spectrum disorders, the primary difficulty lies in understanding the mental states of others – a primary impairment in social cognition. In anti-social behaviour and conduct disorders, there is impaired development of executive function, namely the ability to inhibit thoughts and actions and to change behaviour flexibly in response to social and environmental cues. For children with ADHD, the core symptoms are impulsivity, impairments in decision-making and strategic working memory<sup>149</sup>, over-activity, and difficulties with sustained and selective attention.

Difficulties with social cognition and executive function lead to problems in the child adapting their own social behaviour to the current context. This impairs a child's ability to form friendships, to function efficiently in the classroom, and, eventually, to parent effectively.

A failure to understand “what is going on” arising from impaired social cognition can cause anger and frustration which may manifest as temper tantrums, non-compliance and defiance, aggression, violence and deliberate provocation. Impairments in social cognition also characterise children with depression – a common precursor of eating disorders, in which impaired executive function also often plays a role.

### 2.6.4 New insights into learning: practical and theoretical

Scientific advances in genetics and neuroimaging offer a potential opportunity, within the next 20 years, to identify those children with learning difficulties in infancy. Genetic tests may be able to offer individualised diagnoses of a child's risk at a probabilistic level.

Cognitive neuroscience is already uncovering neural markers or biomarkers for detecting the different learning difficulties, measurable in infancy. As reliability improves at the individual level, these advances will enable immediate environmental interventions which should be broadly conceived. They could include: technological

<sup>148</sup> A “Theory of Mind” involves the capacity of a person to judge how others are thinking and feeling, based on his or her own responses in similar circumstances.

<sup>149</sup> DeVito et al. (2008)

interventions such as a cochlear implant for a deaf infant; improving caretaking behaviours; sensory aids to reinforce the acoustic information in language; new educational initiatives such as the teaching of self-regulation skills; technology-enhanced learning of basic reading and numerical skills; and pharmacological cognitive enhancers. However the genetic testing of children raises sensitive ethical issues, which were considered in the Project<sup>150</sup>.

From our review of scientific developments, we have been able to derive a conceptual model (see Chapter 3) describing both typical and atypical development of learning. This analyses the multiple factors influencing the outcomes of learning difficulties in individuals and provides signposts to possible strategies for intervention, both today and in the future.

### *Catching them young*

Early detection and intervention would alter developmental learning trajectories for these children with consequent benefits for mental capital and wellbeing throughout the lifecourse. This is clear from two fundamental empirical principles of learning. Early capability makes later learning more efficient, and enhancing early capability at the outset of learning also increases the complexity of what can be learned.

Enhancing mental capital at the beginning of learning will increase cognitive flexibility and cognitive reserve, as well as neural resilience; thereby improving future learning and improving mental capital and wellbeing in later life. Importantly, the kinds of interventions that help children with learning difficulties can be similar for a number of learning difficulties.

### 2.6.5 Futures

As many learning difficulties are genetically-driven, without appropriate interventions, prevalence rates are unlikely to change markedly in the future. Therefore, environmental strategies are required to reduce the impact of an inherited vulnerability to a learning difficulty. Those initiatives that address underlying causes early in the developmental trajectory are the most likely to be effective.

Also, there is strong evidence that premature babies are at higher risk of generalised intellectual disabilities than babies born at full-term, with the major risk factor being the degree of prematurity. The Project has not considered generalised intellectual disabilities, as the focus has been on specific learning difficulties. Although medical services are able to deliver babies at earlier and earlier stages, it is not clear that the risk of generalised intellectual disabilities is increasing, as medical advances can also ameliorate factors associated with heightened risk in these groups.

A developmental framework is essential for understanding how learning difficulties impact on future mental capital and wellbeing and who is at risk of resultant anti-social behaviour. Across all learning difficulties, more research is needed into underlying mechanisms, so that developmental trajectories are better understood and consequently more effective interventions can be developed. For example, recent research in cognitive neuroscience is revealing how differences in subtle aspects of very basic sensory processes such as seeing and hearing affect the cognitive trajectories important for high-level processes such as reading and mathematics.

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<sup>150</sup> For a more detailed discussion of the ethical issues, see Morein-Zamir and Brownsword (ER-1); Appendix E refers

In short, the earlier that learning difficulties and generalised intellectual disabilities are detected and interventions put into place, the higher the child's eventual level of mental capital and wellbeing, and the more valuable his or her contribution to society. Also, long-term, secondary benefits to society will include reduced drop-out rates from school and reduced social problems and crime rates.

## 2.7 Cross-cutting issues – informing the analysis of choices and interventions

The foregoing sections of this chapter have summarised important challenges for the future. The task of the second phase of the work (which is the subject of the remainder of this report) has been to consider the choices that stakeholders might make, and the interventions that could help meet those future challenges.

In such a broad project as this, a major consideration was how to structure this second phase. The Project's Science Coordination Team started by reviewing the results across all of the above areas. Two key observations were immediately apparent:

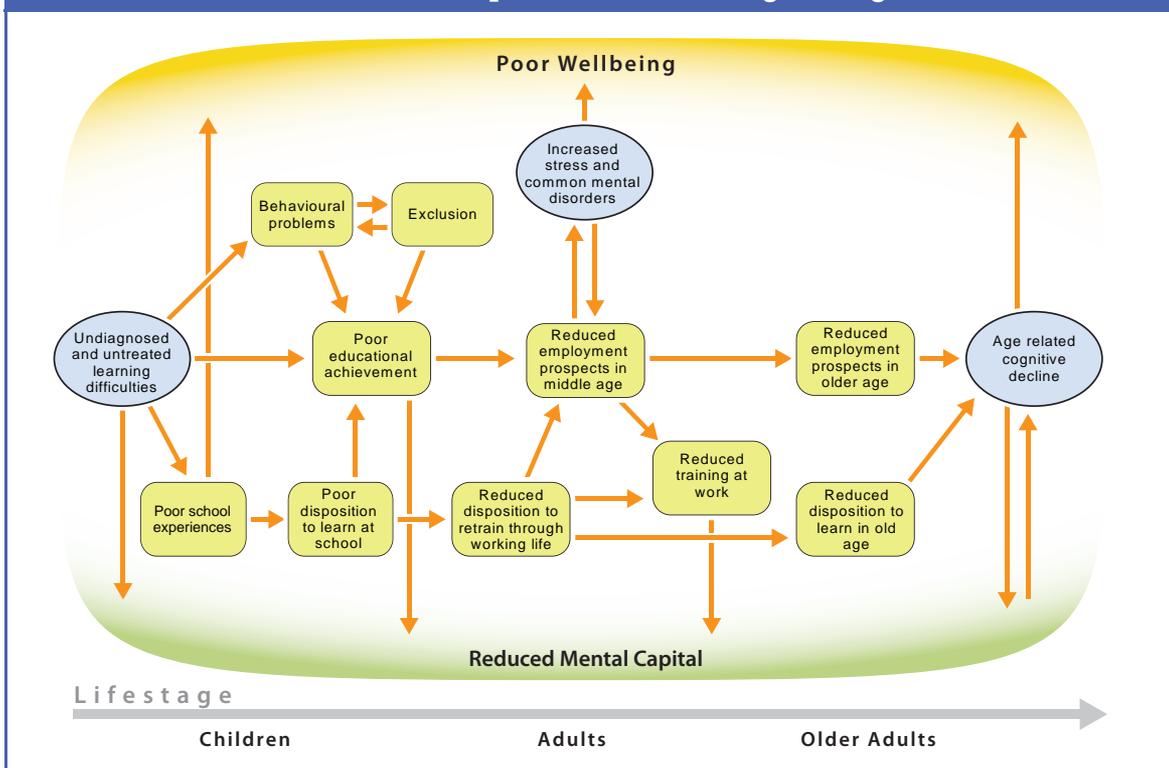
- All the areas<sup>151</sup> are interconnected. For example:
  - Early learning in children can increase their resilience to stress and common mental disorders, which in turn can help to engender good wellbeing in work and through into old age.
  - Cognitive decline in older adults can be mitigated by mental activity (for example, through lifelong learning), by physical activity (for example, through continued work), and by social networking – which will be conditioned, in part, by social skills learned many years earlier.
- Experiences at one time of a person's life can have far-reaching implications for mental capital and wellbeing many years, or even decades, later.

These two observations are brought together in Figure 2.11 which shows some of the routes whereby learning difficulties, learning through life, mental ill-health, and work, all interact. It also illustrates how one of the areas (in this case a failure to identify and treat learning difficulties in children) could affect mental capital and wellbeing at various stages throughout life.

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<sup>151</sup> i.e. Mental capital through life; Learning through life; Mental health; Wellbeing and work; and Learning difficulties.

**Figure 2.11: Illustration of how failure to diagnose and treat learning difficulties can affect mental capital and wellbeing through life**



The two observations (above) were used to inform the structure of the Phase 2 work, which therefore takes a broad view across all the areas, and takes a lifecourse perspective. It is for this reason that the subsequent chapters (3-6) are arranged according to successive stages of life.

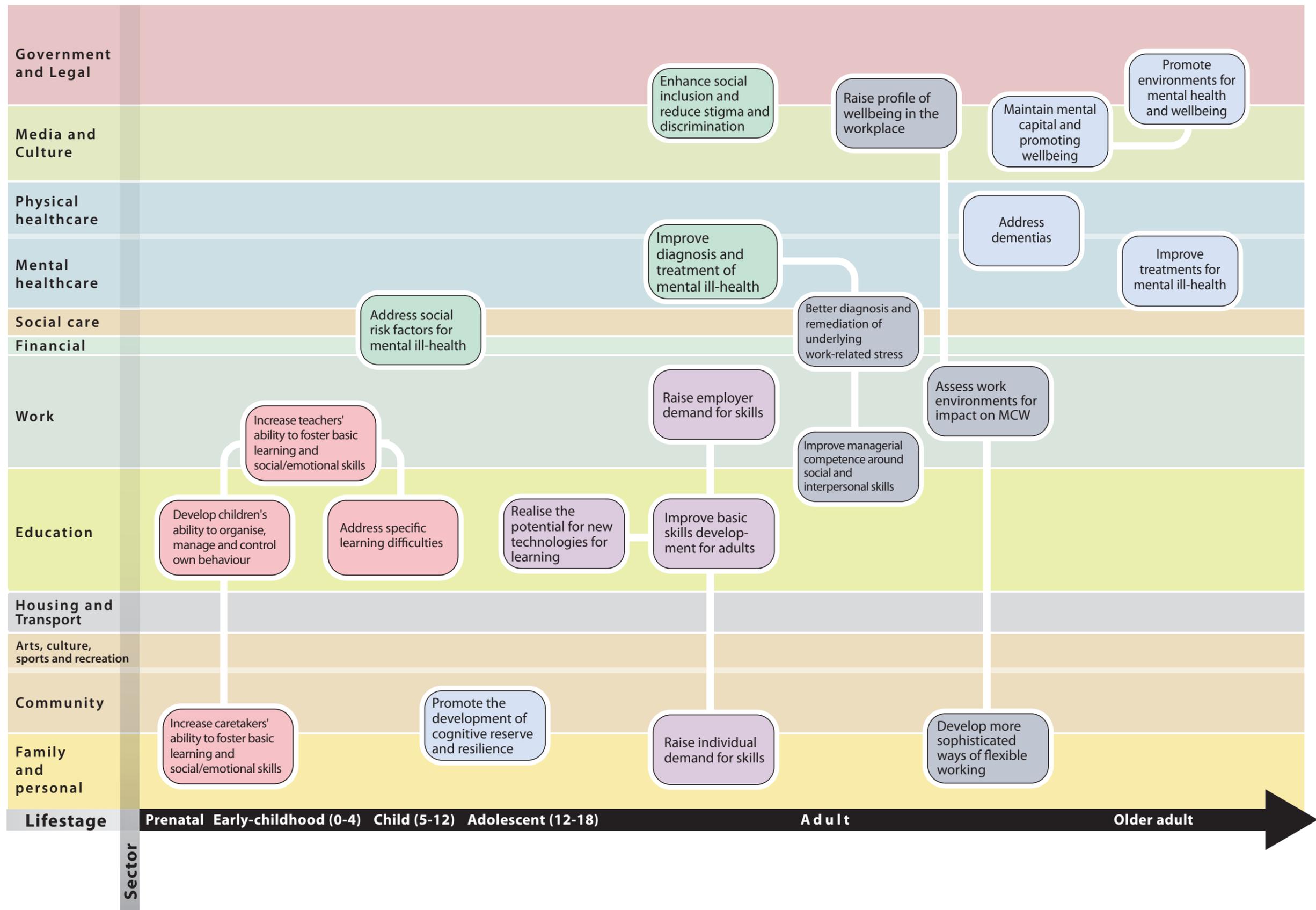
It was also observed that different people's mental capital, mental health and wellbeing lie on a spectrum. Therefore, a decision was taken to consider choices and interventions across a spectrum spanning three categories:

- The promotion of flourishing in everyone.
- Early detection and treatment of disorders and problems – to prevent them from developing.
- Addressing chronic and acute problems.

Next, the experts involved in the Project selected a number of choices and promising interventions for analysis: each of these addressed important challenges identified in Phase 1. Stakeholders in the public, voluntary and private sectors helped to inform this selection, which was conditioned on the potential to yield benefits, scientific and other evidence, and also practical considerations relating to prospects for catalysing subsequent action.

The selected interventions are mapped in Figure 2.12 where they are arranged horizontally according to the time in the lifecourse at which they would be offered; note that their impacts and benefits would generally take place over longer timescales. Each is colour-coded according to the various areas considered in this chapter: Figure 2.12 also arranges the many proposed interventions according to the various stakeholders or settings that would be involved in each case (vertical axis) – these range from Government to work, and through to communities and the individual. The

Figure 2.12: Chart of the principal interventions considered by the Project; plotted by lifestage vs. principle sector in which the intervention operates



broad scatter of the interventions across the diagram demonstrates the importance of taking a broad view of stakeholders who could be involved in implementing interventions at different stages through life.

Since the analysis specifically cuts across stakeholder boundaries, it is unsurprising that many of the resulting insights and potential actions also cut across those boundaries. And it is precisely such actions that stakeholders find difficult to take forward. Therefore, in order to fully realise the benefits identified by the Project, it has been important to consider systems of governance and the basis on which resources are allocated. Such issues go to the heart of how Government makes its decisions, and these are therefore discussed in Chapter 7.

### **Key messages**

If we are to prosper and thrive in the increasingly interconnected world and our changing society, then we cannot afford to waste resources – and this is as true for mental resources as material resources. Encouraging and enabling everyone to realise their greatest mental potential throughout their lives will be crucial for our future prosperity and wellbeing.

In order to achieve this, we need to:

- Take a view across the lifecourse – from conception to death, since experiences at one stage in a person's life can have impacts across many years and even decades.
- Recognise that the factors driving changes in our mental capital and wellbeing will operate in many different settings: globally; nationally (through changing demographics and society); in work; and at the level of the individual (through our changing attitudes, values, and expectations).
- Understand that many aspects of MCW cut across the traditional responsibilities of Government departments.

These points argue strongly for the development of an integrated cross-Government strategy – with interventions acting in concert through the lifecourse, and in different settings. Mapping out important elements of such a strategy is the key aim for subsequent chapters of this report.

## **3. Childhood and adolescence: interventions**

- 3.1 Learning difficulties: introduction**
- 3.2 Developmental dyslexia and functional literacy**
- 3.3 Developmental dyscalculia and functional numeracy**
- 3.4 Executive function skills and helping children to flourish**
- 3.5 Developmental science for teachers and childcare professionals**
- 3.6 Improving the wellbeing of staff in learning and skills**
- 3.7 Education for children, young people and adolescents**
- 3.8 Children's mental health**
- 3.9 Looked-after children**



### **3 Childhood and adolescence: interventions**

Childhood and adolescence are particularly critical stages in life when important skills are learned which set the trajectory for mental capital and wellbeing through later years.

This chapter considers interventions to address important issues that affect outcomes for children, in particular: learning difficulties which affect about 10% of children; and executive function which is crucial for the development of skills to manage and control one's own behaviour. More generally, education and the importance of early environments are also considered. Teachers and classroom environments are specifically discussed because of their substantial effect on children's development.

Finally, the chapter concludes by considering interventions for mental disorders in children and looked-after children in particular.

## 3 Childhood and adolescence: interventions

Childhood and adolescence are particularly critical stages; at this time important skills are learned which set the trajectory for mental capital and wellbeing through life. These include basic skills such as literacy and numeracy; more advanced skills to prepare for working life; and importantly, a wide range of social-cognitive skills related to executive function, emotional regulation and social interaction. It is also the time when certain key behaviours are formed – notably the disposition to learn (see Section 2.3). This chapter therefore considers the choices and interventions that could help to ensure that the children of today are offered opportunities to acquire the best possible skills for their futures.

First, learning difficulties are described (Sections 3.1 – 3.3). Here it will be seen that early detection and intervention is crucial. Interventions related to executive function in children are then discussed (Section 3.4), in view of their substantial effect on a wide range of crucial life skills and behaviours. The importance of early environments for all children, not just children with learning difficulties, is highlighted by this research. Section 3.5 considers advances in understanding of the brain and development have the potential to substantially improve the effectiveness of teaching. Section 3.6 then considers the wellbeing of teachers and other childcare professionals; the evidence shows that their wellbeing is important not just for themselves, but for the substantial effect it can have on the wellbeing of children. Education – both for children and adolescents – is considered in Section 3.7, and the chapter concludes with a discussion of looked-after children, in view of the substantial need to improve their outcomes.

The discussion draws upon several workshops involving leading experts from the UK and abroad, and key stakeholders, particularly from Government. The first two considered learning difficulties (functional literacy and numeracy) and executive function skills. These enabled the participants to review the latest evidence associated with interventions in different countries and also drew upon new systems analysis commissioned by the Project. In so doing, the workshops built upon the science reviews undertaken in the first phase of the Project<sup>152</sup>. Two further workshops focused on treatments for mental disorders<sup>153</sup> and on the priorities for interventions for looked-after children.

### 3.1 Learning difficulties: introduction

Learning difficulties affect up to 10% of children, reducing wellbeing and self-esteem, and significantly reducing the acquisition of mental capital. For example, an economic analysis commissioned by the Project<sup>154</sup> showed that having dyslexia reduced the probability of achieving five or more GCSEs (A\*-C) by 3-12 percentage points. The same analysis found that having dyscalculia reduced this probability by 7-20 percentage points, and having Attention Deficit Hyperactivity Disorder (ADHD) reduced it by 14-31 percentage points, even when intellectual ability at age 11 and other demographic factors were taken into account.

<sup>152</sup> See Appendix E

<sup>153</sup> See Chapter 4

<sup>154</sup> Challen et al. (2008). *The economic consequences of "specific learning difficulties" and the cost-effectiveness of prevention strategies*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk)

Most learning difficulties represent the extreme low end of a continuum of ability. This means that there is no sharp dividing line between having a learning difficulty and not having a learning difficulty. A good analogy is drawing a dividing line concerning whether a child is “small” or not. Tallness is heritable, but to decide whether a particular child is “small” requires a comparison with the peer group, and a consideration of the functional effects of being “small”. It may be decided that only children in the bottom 5% of the distribution of “tallness” should be identified as small, or alternatively, it may be decided that children in the bottom 10% of the distribution should be identified as small. In the former case, children who are near to the bottom end of the distribution yet who are still rather small compared to their peers would not be identified as “small”. Applying this analogy to learning difficulties, we can see that children near to the low end of the distribution who do not exhibit sufficiently severe difficulties to qualify for formal identification will still have significant learning problems. Learning difficulties frequently place affected children at risk for mental ill-health, social exclusion, unemployment and criminal behaviour.

New science is revealing that brains with learning difficulties are less efficient in particular and measurable aspects of processing, providing specific targets for intervention. This is illustrated by the conceptual model for learning difficulties (see Figure 3.1 overleaf) that has been developed by the Project. Learning difficulties have a genetic basis, and changing early environments can have a dramatic impact on how brain-based vulnerabilities play out in terms of developmental trajectories. For example, early environmental support for inefficient sensory processing e.g. a cochlear implant for a deaf child, can have a dramatic effect on subsequent development for some deaf children<sup>155</sup>.

It was decided to focus on developmental dyslexia (Section 3.2) and developmental dyscalculia (Section 3.3) in view of the pervasive and long-lasting effects that these can have on the outcomes of children. Also, the Project’s analysis relating to the future of work<sup>156</sup> has shown that pressure specifically for functional literacy and numeracy is likely to increase in the future. Moreover, an economic analysis commissioned by the Project suggested that having low skills in literacy or numeracy produces a lifetime earnings cost to the individual of around £81,000 and £114,000, respectively<sup>157</sup>.

Poor self-regulatory skills (also referred to as “executive function skills”) were also chosen for consideration. These affect the ability of the individual to organise, manage and control their social, emotional and cognitive behaviours. As such, they characterise a number of learning difficulties, as well as anti-social behaviour and conduct disorders, which can have a substantial impact on the child, families, and on wider society. Having the particular combination of poor behaviour management skills that characterises ADHD produces an estimated lifetime earnings cost of £43,000, suggesting that substantial benefits would accrue to the individual (and to the economy) from interventions that would reduce these problems<sup>158</sup>. Fostering the development of self-regulatory skills would help all of our children to flourish.

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155 Woll (SR-D5); Appendix E refers

156 See Chapter 5

157 Challen et al. (2008). *The economic consequences of “specific learning difficulties” and the cost-effectiveness of prevention strategies*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

158 Ibid

### Ethical issues

The ethical acceptability of early detection of learning difficulties is predicated on two key criteria (i) the ability to address the problem; and (ii) that the interventions are carried out primarily for the sake of the child.

Even where the first criterion might not be satisfied in full, there are additional possible benefits. Thus early detection might help to make allowances within the education system as well as outside; and having a “label” might provide access to additional forms of support and resources for the child and the family. Early detection might also allow for more strategies for coping. Indirect benefits can also occur: for example, as figures on prevalence and severity are collected and aggregated, an appreciation of the need for treatment should grow, and increased funding might be made available. However, these benefits have to be balanced against possible negative effects of labelling a child as having a learning difficulty – a category that is perceived by some as being associated with stigma and discrimination.

For further discussion of ethical issues relating to mental capital and wellbeing, see the Foresight Ethics Workshop report<sup>159</sup>.

### 3.2 Developmental dyslexia<sup>160</sup> and functional literacy<sup>161</sup>

Developmental dyslexia, as stringently identified, affects around 4-8% of children, with a 4:1 gender ratio boys:girls. It reflects the extreme low end of the continuum of ability in reading. Typically, it is identified relatively late, at about eight or nine years of age. By this point an atypical learning trajectory is relatively entrenched.

Large-scale studies of at-risk infants suggest that dyslexia is associated with subtle impairments in how the brain processes auditory information<sup>162</sup>. By early childhood, the hallmark of dyslexia is a selective difficulty in processing phonological (sound-based) aspects of language. For example, children with dyslexia have difficulty in reliably deciding whether words rhyme, in counting the number of syllables in words, and in short-term memory tasks (short-term memory is a phonological system).

This phonological impairment is found across languages. However, for languages with irregular spelling systems, such as English, phonological difficulties have more severe effects on the learning trajectory. Whereas children with dyslexia in most European languages read extremely slowly but accurately, children with dyslexia in English read extremely slowly and inaccurately. Indeed, the relative difficulty of acquiring reading skills in English also results in an “under-achieving tail” of *typically-developing* children, for whom achieving functional literacy remains a challenge. Boys are over-represented in this under-achieving tail.

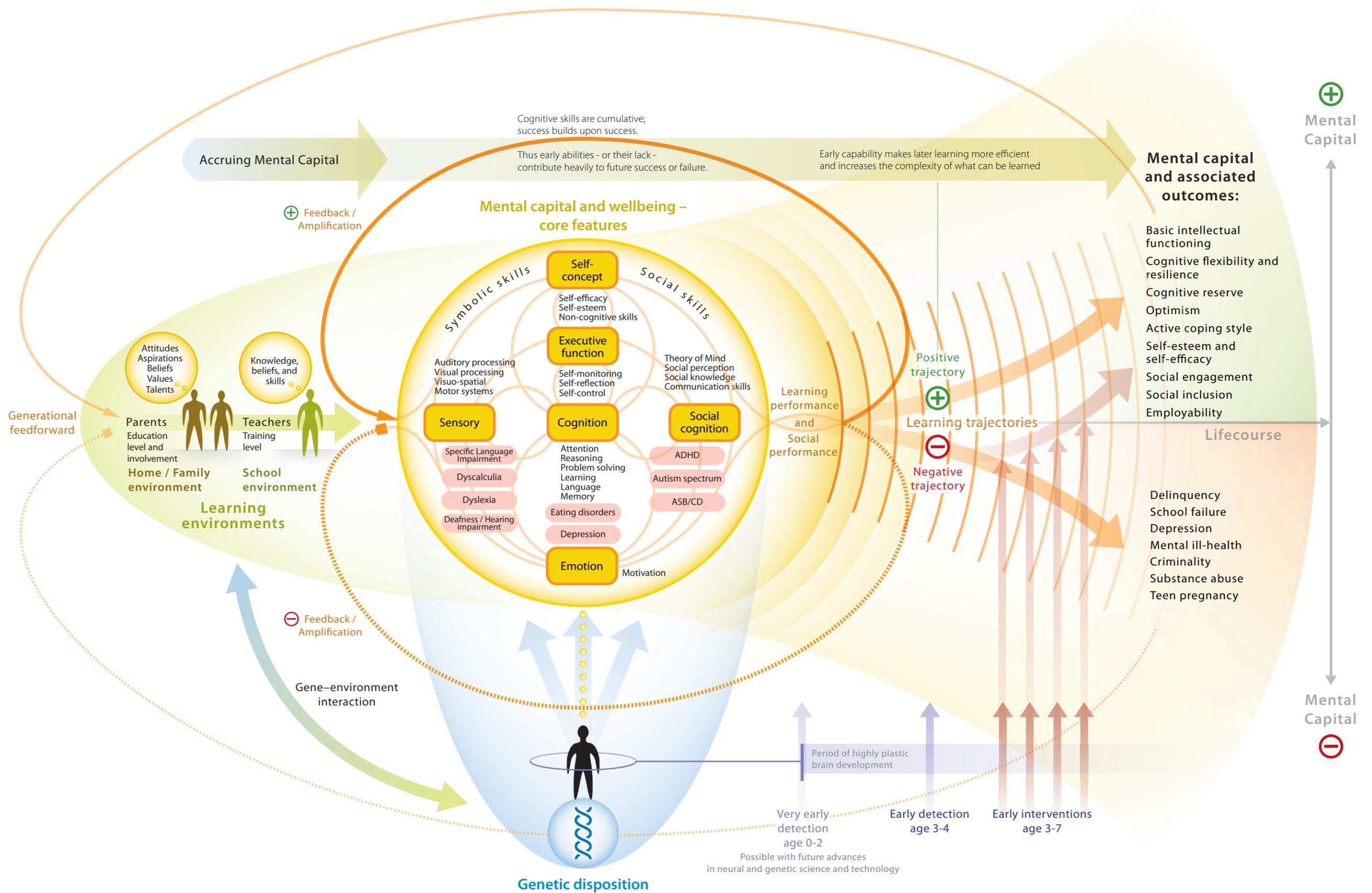
<sup>159</sup> Morein-Zamir and Brownsword (ER-1); Appendix E refers

<sup>160</sup> Developmental dyslexia is a disorder manifested by difficulties in learning to read and spell despite conventional instruction, adequate intelligence and socio-cultural opportunity.

<sup>161</sup> Functional literacy refers to whether a person is able to understand and employ printed information in daily life, at home, at work and in the community.

<sup>162</sup> Lyytinen (SR-D12); Friedrich (SR-D14); Appendix E refers

Figure 3.1: A conceptual model for learning difficulties developed by the Project



### 3.2.1 Influences on functional literacy

Figure 3.2 overleaf presents a diagrammatic summary of how different genetic, family-based and school-based factors affect the development of functional literacy (note that complexities of gene-environment correlations and interactions are not represented)<sup>163</sup>. The development of this “influence diagram” has drawn on scientific evidence commissioned by the Project.

The diagram shows that genetic factors act largely through their influence on phonological development and overall language development. The family environment acts through language development and through the child’s exposure to print (for example, parental reading with children, the value placed on print in the home). The school environment acts mainly through teacher expertise, pupil self-esteem and motivation, and the quality of the reading curriculum.

The national reading curriculum was addressed recently by the Department for Schools, Children and Families (DCSF) in the Rose Review<sup>164</sup>. However, Rose’s focus was on teaching decoding (phonic) skills rather than on fostering the general phonology and language-based skills relevant to reading and comprehending text. Teacher expertise in recognising learning difficulties and teacher knowledge of the reading process remains problematic. Remedying this situation is critical to the early identification of, and intervention in, learning difficulties such as dyslexia.

### 3.2.2 Options for intervention

Within the next 20 years, it may become possible to identify genetic risk for dyslexia, and brain imaging of infants may have advanced enough to reveal whether a particular child has a specific processing difficulty, enabling very early identification and intervention. Figure 3.2 suggests that three kinds of interventions should be considered in early childhood:

- Interventions focused on phonological development.
- Interventions focused on the family environment.
- Interventions designed to “skill up” teachers.

It should be noted that these interventions would also help children struggling to achieve functional literacy who do not have specific learning difficulties, as well as children who have developmental dyslexia.

At the Project workshop on functional literacy, it was observed that current early screening tools for identifying developmental dyslexia were ineffective, generating many false positives. The most effective interventions are thus likely to be generic, focusing on developing phonological skills in all children in the early years. Generic intervention could then be followed by differentiated interventions for those most at risk. Teachers could be trained to recognise children who were unresponsive to generic enrichment, identifying those with likely learning difficulties for more specific interventions (the “response to intervention” screening model). These children could be given individualised treatments, with different “tiers” of intervention depending on the persistence of learning difficulties. The “wave” model being developed by DCSF as part of the Literacy and Numeracy strategies is a partial implementation of a “response to intervention” approach. In the Strategies, Wave 1 refers to whole-class teaching, Wave 2

<sup>163</sup> Note: in Figure 3.2 and other figures in this section, “social class” is used as a generic term for socio-economic status.

<sup>164</sup> Rose (2006)

to small-group teaching, and Wave 3 to personalised teaching. Building on this, early generic intervention, with later focused and differentiated intervention, individualised to each child with a learning difficulty, seems likely to offer the highest return on educational investment.

### *Phonological interventions*

Targeted phonological interventions that include teaching about letters across languages generally are usually effective in treating developmental dyslexia (mean effect size 0.67, which is considered large<sup>165</sup>). Many interventions considered by Bus and van Ijzendoorn were for school-aged children, but they reported greater effect for pre-school children. It is important to clarify that phonology (the sound structure of language) is not represented by the brain in terms of sound units that map onto alphabetic letters. However, once the alphabet is successfully acquired, the brain 're-maps' phonology, meaning that the phonological insights achieved by the literate brain are different from those achieved by the non-literate brain. This is why phonological interventions must be broader than letter-sound training. A successful generic phonology-based intervention in German with younger pre-reading children (20-week programme "Hearing, Listening, Learning", delivered by German kindergarten teachers) reported an effect size of 0.57 for spelling development by Grade 2, with a smaller effect size for reading (0.26)<sup>166</sup>.

The German studies showed similar enhancement of reading and spelling following phonological training for migrant children from other language backgrounds, and for children with language difficulties. Training for the migrant children was delivered in the mother tongue (for example, Turkish migrant children received oral language interventions in Turkish, and this had an impact on learning to read in German). Targeted interventions with older at-risk children in English also show large effect sizes (0.69), which translate into gains of around 7 standardised score points in reading<sup>167</sup>. These scientific studies suggest that phonological interventions which link phonological training to letter-sound relations offer an important tool for early intervention.

The generic German intervention had a number of important features. As it was delivered in kindergarten by teaching assistants, there was equal access for all children, and no need for parental "buy-in". Its generic nature also allowed for the wide variability amongst children in early development. The intervention followed a developmental progression that is supported by experimental studies across languages, beginning with listening and rhyming games, followed by oral work on sentences and words, then oral work on syllables and initial sounds in words. Oral games to foster blending and segmenting sound elements in words came next, and finally letter-sound correspondences were introduced. Hence the major focus of the intervention was on oral language skills. Developmental appropriateness is an important consideration for early interventions, and language and listening skills are the most appropriate targets for intervention in early years settings. As well as improving the children's phonological skills, the intervention was also found to improve their emotional response to learning, as well as the self-esteem of the teaching assistants.

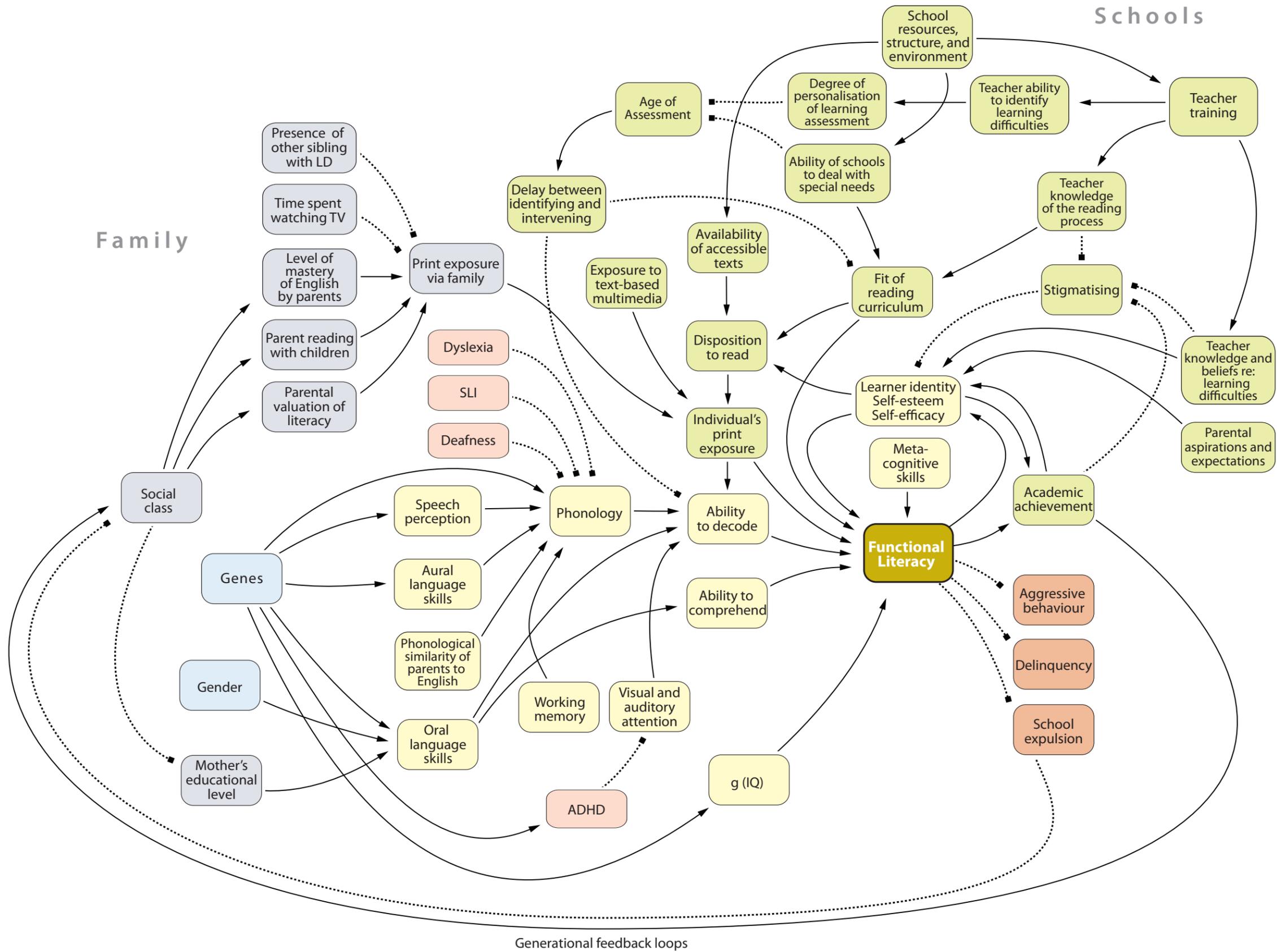
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165 Bus and van Ijzendoorn (1999)

166 Schneider et al. (1997)

167 Hatcher et al. (2006)

Figure 3.2: An influence diagram showing the interactions between the causal factors that drive the development of functional literacy



### Family-based interventions

Parents and the home environment also play a crucial role in literacy development. Connor et al.<sup>168</sup> estimate that the family environment is the major source of the variability in children's literacy skills at school entry. As shown in Figure 3.2, the home environment influences both phonological development (via oral language practices in the home) and print exposure (via number of books in the home, parental valuation of literacy etc.). Interventions designed to introduce books into the home and to guide carers in optimal "shared reading" practices appear to be effective in fostering early literacy skills<sup>169</sup>, with typical effect sizes of about 0.50.

Interventions involving shared reading enhance the language that carers use with young children as well as providing exposure to print. This is important, as overall language skills (vocabulary and complex language) as well as phonological awareness and letter knowledge are extremely strong predictors of later literacy<sup>170</sup>. Effective shared reading programmes also teach caretakers to use books as a starting point for dialogue, increasing the complexity of the language used with the child and raising parental responsiveness to the interests of the child. The latter is an important predictor of later independent learning (see Section 3.4.2).

Shared interactions involving books also reduce the amount of "empty language" used with young children which can be characteristic of lower socio-economic status homes (e.g. "get it", "bring it here", "I told you not to do that"). These interactions also help to promote the experience of contingent responsiveness by the child (the child initiates and the parent responds promptly and effectively; this is another important predictor of later independent learning). Hence shared reading interventions have wider impacts than promoting functional literacy, as they foster the kind of parent-child interactions that predict good self-regulation (see Section 3.4.2).

### School- and teacher-based interventions

Classroom environments depend on the teacher, and American cost-benefit analyses suggest that high-quality pre-school interventions show strong returns on investment (for example, it has been estimated that every \$1 invested in pre-natal interventions returned \$3.01 by age 21, every \$1 invested in infancy interventions returned \$4.42 by age 21, and every \$1 invested in pre-school interventions returned \$7.16 by age 21<sup>171</sup>). The breakdown of returns on the investment in pre-school programmes is provided in Figure 3.3 overleaf<sup>172</sup>. When considering these returns, it is important to bear in mind that benefits accruing after age 21 (such as improved earnings) were not included, and that other possible benefits with implications for future mental capital and wellbeing, such as improved physical health, were not considered.

The experts involved in the Project identified three nodes in the influence diagram (Figure 3.2) as most critical for intervention:

- Increased teacher knowledge of how reading develops in children.
- Increased teacher knowledge about learning difficulties such as dyslexia.
- Increased training to help teachers to identify children with learning difficulties.

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<sup>168</sup> Connor et al. (2004)

<sup>169</sup> Whitehurst et al. (1994)

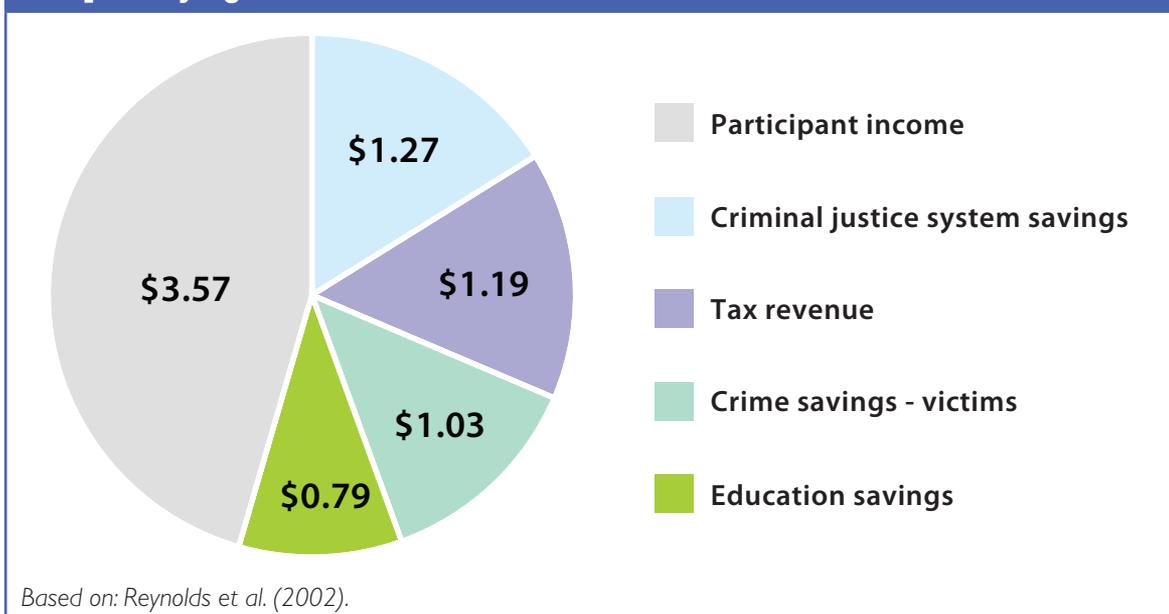
<sup>170</sup> US National Reading Panel (2000)

<sup>171</sup> Reynolds et al. (2002)

<sup>172</sup> Taken from Landry (2005)

In addition, the US Department of Education/National Institutes of Health (NIH) Individualised Student Instruction Project<sup>173</sup> has shown that matching teachers' literacy instruction to the current level of the child was critical to the effectiveness of literacy teaching for all children. This matching can be accomplished effectively by classroom teachers if they use special instructional software developed by the NIH project, which recommends the optimal type of input for each child given their current developmental level. For example, using algorithms derived from empirical studies, it advises on the proportion of time that the child should spend on meaning-focused or comprehension activities versus code-focused or phonics activities.

**Figure 3.3: Returns on investment for pre-school programmes in the USA for children aged 3 to 5. Total return on investment is \$7.16 for every \$1 spent by age 21**



Randomised controlled trials of the intervention indicated stronger student outcomes when instruction was individualised, with a dosage effect: the more that teachers in participating schools individualised instruction, the larger the effects on literacy (for example, large effect size of 1.4 for reading comprehension). Hence individualising instruction to the strengths and weaknesses of the child would improve the achievement of functional literacy *for all children*.

There was strong agreement in the workshop that the status and training of teachers of children with specific learning difficulties need to be improved. Such interventions may require a culture shift in teacher training establishments, and may need a reconsideration of the inclusion agenda. For example, it was reported that there is still widespread misunderstanding of learning difficulties, with the view that learning difficulties are socially constructed still prevalent. Recent knowledge about the brain and cognitive development (the so-called "medical model") therefore needs to be communicated effectively to teachers<sup>174</sup>. Increasing teachers' awareness of learning difficulties and of the powerful role of their expectations of pupils may help to avoid potential disadvantages associated with early identification<sup>175</sup>, while raising public awareness of learning difficulties could help to reduce stigmatisation. Clear understanding of the features of specific learning difficulties of the kind discussed in this

<sup>173</sup> Work presented by Professor Connor at the Project workshop, *Perspectives on equipping children for the future*.

<sup>174</sup> See Section 3.5 for further consideration of these issues.

<sup>175</sup> Morein-Zamir and Brownsword (ER-1); Appendix E refers

report, together with generalised intellectual disabilities as discussed in the Phase I report<sup>176</sup> (such as Down syndrome) are also required, so that each group can receive systematic educational and social support tailored to their specific needs. The media could be pivotal in promoting public understanding and in advocating greater attention to these issues in schools.

Clear leadership on learning difficulties in schools, with accountability for the success of children with difficulties residing with school leadership, is crucial. Systematic leadership on learning difficulties within a school depends on the involvement of the head teacher and other senior staff, ensuring that a “culture of responsibility” for the weakest learners is fostered.

Finland was also considered as a model; there, decisions about special educational needs (SEN) are made in individual schools by trained SEN teachers. SEN teachers represent 22% of the teaching workforce in Finland, and 22% of Finnish children see an SEN teacher during their school career. All teachers in Finland spend at least five years at university and hold a masters-level qualification. Central Government provides extra resourcing for all identified SEN children, with the school free to spend the resource as it chooses. This extra resource is equivalent to approximately 50% of that spent on a normally developing child, thus SEN children in Finland receive 150% of the usual resource. In 2006, 8% of Finnish schoolchildren had personal educational plans for SEN, with about half of these being schooled in mainstream schools and half in special schools.

Finally, other potentially effective models were also considered, such as a more fluid special school system for the UK, where children can dip in and out of specialist schools depending on their needs. The focus of such a system would be on what the child needs to learn, and where this might best happen, with different special schools developing specific areas of expertise, perhaps in partnership with universities.

### 3.2.3 Research priorities

These are defined as:

- Longitudinal studies involving genetics and neuroscience. These would seek to improve understanding of key developmental mechanisms in learning difficulties, thereby enabling the power of screening tools and the effectiveness of interventions to be improved.
- Investigating basic sensory processing across learning difficulties in large samples, aimed at deeper understanding of co-morbidities.
- Intensive research with children highly resistant to intervention, to develop better methods of intervening.
- Improved dissemination and leverage of knowledge about the science of learning difficulties into the classroom.

## 3.3 Developmental dyscalculia and functional numeracy

As stated above, developmental dyscalculia has a similar prevalence to developmental dyslexia, affecting around 3.6-6.5% of children (with an equal gender ratio boys:girls). As with dyslexia, it reflects the extreme low end of the continuum of ability, here ability in numeracy. However, research into developmental dyscalculia is less well-developed

<sup>176</sup> See the Project report: Goswami. *Learning difficulties: Future challenges*; Appendix E refers

and the learning difficulty is less well-understood. Therefore in the UK it is relatively uncommon for a child to be formally identified as having dyscalculia.

Genetic studies suggest that dyscalculia is heritable, with possible genetic influence on the neural representation of magnitude in the parietal cortex (the “number sense”, or non-symbolic understanding of number<sup>177</sup>). By early childhood, the hallmark of dyscalculia is the lack of an intuitive grasp of number. For example, children with dyscalculia have tremendous difficulty in estimating small numbers without counting (e.g. recognising four dots as “4”), in counting, and in choosing the larger of two sets. They also find it difficult to learn simple arithmetical concepts and simple arithmetical routines.

This difficulty with numbers is found across languages, suggesting that a core difficulty lies in understanding the non-symbolic aspects of number. However, numeracy is not a unitary ability. It is made up of many components (e.g. counting, knowing number facts, knowing algorithms, magnitude estimation, understanding place value – the mental “number line”), and difficulties in any one component can occur relatively independently of difficulties in other components. Identification of the components with which a child has particular difficulty is thus required for effective intervention. There are also large differences in numerical performance between *typically-developing* children from different countries. This suggests that the environment plays a crucial role in learning arithmetic and other components of numeracy<sup>178</sup>.

### 3.3.1 Influences on functional numeracy

An influence diagram summarising scientific findings on how different factors affect the development of functional numeracy is provided at Figure 3.4. The diagram shows that, as for functional literacy, genetic factors, family environment and school environment are key. The model shows that genetic factors act largely through their influence on the number sense and overall language development (language skills affect learning number facts and oral skills like counting). The family environment acts through language and the quality and amount of number experiences provided in the home e.g. playing board games, explicit sharing, use of counting language. The school environment acts mainly through teacher expertise, pupil self-esteem and the quality of the number curriculum.

### 3.3.2 Options for intervention

Figure 3.4 suggests that three kinds of interventions should be considered in early childhood:

- Interventions focused on the intuitive understanding of number and learning number facts.
- Interventions focused on the early family environment.
- Interventions designed to “skill up” teachers.

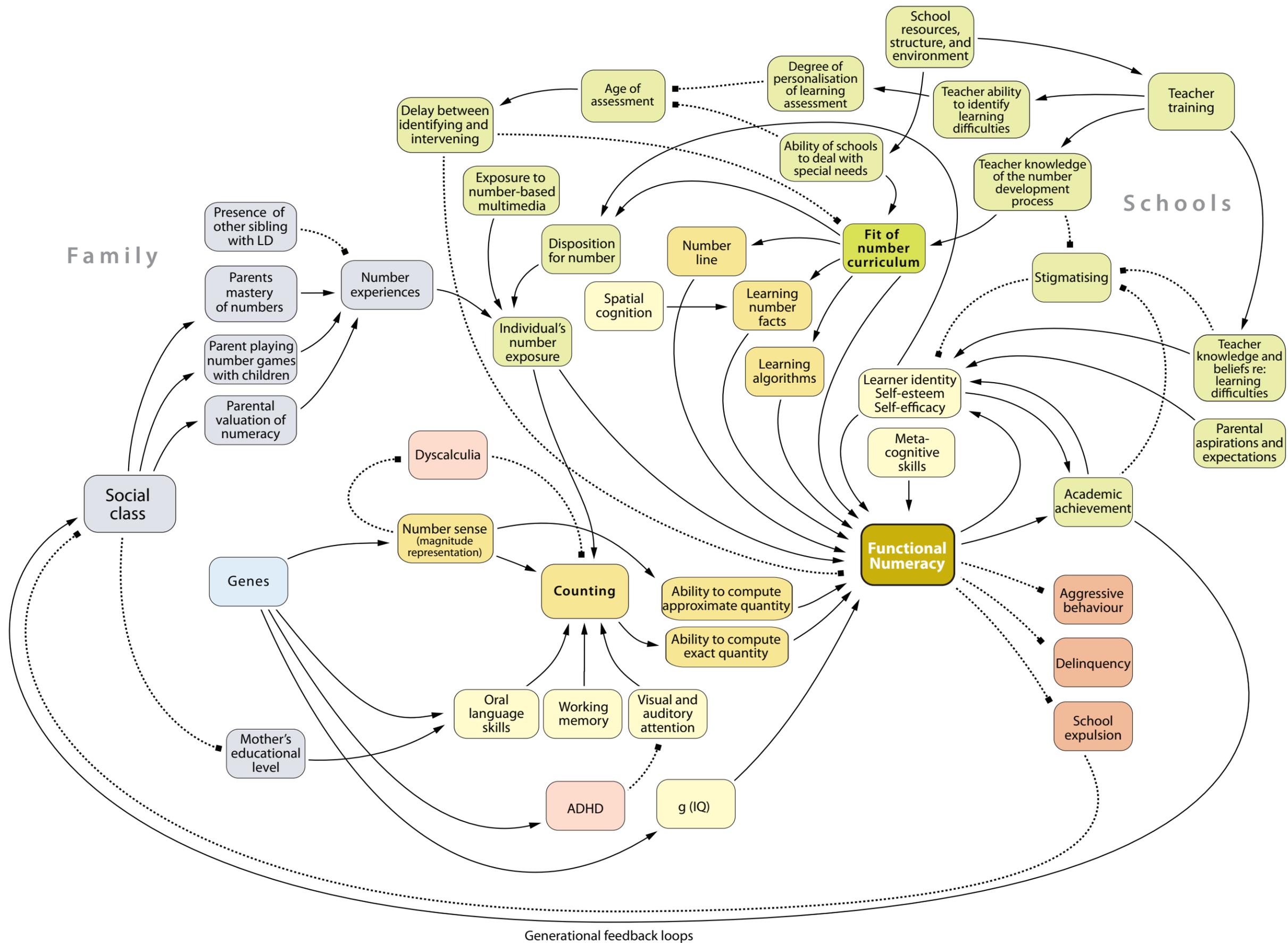
These interventions would help children struggling to achieve functional numeracy who do not have specific learning difficulties, as well as children who have developmental dyscalculia.

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<sup>177</sup> Butterworth (SR-D4); Appendix E refers

<sup>178</sup> See also Dowker (2004); Williams (2008)

Figure 3.4: An influence diagram showing the interactions between the causal factors that affect the development of functional numeracy



### *Number-specific interventions*

A review of the evidence from interventions in different languages reveals that the research base is fragmented, outcomes are mixed, and no single intervention can be identified as particularly effective, although many interventions show some effects. For example, technologies designed to enhance the learning of basic number facts, such as the computerised “Number Race” game from France which emphasises numerical comparisons, show learning effects. However, differences in learning compared to control children playing other computer games (for example, literacy games) are not always significant. Similarly, a Finnish computerised intervention designed to foster the spontaneous recognition of quantities and magnitudes also shows some learning effects. Again, however, these are not always significantly stronger than the numerical learning shown by control children who experienced literacy interventions.

The most likely reason for these mixed results is the multi-componential nature of numeracy. Therefore, it is likely that interventions need to be targeted to the particular components that are causing difficulty for an individual child. Technological interventions offer great scope for doing this, as technology can, in principle, be developed to support each component of functional numeracy, with individual children then receiving the combination of components individualised to their specific difficulties. The development of such technological interventions would require intensive resourcing, but the required expertise does exist within the academic community. It is considered unlikely that the commercial sector would take on this challenge, as currently there are no market pressures to do so.

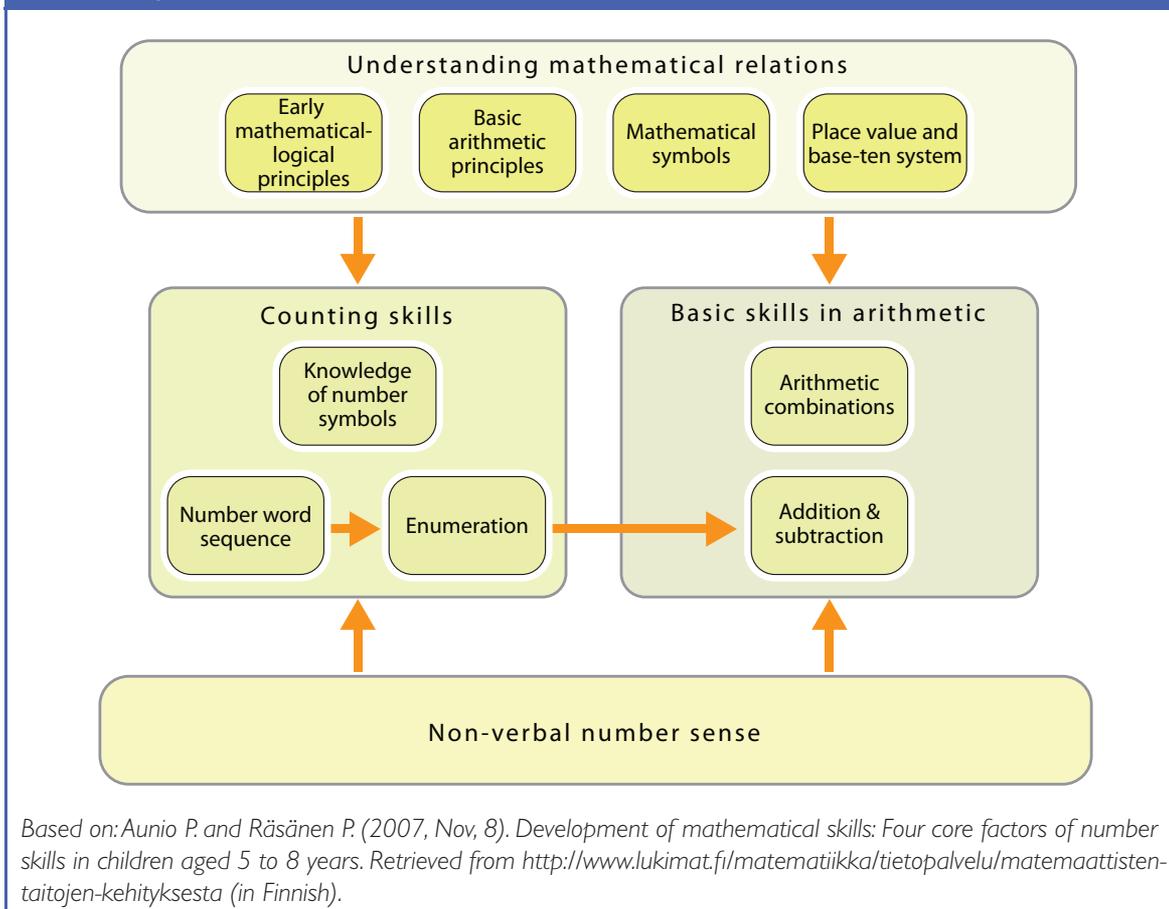
The cumulative nature of learning in numeracy is an important issue. If a child experiences difficulty in learning basic components of numeracy, such as counting and simple number facts, then the child will not be able to progress. This highlights the importance of early intervention. Another significant constraint on the timescale for learning<sup>179</sup> is the development of “maths anxiety”. Many people develop anxiety about mathematics, which then severely impedes learning. Improving arithmetical abilities in younger children is more likely to prevent such anxieties developing. The “response to intervention” model was felt to offer the most effective current model for identifying children with numeracy difficulties. Here, children who were not responding to whole-class teaching would be selected for differentiated intervention.

Scientific understanding of the processes underpinning number development is less advanced than for literacy, and so there is less agreement regarding the ideal content of both generic and individualised interventions. Nevertheless, a possible model of central mathematical skills at ages 5–8 years, generated by the Finnish longitudinal project, is provided in Figure 3.5 overleaf.

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179 Dowker (2004)

**Figure 3.5: The core skills of mathematical development in children aged five to eight years**



### Family-based interventions

Parents and the home environment also play a crucial role in the development of numeracy. Again, there is less research than for literacy. However, early home-based interventions designed to enhance caretaking skills and linguistic interactions between mother/carer and child typically have long-term effects on school numeracy as well as on school literacy (see Section 3.4.2). As shown in the influence diagram, the home environment influences both number experience (via shared number-related activities such as playing board games, parental valuation of numeracy etc.) and counting (via general language development, and the use of numerical language such as count labels and explicit discussion of sharing etc).

Interventions designed to introduce books into the home and to guide carers in optimal “shared reading” practices are likely to also affect children’s numeracy, particularly if some of the books enable activities around numbers such as counting activities. For example, nursery rhymes (“Ten Green Bottles”; “There were Ten in the Bed”) can be one source of number-related activities.

### School- and teacher-based interventions

Research<sup>180</sup> shows that the school environment and teaching methods are important influences on the mathematical performance of children throughout the ability range. Appropriate teaching may prevent some mathematical difficulties from ever becoming apparent, while inappropriate teaching may actually cause many mathematical difficulties. This analysis is consistent with the conclusions of the Expert workshop,

<sup>180</sup> Dowker (2004)

where increased teacher knowledge of the number development process, the fit of the number curriculum, and increased teacher knowledge about developmental dyscalculia were identified as critical nodes for intervention on the influence diagram.

Effective teacher understanding of the number development process is made difficult by the many components of functional numeracy, the lack of scientific understanding of what all these components are, and the nature of the developmental interrelationships. The fit of the number curriculum is also hampered by insufficient research. Nevertheless, there is core agreement regarding the importance of counting procedures and principles, learning number symbols, understanding place value and learning simple number facts (see Figure 3.5).

In terms of learning difficulties, numerical interventions should be individualised, and should focus on the particular components of functional numeracy that are problematic for the learner. As noted, technological interventions for numeracy were identified as highly promising at the workshop. Computer-based interventions allow the teacher to tailor the components being trained to an individual child's strengths and weaknesses, and enable repeated practice of simple activities in relative privacy. This should help to avoid stigmatisation and the development of maths anxiety. Some scientifically-based intervention programmes for delivery by teachers also show promising results, although evaluation is still at an early stage<sup>181</sup>. Analysis of existing research<sup>182</sup> suggested that individualised work with children falling behind can have a significant impact on their performance, and that the amount of time given to such individualised work need not be very large in order to be effective.

### 3.3.3 Research priorities

These are:

- Longitudinal studies involving genetics and neuroscience, aimed at improving understanding of key components of numeracy, developmental mechanisms, and potential biological markers of dyscalculia.
- Research-based technology-enhanced learning to provide high-intensity interventions for improving different components of numeracy.

## 3.4 Executive function skills and helping children to flourish

“Executive function” (EF) skills are self-regulation skills. Executive function is a term from cognitive psychology referring to the individual's ability strategically to self-regulate or control his or her emotions, desires, beliefs, thoughts and behaviours in situations where there is cognitive conflict. In other words, these are the skills of organising, managing and controlling one's behaviour. EF skills overlap with what are sometimes termed “non-cognitive skills”, as personal qualities like motivation, persistence and resilience in the face of setbacks depend in part on EF skills<sup>183</sup>. Good EF skills are also linked to a positive self-concept, good social and emotional development, and good self-esteem. Poor EF skills characterise a variety of learning difficulties, including ADHD, autism spectrum disorders, eating disorders and childhood depression. They are also important in anti-social behaviour and conduct disorders. This is shown in Figure 3.6 overleaf.

<sup>181</sup> e.g. Numeracy Recovery programme, Dowker (2001); Wright et al. (2002)

<sup>182</sup> Dowker (2004)

<sup>183</sup> Note: such skills are sometimes referred to as “non-cognitive” skills. However, this term is inaccurate since these skills are still an aspect of cognition.

EF is usually considered to have three core aspects: working memory; inhibitory control i.e. the ability to stop oneself behaving or thinking in a certain way; and attentional flexibility i.e. the ability to shift attention or to hold competing aspects of a situation in attention as the environment demands. Only one of these core aspects may be impaired in a given learning difficulty or developmental disorder e.g. only attentional flexibility appears impaired in eating disorders. Nevertheless, in early childhood, EF is measurable as a single factor that develops independently of core cognitive skills like reasoning.

Good EF skills are important for personal development, wellbeing, and achievement in the workplace, as well as for academic success<sup>184</sup>. Fostering EF skills in early childhood will create learners with better coping and resilience skills, with positive impacts on mental capital and wellbeing. Stronger EF skills should also promote a flexible attitude to learning. Importantly, the development of good EF skills in childhood could positively affect the individual over considerable periods of time. For example, coping and resilience skills can protect against common mental disorders through life (see Chapter 4). Also, a flexible approach to learning is identified in Chapter 5 as important for individuals to participate successfully in future working environments.

### 3.4.1 Influences on executive function

Figure 3.6 summarises scientific findings on how multiple factors, including genetics and family and school environments, affect the development of executive function (note that complexities of gene-environment correlations and interactions are not represented). Although the nature of EF skills is complex, it shows that there are important home, daycare, pre-school and school environment factors that can foster and support EF skills. Improving early EF skills would benefit typically-developing children as well as children with learning difficulties, as they help everyone to flourish. EF skills measured in kindergarten are a significant predictor of attainment in mathematics and literacy as well as of pro-social skills such as conflict resolution<sup>185,186</sup>. Importantly, developing EF skills in children is not achieved by direct teaching. Scientific evidence suggests that the development of the cognitive control of behaviour occurs without formal instruction, via appropriate teacher guidance in social situations such as play, sharing and conflict resolution. However, the question remains open as studies that attempt to train aspects of EF are only just beginning to appear in the literature<sup>187,188</sup>.

A second Foresight workshop of international experts and stakeholders from Government considered longitudinal studies of the development of EF skills, and reviewed international interventions. The consensus view was that optimal interventions should begin very early, and focus on caretaking behaviours in infancy and the toddler/pre-school period. Longitudinal studies from America<sup>189</sup> suggest that important key factors affecting the development of EF-type skills include “responsive contingency” in parenting (see below), language development/verbal ability, and avoiding negative caretaking styles (as the latter depress the development of EF). These key factors also affect the development of pro-social skills, which are also important for flourishing. These same key factors would be important to adopt for other carers of young children in addition to parents, such as nursery care providers and early-years

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<sup>184</sup> Sodian and Frith (2008)

<sup>185</sup> Blair and Razza (2007)

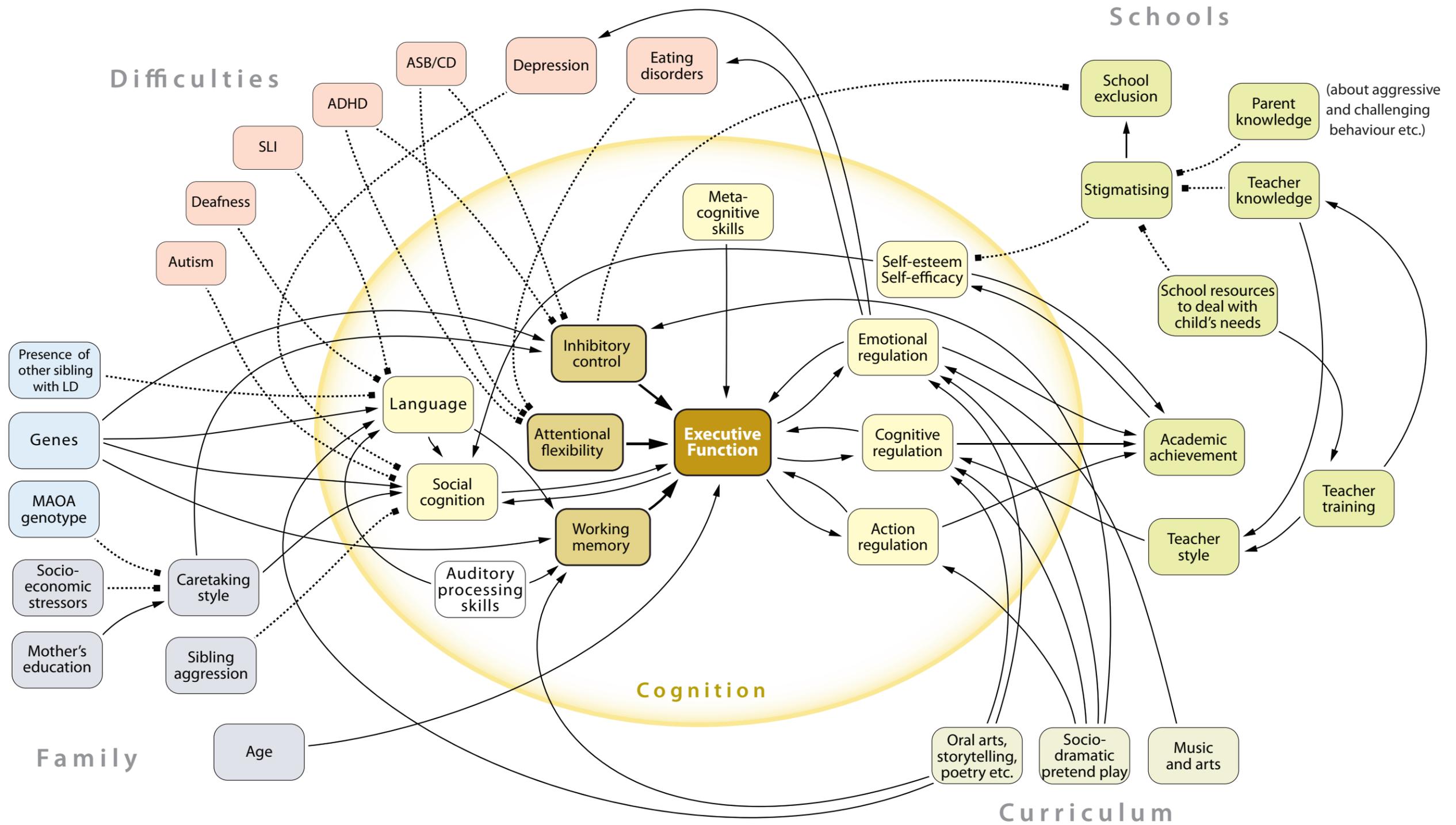
<sup>186</sup> Landry et al. (2003)

<sup>187</sup> Landry (2005)

<sup>188</sup> Diamond et al. (2007)

<sup>189</sup> Landry et al. (2006a)

Figure 3.6: An influence diagram showing the causal factors involved the development of executive function



teachers, and could usefully be considered by professionals concerned with looked-after children (see Section 3.9). Teacher style, teacher modelling and other factors associated with the delivery of the curriculum in the early primary years were also identified as important areas for intervention.

### 3.4.2 Options for intervention

The evidence suggests that core interventions should be based on:

- Early environments and carer-infant interaction.
- Language behaviours in early environments.
- Learning environments in schools.

It was felt important to make the evidence from scientific studies available to all parents and carers. A variety of media could be used including: creation of a “Parent’s TV” channel, extending the information provided in “super Nanny” programmes to cover all aspects of behaviour and behaviour management; including key information in the Red Book<sup>190</sup> given to new mothers; and provision of online coaching via the internet, so that mothers can interact directly with someone knowledgeable about parenting, perhaps by expanding the remit of the National Academy for Parenting Practitioners.

However, carers living in poverty, who are disadvantaged in other ways, or who have their own mental health problems might need social support. Certain parenting behaviours, such as lack of warmth, are partially genetically determined e.g. via psychiatric risk<sup>190</sup>. An avenue for such support could be community-based coaches trained in parenting skills, supported by senior citizens, as in one successful intervention study in Texas (see below): this intervention is particularly interesting since it also benefited the wellbeing of the older adults. These options for intervention are discussed more fully below.

#### *Early environments: the importance of carer-infant interaction*

Longitudinal research has shown that caretaking interactions that foster the development of EF<sup>191</sup> affect a large variety of outcomes, ranging from greater initiative-taking at age three to stronger deductive reasoning skills at age 13. Responsive and contingent parenting or caretaking play a critical role in the development of these skills, in part through their developmental effects on the child’s self-concept and self-esteem. The notion of “responsive and contingent” parenting draws on the scientific literatures of attachment theory and Vygotskian socio-cultural theory<sup>192</sup>.

Early learning is seen as embedded in the “zones of proximal development” (ZPDs) created by the social contexts provided by parents and teachers. These zones refer to opportunities for supported learning that enable development beyond what could be achieved by the child acting alone. Creation of these ZPDs requires warm, responsive and contingent parenting, so that any action initiated by the child is responded to promptly by the parent or teacher; such that the child experiences a supportive consequence e.g. the baby cries out, the parent realises the baby wants to be handed a particular toy, the toy is offered. This “three-term series” defines responsive contingency<sup>193</sup>.

<sup>190</sup> Kendler et al. (2000)

<sup>191</sup> Landry et al. (2002)

<sup>192</sup> See Project report: Goswami. *Learning difficulties: Future challenges*; Appendix E refers

<sup>193</sup> Bornstein and Tamis-LeMonda (1989)

Taking the child's focus of attention as the starting point for the interaction is critical for effective learning<sup>194</sup>. Longitudinal studies show consistently that when carers either ignore the signals made by babies and toddlers or fail to respond supportively (for example, “you don't need that right now”), development is impaired. The use of negativity, sarcasm and verbal punitiveness with young children is particularly damaging, and high or sustained directiveness (i.e. directing the child away from their focus of interest to what the carer thinks they should be doing) and restrictedness (e.g. “stop doing that”, “come away from that”, “leave that alone”) show significant negative impacts on later social, cognitive and academic developmental outcomes.

In one parenting intervention designed to affect pre-school outcomes<sup>195</sup>, mothers in 350 families in a low-income sample were assessed for their levels of responsive and contingent caretaking behaviours during infancy and the toddler/pre-school period. This group was selected because 3-5-year-old children living in poverty are much less likely to have school readiness skills. Mothers who showed high levels of responsiveness in both the infancy and the toddler/pre-school periods had children who showed the best developmental outcomes; currently the children have been followed until age 13. Early experience of good parenting was the most important predictor of later outcomes, as parenting measured at six years and eight years did not predict the differential developmental trajectories. However, showing a high level of responsiveness in infancy, but a low level in the toddler/pre-school period (when it is much more demanding to be a responsive parent, or when a new baby may be present), depressed later outcomes. Hence an “early injection” of responsiveness in infancy is insufficient by itself to protect developmental trajectories. Children in the sample whose mothers exhibited low responsiveness in both infancy and the toddler/pre-school years showed on average only 7.6 months of development for every year of life for the first 54 months, and then showed plateau effects. There were also significantly more children who developed ADHD in the “low – low” group. In contrast, high responsiveness from the mother or other carer can mediate the effects of high biological risk.

A number of ways of supporting mothers and carers have been devised, including the Olds' Nurse Home Visitation programme, Positive Parenting (Queensland, Australia) and Landry's own PALS programme (Playing and Learning Strategies<sup>196</sup>). However, programmes such as the Olds' programme are effective in changing maternal health-related behaviours that affect children's development (smoking, nutrition) rather than child development itself. To ensure improved MCW outcomes for children, such interventions must incorporate the evidence base on carer-child interactions discussed above. The critical ingredients for a successful intervention that changes child development were identified as:

- Warm and responsive parenting.
- Carers' language behaviours (see below).
- Carers' “mind mindedness” – how they help their children to think about and reflect on their actions in the family context.
- Carers' understanding of pretend play – and how to use pretence to promote rich language and self-reflection in children.
- Carer monitoring of the child – checking development.

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<sup>194</sup> Assel et al. (2003)

<sup>195</sup> Smith et al. (2000)

<sup>196</sup> Landry (2005)

- Carer awareness of normative developmental milestones.

All childcare settings require support in understanding these aspects of early interaction, which are not systematically addressed by current interventions such as Sure Start. They could be disseminated using a variety of means – for example, training of childcare providers, “Parents TV”, and information delivered over the internet.

However, studies show that socially-disadvantaged mothers can benefit from interventions delivered to the home by trained coaches<sup>197</sup>. In one example, African-American, Caucasian and Hispanic mothers received home visits from trained coaches who supported them in developing responsive and contingent caretaking behaviours. A key tool involved watching short educational videos with the coach: these illustrated other mothers acting responsively, trying to avoid being directive etc. The coach and the mother discussed the key concepts, and then the mother was videoed trying them out with her own infant. These videos were then reviewed with the coach, with the mother critiquing herself (the coach did not critique). Large effect sizes on both mother and infant behaviour were found (0.85), compared to a control group who received the same number of home visits without coaching.

Social support is important in sustaining responsive practices. In another intervention, senior citizens (“parent facilitators”) were recruited who also learned about the parenting programme, but who had a separate role of identifying the families’ needs and advising them of relevant resources. The senior citizens received a small stipend and were seen by the families as a partner to the coach, but also a support to them outside the coach’s visits. The senior citizens developed their own social network and built a strong resource for the families. They also identified other families in need and brought them into the programme (this is discussed further in Chapter 6 – see box in Section 6.3). A side effect of the senior citizens’ network was greater understanding within the community of other cultures. For example, the Hispanic and African-American groups had different beliefs about child-rearing that required negotiation. Clearly, it is also important to attend to factors beyond the parenting behaviours to bring about change, such as belief systems and social support.

### *Early environments: the importance of language behaviours*

Research studies show that the longitudinal stability of EF behaviours is highly dependent on language skills<sup>198</sup>. They also suggest that EF skills develop more rapidly in girls, which may be partly because language development is typically faster in girls and partly because female mammals tend to be more well-regulated physiologically than males. Children’s language development depends on their early linguistic environment as well as their sex, with both the quality and quantity of language experienced from caretakers thought to be important. One longitudinal study<sup>199</sup> found that many mothers with “hard-to-manage” toddlers spent very little time in talking with their children, or in using language to scaffold and support the child’s activities. In Landry’s longitudinal study of low-income families, 50-60% of the mother’s verbal utterances to the child in the “low – low” responsive contingency group were restrictions (“stop”; “don’t”).

The parenting intervention also focused on language<sup>200</sup>. For example, coaching videos demonstrated verbal scaffolding of the child’s activity, the use of language for labelling,

197 Smith et al. (2005)

198 Hughes (SR-D8); Appendix E refers

199 Ibid

200 Landry et al. (2002)

how to enrich verbal input and how to encourage the child verbally, for example in the context of going on a walk to the park. This kind of video coaching was particularly effective in the toddler/pre-school intervention, after the infancy intervention. One possible reason is that this is a key period for language development for the child i.e. the intervention is appropriate for the child's developmental goals at that point in time. Receiving the intervention at this period promoted the child's social development, language, co-operative behaviours and social engagement, with the primary mediators being responsive contingency and less redirecting of the child's behaviour. In Landry's longitudinal follow-up<sup>201</sup>, independent play at ages three, four and five years of age predicted standard EF measures in the primary school years, and predicted adolescent conflict resolution skills at age 13 years. The richness of maternal language input in the toddler/pre-school years was another significant predictor of adolescent conflict resolution skills, this time mediated by primary school EF skills.

Interventions designed to promote shared storybook reading in the home also promote language skills via the same mechanisms of verbal scaffolding and enriched input (see Section 3.2.2), because the carer is shown how to use the child's attention to the story as a basis for discussing the story and elaborating beyond it. Pretend play, particularly socio-dramatic pretend play, is also a language-rich activity as children need to negotiate their roles and discuss the plot. Caretaker recognition of how pretend play fosters language development and self-reflection, especially in behavioural and emotional regulation, were identified as useful points for intervention (see [Early environments: the importance of carer-infant interaction](#) above). This analysis of how to promote the quality and quantity of early language environments may also be useful for the improvement of workforce skills regarding language in early-years settings, one remit of the DCSF Bercow review<sup>202</sup>.

### [Learning environments in pre-schools and schools](#)

Two interventions in formal learning environments have been considered:

- “Catch up” interventions during nursery schooling, to promote EF and school-readiness skills in disadvantaged children who have not experienced home-based interventions.
- The creation of learning environments in schools that facilitate the development of independent learning, taking the art curriculum as a model.

#### **(i) Catch-up interventions**

Although early parenting and early schooling interventions delivered together are most effective, children from high-risk groups who have not received an intervention by ages three or four years can still be helped to develop important pre-school skills via pre-school interventions. One example of a successful intervention in the early school years has been the Texas Early Education Model (TEEM), also from Landry and her research group<sup>203</sup>.

The aim of the intervention is to get children from low-income families ready for school, using a support model for early years teachers that provides training in the unique issues surrounding the education and care of very young children. TEEM aims to help teachers to develop children's socio-emotional skills and cognitive skills, in any early-years setting. The core of the programme is to show teachers how to: (a) be sensitive to children's level of understanding; (b) be contingently responsive; (c)

201 Reported at the Project workshop, *Perspectives on equipping children for the future*

202 Bercow (2008)

203 Landry et al. (2006b)

maintain and build on the children's focus; (d) avoid high levels of restriction; and (e) provide choices in the context of planning learning activities that are "purposeful, planful and playful". Tuition is given in using a combination of child-directed discovery and direct instruction to develop language, social and emotional skills; phonological awareness; preparatory skills for numeracy such as counting, ordering and sharing; and print knowledge (see also Sections 3.2.2 and 3.3.2). Evaluation of this model shows that three aspects of successful pre-school interventions seem vital:

- A research-based curriculum that gives the teacher the materials, the scope and the sequence for social activities, literacy, maths and language building.
- Higher levels of teacher education. TEEM professional development was based on a 130-hour web-based course delivering course credits, using video examples of real teachers, interfaced with college visits where the teachers watch with a facilitator who then visits them in their own classrooms, leading eventually to a qualification in early childhood teaching.
- Teacher use of a specially-devised system to monitor each individual child's learning and development weekly across the year.

Evaluations showed that the individual monitoring system always gave a large added value. So individualising instruction to the appropriate level for the child appears to be a key factor in the success of the intervention (see also Section 3.2.2). In TEEM, the teacher used a specially-developed monitoring programme on a Personalised Digital Assistant to keep track of each child's development e.g. vocabulary, letter naming, phonological awareness. These core aspects of a successful "catch-up" intervention could usefully be considered by current UK initiatives. The *quality* of early-years provision is critical to the success of such interventions. Therefore, ensuring that the core features discussed above are incorporated may make a difference to efficacy.

## (ii) Classroom learning environments: art as a model

To foster EF skills, it was recognised that learning environments based on authentic projects where there is not necessarily a "right answer" are important. The art curriculum was discussed as a model. OFSTED reported recently that: "the proportion of very good and excellent art teaching [in UK schools] is higher than any other subject<sup>204</sup>". In the art studio children have to reflect on what they are learning, as they have to critique and continuously revise their own developing portfolio of work. This also fosters EF skills.

Art teachers create a particular type of learning environment that could be applied across the curriculum. Art teachers work from the interest of the pupil, fulfilling the key aim for fostering wellbeing of individual engagement in a task considered fulfilling and worthwhile (identified by The Good Childhood Enquiry<sup>205</sup>). The interactions around learning are therefore responsive, involving listening to the ideas and opinions of the child. Art teachers appreciate that pupils want to create something of aesthetic significance, they encourage them to take risks, and they help them to learn from their failures. They teach pupils how to persist, and work through frustration. Art rooms are usually attractive and interesting environments, with physical infrastructures conducive to learning.

Dialogue is an essential part of building the art portfolio, as the pupil explains their aesthetic aims and the teacher responds positively to these aims, thereby treating each

204 <http://live.ofsted.gov.uk/publications/annualreport0405/4.2.1.html>

205 The Good Childhood Enquiry Briefing Paper – Lifestyle

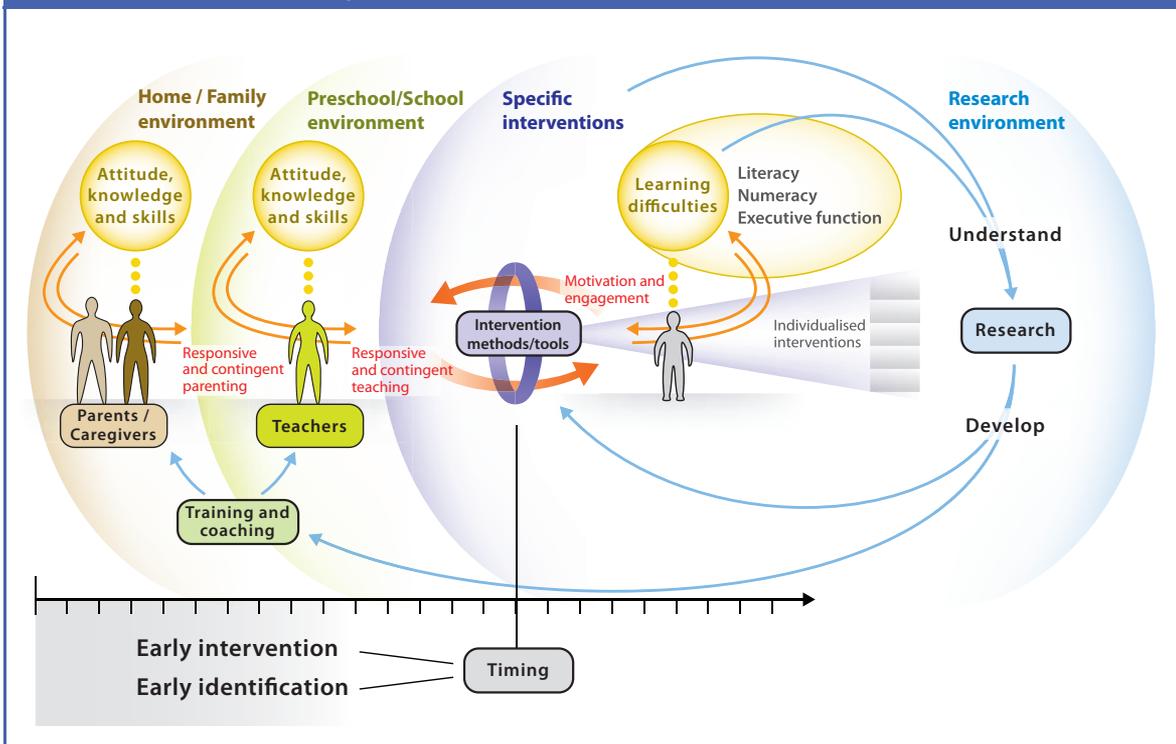
pupil as an individual. Hence an important part of the teacher-pupil relationship is sensitive and contingent individualised responding – the same factor important for effective parenting with much younger children. There is also a sense of playful exploration in the art studio, and the learning environment involves creativity and joy. Finally, the assessment process has to be negotiated, because the art teacher has to understand the developmental progression in the student's ideas represented in the portfolio of work and what the student was trying to express in order to judge the output. Assessment thereby naturally incorporates many principles of formative assessment e.g. using assessment as part of learning, to decide what has been achieved and where to go next<sup>206</sup>.

The key aspects of the learning environment in the art studio that could be transferred to other subjects are:

- Engagement in a long-term project which has intrinsic meaning.
- Learning to reflect on and talk about one's work.
- Individualised and contingent responding from the teacher.
- Portfolio-based assessment reflecting student development and based on a dialogue.

These core aspects of the learning environment seem likely on current evidence to enhance the key EF skills of organising, managing and controlling one's behaviour; thereby producing more independent and flexible learners who are resilient in the face of set-backs and more adaptable regarding retraining. At the same time, such learning environments appear more likely to foster creativity and enhance wellbeing. A diagram summarising factors important for addressing learning difficulties is provided in Figure 3.7.

**Figure 3.7: An overview of the primary success factors required to address the particular learning difficulties considered in detail here**



206 Black et al. (2003)

### 3.4.3 Research priorities for executive function skills

These are:

- Research on interventions that may improve the development of executive functions is urgently needed as very little is presently known.
- Longitudinal studies exploring the different components of EF (for example, attention shifting versus inhibitory control) in order to understand developmental aspects of its multi-factorial structure, perhaps using microgenetic methods.
- Understanding particular aspects of EF with respect to particular learning difficulties, and overlaps with constructs such as temperament.

## 3.5 Developmental science for teachers and childcare professionals

There have been enormous advances in developmental and brain sciences in the past decade, and more are expected in the future. These offer the prospect of substantially improving the education and development of children. In particular, an understanding of milestones in social and cognitive development, of the mechanisms whereby teacher expectations and teacher behaviours promote learning, and of the development of children's self-regulation skills and of the precursor skills for literacy and numeracy, are all very important for delivering effective teaching in the early years and beyond. These factors were discussed in Sections 3.2.2, 3.3.2 and 3.4.2. Increasing understanding of individual differences between children, and new scientific evidence on how to match teaching with the developmental level of learning, have the potential to inform the individualisation of learning for children, and to promote the earlier detection and treatment of possible learning difficulties.

However, there is good evidence that the considerable benefits offered by these advances are not being realised. This section therefore considers why this is the case, and suggests how the situation could be addressed. In so doing, it draws upon a number of helpful discussions with key stakeholders (in particular the National College for School Leadership, the Training and Development Agency for Schools [TDA], and the Department for Children Schools and Families), as well as the Project's workshops involving leading experts and stakeholders.

The discussion here focuses on the teaching profession, but many of the suggestions for interventions could also be considered for other childcare professionals, such as early-years care providers, health professionals who visit the home, and professionals responsible for looked-after children (see Section 3.9).

### 3.5.1 The current situation

Research shows that most teachers consider that having some knowledge about the brain is important for education<sup>207</sup>. Indeed, a recent Teaching and Learning Research Program report from the Economic and Social Research Council (ESRC)<sup>208</sup> discussing recent advances has already been downloaded over 120,000 times. However, the current provision of information to teachers has two drawbacks:

- Teachers and other childcare professionals are not being systematically taught the implications of new knowledge and understanding about the brain, and of

<sup>207</sup> Pickering and Howard-Jones (2007)

<sup>208</sup> Economic and Social Research Council (2007)

developmental mechanisms such as responsive contingency and how it affects child development. Indeed, basic child psychology is not part of initial teacher training (ITT).

- The popular media often misinterpret findings in brain science (see below), thereby confusing the messages for teachers.

The resulting skills gap in teacher education is becoming more critical with the advent of “brain-based” packages for education that are marketed vigorously to schools, teachers and childcare professionals. Some of these packages have very little scientific support, but it has been shown empirically that adding some jargon about the brain makes any claim more credible<sup>209</sup>.

Teachers and schools would therefore benefit from better support for acquiring basic knowledge about child psychology and brain development, and for distinguishing between brain-based claims with a scientific basis, and those without.

### 3.5.2 Neuromyths and the popular media

The role of the popular media in misinterpreting findings in brain science and spreading confusion is substantial, and is illustrated by the following examples:

- *“Left brain” versus “right brain” learning*<sup>210</sup>: This concept has proved remarkably resistant despite the lack of scientific support. Teachers are told that children should be identified as either “left-brained” or “right-brained” because each individual prefers one type of processing, and so teaching should ensure that learning experiences are “left- and right-brain balanced”.
- *Learning styles*: Teachers are advised that children’s learning styles can be either visual, auditory or kinaesthetic (VAK), and that children should be taught according to their perceptual style.

A further example concerns the variety of confident claims appearing in the media about the benefits to the brain of different food supplements (such as fish oils). These are usually given highly positive media coverage<sup>211</sup>, and have the potential to result in Local Education Authorities spending significant amounts of money. The idea that nutrition will affect brain function, and therefore learning, is obviously correct at a simple level, as a malnourished brain learns less efficiently. Furthermore, fatty acids appear to be important for myelination, the process whereby protective sheaths build up around neuronal axons and increase electrical transmission speeds. However, it does not necessarily follow that if children ingest essential fatty acid (EFA) supplements such as omega-3 EFA and omega-6 EFA, their brain function will improve. Large US Government-sponsored meta-analyses in psychiatry suggest that there may be a protective effect of omega-3 EFA intake for affective disorders such as depression and bipolar disorder, but this meta-analysis reported no strong evidence as yet for cognitive disorders such as ADHD<sup>212</sup>.

The detail of this last example shows how easy it can be for the media to misinterpret scientific results, and jump to incorrect conclusions; for example, that ingesting fish oil

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209 Weisberg et al. (2008)

210 E.g. Smith (1996)

211 Goldacre (2006)

212 Freeman et al. (2006)

can improve intelligence. It also shows how difficult it can be for the non-expert to disentangle scientific fact from fiction.

### 3.5.3 Implications for Initial Teacher Training

Every teacher matters, just as every child matters. So, if teachers and children are to realise the benefits of the new understanding of brain science and development, the following interventions could usefully be considered.

First, basic knowledge about the brain could usefully be included in ITT. In the discussions with stakeholders referred to above, there was general agreement that this would be helpful. In particular:

- Current initiatives focused on children such as Every Child Matters and the Children's Plan recognise the important contribution of personal, moral, social and emotional development to educational outcomes<sup>213</sup>. However, ITT does not currently instruct teachers in these aspects of child development. Teachers are not trained in the evidence base contributed by developmental science, discussed in the Phase I report<sup>214</sup>, nor in how to foster children's personal development by interaction style and teacher modelling. For teachers to understand developmental milestones in moral, emotional and social development, they need some basic training in child psychology.
- Moreover, the Children's Plan envisages "a professional children's workforce that is graduate-led"<sup>215</sup>. Part of this graduate training could usefully include simple and accurate basic brain science and child psychology.
- Finally, the Children's Plan recognises the importance of children's wellbeing to learning<sup>216</sup>. In particular, it states that success here depends on looking at all aspects of a child's life in the round<sup>217</sup>. The conceptual model of child development previously presented in Figure 3.1 provides one way of conceptualising a child's "life in the round". Also, the influence diagrams for functional literacy, functional numeracy and executive function (behavioural self-regulation and self-directed learning – Figures 3.2, 3.4 and 3.6) show the main factors in the wider environment that can influence children's educational achievement. These diagrams could therefore be used as a basis for a common conceptual framework for teacher training.

Secondly, teachers need to be sure that the information on the brain and development that they use is scientifically robust. There are two approaches that could usefully be considered to promote this:

- Teachers could be better equipped to assess the relevance and applicability of brain research for their own teaching. For example, the TDA has produced "Professional Standards for Teachers" which states that being able to "research and evaluate innovative curricular practices and draw on research outcomes" is an indicator of "excellent" professional development. Therefore, direct guidance on how to develop these evaluation skills could usefully be provided, for example, via Continuing Professional Development (CPD) in quantitative research methods and evaluating evidence.

213 DCSF Children's Plan (2007c) section 3.86

214 See Project report: Goswami. *Learning difficulties: Future challenges*; Appendix E refers

215 DCSF Children's Plan (2007c) section 7.34

216 DCSF Children's Plan (2007c) section 7.3

217 DCSF Children's Plan (2007c) section 7.6

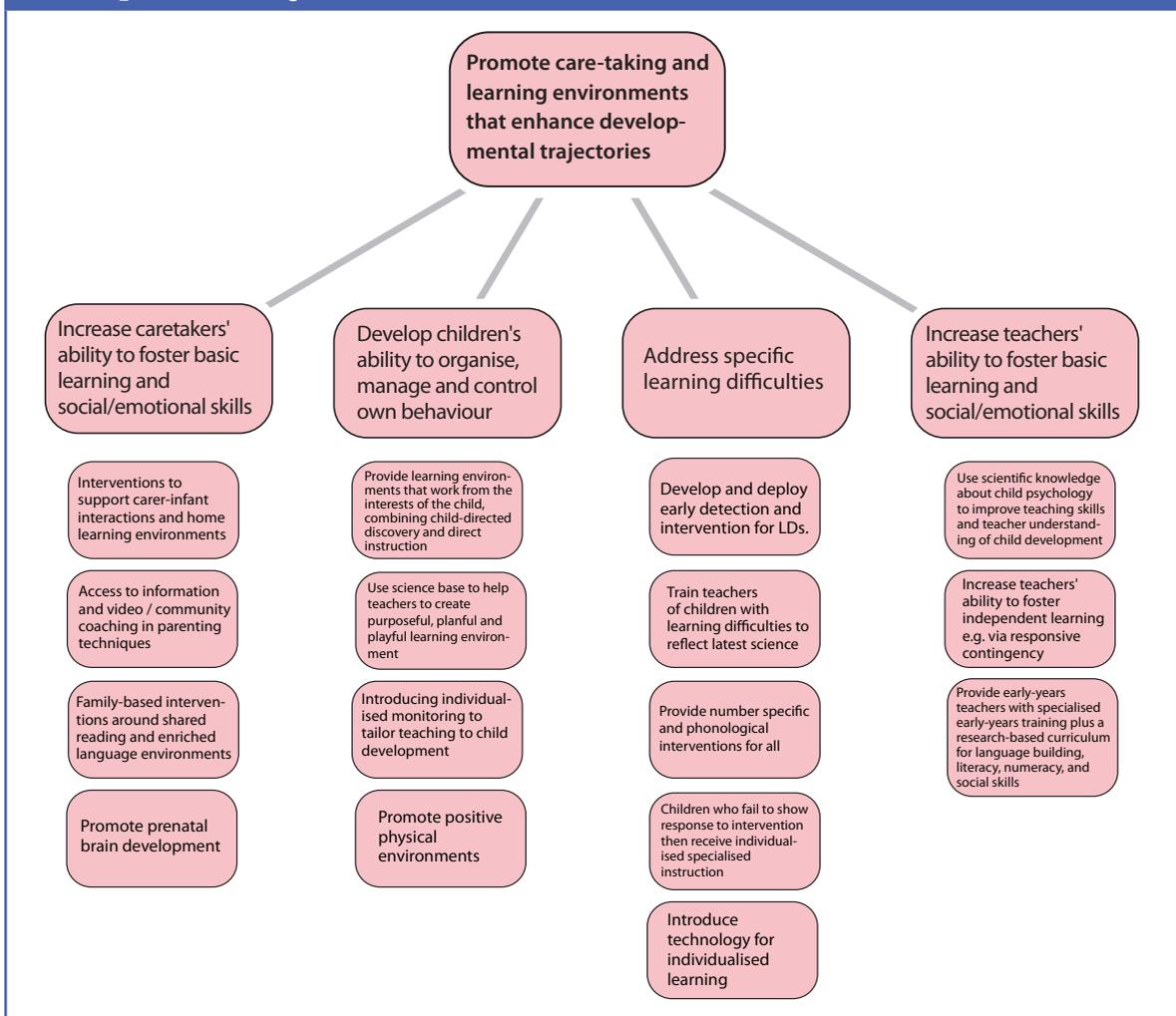
- The establishment of a source of independent guidance, such as an authority which would oversee and accredit brain science in teacher training and provide advice for teachers regarding new commercial products.

The substantial influence of the media in promulgating scientific misinformation is not easily addressed. Two suggestions are:

- The science accreditation authority referred to above could potentially play a role in providing ongoing advice to teachers by reviewing new developments and claims made in the media. This could be achieved through existing teaching journals or via a suitable website.
- By the provision of accredited advice in response to queries from teachers about which commercially-marketed brain science packages should be in their classrooms – for example, through the website above. The use of standard briefing and Q&A material could be useful.

A diagram summarising a range of possible interventions is provided in Figure 3.8.

**Figure 3.8: Interventions identified as being important for enhancing developmental trajectories**



### 3.6 Improving the wellbeing of staff in learning and skills

There is concern among some stakeholders over levels of turnover in the teaching profession, and indeed among head teachers and college principals<sup>218</sup>. Turnover is very varied, with some types of school and college facing much higher rates than others<sup>219</sup>. Moreover, some degree of turnover is desirable to ensure that fresh approaches and different perspectives are brought into the school or college. And not all turnover is caused by stress or poor morale; on the contrary, it may arise for a variety of reasons, including the ready availability of other career options for some disciplines or in some regions. However, teacher unions are particularly concerned by what they describe as “burnout” among some teachers.

Teachers who are stressed, or demoralised, make poor role models for young people. The findings from research in education are consistent with studies of workplace stress and morale more generally. They confirm the central importance of line managers, and indeed school/college leadership at all levels, to the wellbeing of the workforce. Doing nothing about the problems means that the country loses the costs of training teachers who may spend a relatively short time in the career; and fails to benefit from their experience and skills. It also has an impact on the learning experiences of young people in schools and colleges.

There is nothing inevitable about stress and turnover in teaching. This report sets out a number of ways of reducing stress and improving wellbeing in the workplace, including specific options for improving leadership and management training<sup>220</sup>.

### 3.7 Education for children, young people and adolescents

#### 3.7.1 Children and young people

Government has achieved a great deal in improving outcomes from schooling, although there is scope for further improvement in England and Wales in particular. For example, relatively high proportions of young people leave school with no qualifications, especially in Wales. Also, the range of attainment is unusually wide by international standards. While the top 10% of high performers in England and Wales compare very well with their peers overseas, the lowest 10% compare very unfavourably. Scotland performs better: its performance in the most recent Programme for International Student Assessment (PISA) study was much more comparable with that of the Nordic nations<sup>221</sup>.

As discussed above, the evidence shows that interventions for learning and child development should start early, even from birth. There is also a case for integrating interventions in different settings: the family, school, and inter-generationally. Analysis of the Millennium Cohort Study (a longitudinal survey of a group of children born in a single week in 2000) shows that parental support affects the child's intellectual ability from a very young age<sup>222</sup>. Interventions already in place, such as Sure Start, demonstrate the potential gains from engaging the parents in the education of their children, focusing particularly on families from disadvantaged backgrounds. Gains are especially likely if Sure Start programmes encourage the kinds of parenting practices discussed in Section 3.4.2. At present, these interventions rarely engage many fathers;

218 Travers and Cooper (1996)

219 Falch and Strøm (2005)

220 See Section 5.2

221 OECD (2007)

222 Hansen and Joshi (2007)

there are particularly strong grounds for seeking to engage teenage fathers, whose children otherwise are likely to experience significant disadvantage at school. Nor do they fully exploit the potential support available from older adults in the community, including grandparents.

### 3.7.2 Adolescents

Adolescence is characterised by transitions, from school into work and from childhood into adulthood. These transitions have long been recognised as potentially significant in the wellbeing of young people, and steps have been taken to ease the process at a period of life when young people are extremely vulnerable.

Government has identified a clear set of strategies to tackle poor transition and precariousness in adolescents. The UK is characterised by a relatively low proportion of young people who remain in training or education after 16 (compared with most other OECD nations), with a relatively high number of young people who are neither in employment, education nor training. One important set of recently announced measures aims to raise the proportion of 16-18-year-olds in education and/or training (including informal training) significantly, with specific and challenging targets. Its success will depend on how well employers and providers respond to the underlying issues of the achievement gap.

Government has also sought to expand the numbers of young people who enter apprenticeships. This policy has met with considerable success, with a growth in the numbers employed as apprentices. However, the Chartered Institute of Personnel and Development (CIPD) reported in early 2008 that its survey data showed that employers' participation in the scheme remained patchy.<sup>223</sup> According to the CIPD, employers' concerns over the level of bureaucracy involved in the scheme were holding them back from participating, particularly among smaller and medium-sized enterprises. Given the success of this policy overall, it is clear that further expansion will be limited unless these concerns are met.

## 3.8 Children's mental health

Within the Project, analysis at different stages in the lifecourse has consistently shown the importance of diagnosing mental disorders early, and treating them promptly – before they become chronic, and before they have a substantial impact on the individual and on society<sup>224</sup>. This is particularly the case for children, since the trajectory of MCW through life is strongly conditioned by their development and experiences in the early years, and disorders can substantially disrupt this critical time. A review was therefore commissioned<sup>225</sup>, and a workshop was held on interventions for looked-after children (Section 3.9).

Our analysis shows that the evidence base for mental health in children has increased considerably over the past decade in particular, although significant uncertainties still remain. For example, the efficacy of Cognitive Behavioural Therapy (CBT) in children is debated.

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223 CIPD (2008)

224 See Project report: Jenkins et al. *Mental health: Future challenges*; Appendix E refers

225 Goodyer (2008). *Interventions, treatments and managements in child and adolescent psychiatric disorders*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk)

The key messages are:

- Medications have a very limited and specific place in treatment of children and adolescents (they are used in Attention Deficit Hyperactivity Disorder, and have a debated place in some depressions).
- There have been increasing numbers of randomised controlled trials (RCTs) of: specific treatments in conduct disorders, delinquency, major depression and ADHD; and for parental interventions for behavioural disorders in nursery and school settings, with evidence of efficacy.
- Models for assessment and intensive daily follow-up of acute suicidal behaviour have been developed with reduction in long-term admissions.
- There is also a large clinical literature on contagion suicide<sup>226</sup> of which social care and non-mental health organisations appear unaware, for instance, in relation to Bridgend.

There is a need for larger and better-powered RCTs of treatments for children with mental disorders, and meta-analyses that include unpublished trials. Lessons from universal programmes have had mixed success and suggest the importance of pilot programmes to precede full implementation, and in building thorough evaluation of outcomes into the design of such programmes. In addition, better ways of evaluating universal prevention strategies for mental disorders, and also alcohol and substance misuse, are needed: these should be used with staggered introduction in different areas, and with careful measurement of effects in these and comparison areas.

- There is also a need for: better coordination between child and adult services, and particularly transitional care between ages 16 and 25; and to address difficulties in catering for children at risk because of parental mental illness and substance misuse. Moreover, further use of computer and web-based programmes are considered to have potential for managing disorders in adolescents.

The analysis of the evidence at the workshop also identified the following, which, if implemented, would lead to substantial benefits:

- Mental health clinicians should routinely assess clients of all ages for dyslexia and other cognitive problems, and then refer and manage appropriately (see also Section 3.2).
- Best practice in health and social care in managing acute suicidal behaviour should be better implemented.
- Mental health promotion in schools (whole-school approach involving teachers, pupils, parents and the wider community) appears more effective than curriculum-based projects.

### 3.9 Looked-after children

Caregivers possess tremendous power to make children's lives either miserable or joyful. Children who experience clear and consistent parenting that is warm and responsive will learn effective emotional self-regulation and pro-social behaviour, and will flourish intellectually (see Section 3.4.2). Conversely, children who have caregivers who take drugs, who are violent, or who are mentally ill will develop in ways to match

226 For example, CSIP (2007); Department of Health (2008); NIMHE (2007)

the demands of these hostile early environments: and those ways are likely to be maladaptive for the child and for society.

Children come into contact with a variety of care providers (such as day care and nursery teachers), and all of these carers will have an impact on the child's overall developmental trajectory. In particular, the developmental effects of severely maladaptive early social and emotional experiences could potentially be countered by enriching environments in care settings such as foster and residential care. The evidence base is there (see 3.4.2) to enable carers to create enriched environments and to improve developmental trajectories for children in care, while also supporting families. Investment in the education and skills of foster carers, adopters and residential staff appears to be of particular importance, together with attaching a much higher value to the caring professions.

### 3.9.1 The current situation

Only 2% of looked-after children are placed because of their unacceptable behaviour<sup>227</sup>. The majority are in care because they have been the victims of abuse, neglect and family dysfunction. Yet looked-after children are stigmatised as though they themselves are at fault, and they experience difficulties in accessing services. The quality of care across 150 local authorities in England is currently very variable, ranging from extremely good practice to very poor, with a lot of room for improvement<sup>228</sup>. It is crucial to deliver a high standard of evidence-based practice across the country for looked-after children because the developmental ill-effects of their adverse early environments are amplified by current care practices. Current practices do not provide sufficient stability, loving care, or support for learning and development, nor support for emotional, physical and mental health issues. There is also a need for early diagnosis of genetic risk e.g. for learning difficulties or mental ill-health. Thus widespread good practice is likely to have a significant effect on reducing the social and health disadvantages currently experienced by looked-after children.

Forty-five per cent of looked-after children have a mental health disorder and they are 10 times more likely to have a statement of special educational need. Educational attainment is considerably worse than that of other children (for example, 41% attain 5 GCSEs [A\* to G] compared to 91% of children overall); unemployment on leaving school is four times more likely; and around one-third of prisoners were in care as children<sup>229</sup>. Children who are in residential care show even more severely disadvantaged trajectories, with 72% clinically rated as having a mental disorder, 60% a conduct disorder, and 66% having physical complaints<sup>230</sup>. The low educational attainment is related to a number of factors including low educational expectations in the children themselves, their carers, and their teachers; and a high prevalence of undiagnosed ADHD, dyslexia and other disorders.

### 3.9.2 Implications for carer training

The mental capital and wellbeing of looked-after children is highly dependent on the quality of their immediate placement, their school<sup>231</sup>, and their relationships with their carers and teachers. Currently, the carer profession is low-paid, low-skilled (National

227 DCSF (2007b)

228 Reported at the Project workshop on looked-after children – see [www.foresight.gov.uk](http://www.foresight.gov.uk) for the workshop report, Hurlston and Jenkins (2008)

229 DCSF (2007b)

230 Meltzer et al. (2003)

231 OFSTED (2008)

Vocational Qualification required only) and low status. In order to improve the developmental trajectories of looked-after children, we need to value good parenting, and produce foster carers and residential care workers who have the skills of excellent parents and teachers. This may require higher pay to reflect a higher value attached to caring, as well as additional special training regarding optimal parenting techniques, following the evidence-based principles discussed earlier. The team around the child and foster carer could also usefully include a child psychologist, trained in the new insights into social, emotional and brain development discussed in Sections 3.4.2 and 3.2.2, and available if therapy is required. As outlined previously, optimising parenting and teaching skills will require a focus on:

- The importance of responsive and contingent reactions to the child's signals (the three-term series, see Section 3.4.2).
- Supportive interactions, not restrictive or punitive ones.
- Rich and appropriately-paced language input.
- Creating optimal learning environments, so that being looked after becomes an enriching experience (see Section 3.4.2).
- Trust and communication.
- Understanding the developmental evidence base underlying the knowledge and skills being learned.
- Understanding that high-quality care will change developmental trajectories for looked-after children.

### 3.9.3 Options for intervention

A Foresight Expert workshop on looked-after children was convened to review the evidence for interventions and to identify a range of options for improving the current situation. It was outside of the scope of the Project to provide a detailed analysis of all of these, although further details are available through the report of the workshop<sup>232</sup>. Important components of an integrated strategy were considered to be:

- Increasing the priority and nature of support for looked-after children with a view to improving: the promotion of good mental health; better prevention of mental disorders; and more effective help for those affected. Strengthened and systematic educational support is also needed to reduce the major inequality of educational attainment for all looked-after children.
- There is a need for improved training and support for care workers and social workers in childcare, education and mental health, as outlined in Section 3.9.2.
- Local authorities need encouragement to provide the same standard of love, care, education and discipline as might be expected in a family – or even to provide a more enriched experience, in order to counter the effects of negative early environments.
- Earlier identification of vulnerable children and families is required (for example, via ante-natal clinics), enabling “continuity of care” pre- and post-birth.

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232 Hurlston and Jenkins (2008); available through [www.foresight.gov.uk](http://www.foresight.gov.uk)

- Additional training is needed for social workers so they can better fine-tune care plans to recognise that each child is different, has a different set of needs, and may require a different kind of foster family.
- There is a case to consider the rationale and effectiveness of residential care: this accounts for half of the money spent on the care system, while catering for 12% of looked-after children.
- Linking services for children to adult services for substance abuse, domestic violence etc., with earlier identification of potential mental health difficulties in children and improved referral to the Child and Adolescent Mental Health Service (CAMHS).
- Closer working between health, social care, education, and criminal justice systems at both local and national levels to improve the health, social and educational outcomes for looked-after children.
- Consideration of extension of access to care until age 21 to help achieve a successful transition into adulthood<sup>233</sup>. This would reflect the continuing support that many non-looked-after children receive from their parents.

In addition, several interventions already considered earlier in this chapter could usefully be focused on looked-after children. Notably:

- Health visitors could be given an enhanced role; for example, in supporting the parenting skills that foster child development in the early years (see Section 3.4.2).
- Consideration to assigning individual trained advocates to vulnerable children and their families, known as the “social pedagogue model”, to advise and advocate on social and educational issues for the duration of childhood and adolescence. Also, more piloting of “artist pedagogues”, which have the potential to enhance creativity and learning via the mechanisms outlined in Section 3.4.2, should also be considered.
- Earlier identification of potential learning difficulties in looked-after children (earlier discussion in this chapter has underlined the importance of early identification of difficulty for all children).

#### 3.9.4 Research priorities for looked-after children

Three specific priorities for research were identified through the workshop and following discussion with experts and stakeholders:

- Systematic evaluation and use of available research on early predictors of vulnerability before becoming looked-after; costs, benefits and long-term outcomes of national and local interventions, and pathways of children leaving care, including stepwise implementation and integrated use of local authority, prison and education system databases; and evaluation of long-term mentoring of looked-after children up to age 30.
- Changing practice in accord with research that is designed to improve the quality and effectiveness of foster and residential placements.
- Research on the levers that can improve the effectiveness of social pedagogy and placements: for example, through support, training, selection and quality assurance.

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233 Kessler et al. (2008)

**Key messages**

Today's children will shape the future of the country, and their childhood is critical in setting a course for their trajectories through life.

New science has transformed our understanding of child development, learning and learning difficulties. We need to capitalise on this to:

- Improve how we address learning difficulties such as dyslexia and dyscalculia. Learning difficulties affect up to 10% of children and are genetic in origin. Early identification and prompt intervention for everyone should be a priority.
- Build on the new science concerning the delivery of optimal learning environments: for example, disseminating information on how to optimise home learning environments; and offering parents coaching in relevant skills to help them to create environments that help pre-school children to flourish – this is particularly important for parents who have not experienced effective parenting skills in their own upbringing.
- Use the science base to better inform early-years education, which brings unique challenges, so that educators can create the environments that optimise development, focusing on play and informal learning in language-rich environments.
- Change the way education is structured so that:
  - It is more child-centric.
  - Evidence-based philosophies are integrated across different settings – family, daycare, school, and inter-generationally.
- Provide scientifically-accredited training for teachers and other childcare workers, so that they better understand the development of children, the learning process, and learning difficulties.
- Substantially strengthen existing interventions to improve health, social and educational outcomes for looked-after children within an integrated and inter-sectoral strategy.

## **4 Mid-adulthood – mental ill-health: interventions**

**4.1 Developing a strategy for the future**

**4.2 Improving the delivery of treatment for mental ill-health**

**4.3 Improving service organisation to facilitate treatment delivery**

**4.4 Developing new treatments**

**4.5 Biomarkers for depression**

**4.6 Tackling an important risk factor for mental ill-health: debt**

**4.7 Addressing stigma and discrimination**



## 4 Mid-adulthood – mental ill-health: interventions

Recent estimates suggest that mental ill-health costs up to £77 billion a year for England alone. And in the future, certain important drivers of change could substantially increase this figure; for example, increase in life expectancy is likely to lead to much more cognitive decline and dementia.

This chapter therefore looks at the challenges ahead and assesses how they might be addressed. In so doing, it suggests principles that could usefully govern future strategies, and also specific interventions.

## 4 Mid-adulthood – mental ill-health: interventions

Chapter 2 summarised the importance of both mental ill-health, and positive mental health. The potential costs of the former are considerable: recent estimates for the annual impact of mental ill-health are about £77 billion for England<sup>234</sup> when wider impacts on wellbeing are included, and £49 billion<sup>235</sup> for economic costs alone. Importantly, the full costs are spread broadly across society and Government and relate to health and social care, lost productivity, education, the criminal justice system, and also reductions in quality of life. However, the overall economic importance of positive mental health, which is strongly linked to many important social outcomes such as personal attainment, social development and good functioning of families, is much more difficult to quantify, and is almost certainly understated in the figure given above.

The promotion of positive mental health is specifically considered in Section 2.2, and is a recurrent theme in other chapters (notably Chapters 3, 5 and 6). This chapter therefore focuses specifically on adult mental ill-health<sup>236</sup>. In particular, important components of a future strategy for mental ill-health are identified, as well as interventions to address specific future challenges.

Mental ill-health is very common in adults, (for example, about 16% of adults and 10% of children are affected by common mental disorders at any one time), and it is often accompanied by major disability. At least half of mental disorders last for longer than a year, and some may last for years or be lifelong, especially if they are untreated or inadequately treated. Furthermore, their effects can be intergenerational, for biological, psychological and social reasons<sup>237</sup>.

Mental disorders have identifiable social risk and protective factors which intervention strategies need to take into account. Looking to the future, it is expected that the social and economic costs for some disorders could rise substantially: this is because the numbers of individuals affected are set to grow, as they are strongly linked to clear trends in important drivers of change. A key example is cognitive impairment and dementia in older adults: this is likely to rise with the greatly increased numbers of people aged over 65 due to changing life expectancy, age being the greatest risk factor for Alzheimer's disease. This specific example will create an expenditure time bomb: over the next 30 years, the number of people with dementia in the UK could double to 1.4 million, and costs to the UK economy could treble from £17 billion a year today, to over £50 billion a year<sup>238</sup>.

However, the future incidence, prevalence, disability and chronicity of many other mental disorders is much more uncertain, since they are strongly influenced by a wide range of factors that could evolve and interact in unpredictable ways. For example, common mental disorders (for example, depression, anxiety, phobias and obsessive compulsive disorder) are linked to changing family structures, societal values, income

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234 Sainsbury Centre for Mental Health (2003)

235 McCrone et al. (2008)

236 See Chapter 3 for a discussion of mental ill-health in children. Chapter 6 considers older adults; in particular, age-related cognitive decline and dementia.

237 See the Foresight Project report: Jenkins et al. *Mental health: Future challenges*; Appendix E refers

238 Knapp et al. (2007); see also Chapter 6

and housing and the changing environment of work and life events e.g. exposure to bereavement, redundancy, crime, and illness.

#### 4.1 Developing a strategy for the future

A comprehensive strategy for mental health and mental ill-health should include: promotion of positive mental health; prevention, treatment and rehabilitation of mental disorders; and prevention of mortality. Principles underpinning a strategic approach to mental ill-health should take account of the following:

- Mental ill-health is likely to continue to have considerable and diverse impacts on the individual and across society. This argues for according it high priority in allocating resources (currently it accounts for about 13% of the NHS budget). In particular, the costs of inaction or policy failure would be much more expensive in the long term: evidence shows that if mental disorders are allowed to develop, their impact on the individual and also on their family, workplace and wider community can then be much more costly to address. Indeed, if they are allowed to become long-term, they can lead to a cycle of inter-generational decline and social exclusion.
- The impacts of many disorders are likely to take place over timescales that are considerably longer than those usually considered by policy-makers. Similarly, some of the benefits that would result from possible interventions to deliver prevention, treatment and rehabilitation (whether at the individual, population, or organisational level) might be realised over decades.
- New strategies and interventions will need to be robust to diverse future uncertainties; this implies the need for flexibility to adapt to the evolving situation.
- Many disorders are affected by diverse areas of policy that are presently outside the direct control and influence of those charged with managing mental health.

Many of the above principles go to the heart of how Government weighs up costs and benefits, the rationale used to justify expenditure, and how it determines priorities. These are substantial issues and are outside the scope of this chapter but are discussed more fully in Chapter 7. The focus here is more about how we might use new scientific and other evidence to inform how best to manage the uncertain challenges ahead. In this respect, several principles are clear:

##### *A. Address the risk and protective factors associated with mental disorders*<sup>239, 240</sup>

There is now good understanding and evidence for some social risk and protective factors for illness, as well as rapidly growing understanding of biological influences. In particular, much more could be done to address the risk factors, many of which can be modified. As a case example, the issue of **debt** is considered in Section 4.6. Recent analysis has shown that this is a much stronger risk factor for common mental disorders than low income<sup>241</sup>. Here the recommendations for action draw, in particular, on a dedicated Project workshop<sup>242</sup> involving experts from major banks, utility companies, businesses and mental health organisations. Another important example which concerns the prevention of stress and mental ill-health in the workplace is considered in Chapter 5.

239 See Project report: Jenkins et al. *Mental health: Future challenges*; Appendix E refers

240 Academy of Medical Sciences (2007)

241 Jenkins et al. (2008a), (2008b)

242 Hurlston and Jenkins (2008). Report of the Project workshop on debt and mental health. It will be made available through [www.foresight.gov.uk](http://www.foresight.gov.uk)

### *B. Detect and take action early*

Evidence shows that particular disorders are best detected as early as possible, and measures taken promptly to treat or prevent them from developing. Examples include: childhood disorders; adult common mental disorders; psychoses; addictions; and personality disorders. A broadly-based strategy which emphasises early diagnosis and treatment would be responsive to future changes in the prevalence of different disorders. See, for example, biomarkers for the detection of depression (Section 4.5) and biomarkers for cognitive decline (the latter are considered in Chapter 6 as they are particularly relevant to older adults).

### *C. Exploit better the potential of new science and evidence*

There have been considerable developments in science over the past 20 years and similar advances can be expected in the future. However, evidence shows that these advances, which have the potential to create new treatments and to determine optimal strategies for treatments, are not fully capitalised upon. In this report, leading experts from across the world have helped to inform how to improve: the delivery of treatments (see Section 4.2); the organisational structure for diagnosis and delivery (see Section 4.3); and the development of new treatments (see Section 4.4)<sup>243,244</sup>.

### *D. Address important mediating factors such as discrimination*

Many factors mediate the severity of mental disorders in society and the numbers of people affected. However, in discussions with experts and stakeholders, the importance of societal attitudes (in particular, relating to **stigma and prejudice**), was repeatedly stressed as a factor inhibiting access to care, recovery and social participation. Therefore, the Project brought together experts to develop fresh perspectives on how this issue could be addressed (see Section 4.7).

### *E. Target high-risk groups*

These include looked-after children, drug users, prisoners, and migrants. Mental illnesses often go undiagnosed and/or untreated in these groups. As a result, the behaviours associated with the mental disorders can go unrecognised and be misconstrued. The individuals can then easily fall into a cycle of exclusion, inappropriate responses by the authorities, and subsequent deprivation. Breaking this cycle is a major challenge, but failure to do so will store up substantial and long-term costs in the future. Two groups were considered as exemplars: looked-after children (see Chapter 3) and migrants (see box later in this chapter).

### *F. Promote positive mental health as well as addressing mental ill-health*

This has been discussed in Section 2.2. (Note: the specific issue of promoting wellbeing in older adults is addressed in Chapter 6).

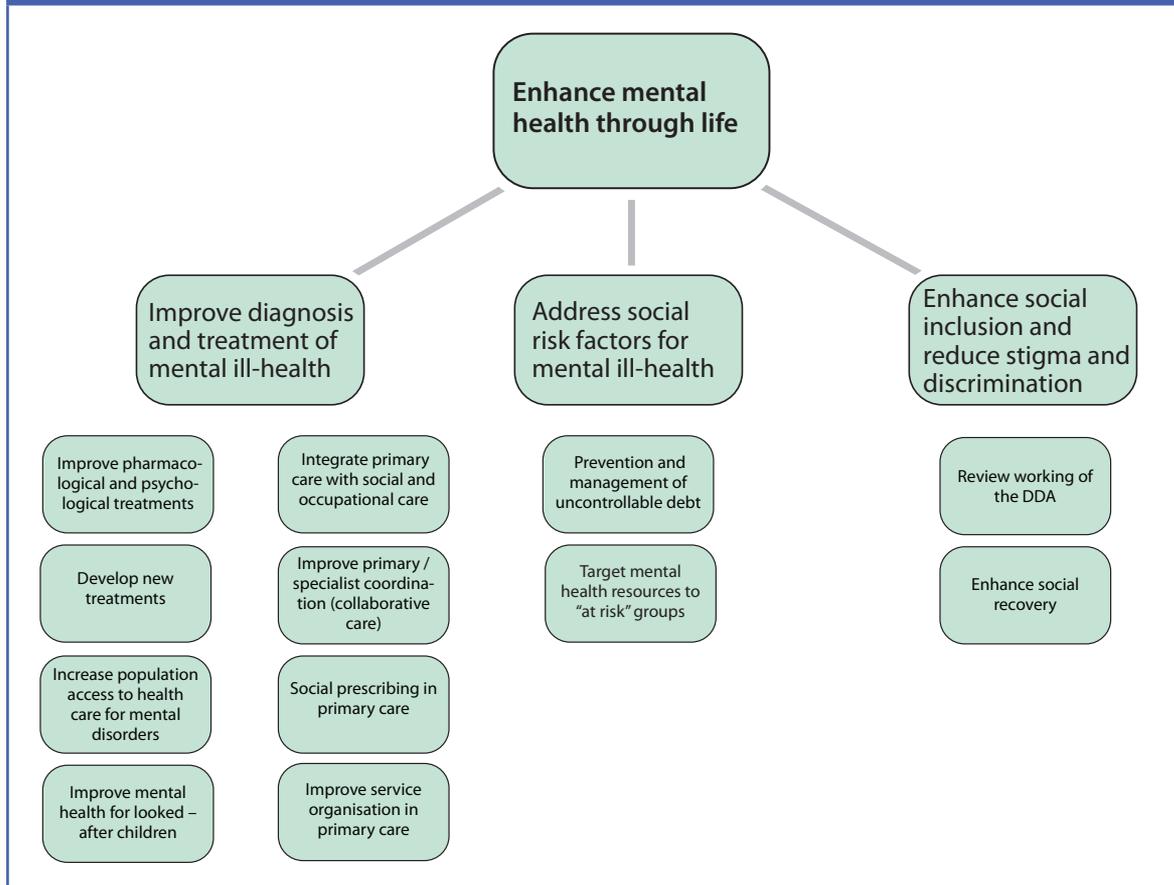
Following the above principles, a number of classes of interventions are considered in Sections 4.2 – 4.7: these are set out in Figure 4.1.

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243 In addition to a workshop of international experts and stakeholders, three discussion papers were commissioned: Paykel et al. (2008). *Impact of pharmacological treatments for mental disorders*; Scott et al. (2008). *Psychological treatments for mental health problems*; Shepherd and Grove. (2008). *Public mental health; Social interventions for people with common mental health problems and psychoses—promotion of rehabilitation and recovery*. These discussion papers will be made available on request through [www.foresight.gov.uk](http://www.foresight.gov.uk)

244 Grove (SR-B9); Appendix E refers

**Figure 4.1: Diagram of the suggested interventions to address mental ill-health. For the promotion of positive mental health, see Chapter 2**



## 4.2 Improving the delivery of treatment for mental ill-health

Randomised controlled trials (RCTs) now form a large evidence base for pharmacological and psychological treatments for mental disorder<sup>245</sup>. If we are to meet the challenges of mental ill-health in the future (and today), this needs to be used to inform how to achieve best results.

There are two main challenges. The first is how to meet a higher proportion of needs for treatment. A recent national study<sup>246</sup> found that three years after the baseline survey: only about half of all needs for treatment of depressive disorder were met; approximately a third of all needs for treatment of anxiety disorders were met; and most people with alcohol dependence were not receiving treatment. The second challenge is to implement best practice. In medicine, application of treatment in practice generally lags behind knowledge, and mental health is no exception<sup>247</sup>. Economic analysis commissioned for the Project indicates that substantial net economic benefits could be achieved by better implementation: the treatment of depression according to NICE guidelines is used as an example (see box).

245 See the Project discussion papers referred to in Section 4.1.

246 Singleton and Lewis (2003)

247 Ramana et al. (1999); Bebbington et al. (2003)

### Improving the delivery of treatment for depression: estimated savings<sup>248</sup>

The Project commissioned an economic analysis of benefits and costs of improving treatment for depression – one of the common mental disorders.

The analysis used data in the recent King's Fund report and the 2000 Psychiatric Morbidity Survey<sup>249</sup> to estimate that there are 828,000 people with moderate to severe depression in England. Compared to being untreated, NICE-recommended treatment presently yields a net saving of £578 million from the current 53% people that are treated. However, this would increase to £1.1 billion if everyone affected benefited. The difference (£512 million) results from £164 million additional savings in incapacity benefits and £415 million reduction in lost tax revenues offsetting the £66 million required to provide these treatments. The number of quality-adjusted life years (QALYs) gained would also change from 40,000 to 76,000. When savings related to employment are included, it is estimated that the overall economic benefit would exceed £1 billion.

A recent analysis of optimising evidence-based treatments across the wide range of mental disorders<sup>250</sup>, also shows net savings.

The discussion starts by reviewing the delivery of treatment today (see Section 4.2.1), and in particular, considers the pivotal role of the General Practitioner (GP – see Section 4.2.2). Suggestions are then made in Section 4.2.3 about how the delivery of treatments could be improved to meet the challenges of the future. In common with other parts of this chapter, the text draws on the papers commissioned by the Project, the expert workshops that were held, and in some instances, on economic cost-benefit analysis.

#### 4.2.1 Developments in pharmacological, psychological, and social interventions

##### **Pharmacological treatments**

The main drug classes used today were first developed between the 1950s and 1970s and have had a major impact on the outcome of severe mental disorders. Developments since have been slower. Evaluation by RCTs began in the early 1960s, with large numbers of trials since, and meta-analyses in more recent years. Currently, medications are used particularly for schizophrenia and affective disorders (depression and bipolar-manic-depressive-disorder). There is good evidence both of their moderate efficacy in improving symptoms and preventing relapse, and also of their limitations<sup>251</sup>. For example, in the case of schizophrenia, these limitations particularly include failure to ameliorate negative cognitive symptoms; for affective disorder, they include the non-response and partial response in some individuals. Recent questioning of efficacy of serotonin reuptake inhibitors (SSRIs) is based on one limited meta-analysis, and many other antidepressant meta-analyses show moderate, rather than overwhelming, efficacy. Medications are also used for addiction, smoking withdrawal, and to a lesser extent, anxiety disorders. Medications are perceived negatively by many users, partly because of side effects, and this can lead to poor adherence (failure to take prescribed medication).

248 Based on a paper prepared for the Project: Knapp et al. (2008). *Better treatment responses to depression: Economic consequences*. Available through [www.foresight.gov.uk](http://www.foresight.gov.uk)

249 Singleton et al. (2001)

250 McCrone et al. (2008)

251 See Project discussion paper: Paykel et al. *Impact of pharmacological treatments for mental disorders*. Available through [www.foresight.gov.uk](http://www.foresight.gov.uk)

### Psychological treatments

RCT evaluation started later for these, but there is now a large evidence base for certain therapies. There is good evidence of efficacy for brief outcome-orientated therapies, particularly cognitive behaviour therapy (CBT) and interpersonal therapy (IPT). In mild to moderate depression (but not severe depression), CBT and IPT are equally efficacious alternatives to medication for acute treatment, and in the case of CBT, for relapse prevention<sup>252</sup>. Neither computerised CBT approaches nor exercise were recommended by the Expert workshop as first-line treatments for depression except as adjuncts<sup>253</sup>. Self-help adjunctive approaches are growing and are useful. In anxiety disorders, behaviour therapy and CBT are of proven efficacy without medication, and in obsessional disorder in combination with medication. CBT is also used for chronic fatigue syndrome, eating disorders and psychological aspects of health problems. There is high public demand for talking therapies, but some patients prefer medication. (These attitudes may change over time: in the US, people currently prefer medicines to participating in talking therapies; however, a few decades ago the situation was reversed). A large expansion of provision of psychological therapies in general practice has been recommended in the Layard report<sup>254, 255</sup>, which is now being implemented by Government in the UK. Research needs in this area include relapse prevention studies with adequate numbers of participants, trials of other therapies, and research into non-responders to current treatments.

### Social interventions

These form a crucial element in mental health care. Movement of people with severe disorders from the hospital to the community started in the late 1960s, and accelerated through the 1960s to 1990s, with the establishment of community teams, and more recently, “assertive outreach”. RCTs have been carried out on a number of aspects, including: replacement of mental hospitals; day care; supported employment; assertive outreach; and early intervention. Patterns of linkages between healthcare and social care have been a key component of official and semi-official recommendations for mental health specialist services and their organisation.

As well as the recovery from symptoms of disorders, another important concept in care is (social) “recovery”. Paid employment requires employment opportunities, and use of the individual placement and support (IPS) approach. It is helpful to place IPS-trained specialists in specialist community mental health teams and in primary care<sup>256</sup>. Such specialists need to focus on both job retention and placement. A range of housing alternatives is required to allow for preferences, with relative independence (e.g. own front door), security and continuity of support, with good working partnership between social care and healthcare, and commissioning standards. Community integration is important and raises the need for opportunities for social contact and informal peer support, support to retain and to find new social roles, relationships and activities; many of these services could usefully be run by users<sup>257</sup>. Specific programmes would be useful for addressing employment problems of specifically disadvantaged groups, for example, in parts of the Black and Minority Ethnic (BME) communities, people with personality disorders, and offenders. Issues of

252 See references in Scott et al. (2008). *Psychological treatments for mental health problems*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk)

253 Note: the NICE guidelines on the treatment of depression (2004) are due to be revised in December 2008.

254 London School of Economics (2006)

255 Layard (2006)

256 For more detail, see Grove (SR-B9); Appendix E refers

257 The benefits of user participation in the design and delivery of services has been increasingly recognised over the last 20 years.

supervision, personalisation, and managing complexity in the delivery of social packages of care, are all important.

#### 4.2.2 The pivotal role of GPs

The GP is a key figure in the diagnosis and treatment of mental disorders for the majority of people: a key suggestion of the Project is that the role of GPs could usefully be improved. The 2000 national survey summarised in the Phase I Project report<sup>258</sup> indicated that 75% of people with common mental disorders (CMDs) in the general population are not receiving any treatment. Also, only about 40% of people with neurotic disorders had spoken to their GP in the previous year about a mental or emotional problem. Moreover, studies at the level of primary care show that while one in three GP attenders have a CMD at any consultation only about 50% are detected/diagnosed by their GP<sup>259</sup>. Since patients consult repeatedly and GPs use repeated consultations to improve diagnosis, a greater proportion of the morbidity is ultimately detected, but with significant undesirable delay; one US study<sup>260</sup> found that 41% of patients whose depression had been missed were recognised in the next three years. And similarly in the UK, the 2003 longitudinal study<sup>261</sup> found that after three years, just over half of all needs for treatment of depressive disorder and adjustment disorder were met. Moreover, only around a third of all needs for treatment of anxiety disorders were met, and most people with alcohol dependence were not receiving treatment.

However, even when diagnosed, a significant proportion of people with mental disorders are not adequately treated, resulting in: a greatly increased load on health services due to repeat consultations<sup>262</sup>; increased social and economic indirect costs due to greatly prolonged illness; and increased mortality<sup>263</sup>. For example:

- In the Stratford follow-up study<sup>264</sup>, people with CMDs were found to be 1.73 times more likely to die prematurely than the general population, and on average, consulted their GP once a month over the intervening 11 years. This represents a huge burden in primary care, which could be alleviated by prompt and effective treatment entailing appropriate social interventions to address the social risk and protective factors and social disability, with added medication and/or psychological interventions if warranted by the severity and chronicity of the condition.
- There is also an extremely low rate of access to treatment for people with addictions<sup>265</sup>. People with hazardous drinking were less likely to have seen their GP about a mental or emotional problem in last year or to have used community care services than those with no alcohol problem. Also, only 16% of those with dependence were taking any CNS medication, e.g. antidepressants in the last year, and only 4% were receiving counselling or therapy for a mental or emotional problem. Similarly, only 16% of those dependent on drugs other than cannabis reported receiving some form of treatment, and just 9% of those dependent on cannabis.

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258 See Project report: Jenkins et al. *Mental health: Future challenges*; Appendix E refers

259 Goldberg et al. (1980)

260 Kessler et al. (2002)

261 Singleton and Lewis (2003)

262 Lloyd et al. (1996)

263 Ibid

264 Mann et al. (1981)

265 See Project report: Jenkins et al. *Mental health: Future challenges*; Appendix E refers

One of the factors preventing prompt and effective interventions for CMDs is that GPs often correctly perceive social factors as important causes of common mental disorders, and therefore take the view that the conditions are not appropriate for treatment by a doctor; despite evidence of symptom severity, disability and chronicity. Neither have they generally seen it as their role to address the social problems that had caused and perpetuated the symptoms of mental illness (see Section 4.3). This has meant that the social causes often remain unaddressed and the illnesses remain untreated and chronic, with high social impact on families and the workplace<sup>266</sup>.

Even when medication is prescribed, there is much evidence that adherence to psychotropic medications is poor, with many doses omitted, and medications taken only for short periods with resultant incomplete remission and early relapse. Studies of antidepressants have shown that only 30-40% of patients take their doses as prescribed for the recommended three months<sup>267,268</sup>. Also, the doses prescribed are often far lower than prescribing guidelines. Thus, within general practice, mental health treatment needs to be improved and optimised if it is to meet future challenges.

#### 4.2.3 Suggestions for improvement

##### **Key suggestion: the optimisation of treatment in general practice**

*This would be achieved through the application of the evidence base to achieve best results, particularly in general practice, where most patients with common mental disorders are treated.*

Ways of achieving this include:

- In the last 10 years, there have been many recommendations and guidelines for good practice, for example, from NICE. More attention could be given to current guidance in Continuing Professional Development for GPs and their primary care teams. A valuable publication is the UK version of the *WHO Guide to Mental and Neurological Health in Primary Care, 2nd edition*<sup>269</sup>. This is tailored for British general practice, incorporates the evidence from research, and is comparatively recent. It deals both with treatment and with diagnosis, and with practical information for the client and the family, self-help, and information about relevant voluntary organisations. This could be distributed to all GPs, and updated in due course.
- As psychological therapies expand in primary care with the Department of Health Improving Access to Psychological Therapies (IAPT) programme, development and maintenance of skills and supervision of therapists, and development of systems for monitoring quality and competency, will be increasingly important: therapists need skills and expertise, particularly since a suggested target patient group are those with long-term problems. Regular skills-based supervision with experts in the appropriate therapies is always needed. However, it is important that strengthening the skills base in primary care should not be at the expense of specialist teams who care for people with mental disorder; nor should it create a brain drain from low-income countries to fill the gaps in those specialist teams. Furthermore, there would be a risk that GPs would cease to develop and maintain their own mental health skills, despite their role in treating mental disorders as well as physical disorders. Psychological treatments are also needed in primary care for people with heart

266 See Project report: Jenkins et al. *Mental health: Future challenges*; Appendix E refers

267 Peveler et al. (1999)

268 Olsson et al. (2006)

269 WHO Collaborating Centre for Research and Training in Mental Health (2004)

attacks, diabetes, multiple sclerosis, stroke, and unexplained medical symptoms as well as for depression.

- Psycho-education and reliable easily-assimilated information for patients should be encouraged, to enhance the process of informed consent to medication, adherence, and understanding of early warning signs of relapse and prevention of relapse. Psycho-education needs to be directed at families and not just patients, and may be combined with other approaches e.g. CBT for patients<sup>270</sup>.
- Efforts should be made to increase awareness that preferences for treatment are important in determining engagement and response with treatment, especially in depression. While many people express a wish for psychological therapies, a less vocal population of patients prefer medication: drop-out rates for therapy and medication are equal (30%). Use of combinations of treatment modalities could also be encouraged: medication; psychological therapies as indicated for specific disorders; social intervention to facilitate recovery, where appropriate. The evidence strongly indicates that pharmacological treatments combine easily with, and mutually reinforce and facilitate, psychological and social forms of management, in a variety of ways<sup>271</sup>.
- Basic and post-basic training for doctors could usefully be strengthened with regard to: assessment of teaching needs; initiation of medication to ensure adequate time allocated to discussion of side effects, and how to manage them; timing of taking medication; and duration of treatment.
- Greater efforts could be made to encourage people engaged in hazardous drinking to take up treatment. Alcoholism and other substance use disorders are now accepted nationally as major problems with wide-ranging consequences for the nation's health and for the incidence of anti-social behaviour; and are accepted in general practice as important. However, GPs may be reluctant to persuade patients to reduce or stop their consumption, and if necessary enter treatment. Techniques for achieving this could usefully be taught. Detection, motivational interviewing, and systematic and sustained management are all important. There also needs to be increased focus in GP education on detection and treatment of the relatively new phenomenon of heavy drinking in adolescents, which risks production of, and indeed may already have produced, a significant cohort of comparatively young adults who are severely damaged by liver cirrhosis and/or brain damage.

### *Exploring the benefits of patient self-help*

Self-help covers a broad range of approaches that people take to support their own health and manage ill-health, including mental ill-health. Approaches range from those that have been well researched (for example, those based on CBT approaches), to those that are highly tailored to individual needs, but are somewhat less well researched.

Greater use could be made of its potential:

- Self-help is often an individual activity and there are many self-help guides available for a range of psychiatric conditions, which could be more widely promoted.
- Peer support refers to self-help within groups, often also referred to as self-help groups. These are widespread in the UK and often specialise in a particular

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270 Turkington et al. (2002), (2008)

271 Paykel (1995)

experience, for example, particular phobias, but others are more general. The current evidence for effectiveness of peer support is mixed.

- Self-management refers to a more systematic form of self-help based on particular models, the most widespread being that developed by Stanford University (see <http://patienteducation.stanford.edu/programs/>). This approach has a good evidence base for a number of long-term health conditions, but in mental health, its only application to date has been with bipolar disorder. The Mental Health Foundation is developing a programme to apply self-management principles to other serious psychiatric diagnoses. Self-help, peer support and self-management are all examples of service user involvement at a personal level.

### 4.3 Improving service organisation to facilitate treatment delivery

The effective delivery of treatments in the future could be greatly facilitated if the organisation of service delivery is better matched to those treatments. There is still good scope for improvement here. General practice in this country has evolved rapidly towards deployment of primary care teams. In the last 20 years, mental health services have developed their own enhanced links with primary care, with some psychiatrists having sessions or consultation/advisory links with specific general practices. Community teams have often sectorised on the basis of common geographic boundaries with specific general practices, but this has changed with new specialist teams.

#### *Key suggestion: enhance the organisation in primary care to assist treatment delivery for common mental disorders*

*The effective delivery of treatments in the future could be greatly facilitated by enhancing aspects of the organisation of primary care. Several specific aspects are advocated; two of which are already partly developed, but could be strengthened further.*

- Enhancing GP capacity to diagnose and treat disorders suggests the need for performance management and contractual frameworks so that mental health is seen as their core business. In the 1990s there was much emphasis in GP teaching on detecting mental disorders, with ensuing benefits. This is an issue of organisation and governance, but it also concerns a need to engender a different outlook in many GPs<sup>272</sup>.
- Training of nurses: Within primary care, practice nurses are increasingly being deployed to undertake specialised care functions, for example, relating to depression. Use of nurses in primary care to monitor medication, side effects, adherence, relapse, and suicidal risk, can be valuable. However, many nurses lack adequate training and experience in mental health care. There is a pressing need for active training, coupled with good continuing supervision. This should be coupled with development of tailored guidelines. The WHO primary care guidelines are already written for the primary care team as a whole, including nurses, but a version specifically tailored to the roles of practice nurses could usefully be produced. The *WHO Primary Care Guide* was co-produced in liaison with a number of bodies, including the Royal College of Nursing.
- Collaborative care with specialist services: Good links with specialist services have been shown to improve primary care. A well evaluated model which has been very successful in the US in affective disorders is the specialist primary care-structured

272 See also Section 4.2.3

collaborative care package: here care is in primary care, but linked to the specialist team which provides advice<sup>273 274</sup>. Such a model has not been generally adopted in Britain, although it contains familiar elements, and one controlled trial has recently been reported<sup>275</sup>. It can combine with existing and envisaged developments in specialist nurses and nurse prescribing, and extend to schizophrenia and anxiety disorders.

- Involvement of users in developing the organisation of primary care services for mental disorders: The involvement of service users is already widespread at an operational and strategic level within the UK specialist mental health sector. Also, most statutory and voluntary sector service providers involve their service users in a variety of ways, including involvement in recruiting and training staff and service evaluation. So far, involvement has taken place at a strategic level and has focused on planning future services and on policy development. Therefore, the involvement of users could usefully be extended to the development of services in primary care.

**Key suggestion: integration of primary care with social and occupational care**

*The risk factors associated with many mental disorders have a major social component, and in primary care, capacity for social prescribing needs to be strengthened in recognition of this, and of the complexity of causation. In particular, greater integration of primary care, psychological care, social care and occupational care<sup>276</sup> would help substantially to assist access to sources of help to address a wide range of causes of mental disorder: e.g. debt; poor housing; marital problems; carer burden; social isolation; job retention and job re-entry; violence; and crime.*

In the Project report considering future challenges for mental health<sup>277</sup>, the links between common mental disorder and social risk factors, including life events were reviewed. In particular, a number of critical factors were identified. The prevalence of many of these risk factors continues to evolve, with consequences for the prevalence, incidence and severity of mental disorders. These factors include: being separated or divorced; living as a one person family unit, or as a lone parent; having no formal educational qualification or having a predicted IQ of less than 90; coming from social class V; being tenants of local authorities and housing associations; living in an urban area; and reporting one or more physical complaints. Also, people with a common mental disorder are much more likely to have experienced several life events in the last six months and to have smaller social networks than those without a disorder. People in prison and the homeless have considerably higher rates of disorder than those in the general population.

The epidemiological evidence on the social risk factors for mental disorders clearly indicates that improved outcomes for the management of psychological disorders in primary care will depend on systematic assessment and management of the risk factors in different social domains (housing, occupation, finances, marriage, family and social life). It also follows that provision of social help can make a large contribution to improving outcomes. Since primary care is the first port of call for help and treatment, primary care therefore needs to be able to readily access and implement social interventions. There have been a small number of studies of social workers working

273 Simon et al. (2001)

274 Gilbody et al. (2006)

275 Richards et al. (2008)

276 Note: the possible integration of occupational care with primary care is considered in more detail in Chapter 5 – including cost-benefit analysis.

277 See Project report: Jenkins et al. *Mental health: Future challenges*; Appendix E refers

very successfully in primary care, but current funding and organisational systems have not enabled the dissemination of these models – this deficiency could usefully be addressed.

Two expert discussion papers<sup>278</sup> were commissioned to identify and examine possible options for the greater integration of care. These included:

- Some form of linked commissioning and inspection, together with part-time real or virtual presence in primary care of a range of professionals to provide advice on occupational, psychological, social and debt issues. This would facilitate linking and initial referral, and enhance the access to and use of interventions in each social domain, which would potentially complement physical and psychological interventions. Confidentiality for the patient would be key in building trust in the potential of such a system.
- Single health and social budgets at commissioning level or individual level might be desirable.
- Systematic case management in primary care for people with mental disorders, not just for psychosis, but also for common mental disorders, addictions, dementias, and childhood disorders: this would be needed to coordinate the implementation and to enable reductions in costs of treatment, incapacity benefit and lost productivity.

#### 4.4 Developing new treatments

Although available treatments are very effective for some people with mental disorders, there are still gaps. There remains a strong need for the development of new treatments of all types. Several commissioned papers were used to inform an expert workshop on treatment<sup>279</sup>.

The impact of medications has been most striking on treatment of acute symptoms, and prevention of some earlier relapses and later recurrences by longer-term treatment; indispensably so in schizophrenia and affective disorders. Nevertheless, there are considerable limitations and problems. Available medications do not adequately benefit all patients, and some disorders still lack medications that have major effects. For example, in depression, antidepressants produce about 30% more remissions than occur without them, but benefit is not overwhelming; many people with milder depression recover without them, and many people do not respond well for the severe depressions. The same is true for CBT. For schizophrenia, the older anti-psychotics produce major side effects, in particular Parkinsonian-like symptoms. The newer, so-called atypical anti-psychotics may cause obesity and have less advantage over the older drugs than previously thought<sup>280</sup>. Also, it has become clear that much of the disability associated with schizophrenia is due to cognitive (attention, memory, executive functions, motivation) and emotional dysfunction. Available medications have only small effects on these aspects; the older drugs may even worsen them. In most disorders partial response, recurrence, and long-term disability remain major problems.

278 McCulloch and Cohen (2008). *A vision for developing primary mental health care; Options for integrating health, social and occupational health care in to a unitary primary mental health care service*. Papers prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

279 Paykel et al. (2008). *Impact of pharmacological treatments for mental disorders*; Scott et al. (2008). *Psychological treatments for mental health problems*; Goodyer (2008). *Interventions, treatments and managements in child and adolescent psychiatric disorders*. These discussion papers will be made available on request through [www.foresight.gov.uk](http://www.foresight.gov.uk)

280 Jones et al. (2006)

A familiar theme over past years has been cost-benefit ratios of newer medicines compared with old<sup>281</sup>. Overall, the medicines are cost-effective, usually far outweighing costs of hospitalisation, lost time at work, and impact on families. Older medicines tend to be cheap, particularly when they come out of patent. The advantages of newer medicines tend to be more on reductions of adverse effects than on the main therapeutic effects. With some exceptions e.g. clozapine, major therapeutic advances in new classes of drugs have tended to be quite uncommon compared to marginal improvements.

Wider policy implications, going beyond mental disorders and the use of psychotropic drugs, are relevant here. The pharmaceutical industry is important to the national economy, and is a sector that draws on innovation in biological and bio-medical science, in which the UK excels. However, there are tensions between: the needs of the companies to generate returns by high prices for the comparatively few drugs that are able to enter the marketplace; the needs of regulators to ensure that new drugs are effective and safe, with high profile public concern over safety failures; and for health care funders to minimise costs. Many of these tensions are linked to the nature of the development of new drugs, which involves a long, expensive and risky process. Many drug candidates have to be dropped at late stages of development or after marketing, because they are found to be therapeutically disappointing or because unsuspected adverse effects are discovered. Potential blockbusters may fail and companies may be severely affected. Therefore, while a successful major drug of a new class can produce very large rewards, it can be tempting for companies to reduce risks by developing modifications of existing drugs rather than novel drugs which embody much higher commercial risks, and may prove ineffective or produce unacceptable side effects.

Balancing these conflicting requirements to maximise the outcomes for Government, business and citizens is a fundamental issue which is considered further in Chapter 7. The next section focuses specifically on research priorities.

#### 4.4.1 Suggestions for research priorities:

- Research to develop new therapeutics for mental disorders should be given a higher priority and sharper focus, particularly through closer co-operation between the pharmaceutical industry and research funders. Development of new medications should be encouraged to fill identified gaps in relation to major disorders, including: anti-psychotics (greater efficacy, benefits on cognition, fewer side effects); antidepressants (greater efficacy); mood stabilisers (greater efficacy, fewer side effects); and neuroprotective agents (drugs with effects on molecular biological causative pathways in Alzheimer's disease and other types of dementia). In addition, improved approaches for addiction are needed, as well as longer-acting oral formulations. More effort could be made (through partnership models – see below) to stimulate the development of novel medications, rather than “me-too” drugs.
- For psychological therapies, greater priority is needed for improvement of implementation and outcomes. This should include:
  - The study of attitudes and appropriateness of different psychological therapies for different cultural and ethnic groups to enable wider application and adaptation.
  - Generation of a better evidence base for therapies other than CBT and IPT.

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281 Barrett et al. (2005)

- Pragmatic controlled trials of treatments under “real-life” circumstances; studies of psychological treatment combinations.
  - Expanded indications for specific symptoms or co-morbidities.
  - Adherence with psychological treatments.
  - For social recovery, evaluation is needed of the effectiveness of employment specialists, and programmes in both primary and specialist care.
  - More evidence is needed on the efficacy of specific interventions.
- Larger RCTs are required in order to establish benefit in a number of areas, such as studies of treatments in childhood, and psychological therapies in relapse prevention. Studies of combinations of treatment modalities, including psychological therapies, pharmacotherapy, and interventions for social recovery, should be encouraged.
  - Meta-analyses of all treatments including psychological therapies and treatments for children, need to include unpublished trials; trial registration is still not required except for drug studies, and needs to be implemented more widely, for example, in psychological treatment studies. Investment should be increased in research and development for social community interventions for children at the population level: NHS Trust and local authority resources could be pooled for this purpose.
  - There may be scope for the development of improved partnership models between Government (including the Medical Research Council and the NHS) and industry, to improve monitoring, surveillance, and sharing of data, including long-term evaluation of new medicines in reasonably large RCTs to identify health and social outcomes, risks and costs.
  - Further research is needed on development and implementation of individual and group self-help techniques for mental disorders. Also, more research would be useful on the involvement of service users in national policy and the development of local services; in particular, reliable tools are needed to measure the effectiveness of service-user involvement.

#### 4.5 Biomarkers for depression

There is still limited knowledge of the underlying neurobiological basis of depression. The restriction to clinical assessment limits capacity to diagnose, and also the development of new treatments. A successful approach for other diseases such as cardiovascular disease and cancer has been the identification of biomarkers. These are objective biological measures associated with the presence of a disease, increased risk for it, or response to treatment.

Biomarkers represent an important development for the early detection of neuropsychiatric disorders. However, whilst the biomarker approach is useful for a range of neuropsychiatric disorders (such as schizophrenia and anxiety), attention within the Project has focused on their use for depression and dementia, due to their importance across society. An International Round Table on biomarkers for neuropsychiatric disorders was therefore held; the findings are summarised below<sup>282</sup>.

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<sup>282</sup> A more detailed discussion including full references is available in Appendix C, which also considers biomarkers for Alzheimer’s disease.

#### 4.5.1 Uses of biomarkers

Before considering the use of biomarkers in depression and dementia, it should be acknowledged that any use of biomarkers in patients or healthy volunteers in research is likely to raise ethical issues. These issues have been considered in more depth in other reports<sup>283</sup>.

The identification and validation of biomarkers aims to improve diagnosis and screening as well as our understanding of a wide range of diseases. Biomarkers for depression could be used for varied purposes:

##### *To identify individuals at risk*

Depression is influenced both by social stresses and by specific genes, of which there appear to be a number. The search for genes associated with depression may be aided by use of endophenotypes, i.e. biological measurements or traits that are more directly related to genetic effects than the more distal clinical diagnosis. Putative depression endophenotypes include abnormalities in rapid eye movement (REM) sleep, cognition, brain structure, and dysfunction in monoaminergic brain pathways. These need further validation. There also appear to be individual differences in resilience to environmental stress, in which some neurochemical factors such as dehydroepiandrosterone, cortisol, and neuropeptide Y may be important. Endophenotypes could be used, for instance, to enable at-risk individuals to receive additional interventions following traumatic events.

##### *To improve diagnosis*

Biomarkers could potentially improve diagnosis and distinguish between different forms of depression. Examples include the sensitive tests of cognitive function now available, and neuroendocrine abnormalities associated with depression. Neuroimaging has also been used to identify patients with depression of vascular aetiology and could be used in older adults with a history of hypertension, who are at risk of developing this form.

##### *To predict treatment outcomes*

Treatments for depression include antidepressant drugs with a range of different pharmacological actions, and CBT. It would be greatly advantageous to be able to predict the treatment most likely to benefit a patient. For instance, variants in the serotonin 2A receptor gene which are strongly predictive of good SSRI response could assist treatment decisions.

##### *To predict the side effects of drugs*

Biomarkers may also predict the likelihood of experiencing particular side effects, pointing to drugs to be avoided or used in lower doses in certain individuals. Recent findings indicate that susceptibility to suicidal ideation may be due to polymorphic variation in a small number of glutamatergic genes. The capability to predict the small proportion of people who experience suicidal ideation on SSRIs (~5%) would allow these drugs to be prescribed with greater confidence to most patients, whilst providing other treatments for those at risk.

##### *To assist drug discovery*

The majority of antidepressants work by increasing levels of one or more monoamine neurotransmitters. The discovery of more effective therapies with novel mechanisms of action and fewer side effects is urgently needed. Biomarkers could be incorporated into clinical trials of these. The pharmaceutical industry could also benefit greatly from

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283 See Project report Morein-Zamir and Brownsword (SR-E1) – Appendix E refers; Nuffield Council on Bioethics (1998)

using biomarkers which would allow less heterogeneous cohorts of patients to be recruited into clinical trials. For example, those possessing a biomarker indicating strong placebo response would be excluded or those likely to respond to the new drug would be preferentially included.

#### 4.5.2 Ways forward

In biomarker identification and validation, a novel biomarker is first identified, and prospectively assessed before large-scale validation and eventual economic testing in a real-world setting. Several biomarkers may have to be validated and used in combination in order to reach a clinically-acceptable level of reliability. There is an apparent bottleneck between the many biomarkers identified in the first phase and progression to later validation. Barriers and possible approaches to address them include:

##### *Costs of biomarker validation*

Mental health charities have modest research budgets that cannot support large-scale validation of biomarkers, as funded by major cancer and cardiovascular charities. The funding gap needs to be met from elsewhere. Since biomarkers could greatly benefit the NHS, by reducing use of non-effective treatments, NHS-based funds from the National Institute of Health Research and the Health Technology Assessment programme would be appropriate. Initiatives such as the Health Innovation Fund (a collaboration between the Department of Health and The Wellcome Trust) could usefully prioritise funding for neuropsychiatric research.

##### *Regulation of biomarker use in drug development*

The pharmaceutical industry has much to gain from the validation of biomarkers. However, without reassurance that trials utilising biomarkers will be acceptable to licensing regulatory agencies when submitting new therapies for approval, their development is perceived as risky. It is therefore desirable for the drug regulatory agencies to consider providing a commitment to specific biomarkers and guidance on their use in trials and discussion. This would benefit the pharmaceutical industry by reducing development risks, but it would also benefit the general population as it would help to stimulate investment by the industry and the subsequent development of new drugs.

##### *Access to patient cohorts*

The NHS offers researchers access to large potential cohorts of patients for research on depression and other areas of mental health – these are already being partly utilised through the Mental Health Research Network. It would be useful if cohorts could also be used to identify and validate biomarkers of risk for depression.

##### *Use in clinical practice*

Even where biomarkers have become available, there can be reluctance to embrace them in clinical practice. An example is the non-use of available tests for variants of P450 enzymes: these are responsible for the metabolism of many drugs including SSRIs, which can be used to estimate the minimum effective and the maximum tolerable dosages of a drug in an individual. A change of attitudes to the use of biomarkers could be helped by demonstration of cost-effectiveness and by incorporation of biomarkers into diagnostic criteria.

### 4.5.3 Prioritisation in biomarker discovery

Given the expense in taking biomarkers to validation, the prioritisation of biomarkers is needed to ensure efficiency in the allocation of research resources. It is highly desirable for a key stakeholder to lead in this process and bring the research and business community together with a view to fostering a consensus on priorities, and considering multiple criteria, including:

- The size of the clinical problem that may be remedied by using the biomarker.
- The extent to which a biomarker has already been characterised and developed.
- The availability of other biomarkers that could be used in combination to increase specificity and sensitivity.

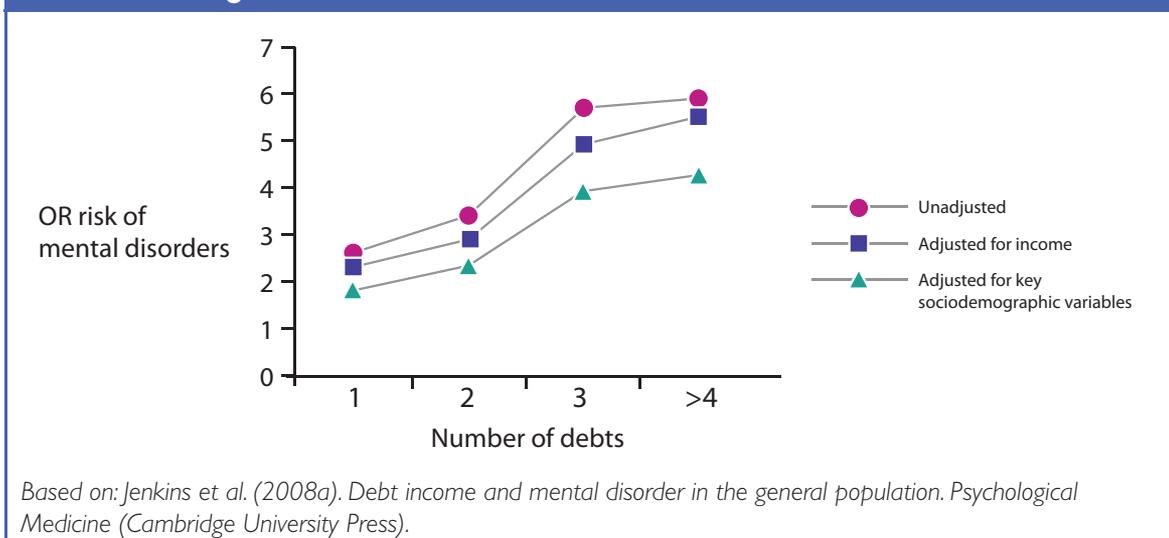
Finally, prioritisation could usefully consider the practicalities of using the biomarker in large, real-world populations. Mental health disorders are extremely prevalent and therefore any reliable biomarkers will be in high demand. Specialist training, infrastructure and funding would need to be identified early to allow smooth incorporation into clinical practice.

### 4.6 Tackling an important risk factor for mental ill-health: debt

Research on data from the most recent national psychiatric morbidity survey has indicated that the known association between poor mental health and low income is largely mediated by debt, and that debt is a much stronger risk factor for mental disorder than is low income. Indeed, when all other factors including income are accounted for, the effect of debt is still strong; but when all other factors including debt are accounted for, the effect of low income largely disappears<sup>284</sup>.

Figure 4.2 illustrates these findings. The index used (the odds ratio) is a measure of how great the increase of mental disorder is. The key finding is that, even when corrected for the increased risk with low income on its own, and with other socio-demographic variables as well as income, there is a very marked increase in rates of the different disorders with increasing numbers of debts.

**Figure 4.2: Odds ratio (OR) risk of mental disorders vs. increasing numbers of debts, showing how debt is related to an increased risk of mental disorders**



284 See the Project report: Jenkins et al. *Mental health: Future challenges*; Appendix E refers

The research also found that a quarter of people with a mental disorder are in debt, and half of people in debt have a mental disorder<sup>285</sup>. People with a mental disorder are 3-4 times more likely to have a debt problem than the general population, while people in debt are 2.5-4 times more likely to have a mental disorder than the general population. The research further noted that the most commonly reported debts among those with a mental disorder were council tax, telephone, rent, gas, water, electricity, television and mail-order payments, and that the associations with the various types of debt varied with the types of mental disorder. Further research is needed to establish the directions of the causal links, but nonetheless, the findings demonstrate the strong association of debt with mental ill-health, and the considerable potential to reduce those disorders by tackling debt as a risk factor.

A Project workshop<sup>286</sup> was therefore held to discuss the implications of these findings<sup>287</sup> and to suggest possible changes in policy and practice. Representatives of mental health charities and other organisations were invited to contribute, along with representatives from the financial services industries (particularly banking and credit) and providers of housing and household utilities. The following suggestions include efforts to prevent and manage uncontrolled debt, both in people with mental disorders and in the general population who could otherwise be at increased risk of disorder. These suggestions are listed here as a stimulus to more comprehensive consideration and analysis by stakeholders and Government.

#### *Key suggestions: breaking the cycle between debt and mental illness*

Actions which could help to achieve this could include:

##### *Actions by health and care teams*

- Since debt is so common in people with mental disorder, it makes sense for routine mental health assessments to sensitively include attention to finance and debt management.
- Debt counselling could also be made more readily accessible to people attending primary care services.
- Developing better understanding in both primary and specialist care teams about: where to direct patients with debt problems; the links between debt and mental health, and hence the need of assessment for depression and other mental disorders in people who are in debt; and the need to enquire about debt in people with known mental disorders. There are also some pilot projects under way of training primary care teams to give very basic debt advice. Also, the mental health charity Mind has produced a useful guide for mental health professionals on debt and mental health<sup>288</sup>.
- Exploring the extent to which patients are more likely to take up debt referral if it is prescribed. Closer integration of primary care and debt counselling such as Citizens Advice Bureau outreach work in primary care could also be explored further (see Section 4.3).

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285 Jenkins et al. (2008b)

286 Hurlston and Jenkins (2008). Report of the Project workshop on debt and mental health. Available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

287 See also Section 7.2.3 for a discussion of an economic paper commissioned by the Project that considers the impact of debt on health service costs

288 Mind (2006)

### *Building financial capability in the general population in relevant settings, and acting early to prevent and manage debt*

To achieve this, a comprehensive strategy would ideally be needed across the lifecourse. Possibilities include:

- The Financial Services Authority is already initiating programmes to improve financial capability e.g. working with Macmillan to help its nurses to signpost help with debt, and financial education resources. The key is to make sure that people do not feel that they are just being passed from pillar to post. This approach could possibly be extended to other settings including schools, universities, workplaces, and job centres.
- University is a place where young people may become mentally ill, and also where they acquire their first debts (student loans etc.), and so is a key setting for potential advice for students. However, it would also be important for people to be taught financial literacy tools before they go to university.
- There could be increased emphasis on achieving basic financial literacy skills for budgeting and saving in the general population. At present such teaching tends to be very abstract rather than practical and related to real life. It is more effective when taught by financial professionals rather than teachers.
- Housing Associations offer financial education to tenants and are aware that they are often the first agency to encounter people with mental disorders. The Consumer Credit Counselling Service is piloting a “Professional Debt Remedy” that can be delivered with minimum training, on the model of its successful online counselling service.

### *Within Government*

Wider policy on financial issues should take account of the health impact of debt, as well as its social and economic impacts on the country.

### *The financial services community should:*

- Be more mental-health proficient. The awareness of banks and financial institutions that uncontrolled debt is bad for mental health, and that poor mental health is bad for effective financial management, could be strengthened.
- However, the majority of high street banks already have a facility where someone in debt can confidentially raise the issue with their bank and be signposted to healthcare services. Many shops will agree to take goods back if the person has a mental disorder. This right of return could be extended to all consumer products and financial services.
- Perform stricter assessment prior to lending money or in allowing interest on credit cards to determine whether the individual is in a position to meet their financial obligations or risks becoming overcommitted financially with unmanageable debt.

**Utility and mortgage companies should:**

- Explore the ways in which they handle arrears, given that a high percentage of debtors will have mental health problems, so that the tone of communication from companies and collection agencies is more appropriate. (Currently, the approach of collection agencies when customers are in arrears may be deliberately designed to produce fear, anxiety and mental stress.) There may need to be specific training for debt collection agencies and the bailiff system in relation to mental health issues.
- Many people are unaware that gas and electricity suppliers are obliged to hold a “priority service” register (PSR). People can self-register for this, or be registered by a third party, or by their supplier. If a PSR-registered person falls into arrears, then the procedure must follow specific guidelines to prevent disconnection. Research from the US suggests that those in mortgage difficulties would prefer to communicate with a trusted third party.
- British Gas and EDF Energy run trust funds that can assist people who get into arrears, and in certain situations can provide grants to cover the outstanding amounts. This could be modified so that if a registered customer changed supplier, he or she could be automatically put on the PSR for the new supplier, without having to re-register. Energywatch is compiling a register of supplier practices and looking for ways to enable earlier identification to help people onto the PSR.
- The *Good Practice Guidelines*<sup>289</sup>, produced by the Money Advice Liaison Group of the Money Advice Trust, offer suggestions on debt issues relating to health and social care. Water UK is considering how these guidelines can be applied within the water industry. This approach could be extended to other utility and mortgage companies.

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289 Money Advice Liaison Group (2007)

### Reductions in suicide – a UK success story

Reductions in the rate of suicide show the considerable potential of national initiatives to address issues closely associated with mental health.

The rate of suicide (official and undetermined combined) in England and Wales has shown a downward trend from 1980 to 1990, falling from 11.38 deaths per 100,000 to 10.58. It subsequently fell much more sharply to 9.2 between 1990 and 1995/6/7 during the Health of the Nation Strategy (which aimed to reduce rates to 9.4 by 2000); and fell further to 8.5 in 2003/4/5 with the Our Healthier Nation Strategy (which aims to reduce rates to 7.3 per 100,000 by 2009/10/11). Both strategies targeted national suicide prevention<sup>290</sup>

Most people who kill themselves have a *mental disorder* at the time, and a significant proportion are under the influence of *alcohol*. Social factors are also significant precipitants (*life events* and chronic *social adversity*, combined with a *lack of social supports*). The so-called rational suicide is extremely rare<sup>291</sup>. Therefore prevention of suicide is multifactorial and encompasses<sup>292</sup>:

- The establishment of national strategies<sup>293</sup>.
- Education of health and social care professionals about better diagnosis and treatment of mental illness.
- Better assessment and management of suicidal risk.
- Supporting high-risk groups; people with severe mental illness who have a one in six chance of killing themselves, those committing deliberate self-harm who have a 100 times increased risk in the following 12 months, certain occupational groups such as doctors, vets, farmers, pharmacists, nurses.
- Reduction in access to means of suicide.
- Liaison with media to influence the way suicides are reported.
- Research and continued audit of suicides.
- England's multifactorial national strategy for suicide prevention is proving very effective, and needs to be systematically continued, with special emphasis on sustained liaison with key non-health sectors that also play a crucial role e.g. the media, where recent reporting has failed to follow reporting guidelines.

## 4.7 Addressing stigma and discrimination

Many people experience mental ill-health: for example, about 16% of adults and 10% of children are affected by common mental disorders such as depression and anxiety at any one time. Nevertheless, the associated stigma continues to be pervasive throughout society, and itself exacerbates many mental health problems by resultant discrimination. The discrimination can occur in many settings: in the home and in the family; at work; and in social life, and can influence opportunities for marriage and access to financial advice and financial loans. There is consensus across the expert and

290 Department of Health (1992), (1999); CSIP (2008)

291 Jenkins et al. (2005); Harris and Barraclough (1998)

292 CSIP (2008)

293 United Nations (1996); Jenkins and Singh (1999)

stakeholder communities that major benefits could result if a step-change in attitudes to mental ill-health could be achieved.

There have been many surveys of the general public's attitudes to mental disorder in several countries, all of which demonstrate negative attitudes. For example, in Great Britain, two large-scale surveys have been reported, each linked with a campaign to improve attitudes, and repeated after the campaign. Surveys in the UK include:

- In 1991, at the start of the Defeat Depression Campaign (a targeted campaign directed towards depression, sponsored by the Royal Colleges of Psychiatrists and General Practitioners), a survey of approximately 2,000 subjects was carried out<sup>294</sup>, with repeats in 1995 and 1997<sup>295</sup>. Initial attitudes towards depression were not unfavourable, but attitudes towards some treatments tended to be negative. There were perceived barriers to consulting a GP, with 60% of the population feeling embarrassed, 50% being afraid that the GP would regard them as unbalanced or neurotic, 40% believing that the GP would be too busy to deal with the problem, and only 30% believing that GPs were well-trained to deal with depression. Moreover 78% believed, erroneously, that antidepressants are addictive. During and at the end of the campaign, and after much public exposure, attitudes had shifted in positive directions, although changes were of the order of 5-10%. An epidemiological survey confirmed that many patients with neurotic disorders are reluctant to seek treatment<sup>296</sup>.
- The Royal College of Psychiatrists undertook a more general anti-stigma campaign called "Changing Minds". Here, surveys were carried out at the start in 1998, and after the end in 2003<sup>297,298</sup>. Attitudes to different disorders varied: they were most negative to addiction (77% negative) and alcoholism (69% negative). For all disorders, many people felt that sufferers were dangerous, unpredictable, and "different from us" (35-57% of the population, depending on the disorder). After the campaign there were some improvements, but often these were small. It was suggested that targeting a change in attitude towards specific disorders was more likely to be productive.
- Since March 1993, the Department of Health has placed a set of questions in the Face to Face Consumer Omnibus about public attitudes to mental illness. From 1993 to 1997 the questions were asked on an annual basis and then every third year until 2003. Since 2007, the survey has been carried out annually to serve as a benchmark, enabling measurement of whether attitudes are changing. While the general public is broadly sympathetic to people with mental health problems and community care, some attitudes towards people with mental health problems are worse now than in 1994, including fear of patients with mental illness<sup>299</sup>.

Exploration of stigma<sup>300</sup>, factors contributing towards it, and actions needed to ameliorate it, show that there are the following core elements: ignorance accompanied by misinformation; prejudice or negative attitudes; discrimination or resultant behaviour. The Project experts have worked with a firm with systems expertise (shiftN), to develop a visualisation of the many factors affecting stigma (see Figure 4.3a for a

294 Paykel et al. (1997)

295 Paykel et al. (1998)

296 Meltzer et al. (2003)

297 Crisp et al. (2000)

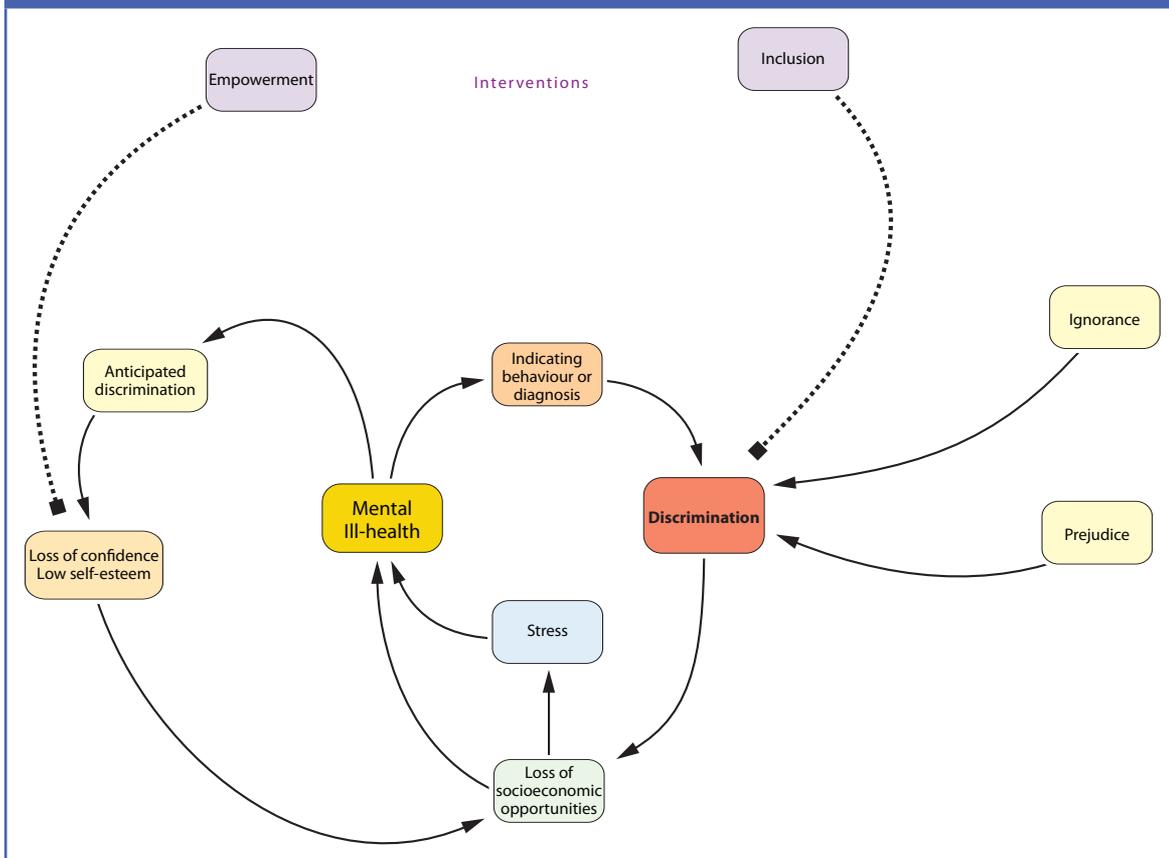
298 Crisp et al. (2005)

299 [http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsStatistics/DH\\_084478](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsStatistics/DH_084478)

300 Thornicroft (2006)

simplified version, and Figure 4.3b opposite for the full visualisation). This adds value over previous work by providing an integrated map of the various actors and interactions affecting stigma and therefore can be used as a tool for informing interventions.

**Figure 4.3a: A simplified influence diagram showing the key factors that drive discrimination against people with mental illness. Fuelled by ignorance and prejudice, discrimination can perpetuate vicious cycles of mental ill-health and further discrimination**



However, in designing such interventions, it should be recognised that some discrimination may be ethically justifiable under some circumstances, for example, selecting one person rather than another for a job may be essential and perfectly permissible. However, it is doubtful that discrimination can be justified against people solely on the basis of low levels of mental capital and mental wellbeing at various stages of the lifecycle. Differential interventions that act to reinforce stigma, which may itself lead to unjustifiable discrimination and possibly to social exclusion, are also a cause for ethical concern.

#### **Key suggestion: combating stigma and discrimination**

*Measures to enhance social inclusion of, and combat stigma and discrimination against, persons with mental ill-health should be a core nationally-funded component of mental health service activity.*

Such an initiative could have a number of aspects. Some of the people and settings that can influence stigma and discrimination are illustrated in Figure 4.4 (a diagram of "Actors") and these suggest the need for an integrated set of interventions.

Figure 4.3b: An influence (or 'causal loop') diagram of the many factors affecting the stigmatisation of, and discrimination against, people with mental illness; factors belonging to the "source" of discrimination on the right, factors belonging to the "target" of discrimination on the left, Legal factors on top

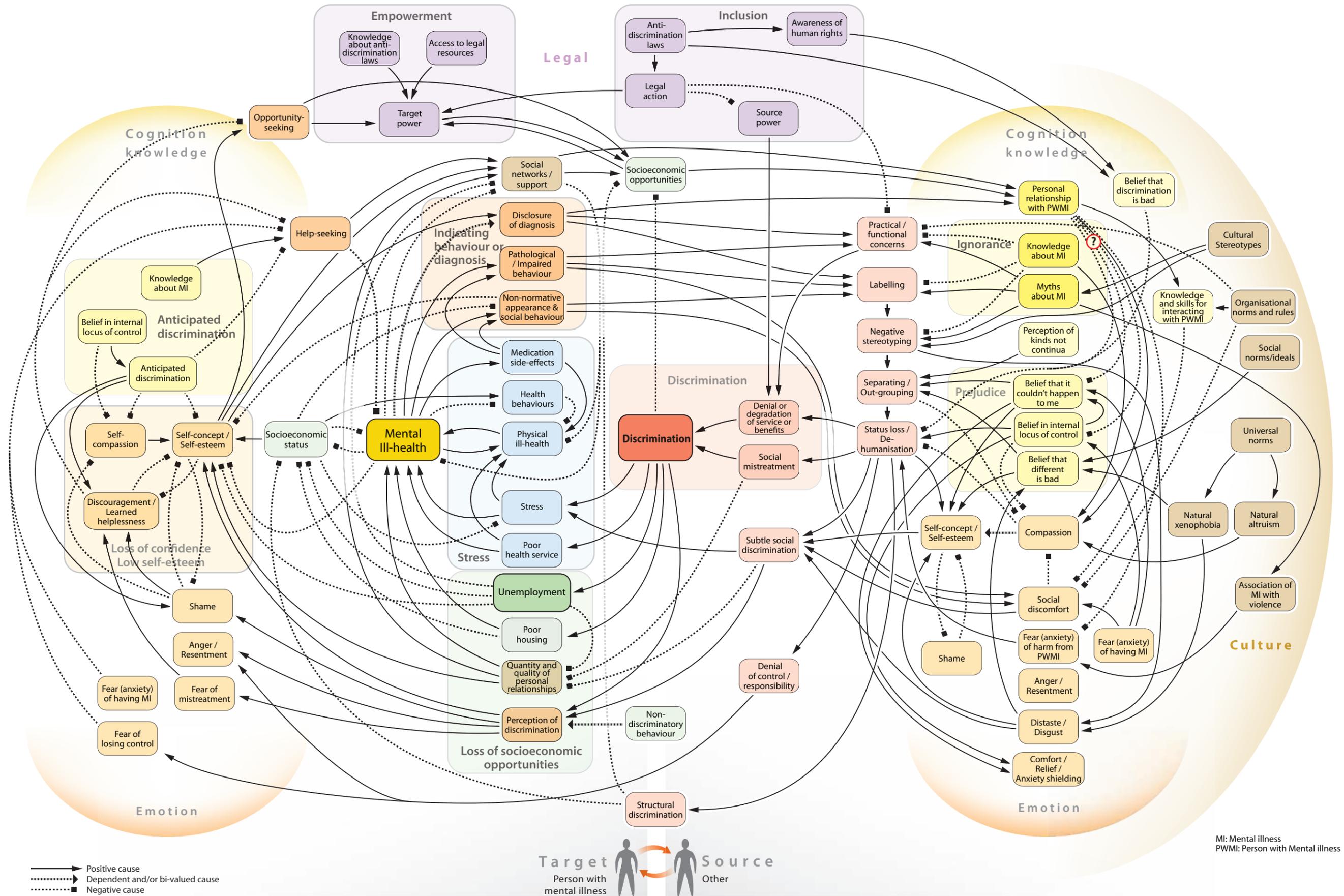
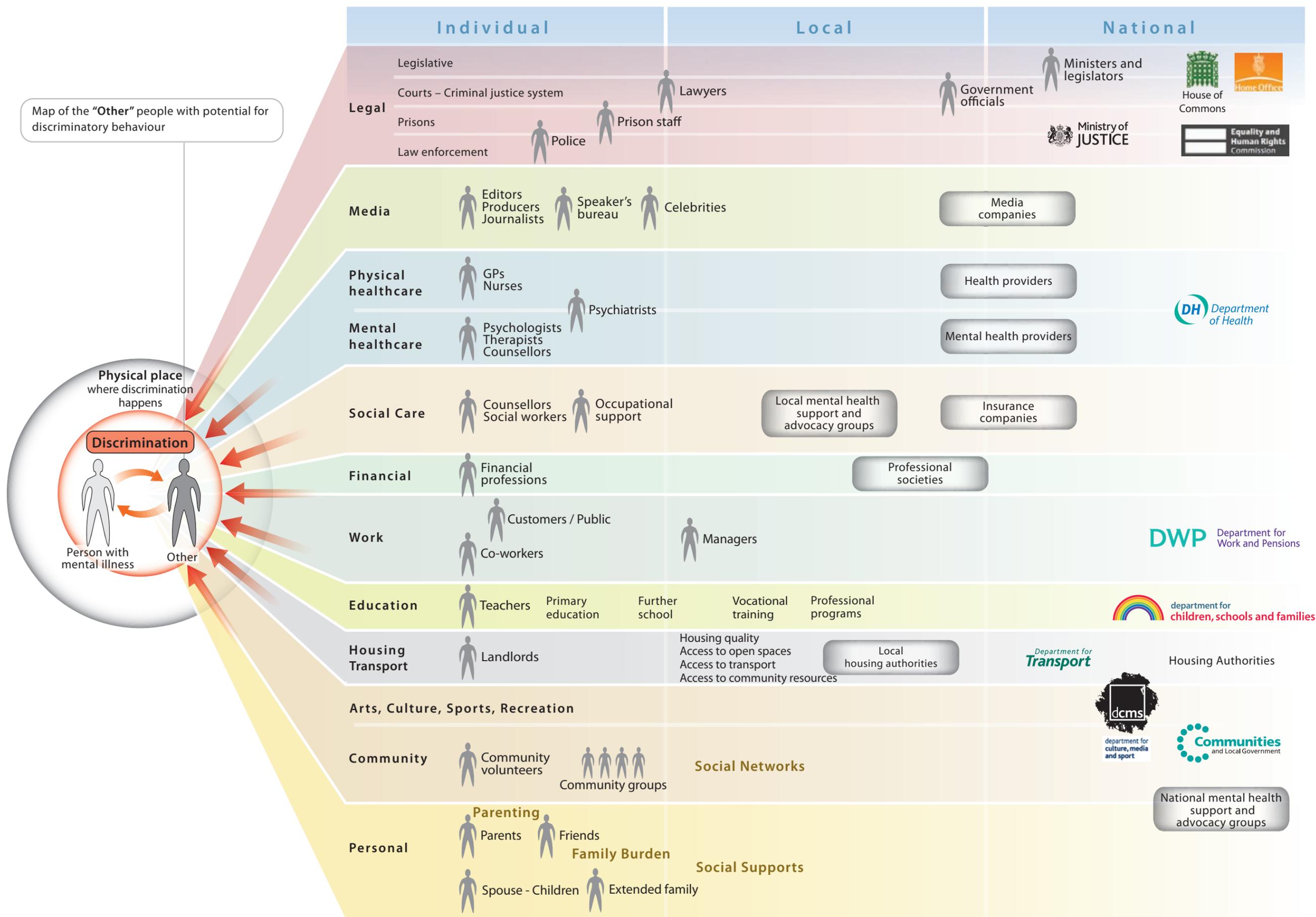


Figure 4.4: Discrimination against people with mental illness can occur in many different sectors of life. An integrated approach to addressing discrimination would seek to reduce discrimination across all sectors of life (top to bottom) and would link interventions across the national, local, and individual levels (right to left)



Possible actions include:

- The provision of accurate public information is needed to combat stigma of mental disorder; to improve knowledge, and to promote treatment adherence, including lessening distrust of medication. Experience has shown that provision of public information will need to be sustained in order to have a lasting effect: in the past there have been time-limited projects, reliant on available short-term project funding. Also, although websites are used extensively for information by sufferers, they vary greatly in reliability and balance. A “guaranteed reliable” website, provided by a body that is trusted and respected by the public, is needed.
- Professionals could be encouraged to develop new ways of offering and discussing diagnosis so that it supports clients and families to move forwards. Information packs for families should be used. Such information is already available in the WHO primary healthcare (PHC) guidelines, but could be expanded in the next revision.
- The media, such as television, radio and newspapers, plays a crucial role in shaping public attitudes. It is therefore important to ensure accurate information is provided about mental health, with balanced reporting. Strict guidelines are needed about public interest and to protect patient confidentiality. An important consideration for policy-makers will be the extent to which a voluntary code of conduct would be effective in protecting against breaches of confidentiality, and against use of derogatory words – or whether a more regulatory approach is needed. Guidelines for reporting suicides and homicides need to be developed.
- Supported work schemes should usefully be developed to combat discrimination in the workplace. Housing authorities could enhance access for people with severe mental illness to: quality housing, transport, and community resources. Financial institutions could enhance access to mainstream financial advice and assistance for people with mental health problems, and operate due care and attention to the impact of debt on mental health.

A range of actions should be considered across Government departments:

- The Department for Work and Pensions: better provision of information concerning the Disability Discrimination Act (DDA); review the working of the DDA; reform the incapacity benefit system; work with the Department of Health on employment support and retention schemes for the mentally ill.
- The Ministry of Justice: consider changing the law on jury eligibility to allow people with history of mental illness and a resumption of capacity to serve on juries; ensure police and prison staff understand the implications of international legal obligations, DDA and Mental Health Act for their approach to mental health problems in the public and prisoners, and that a proper approach is incorporated into training.
- Education ministries could ensure a whole-school/university/college approach i.e. involving all staff, to understanding international and national legal obligations to people with mental health problems and all disabilities; ensure mental-health literacy in educational professionals; and assist public education to empower communities.

## Migration<sup>301</sup>

Epidemiological evidence from around the UK and around the world consistently shows that migrants and their descendants have higher rates of certain mental disorders. The explanation for this is poorly understood, as is the extent to which it persists over multiple generations. The evidence considered by this Project indicated that:

- Immigrant groups and their descendants in the UK have been found to be at elevated risk of psychotic illnesses. When separated by ethnicity, the risk is highest in Black Caribbean and Black African immigrants and their descendants (5-7 times that of the White British). However, it is also raised for non-British white migrants and, in one study, for Pakistani and Bangladeshi women, but not men. The risk for recent Eastern European migrants is not yet known.
- In spite of extensive research, reasons for these elevated levels of risk remain unclear. Some factors have been ruled out, including misdiagnosis by mental health services, obstetric complications, perinatal trauma, substance misuse, or any predisposition for people with mental illness to migrate. Only a few studies have, thus far, considered the confounding effect of socioeconomic status on the risk of psychoses in Black and Minority Ethnic (BME) or immigrant groups. However, these studies observed that raised rates persisted for BME and immigrant groups after adjustment for socioeconomic status. There is some evidence that discrimination and isolation of migrants from their peers contribute. Overall, it appears that the elevated risk may be due to a number of factors which are associated with psychoses in all groups, but are more common in immigrants, such as social disadvantage in childhood e.g. separation from parents.
- A suggested priority is the funding of research into the genetic, individual and environmental causes of psychoses in immigrants and how these factors interact over both the lifecourse and across multiple levels of the interaction between genes, individuals and their social environment. The aim would be to elicit specific, tangible risk factors for psychoses in immigrants and their descendants. The work would consider discrimination and social exclusion, and would require large, multi-centre, longterm studies, which could be funded by the research councils, the National Institute for Health Research, a charity such as the Wellcome Trust and others.
- The demographic make-up of the UK has been shaped over centuries by the arrival of different migrant groups from close European neighbours and the wider world. Migrant communities who arrived in large numbers during the second half of 20th century now have second and third generation descendants and are increasingly mixed in the UK population. However, the epidemiology of psychotic disorders among BME groups in the UK suggests that elevated risk persists.
- If it were possible to identify the causes of the excess of psychoses in migrant groups and their descendants, and implement effective interventions to eliminate them all, we could prevent in the region of 80% of psychosis in the Black Caribbean community in England, 75% in Black Africans and 66% in the black and minority ethnic population, overall, and 20% of all psychotic disorders in England.

<sup>301</sup> Based on two papers commissioned by the Project: Kirkbride and Jones (2008). *Putative prevention strategies to reduce serious mental illness in migrant and black and minority ethnic groups*. Available through [www.foresight.gov.uk](http://www.foresight.gov.uk); and Kirkbride and Jones (SR-B13) – Appendix E refers

- Universal interventions which would tackle factors implicated in the causes of psychosis in general include: (i) improved pre-, peri- and post-natal care, since prenatal maternal malnutrition and infection and obstetric health are linked to risk of psychoses for all groups; (ii) improved family and social support during childhood and adolescence; (iii) reducing discrimination and stigma, particularly against high-risk groups for psychoses including BME groups, particularly young men; and (iv) when targeting at-risk mental states, particularly young people at high risk of developing psychoses, it is important to ensure that services are culturally sensitive and appropriate for an increasingly diverse population.

## Key messages

Many people experience mental ill-health: for example, about 16% of adults and 10% of children are affected by common mental disorders such as depression and anxiety at any one time, and its effect on individuals and society are considerable. Recent estimates place the costs at about £77 billion per year for England when wider impacts on wellbeing are included, and £49 billion for economic costs alone.”

It is impossible to predict the future prevalence and impact of many disorders because they are influenced by so many social factors<sup>302</sup>. In the face of this uncertainty, we should expect that mental ill-health for these will continue to cost the country at least the present value. (Dementia is a notable exception).

Certain guiding principles should guide a future strategy that is flexible and adaptable to future uncertainties:

- It is important to treat the risk factors associated with disorders:
  - Breaking the cycle between debt and depression is a clear example.
  - Harnessing wider policies in Government is also important: for example, common mental disorders are affected by a wide range of issues such as employment, housing, urbanisation, exposure to crime and debt. When policies are developed in areas such as these, more account should be taken of the implications for mental health – as is already the case for physical health and safety.
- For all disorders where treatment is available, it is best to diagnose early and treat promptly – too often, disorders remain undiagnosed and treated, with major consequences for individual, family and society.
  - Many disorders have a social origin and all have social consequences; co-ordinating social, psychological and occupational care with primary care could yield benefits for everyone e.g. individuals and their families, GPs, employers and society.
  - Improving access to treatments could yield substantial benefits: saving £1 billion for depression alone, where extra treatment costs would be outweighed by higher Government revenues and reduced benefit payments.
- Address important mediating factors. Stigma and discrimination, for example, affect the outcome of mental disorders for many people and need to be tackled by systematic, sustained and coordinated efforts.
- Target high-risk groups. These include looked-after children, drug users, and prisoners. Crucially, mental illnesses often go unrecognised and/or untreated in these groups, and the behaviours associated with the disorders go unrecognised and misconstrued.

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<sup>302</sup> Dementia is a notable exception – see Chapter 6

## 5 Mid-adulthood – work and skills: interventions

5.1 Equipping and re-equipping workers with the skills for work

5.2 Meeting the future challenge of good wellbeing in the workplace



## 5 Mid-adulthood – work and skills: interventions

This chapter focuses on how to address two major challenges facing the adult population:

- How to ensure workers are equipped to compete in the global marketplace for skills in the future.
- How to optimise the wellbeing of workers. Here, the increasing intensification of work and its effect on stress and anxiety are of critical importance: to the individual, to business, and to the State.

## 5 Mid-adulthood – work and skills: interventions

This chapter focuses on people in the labour market: of these, those in work currently represent 75% of the working-age population, and this figure could rise to 80% if current Government targets are met.

Whilst work provides economic benefits for the individual and society, it is also an important source of individual wellbeing and self-esteem. Conversely, not working can be a risk factor for common mental disorders such as depression; for many who are currently outside the workforce, gaining employment is a route to sustained wellbeing. Therefore, ensuring that people are able to work and have jobs, including those at risk of suffering from mental health problems, should be a key priority.

This is in line with the approach taken in Government's recent Green Paper on welfare reform<sup>303</sup>, which builds on the successful Pathways to Work and Access to Work programmes and the replacement of Incapacity Benefit by the new Employment and Support Allowance. Government also plans to pilot Dame Carol Black's recommended Fit for Work service, bringing together health and employment support to help people in the early stages of sickness absence. It will be important to ensure that development of these programmes is evidence-based and that they are resourced sufficiently to enable all those who can be expected to benefit from them to do so.

The mental capital and wellbeing of those in work is particularly important since they generate the wealth that enables the wide range of public services that directly affects the mental capital and wellbeing of everyone: for example, mental health care, education, support for families, and care for the our ageing population. They also make possible the services that promote a safe and secure environment for people to flourish – combating crime, and even managing the effects of international financial instabilities.

However, Chapter 2 showed that the world of work is changing in ways that could substantially affect the mental capital and wellbeing of workers. This chapter therefore considers these challenges and how they might be addressed. In particular:

- How to enhance and maintain the best possible **skills base** of workers, so they will be able to compete effectively in an increasingly global and competitive market for skills. This is considered in Section 5.1.
- How to preserve and optimise the **wellbeing** of workers. Here, the increasing intensification of work and its consequences on **stress and anxiety** will be of continuing importance: to employees; to their families (due to its consequential effects on family life); and to the prosperity of business and society (see Section 5.2).

## 5.1 Equipping and re-equipping workers with the skills for work

Chapter 2 highlighted several drivers of change that will make specific demands on the skills needed by workers through their working lives:

- Increasing pace of change: this is driven by many factors including the globalisation of markets and rapid developments in science and technology, in particular, in the information and communications sector. These drivers will require increasing agility in companies to meet changing demands of customers, and to meet rapid changes in competition.
- Intensification and globalisation of the market for skills provision; this is particularly fuelled by increasing numbers of highly-trained workers from emerging economies such as India and China, as well as the growing mobility of lower-skilled workers who can move more freely between countries.
- The duration of jobs is becoming shorter in many sectors.

Together these drivers imply an increasing threat to UK workers. Unless they can obtain the necessary skills and flexibly train and retrain through working life, they could fail to compete with skilled overseas workers coming to the UK, or find their jobs are outsourced abroad. However, these very factors could combine to disincentivise employers to train and retrain their UK staff, particularly when their employees could move and transfer newly-acquired skills to their competitors.

Much is at stake: if UK workers fail to compete in the “race for skills”, it would result in reducing prosperity for themselves, employers and of the country; and their wellbeing and that of their families could suffer. Workers could fall into a vicious cycle of increased mental ill-health and poor employability.

At present, the balance of investment in education and training is heavily weighted towards the young, and among them, particularly towards those who go on to higher education (see Figure 5.1). While this distribution is understandable, given the evidence that returns are highest at young ages, it tends to attract attention away from the huge potential benefits of investing in learning across the lifecourse. It also raises issues of equity, particularly in respect of older generations of adults, many of whom left school early, and few of whom enjoyed access to opportunities that are taken for granted today.

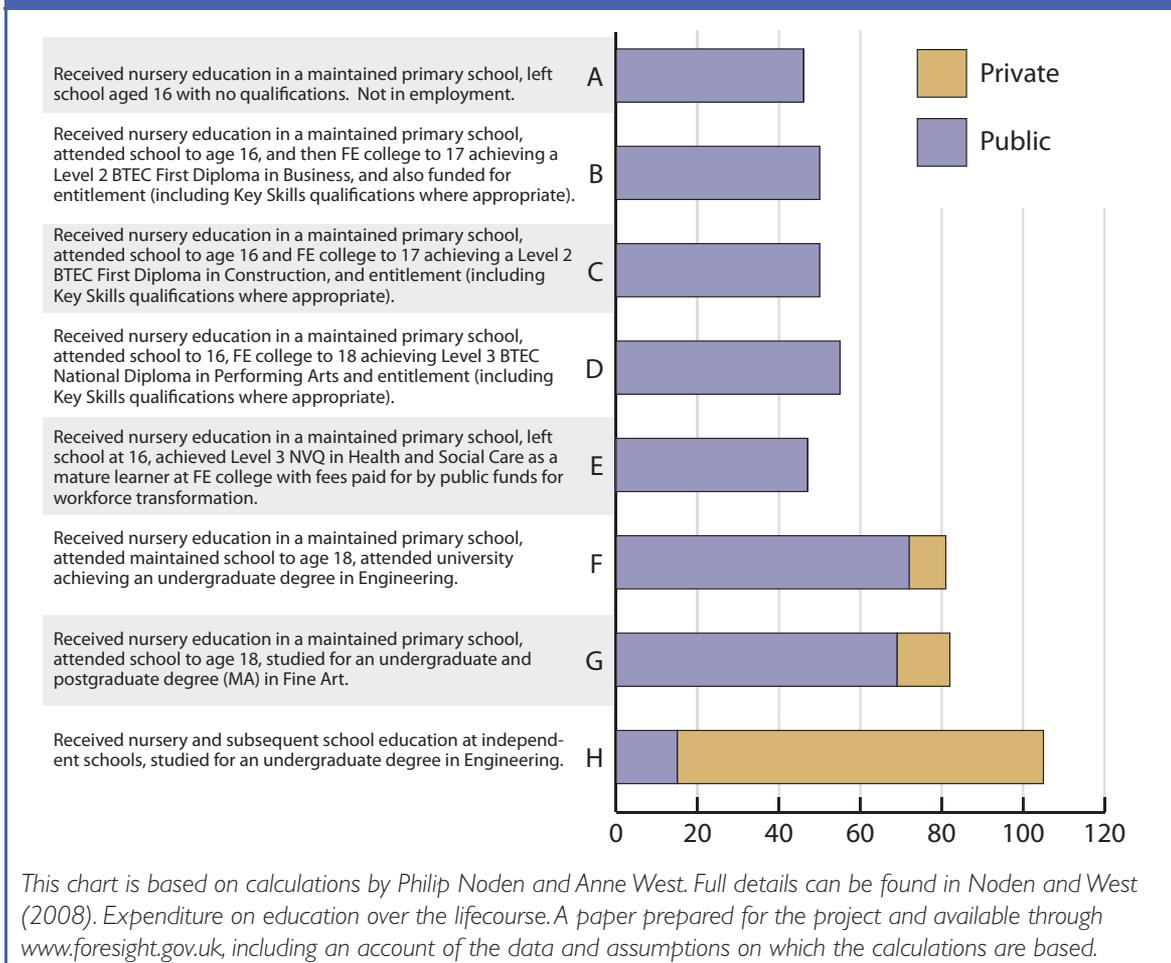
The evidence from earlier work in the Project concerning learning through life<sup>304</sup> drew attention to the importance of “disposition to learn” and the factors that promote or undermine this (see Figure 5.2a which provides a simplified framework for learning through life; Figure 5.2b provides a more comprehensive version). In particular, initiatives to encourage adult learning need to start from an understanding of the individual's motivations, values, fears and aspirations, moving beyond simple notions of practical barriers to learning<sup>305</sup>. However, once working age is reached, the evidence shows that far more is spent by employers in developing workers who are already highly qualified. Also, evaluations of returns to individuals from different types of qualification suggest that returns vary for different groups of worker and different sectors, and are likely to be greater for women than men. Overall, though, while there is reasonably good evidence from a range of sources showing clear economic benefits

304 See Chapter 2, section 2.3

305 Illeris (2006)

from higher-level and craft qualifications<sup>306</sup>, returns on lower-level vocational qualifications appear to be limited and some studies have even shown negative returns from lower-level qualifications (NVQ1 and NVQ2)<sup>307</sup>.

**Figure 5.1: Estimated total public and private expenditure on education and training (£ thousand) associated with specified hypothetical education pathways**



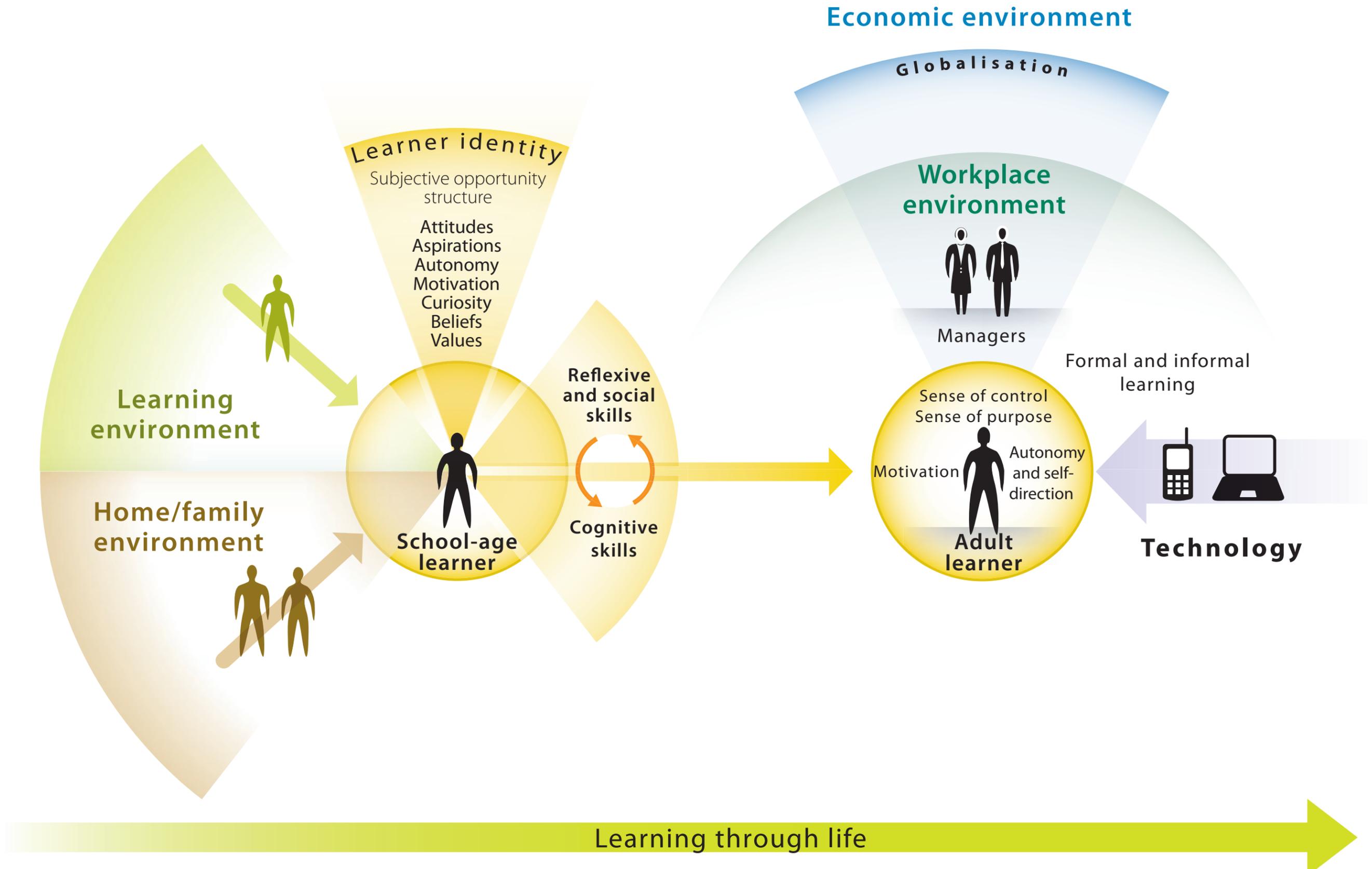
The Leitch Review of Skills<sup>308</sup> expressed a number of concerns about quality, and urged Government to take further steps towards a demand-led system of learning and skills. While Government has responded constructively to this advice, a demand-led system will not in itself improve quality in areas of market failure. Given a very strong public-good case for stimulating demand among groups such as adults with poor basic skills, people with disabilities and older adults, it follows that market pressures alone will not be enough to enhance quality of provision. Setting targets on their own may simply produce behaviour designed to meet those targets, rather than focusing attention on the groups that Government is trying to help. Instead, target-setting needs to be accompanied by partnership with providers in order to enhance the quality of provision.

306 Dearden et al. (2002)

307 Jenkins et al. (2007)

308 Leitch (2006)

Figure 5.2a: Learning through life framework, which outlines the factors that influence the development of learning abilities and encourage life-long learning



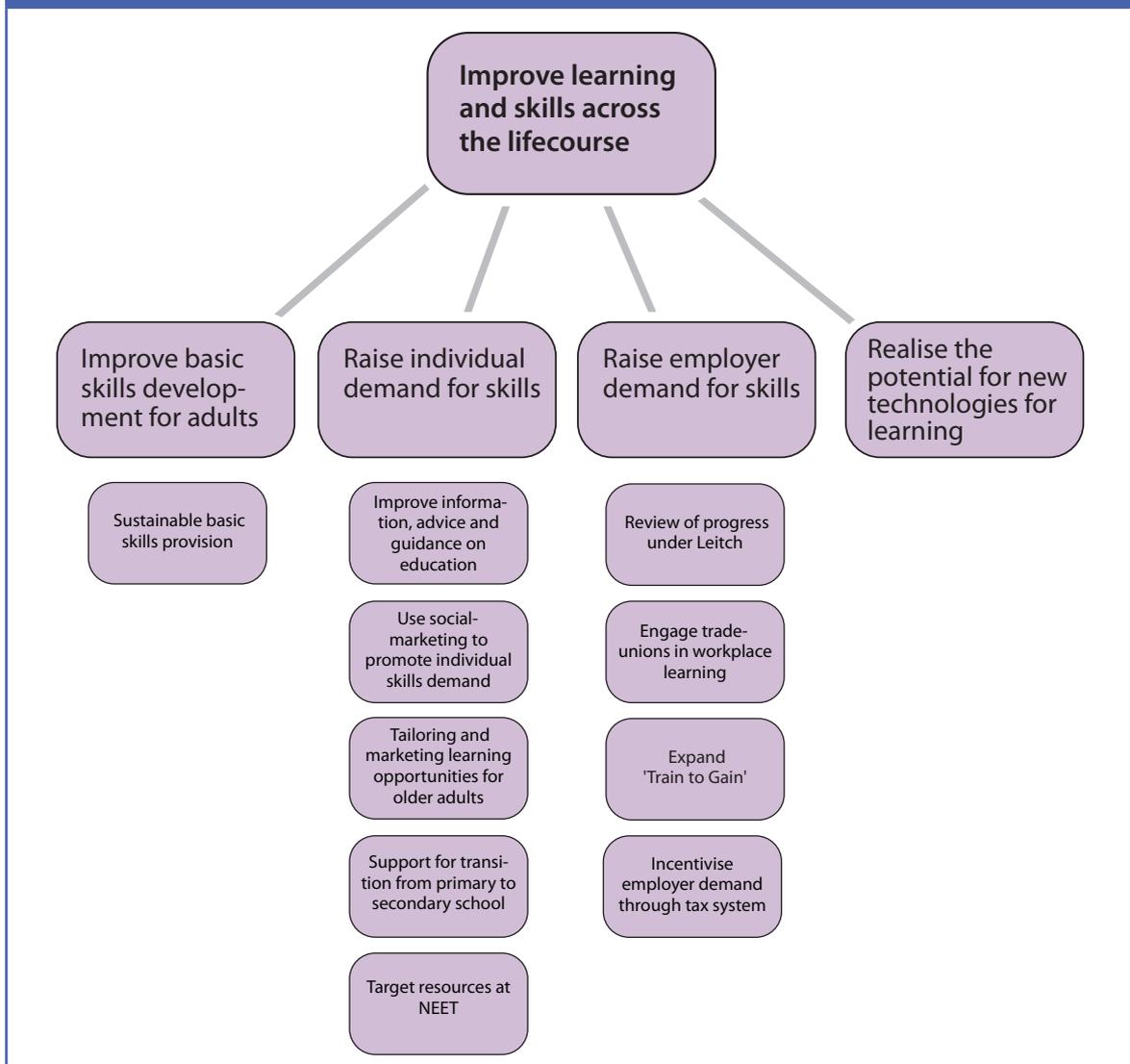


In considering how to approach the above challenges, a number of papers were commissioned and a workshop of leading experts and stakeholders was held to identify and discuss possible interventions. Four key themes were apparent from this work (see Figure 5.3):

- The continuing importance of basic skills – literacy, numeracy and English for speakers of other languages.
- Raising individuals' demand for skills development.
- Improving employers' motivation to develop the skills of their workforce and to enhance productivity/value-added through skills growth.
- Realising the potential role of new technologies for learning.

The first three of these have been the subject of Government action for a number of years and some progress has been made. A summary of successes and suggestions for possible areas for further work is provided below (see Sections 5.1.1 and 5.1.2). Empowering individuals to learn through life is then considered in Section 5.1.3, and the particular potential of new technologies for learning are then discussed in Section 5.1.4.

**Figure 5.3: Summary of interventions to improve learning and skills across the lifecycle**



### 5.1.1 Improving basic skills

The two key messages regarding basic skills within the adult population are: the need to continue to underline the value of such skills in a 21st-century global economy; and to build upon existing progress and work, rather than launching entirely new initiatives. The importance of this work is demonstrated by analyses of longitudinal cohort studies, which have repeatedly shown that poor basic skills significantly increase the probabilities that people will experience unemployment, imprisonment and poor health; and they significantly reduce the probabilities of civic engagement<sup>309</sup>. While some very low-skilled jobs will survive, current trends have revealed a narrowing of opportunities for low-skilled employment, as well as a growing tendency for low-skilled work to be precarious and to involve periods of sometimes protracted unemployment.

For adults in work, Government encourages employer-led basic skills provision, through Train to Gain and its predecessor programmes. Research shows that these initiatives have been particularly successful in workplaces where union learning representatives act as intermediaries with employers and providers, or where “licence to practice” depends on achieving specified levels of qualifications. However, other studies have also shown that the benefits of employer training can be variable (see box on Train to Gain). Therefore, the key message for providers is to underline the importance of engaging consistently with stakeholders who involve and represent the groups they are seeking to reach, but to use the available evidence to focus policies and initiatives carefully on where they can best add benefit.

**Train to Gain** is a national programme of support for workplace training, led by the Learning and Skills Council to offer advice and access to funding for employer-provided training. It was introduced in 2006, and builds on an earlier pilot programme.

Research suggests that this new programme has had an impact, particularly where it is able to engage with workplace representatives of the workforce. However, it is not without flaws. There is a clear risk of deadweight, with employers using public funds to support training that they would otherwise have paid for themselves. In some parts of the economy, employers still see training as a cost rather than an investment. Also, other than publicity, there is no mechanism for engaging with those employers who are least committed to training and do not recognise its value.

Train to Gain focuses on training at relatively low levels (NVQ 1 and 2 – precisely those levels that researchers have found to produce few if any wage benefits for individuals<sup>310</sup>), and it makes no contribution to the widely-acknowledged skills deficits among managers. Options for building on Train to Gain include:

- Using it as a basis for management development in key areas such as managing training and development and managing employee wellbeing.
- Increased targeting on small and micro-enterprises.

The Skills for Life initiative (SfL) promotes literacy, numeracy and ESOL (English for speakers of other languages) provision for adults. It has been widely welcomed and has made progress towards the targets initially set for it (1.5 million adults to reach national certification by 2007). However, Lord Leitch has argued for more demanding targets

<sup>309</sup> See, for example, Bynner and Parsons (2008)

<sup>310</sup> Jenkins et al. (2007)

and the Inspectorate<sup>311</sup> described it as “disappointing” that half of all new literacy and numeracy qualifications awarded were to 16-18-year-olds rather than the adults for whom the initiative was designed. The National Audit Office also expressed reservations about the pace of progress, particularly in respect of adult numeracy<sup>312</sup>, and recommended targeting efforts on adults, migrants and unemployed people.

All of this implies the need to improve the focus of Skills for Life (SfL), if resources are to target those adults who lack the basic skills that will enable them to make a full contribution to their employment, their family life, or the public life of their community. Research shows that SfL has the potential to achieve its goals, if at a slower pace than initially hoped. However, there is evidence that its dependency on time-limited funding is creating problems, with employers, union learning representatives (ULRs) and even learners perceiving it as peripheral and insecure<sup>313</sup>. Addressing this specific issue is therefore desirable.

While many people with poor literacy and numeracy skills do not have learning difficulties, this work with adults through SfL should be additional to interventions in early childhood (see Chapter 3), which will make a complementary and longer-term contribution, particularly for those who do have learning difficulties. In addition, despite recent improvements, training and development for lecturers, tutors and guidance workers in post-compulsory education and training is patchy, and the proportion who have a good understanding of common learning difficulties, and the capabilities required to help deal with them, is still relatively small<sup>314</sup>.

#### **The need for lifelong learning**

The UK Government has actively promoted lifelong learning since 1998, when it published the Green Paper *The Learning Age*. In 2005, the Leitch Review of Skills argued that progress had been slow, and it made a convincing case for adopting extremely ambitious targets for lifelong learning. Lord Leitch argued that these targets were non-negotiable if Britain hopes to remain competitive in a global knowledge economy. Current research<sup>315</sup> suggests that the human resource strategies of international companies are developing in ways that transform the skills agenda even faster than Lord Leitch believed. Even the Leitch targets, which we are still quite a way from achieving in the UK, may be insufficient to protect employability and maintain prosperity.

### 5.1.2 Stimulating demand for learning and skills development in individuals and employers

One concern is that globalisation of the market for skills, combined with more frequent changes in job and employer for many workers, may act to disincentivise employers from pro-actively training their staff. For this and other reasons, there was strong and broad agreement by the experts and stakeholders consulted, that Government has a role to generate demand for learning and skills development amongst individual adults. This is in addition to the vital promotion of a disposition to learn through life, which needs to take place much earlier in schools (see Chapter 3).

311 Adult Learning Inspectorate (2006)

312 National Audit Office (2005)

313 Finlay et al. (2007)

314 OFSTED (2007)

315 Brown and Lauder (2006)

Government can influence individual demand for adult learning by targeted awareness-raising. The Gremlins campaign showed that a concerted and sustained campaign of well-designed social marketing can be very successful in persuading people to engage in learning<sup>316</sup>. The campaign targeted people with particularly poor basic literacy, numeracy and language skills. Its success in an area characterised by stigma and low self-esteem, with people who typically found their school experience humiliating and unrewarding<sup>317</sup>, suggests that a series of high-quality campaigns for lifelong learning could usefully be undertaken, targeted at different groups within the adult population, such as people towards the end of their working lives, or people with specific English language requirements.

Other possible Government interventions could include loans or financial incentives. A recent review of international experience concludes that Individual Learner Account (ILA) schemes can work effectively “if they are well defined, locally administered, and embedded in a wider legislative framework”. The best-known example is the USA’s Individual Training Accounts, which are offered with the wider provision of the 1998 Workforce Investment Act<sup>318</sup>. The experiment with ILAs in the UK was abandoned amid evidence of deadweight. While Government has good grounds not to reintroduce ILAs in England, there is a case for considering a more focused and locally-led scheme as one way of incentivising and empowering individual demand. For example, in 2004 the Scottish Government reintroduced an ILA system which is only available to people earning £18,000 or less; initial evaluation suggests that it provides a valuable additional form of support, particularly for those on low incomes, with limited skills or who are unemployed<sup>319</sup>. Furthermore, from 2010, the Government is rolling out a national scheme of Skills Accounts which aim to motivate learners through an increased awareness of the amount of money being invested in them.

To raise employer demand for skills and workforce development, Lord Leitch again recommended a range of interventions including: public relations campaigns and a skills pledge (modelled on the Basic Skills Pledge pioneered by the Welsh Assembly); more apprenticeships; and clear targets for intermediate and high skills. He urged Government to review achievement in 2010, and to introduce a statutory entitlement to qualifications up to Level 2 if insufficient progress had been made. The Scottish Parliament’s Enterprise and Lifelong Learning Committee had already made similar proposals in 2001. Government has now announced that the review will be held in 2014. Evidence is not strong that a voluntary code will produce sustainable results at the speed needed. Clear and transparent arrangements for the review will be required well in advance of 2014.

It has also been suggested that Government should provide financial incentives to employers through the taxation system. For example, the Chartered Institute of Personnel and Development (CIPD) has called for relief from capital gains tax for small firms who take on apprentices. Similar ideas have been successfully tested elsewhere. In the Netherlands, for example, there is a significant tax advantage for firms who invest in training. Employers can claim a 15% tax rebate against the wages of employees on workplace training contracts. This forms part of an arrangement linking employers, unions and Government in promoting “total” employer involvement in providing training. The arrangement also involves vocational training colleges, who provide the off-the-job element of training; and sectoral bodies must accredit the employers before

316 Tett et al. (2006) p. 36

317 Illeris (2006) p. 18

318 Schuetze (2007) p. 20

319 Gallacher et al. (2007)

they are eligible to provide training places that can gain the tax refund. This partnership ensures that quality standards are maintained, and that off-the-job training matches employer requirements<sup>320</sup>. This Dutch example suggests that incentive systems work best when embedded in a wider structure and culture of collaboration on skills, and suggests that this approach could contribute to a wider set of improvements in Train to Gain.

Trade unions have a role in raising employer demand for skills, as well as promoting learning opportunities to their members. Government has done a great deal since 1998 to encourage trade union support for learning, such as the creation of the Union Learning Funds, the introduction of statutory rights for workplace learning representatives, and support for Unionlearn. Research suggests that these developments, albeit still at a very early stage, are working reasonably well to promote greater interest in learning among union members and the workforce more broadly<sup>321</sup>, while international experiences suggest helpful ways of further broadening the scope of union involvement in learning<sup>322</sup>. While the proportion of employees in unions has been reducing over recent decades (it is currently at around 25%), and union engagement has limited influence on non-union members, it represents an important way of raising demand for learning among types of employee who are otherwise often under-represented in education and training.

Finally, the Project has also considered the possibility for Government to impose statutory training levy systems. Voluntary levies currently work well in some sectors in Britain, where training boards were maintained by industry after the abolition of the statutory framework. However, evidence suggests that statutory levies are of limited value in changing overall levels of employer demand for skills. Indeed, they can be counter-productive, provoking considerable resistance to training levies, which many employers treat as a back-door tax, as well as the cause of unnecessary bureaucracy<sup>323</sup>. Levies also tend to benefit large firms more than small firms, and they generate high administrative overheads<sup>324</sup>. Therefore, there is not currently a compelling case for their reintroduction in the UK.

### 5.1.3 Empowering individuals to learn: information, advice and guidance

Because of the profound changes in the world of work<sup>325</sup>, the strategic economic role of career guidance needs to be reconsidered and emphasised in the context of improving mental capital and wellbeing in the workplace. This is due to the changing nature of careers for a large proportion of the population, as well as to changes in provision. As learning moves towards a more demand-led system, so provision will become more complex and – from the perspective of many learners – the claims of providers will become harder to interpret. In a highly pluralistic learning market, those who are least familiar with the education and training system will need navigational advice if they are to benefit from the opportunities available. Also, the nature and delivery of that guidance needs to adapt to meet that evolving situation.

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320 Sung et al. (2006) pp. 20-21

321 Rees (2007)

322 Lloyd and Payne (2007)

323 McGrath et al. (2006) p. 94; Stanton and Bailey (2004) p. 16; Sung et al. (2006) p. 22

324 McGrath et al. (2006) p. 97

325 See Chapter 2 of this report, and also the Project report: Dewe and Kompier. *Wellbeing and work: Future challenges*; Appendix E refers

Research and practice have begun to shift towards understanding what makes career guidance more effective. Research by the Warwick Institute of Employment Research (WIER)<sup>326</sup> found that “useful guidance” requires “supporting positive outcomes for clients, giving clients access to relevant sources of information, encouraging constructive change in the client and providing the client with a positive experience”. The research also identified characteristics of “effective” guidance, which included establishing a working alliance, exploring the client’s potential, identifying options and strategies, and following through. However, there is still a need for a greater understanding of effective guidance, how this information is shared, and how research and practice can be brought closer together.

A second issue that will attract the attention of both researchers and practitioners is how career success will be judged in the future. The markers of career success are firmly attached to more traditional organisational structures. So, as these structures change and create new types of career expectations and opportunities, then the evaluation of careers will require new markers and different criteria that reflect the diversity of the workforce, the aspirations of individuals and the opportunities provided by organisations.

Government has announced important changes to the careers advisory services in England, with the planned creation of an Adult Advancement and Careers Service that will bring together existing services to provide a coherent system of information, advice and guidance. This is a welcome development as the service will be universal, available to all adults; whether they are in work, looking to improve their skills, or seeking employment. It will offer information and support about learning, work and careers. It will also provide access to sources of specialist advice to those that need it, on the wider issues that can represent barriers to progression such as health, employment rights, debt and transport. The new adult careers service will have the potential to provide significant support to vulnerable adults and those with learning difficulties, as well as to older adults who are much less likely to be able to access learning through their workplace. One pilot initiative in Nottingham placed learning advisers in health centres: an evaluation suggests that this approach is promising, and could be tested and evaluated on a wider scale.

#### 5.1.4 The potential role of new technologies for learning

In view of the considerable potential of new technologies for learning to contribute to meeting the goals of improving mental capital and wellbeing, the Project commissioned a detailed study to inform its analysis<sup>327</sup>. The following draws upon that work.

It was found that, despite considerable investment and enthusiasm, results to date have been limited. A key message is that: in order to take advantage of technological opportunities in the future, it will be important to continue to define learners’ needs and requirements, and then challenge technology to meet them, rather than trying to adjust learners to technologies developed for other purposes, such as the leisure or business markets (see Figure 5.4 which provides a visualisation of the broader learning environment).

It will also be important to address the digital divide. Despite rapid growth in access to the internet, older adults are much less likely to have internet access than the young (see Section 6.5.3); and people from lower socio-economic classes are less likely to have access than people from professional and managerial backgrounds. Therefore, if

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326 WIER (2005)

327 Laurillard et al. (SR-A12); Appendix E refers

the considerable potential of internet-based learning technology is to be open to all, then this imbalance will need to be tackled.

Technology can contribute to personalisation, flexibility, inclusion, and productivity for both learner and teacher. The “technologies to watch” are typically those that are currently making an impact in education, and those that can be developed as a result of clearly identified requirements for learning. Technologies currently making an impact include:

- Online access to a personalised needs-benefit analysis to help people analyse their current skills, qualifications, and career ambitions in order to evaluate a particular learning opportunity.
- Study support via online access to educational resources, and tutor-moderated communities of learners: in particular, key technologies are those that enable learners to use collaborative tools to work together, providing a rich, supportive, but flexible learning experience.
- Interactive skill-learning environments for literacy and numeracy, adapting to learner’s needs: these can enable individuals who leave school with no qualifications to catch up in a private and highly supportive way, working at the pace they need, and thereby bringing learners lost to education back into learning.
- Automated formative assessment (not just multiple choice, but using the power of simulations, models, and role play) is a powerful way to support learners, while taking the marking pressure off teachers and lecturers – thereby making it easier for them to work at scale without reducing quality.
- Digitisation of content combined with open access and copyright in common, making a broad variety of knowledge available to learners.

These technologies are already making an impact on education and training, and could be rapidly developed to make a difference for many more learners in the future.

A Futures Workshop with experts in the field identified the following technologies, all of which exist already but have not yet been adapted for educational use:

- Ubiquitous and mobile technologies – phone-computers, virtual presence.
- Artificial Intelligence – seamless creative networks, intelligent tutorials with multimodal interfaces able to track and analyse learners’ behaviours and to provide symbolic, graphic and haptic feedback.
- Assessment technologies – context-related assessment methods; simulation environments with interactive dialogues that can be used for assessment.
- Data management – workflow planning.
- Design tools – decision and analytical tools with visual representations to support teachers in designing and exchanging learning activities.

An alternative approach is to look beneath the technologies themselves, to the technological features they embody or exploit. This enables us to see what further combinations might emerge in future, and to consider where the most interesting opportunities lie for education. For the learning process to be fully supported, it is important for technology to be able to elicit and facilitate all these forms of learning, and each one requires several technological features to be in place. For example,

“ubiquitous and mobile technologies” exploit features such as “remote access to information”, “intelligent search engines”, and “control of data capture”, all of which are necessary for “learning through inquiry”; and this would be further enhanced by “rich site summary (RSS) feeds”, and “embedded sensors”. However, learning through inquiry itself is enhanced if the learner has the opportunity also to discuss their work with their peers, and is further consolidated if they have to produce their own articulation of their findings.

This approach suggests that it would be useful for stakeholders to consider launching an interdisciplinary research and development programme. This would entail inviting the research communities from education, sociology, neuroscience, and computer science, to collaborate to meet the latest challenges and opportunities of technology-enhanced learning so that the greatest benefit can be realised for people of all ages<sup>328</sup>.

## 5.2 Meeting the future challenge of good wellbeing in the workplace

The importance of wellbeing at work is well documented: Government policy continues to recognise that quality of the work experience and the need to make work “fulfilling” are “important in their own right”<sup>329</sup>. Nevertheless, despite the many initiatives taken to invest in the health and wellbeing of employees’, data collected in the workplace suggests that 420,000 employees in Britain in 2006 believed they were experiencing depression, anxiety or stress at work at levels that were making them ill<sup>330</sup>.

It is more difficult to support the responsibility of employers to build up the resilience of employees, unless it is part of the job requirements. However, employers do have a legal “duty of care” to ensure that the health of employees is looked after, whether because of excessive workloads or the way they are managed. Employers can be more attuned to ways in which they could modify the work environment to improve mental wellbeing. In many cases, promoting the improvement of mental wellbeing (rather than merely preventing poor wellbeing) would be a win-win situation compatible with employers’ economic imperatives; for example, because there would be a significant reduction in the amount of time lost at work as a result of stress and depression, and the like. Employers’ policies should also be shaped by those empirical findings that indicate that being in control of one’s working life and having a certain degree of autonomy lead to greater health, longevity and mental wellbeing. Employers should be made aware of the ways in which modifications to the working environment might be good for both their business interests and the mental capital and wellbeing of employees.

However, the scale of mental health problems at work cannot be understood or measured through work-related causes alone. Common mental health problems can arise from diverse factors, many of which are unrelated to work<sup>331</sup>, and mental health problems “are almost as common in the workplace as they are anywhere else”<sup>332</sup>. So clearly, the impact of mental ill-health at work is far greater than generally acknowledged and extends beyond just work-related causes. Drawing on data from the Office of National Statistics<sup>333</sup>, it is estimated that 22.3% of all people in paid employment have some kind of mental health problem (15.4% if alcohol and drug

328 Laurillard et al. (SR-A12); Appendix E refers

329 Brown and Lauder (2006)

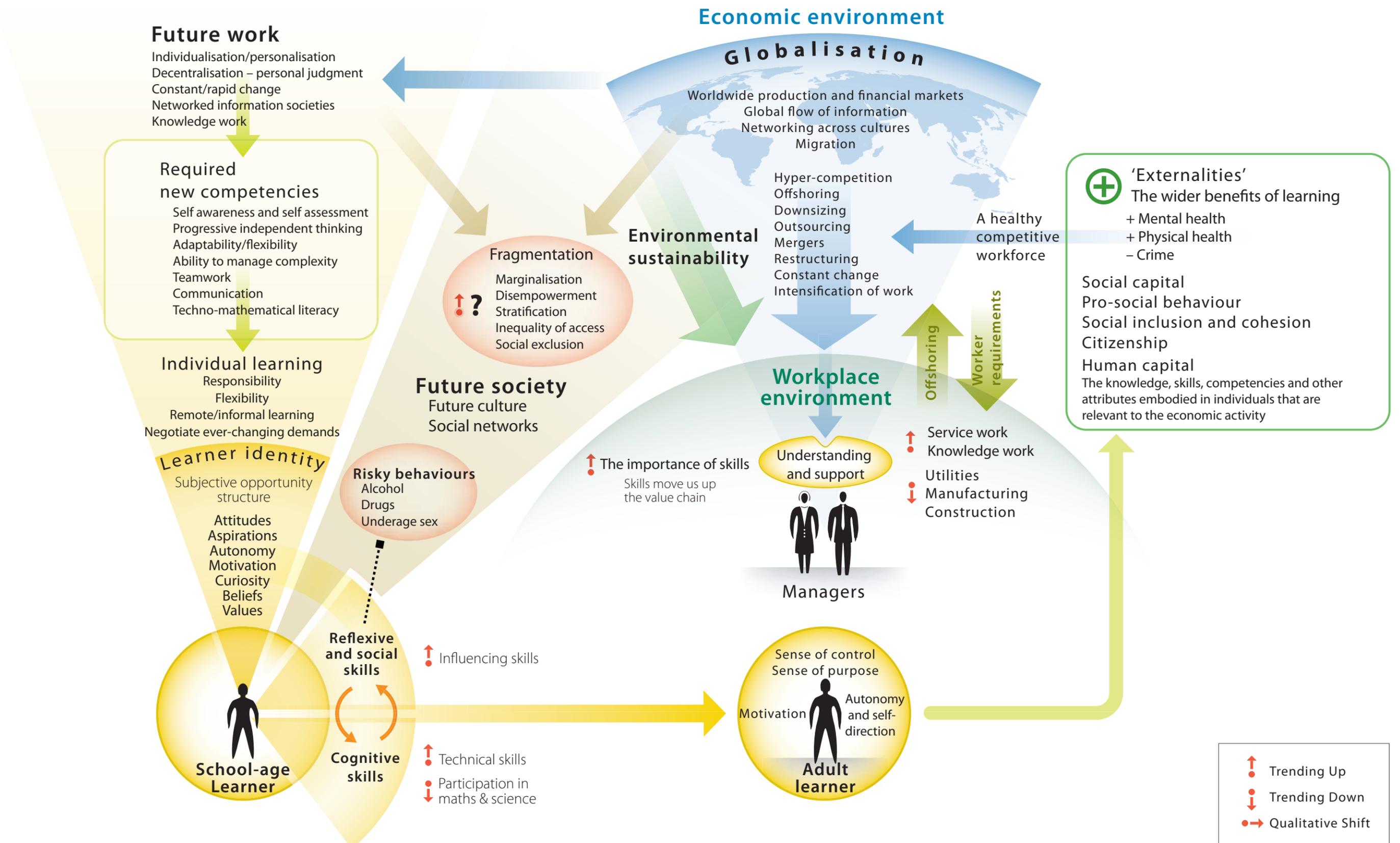
330 Health and Safety Executive (2007)

331 See Chapter 4

332 Sainsbury Centre for Mental Health (2007) p. 6

333 Singleton et al. (2001)

Figure 5.4: The broader learning environment. There is an interplay between the learning capabilities of individuals and the broader influences of the economic environment and culture



dependency are excluded); the Sainsbury Centre therefore makes the point that “in other words, employers should expect to find on average that nearly one in six of their workforce is affected by depression, anxiety or other mental health condition...or around one in five if alcohol and drug dependency are included”.

It is a concern that these levels of mental ill-health in the workplace are not fully recognised by employers. Work by the Shaw Trust<sup>334</sup> has found that whilst some respondents were able to identify stress and depression when asked “what specific disorders do you think of when you hear the term ‘mental ill-health in the workplace’”, over a third couldn’t give an answer to this question. Similarly, when asked “what percentage of employees do you think will have a mental health problem at some point during their working life?”, only around 17% of the respondents were able “to estimate the magnitude of the impact of mental health to any accurate degree”. The conclusion was that “employers seriously underestimate the extent to which employees and fellow managers are experiencing stress, anxiety, depression and other forms of mental ill-health”, and the damaging impact that mental ill-health may be having on their business.

It is also important to recognise that the situation is not static. For example, Chapter 2 outlined how the world of work is changing due to globalisation, workforce mobility and the rate of knowledge transfer and technological developments. Also, demographic changes will shift the workforce towards one that is more culturally diverse, reflecting: an older age profile which embodies generational differences in aspirations and values; the increasingly important role of women in the labour market; patterns of immigration; and differential fertility rates. At the same time, advances in technology will require the workforce in the future to be higher-skilled, and to be more flexible in how work is organised and how organisations are structured and managed. Finally, work patterns will continue to change, reflecting a wide range of interacting factors including: growth in part-time working, work insecurity, the intensification of work and a long working hours culture, the changing nature of careers, a greater “emotional” content and impact in many jobs, the difficulties of achieving work-life balance, increasing worker demands for greater control over their jobs and work, and demands for more flexible working arrangements.

The recently published Black report<sup>335</sup> also presents a compelling case “to act decisively in order to improve the health and wellbeing of the working-age population [with] employers and employees recognising not only the importance of preventing ill-health but also the key role the workplace can play in promoting health and wellbeing”. It is therefore important for public and private sectors to work together to develop policy that makes healthy choices easier, improves the quality of working life, and sets in place procedures that support the health and wellbeing of employees.

### 5.2.1 Identifying classes of intervention for analysis

A key task for the Project was to identify and analyse possible interventions that could help workers to enhance their wellbeing in the workplace, whilst preserving, or even enhancing, efficiency and productivity.

As a first step, discussions were held with key organisations and stakeholders including the Confederation of British Industry, the Trades Union Congress, the Chartered Institute of Personnel and Development (CIPD), the Sainsbury Centre for Mental

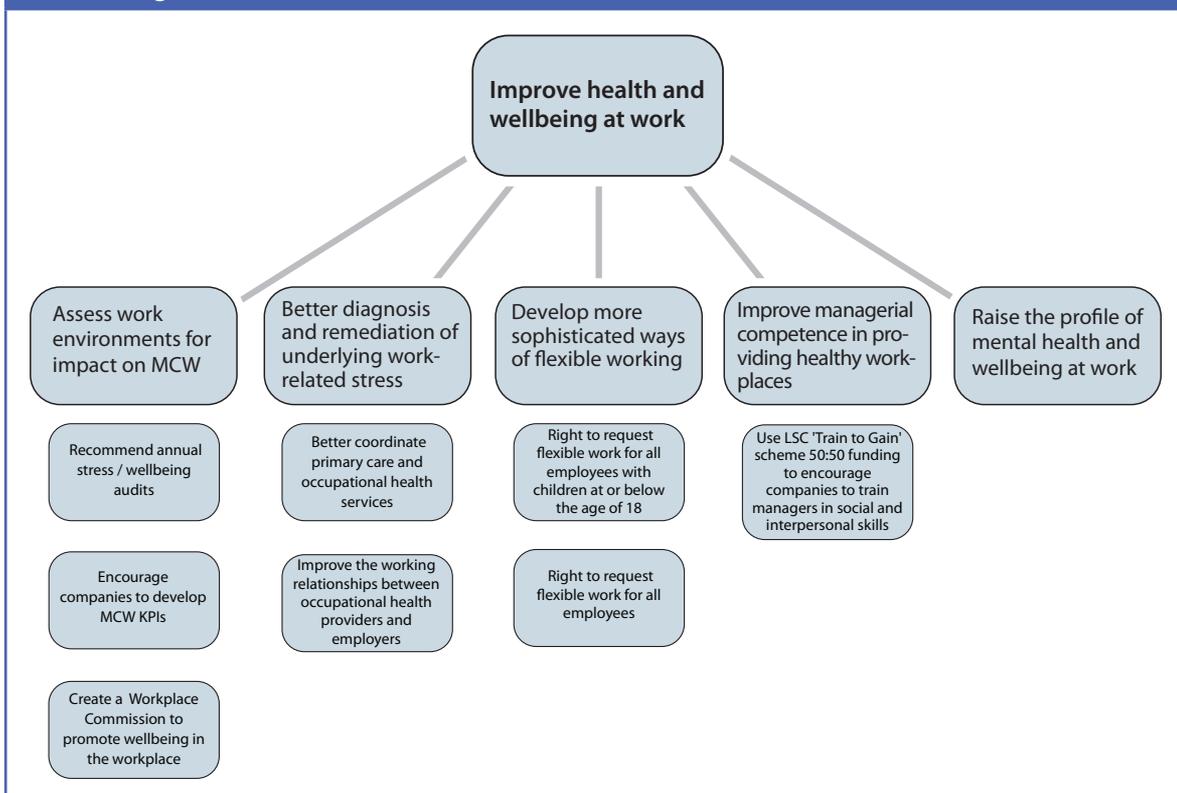
334 Shaw Trust (2006)

335 Black (2008) p. 10

Health, the Department of Health, the Department for Works and Pensions, and the Department for Innovation, Universities and Skills, and Business Enterprise and Regulatory Reform. The aim was to identify possible initiatives that would enhance mental health and wellbeing at work, and to assess the policy constraints of those organisations. In so doing, a range of particularly promising interventions were identified for further analysis. These fell into the following categories (see Figure 5.5):

- The assessment of work environments:
  - The use of annual audits to provide quantitative measures of stress and wellbeing in the workplace.
  - The development and use of key performance indicators relating to mental capital and wellbeing for organisations.
  - The establishment of a Workplace Commission to promote workplace audits and to help small and medium-sized enterprises (SMEs) to respond to the findings.
- Improving the integration of primary care and occupational health services to support mental health and wellbeing.
- New approaches to flexible working. In particular: extending flexible working to those with children at or below the age of 18; and secondly, to all those in employment.
- Training for line managers so they had a better understanding of their impact on mental capital and wellbeing, and how to address shortfalls.
- Emphasising the significance and importance of good wellbeing and mental health at work so that managers better understand their benefits.

**Figure 5.5: Suggested interventions for the improvement of health and wellbeing at work**



Within these categories, the first three were considered to be particularly promising interventions for improving the quality of working life, and for promoting the health and wellbeing of employees. They were also amenable to cost-benefit analysis (see Sections 5.2.3 – 5.2.5). The others are also considered to be of potential interest and are discussed briefly in Section 5.2.6.

Together the first three classes of interventions capture two important principles. First, managers in particular need to be responsive to mental health problems at work and to understand how early intervention and support can help avoid employees having to take sick leave. Secondly, it is equally important that employers work with GPs to identify appropriate return-to-work strategies built around rehabilitation so that employees are managed back into the workforce<sup>336</sup>. The message is clear: “good work engenders good health”; and as the demand for more meaningful work and a better work-life balance grows, so will the need to ensure that work practices fit the changing world we live in, and are aligned with the way people want to live and work.

None of these interventions are mutually exclusive and each can and may contribute to the aims of the others. For example, a better understanding of the extent and impact of work stress through annual wellbeing audits may provide individuals, managers and organisations with the data necessary to identify policies and processes that enable employees to seek help, or which offer opportunities to achieve workplace control, improve coping and improve a sense of work-life balance.

### 5.2.2 Approach to the analysis

The cost-benefit analysis was subject to the following limitations:

- Many important aspects of wellbeing are essentially subjective in nature, and therefore are not easy to measure or value in a full cost-benefit analysis. This implies that choices made on the interventions may have to be based on a less comprehensive cost-benefit analysis combined with more qualitative assessments of these wider wellbeing impacts.
- There were additional limitations due to a scarcity of evidence on the relative effectiveness of particular policies and interventions under consideration. As such, the cost-benefit calculations performed were predicated both on existing evidence (where available), and on the advice and guidance of a panel of experts where the information was less robust.
- It was beyond the scope of the Project to perform rigorous and comprehensive analysis – it is anticipated that stakeholders may wish to undertake more detailed assessments for those interventions of particular interest.
- The analysis specifically covers the impact of interventions on mental health, and on issues such as absenteeism, presenteeism, productivity and incapacity benefit. The effects of mental ill-health on wellbeing, physical health, and the consequential costs associated with these are not considered.

The first and fourth of the above bullets, in particular, imply that the estimates omit some benefits which may be substantial.

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336 CIPD (2007)

Despite the above caveats, the cost-benefit analysis presented here provides some valuable information when making policy choices. At the very least, it provides an indication of the possible effectiveness of the interventions. The key results are presented below<sup>337</sup>. Some of the principal assumptions and data used in the analysis are:

- **Absenteeism.** The primary absenteeism studies include the Office for National Statistics, the Confederation of British Industry (CBI), the CIPD, and Health and Safety Executive. From these data sets the average number of days lost per annum as a result of absenteeism was estimated to lie somewhere between 27 million and 30 million. In terms of work-related absenteeism, the figure is between 10 million and 14 million days lost, at a conservative cost of around £750 million.
- **Presenteeism.** There is little information on the incidence or impact of presenteeism in the UK where the concept is defined as the potential lost productivity that occurs as a result of an individual being less than totally productive while being at work. Taking data from the United States on presenteeism and adjusting it to fit the UK work environment suggests that the ratio of costs associated with presenteeism in the UK to absenteeism is around 1.29 to 1 or an annual cost of work-related presenteeism of £966 million.
- **Labour turnover.** The average turnover rates from surveys from the CIPD and the CBI estimate rates of 18.1% and 14.7% respectively. Aggregating the number of turnovers by the cost per turnover from these surveys provides an estimate of work-related mental health turnover of £95 million per annum.
- **Reductions in incapacity benefit.** Those with mental health problems claiming incapacity benefit climbed in 2006 to around 40% of total incapacity benefit recipients. Just as significant is that the annual growth rate for mental and behavioural disorders claims since 2000 is 5.4%, compared with an average annual growth rate of 0.8% for total incapacity benefit receipts<sup>338</sup>.
- **Firm profitability.** The total economic loss of transitions from employment to unemployment as a result of work-related mental health problems illustrated in the form of lost profitability stands at around £82 million per annum.
- **Increased taxation revenue.** The analysis of enhanced Exchequer revenues associated with reducing the initial entry to economic inactivity and increasing the exit rate to employment indicate that the total economic cost to the Exchequer in the form of lost revenues per person per year of economic inactivity stands at just under £5,000. The total economic cost to the Exchequer in employment years lost to work-related mental health-related economic inactivity is estimated to be about £130 million per annum<sup>339</sup>.

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337 Full details can be found in London Economics (2008). *Cost-benefit analysis of work and wellbeing interventions*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk)

338 Oxford Economics (2007)

339 Ibid

### 5.2.3 Interventions: The collection of wellbeing data against Key Performance Indicators and the undertaking and implementation of annual wellbeing audits

This initiative suggests that all public and private sector bodies could usefully carry out an annual stress and wellbeing audit. This could be achieved using standardised auditing instruments of the Health and Safety Executive (HSE) or others to identify if there are problems, and if so, to pinpoint their location and nature. The cost-benefit analysis was calculated twice:

- First, assuming that there are no additional costs in taking action to address the findings of the audits – any follow-up is assumed to involve adjusting existing activities to promote good health and wellbeing within organisations.
- Secondly, assuming extra intervention activities are instigated to respond to the results of the audits.

Organisations are increasingly developing policies to raise awareness about stress and mental health with the rise of the “wellbeing” workplace as well as ‘a greater introduction of stress management tools and other preventative measures within the workplace’<sup>340</sup>. However, it appears that little use is generally made of stress audits or other more formal measures to monitor stress levels<sup>341</sup>. In the absence of such audits, it is clear that organisations look within as well as outside their organisation for help in developing best practice and building expertise to manage stress and wellbeing.

Price Waterhouse Coopers<sup>342</sup> was commissioned by the Health Work Wellbeing Executive to consider the economic business case for undertaking wellness programmes among UK employees. This was done by reviewing case studies and through interviews, and the findings suggested that “workplace wellness makes commercial success”. The financial benefits derived through cost savings arising from implementing “wellness interventions” related to reduced sickness absence, turnover and injuries. Positive impacts were also reported in employee satisfaction, time-resource allocation, productivity levels, and organisational profile. While benefits will vary by type of organisation and the nature and target of the programme, the conclusion was that there is a positive link between implementing wellness programmes and improved key performance indicators and “that programme costs can quickly be translated into financial benefits”<sup>343</sup>.

What does the evidence say about which workplace interventions work? An overview of the results of an evidence-based review<sup>344</sup> found moderate evidence that a range of stress management programmes can have a beneficial and practical impact. These programmes embraced a number of approaches, including improving the ability to cope with stress and identifying potential work stressors. They also provide employees with a range of skills that can be used to their own benefit, as well as the organisation’s. However, it remains unclear whether these types of programme prevent common mental health problems. Nevertheless, moderate evidence supported the view that programmes that are comprehensive and combine a range of approaches addressing both individual and organisational factors were effective. There was limited evidence to suggest that individual approaches rather than organisational or organisational-development approaches were more effective in managing common mental health problems.

340 Shaw Trust (2006) p. 30

341 Shaw Trust (2006)

342 Price Waterhouse Coopers LLP (2008)

343 Price Waterhouse Coopers LLP (2008)

344 Seymour and Grove (2005) pp. 3-4 and 21-26

### *Economic benefits: annual stress and wellbeing audits*

As noted above, the evidence base available for analysing the impacts of such interventions is comparatively limited, and significant judgement is needed when assessing the impacts. However, the analysis suggests tentatively that, just performing the audits can lead to economic benefits of the order of £100 million per annum, with around three-quarters accruing to the private sector: these benefits would result through raising the profile and awareness of issues relating to wellbeing at work. Moreover, when the employer addresses the findings of the audits by explicitly committing resources, the total economic benefit would be larger, perhaps in the region of £275 million.

#### 5.2.4 Intervention: Integration of occupational health professionals with primary care

There are two key elements of this intervention:

- The co-ordination of employment advisors/occupational health professionals with GP practices to facilitate the early identification of workplace stress and mental ill-health in patients. (Note: such co-ordination need not include the physical co-location).
- Collaboration between employment advisors/occupational health professionals and relevant employers to address those aspects of the workplace environment that are causing poor mental health. In particular, to develop a plan with the individual patient and the employers to get the person back into work in a way that will be effective and sustainable.

It is clear that organisations look both within and outside for help in developing measures and accessing services to ensure best practice in managing stress and wellbeing. Within the organisation, the training of line managers is a key initiative, together with provision of information and opportunities to all employees to help them engage in activities that help prevent mental health problems. Access to “outside” expertise includes programmes and professionals who are able to support and provide advice on mental health issues and give practical help in recruiting and retaining those with mental health problems<sup>345</sup>. However, there is nevertheless a need for professional help and guidance in identifying mental health problems and ensuring these are not simply treated as poor performance<sup>346</sup>.

Reporting on its research into sickness absence, the CIPD<sup>347</sup> stresses the importance for managers to be responsive to mental health problems and also how their actions through early intervention and support can help to prevent the point being reached where employees take sick leave. The CIPD also adds: “Just as crucially, employers and General Practitioners (GPs) working more closely together, need to identify appropriate return-to-work strategies built around rehabilitation so that employees are managed back into work”.

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345 Shaw Trust (2006)

346 Rolfe et al. (2006)

347 CIPD (2007)

While the merits of such approaches are recognised, issues relating to patient confidentiality would be raised if GPs were in contact with employers about their patient's mental health, without the patients explicit agreement. There may also be conflicting role requirements as the GP is the patient's advocate. Therefore, Henderson et al. suggest that occupational physicians "are best equipped to manage these cases", although recognising that the United Kingdom has a poor provision of occupational health specialists<sup>348</sup>. These authors go on to conclude that it would be wise to invest in inventive policies "possibly requiring major expansion in occupational health and provision of psychological therapy service in primary care will be required alongside research into the most effective and cost-effective methods of delivering service".

Recognising the key role GPs have to play in "fitness for work decisions" the Sainsbury Centre for Mental Health<sup>349</sup> comes to a similar conclusion, making the point that changing how mental health is managed must now go beyond the GP to all health professionals; where working together requires education, particularly in terms of the relationship between work and health and training to "manage the fitness for work consultation in a therapeutic manner".

General training for staff in primary care practices (such as practice nurses and counsellors) could involve developing their knowledge about workplace stressors and supports, and the links between the workplace and health. This would enable them to understand better employee capabilities and how these can be developed for a return to work. This would also provide an orientation for primary care staff so that they can be equipped in terms of their basic assessments and management plans, and refer the patient appropriately to the occupational expert.

### *Economic benefits*

Whilst the same caveats about the evidence base apply here as to the previous interventions, it is possible that the total economic benefit associated with this initiative of integrating of occupational health professionals with primary care might lie in the range £200–325 million – with a benefit/cost ratio perhaps around 2.5–2.75. These cost-benefit figures reflect a core group of 364,000 people reporting mental ill-health problems who are either in employment, unemployed or economically inactive; and a second group of 537,000 people in employment who might avail themselves of these services.

It is estimated that an additional 1,425 to 2,100 occupational health professionals might need to be hired, depending on the scale of the initiative and the target audience. Working from information from the Labour Force Survey, there are around 31,650 occupational health professionals nationally; this is equivalent to a 4.5–6.5% increase in their number. The costs associated with this initiative are estimated at £80–115 million.

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348 Henderson et al. (2005) p. 803

349 Sainsbury Centre for Mental Health (2007) p. 5

### 5.2.5 Intervention: Extension of flexible working arrangements

This initiative involves either:

- The extension of the right of all employees with children at or below the age of 18 to request flexible working arrangements and the duty of employers to consider these requests; or
- All individuals of working age to have the above right.

These expand on the recent legislation that has extended the right to request flexible working patterns for all those parents of children at or below the age of 16.

It is not just the long hours being worked that drive the case for transforming work: changes in workforce demographics and the changing aspirations of workers also mean that “the way we work is not responding fast enough to the challenges presented by changes in the world around us”<sup>350</sup>. With half the workforce wanting to work more flexible hours, flexible working arrangements become an important part of any work change agenda. While flexible working is already a common practice and flexible working arrangements are on the increase, the Equal Opportunities Commission argues that it is not happening fast enough, or in the right way to deliver what people and organisations want. This makes “the flexibility agenda unfinished business for 21st Century Britain”.

Data from the 2004 British Social Attitude survey shows that since 1994, the greater availability of *flexible working options* has resulted in an increased level of use by employees. Employees reported the greatest use of flexible hours (33%), followed by part-time work (30%), and working from home (16%), with both job-sharing and term-time working used by 9% of employees. The four main reasons employers gave for providing employees with flexible working opportunities included<sup>351</sup>: to improve morale, staff retention and recruitment (41%); to work around the family life of staff to benefit staff (37%); to improve service for clients/customers (20%); and to improve productivity (8%).

As data from the 2004 British Social Attitude survey suggest: “work-life balance considerations clearly matter a great deal to a significant proportion of employees”<sup>352</sup>. Nevertheless, the long-hours culture still seems to be an impediment. Data from the same survey indicates that 45% of employees strongly agree or agree that in the jobs they are in, there is an expectation that they will work longer hours than they used to, with just over a quarter strongly agreeing or agreeing that they are expected to work more than 48 hours a week. Flexible working arrangements are one way forward to achieving work-life balance, but such arrangements are complex, and depend on marital status, gender, dependents and caring responsibilities.

Nevertheless, they are an important way forward, if for no other reason than the result of this analysis, which shows that wanting but not having flexible working arrangements leads to lower levels of job satisfaction. Where organisations provide a more flexible working ethos, higher levels of job satisfaction prevail. Despite the complexities of the relationship between work-life balance and flexible working, Bell and Bryson conclude from their analysis that “flexible work is nevertheless a legitimate tool to use in the pursuit of greater employee satisfaction”.

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350 Equal Opportunities Commission (2007)

351 Smeaton et al. (2007)

352 Bell and Bryson (2005)

More and more organisations are developing policies to raise awareness about stress and mental health with the rise of the “wellbeing” workplace as well “as a greater introduction of stress management tools and other preventative measures within the workplace”<sup>353</sup>. Interestingly, the Shaw Trust found that about 73% of respondents used flexible working arrangements as a means of minimising workplace stress. A Mind report<sup>354</sup> also pointed to flexible work arrangements as a means of providing employees with opportunities to manage stress and wellbeing problems.

### *Economic benefits*

Subject to the familiar caveats about the evidence base in this area, the total economic benefit associated with the first initiative (the extension of the right of all employees with children at or below the age of 18 to request flexible working arrangements and the duty of employers to consider these requests) might be in the region £165 million per annum, according to our study – equivalent to a benefit-cost ratio of approximately 2.5.

The total economic benefit associated with the second initiative (all individuals of working age to request flexible working arrangements and the duty of employers to consider these requests) would be larger, perhaps around £250 million per annum – equivalent to a benefit-cost ratio of approximately 3.5. But both the benefits and employer costs of these initiatives are subject to considerable uncertainty.

## 5.2.6 Other interventions (for which economic analysis has not been performed)

Further interventions have been considered, albeit in less detail. These add to the general context required to focus attention on the importance of work on the mental health and wellbeing of employees:

### *Training managers*

Rolfe et al. highlight the importance of the manager’s role in dealing with mental health problems at work and how the day-to-day management of such problems depended on the “skills of the manager and relationship with the employee”<sup>355</sup>. They add that “there is a clear business case” for improving practice, particularly when it comes to issues surrounding identifying and addressing mental health problems, and the management issues of retention, discrimination, training and support. Moreover, the lack of good management practices increases the risk of those with mental health problems leaving the organisation.

One possible way to promote the training for managers in social and interpersonal skills would be to extend the Train to Gain programme so that employers, particularly small and medium-sized enterprises (SMEs), can obtain part funding for this.

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353 Shaw Trust (2006) p. 30

354 Mind (2005)

355 Rolfe et al. (2006) p. 47

### *Raising the profile of the importance of mental health and wellbeing at work*

Here is a concern that mental ill-health in the workplace is insufficiently recognised by employers. Research, for example, by the Shaw Trust, confirms this concern<sup>356</sup>: while many respondents were able to identify stress and depression when asked “what specific disorders do you think of when you hear the term ‘mental ill-health in the workplace?’”, over a third couldn’t give an answer to this question. Similarly, when asked “what percentage of employees do you think will have a mental health problem at some point during their working life?”, only around 17% were able “to estimate the magnitude of the impact of mental health to any accurate degree”. The Shaw Trust concluded that “employers seriously underestimate the extent to which employees and fellow managers are experiencing stress, anxiety, depression and other forms of mental ill-health”<sup>357</sup> and the damaging impact that mental ill-health may be having on their business.

Concerning “policy awareness” and “understanding”, research from the Shaw Trust found that 80% of its sample of 550 senior managers did not, to their knowledge, have a formal policy on stress and mental health in the workplace; and of those who did, only 14% said it was effective and only 16% felt it was well understood. Few employers have had experience in dealing with or recruiting applicants with mental health problems<sup>358</sup>. Perhaps because of this inexperience and because employers “want to do the right thing”, and recognising that they need more support to deal with mental health problems in the workplace, employers reveal a sense of discomfort and hesitancy when confronted with issues around mental illness and mental ill-health in the workplace. While “there is a clear potential to educate further” and a continuing need to raise awareness, rather than be critical of current practice, the Shaw Trust concludes that its results seem to reflect “a cry for help, and it is up to Government and industry to work to put support and structures in place to answer it”.

### *The establishment of a Workplace Commission*

This would raise awareness of the importance of mental capital and wellbeing at work, promote stress audits, and help SMEs to promote action to respond to the findings of those audits. However, the detailed work, responsibilities and powers of the Commission would need to be worked out in with key stakeholders and employer organisations.

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356 Shaw Trust (2006)

357 Shaw Trust (2006a) p. 1

358 CIPD (2008); Shaw Trust (2006)

## Key messages

Learning through life will be critical to the future wellbeing and prosperity of society – in particular if individuals are to compete effectively in the global marketplace for skills. It will be important to:

- Start early – the early years are especially critical for developing a strong disposition to learn.
- Adult basic skills, such as literacy and numeracy, will remain critical. This will require further action to improve these skills in children and adolescents, and also to address existing deficiencies in adults.
- Raising the demand for skills in employers will be important, but not enough in itself. Individuals should also be encouraged to take personal responsibility for their training and retraining through life.
- Government can usefully play a substantial role in empowering individuals to learn through life – for example, by providing advice for careers and training, and in promoting training for specific groups such as older people.

Work has both economic benefits and generally contributes to individual health and wellbeing. Measures that help people at risk of mental ill-health to find or remain in work offer considerable benefits. However, the intensification of work may also have implications for stress and anxiety, and harm the wellbeing of individuals and their families, unless care is taken. This would adversely affect the productivity of firms, the level of incapacity benefit, and tax revenues. People could be helped to flourish in this changing environment, and reap the benefits of work more fully, by:

- Promoting wellbeing through auditing work environments for stress.
- Encouraging firms to publicly use key performance indicators relating to stress and wellbeing.
- Establish a Workplace Commission to help SMEs improve the wellbeing of their staff at work.
- Better access to occupational care – in particular by referrals through primary care.
- Developing new and more sophisticated ways of flexible working.
- Promoting better training for managers in the wellbeing and mental health of their staff.
- Company health policies should address mental health.

## **6 Older adults: interventions**

**6.1 Three strategic principles**

**6.2 Dementia**

**6.3 Addressing mental ill-health in older adults**

**6.4 Promoting mental capital and wellbeing in older adults**

**6.5 Environments to promote mental capital and wellbeing**



## 6 Older adults: interventions

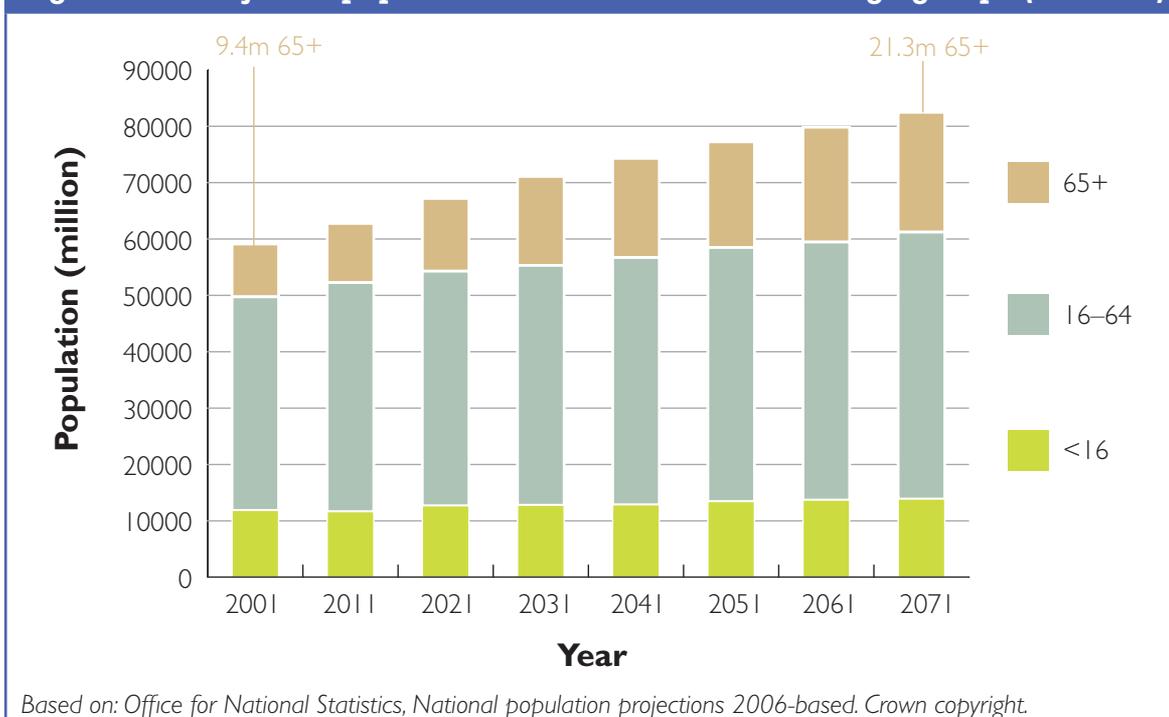
The number of older adults in the UK is projected to rise substantially over coming decades, both in absolute terms and as a proportion of the population. This chapter therefore considers choices and interventions that will affect their mental capital and wellbeing.

Section 6.1 first raises the question whether there needs to be a step-change in approach to addressing the needs of older adults. Particular interventions are then considered for: dementia; other forms of mental ill-health; conserving mental capital; and promoting wellbeing. The chapter concludes by discussing important environments for optimising mental capital and wellbeing in older adults.

## 6 Older adults: interventions

The age profile of the population will change over coming decades due to factors such as increasing life expectancy, levels of net migration, and changes in fertility. Figure 6.1 shows the current projections for three age groups: under 16 years, 16-64, and 65 and over<sup>359</sup>. Of particular significance is the increase in the number of people over 65: this group could double to nearly 21.3 million between today and 2071. Moreover, the number of people aged 80 and over could more than treble to 9.5 million over the same period. Figure 6.2 shows that the elderly dependency ratio<sup>360</sup> will also rise substantially over the coming decades.

**Figure 6.1: Projected population of the UK for different age groups (millions)**



Many factors will affect the mental capital and mental wellbeing of older adults in complex ways. However, two particularly important challenges are clear from the Project's analysis:

- **Mental ill-health – especially late onset dementia.** Over the next 30 years, the number of people with dementia in the UK could double to 1.4 million<sup>361</sup>. This will raise serious concerns for the wellbeing of affected individuals, their carers, and their families. It also constitutes an expenditure time bomb for the country: over the same period, the annual costs to the UK economy could treble from £17 billion a year today to over £50 billion a year.

<sup>359</sup> All future demographic projections in this report are inevitably estimates, and their uncertainty will increase with their time horizon, particularly beyond 2031. The estimates cited here are based on figures produced by the Office of National Statistics and made available in: *Office for National Statistics, National population projections 2006-based*. The reader is referred to this publication for a detailed account of the underlying assumptions used in their production.

<sup>360</sup> The elderly dependency ratio is the population of pensionable age expressed as a percentage of the working age population.

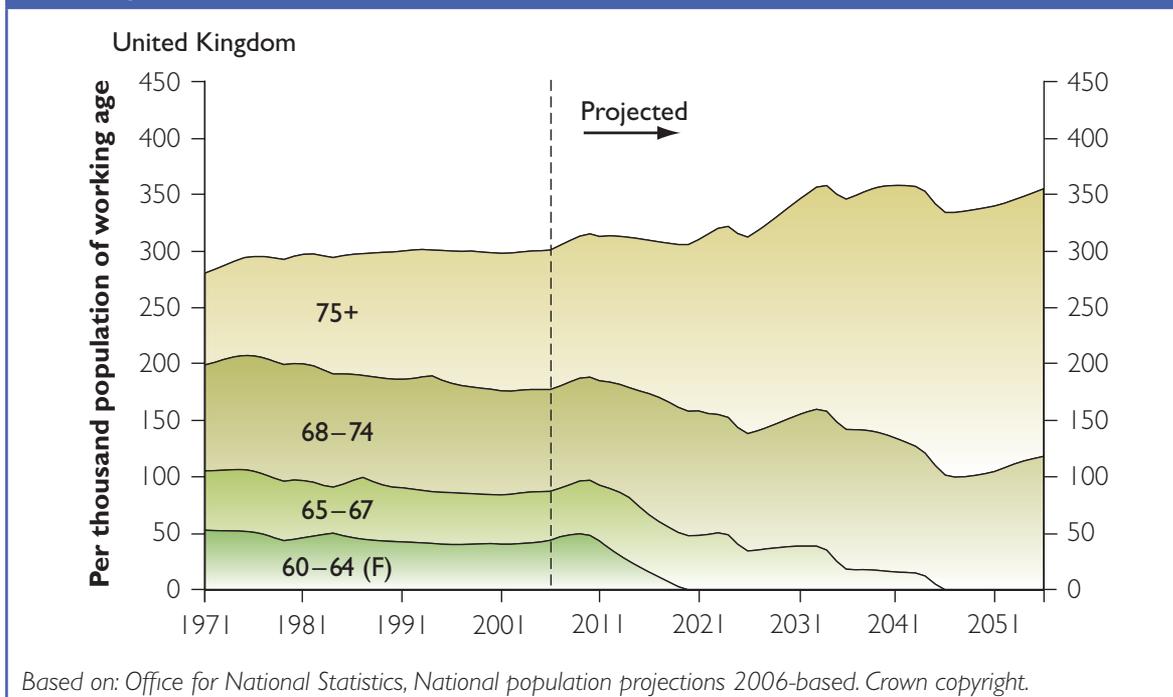
<sup>361</sup> Knapp et al. (2007)

- **Wellbeing of older adults and the massive under-utilisation of their mental capital.**

These two factors are related, and are strongly linked to the negative stereotyping of old people – both within their own age group, and in wider society. The shift in age structure of the population argues strongly for the need to unlock the mental capital in older adults, for their own benefit and for society's.

The magnitude of these two challenges is a major issue both for Government and for society as a whole. Whilst Government is already doing a great deal, a step-change in approach is needed to deepen and strengthen current policies. Three fundamental principles that could form the basis for a long-term strategy are therefore set out in Section 6.1.

**Figure 6.2: Actual and projected components of elderly dependency ratio, 1971–2056. The figure splits the ratio into four age bands (60–64, 65–67, 68–74 and 75 and over), with the first two bands representing age groups which become part of the working age population during the projection period**



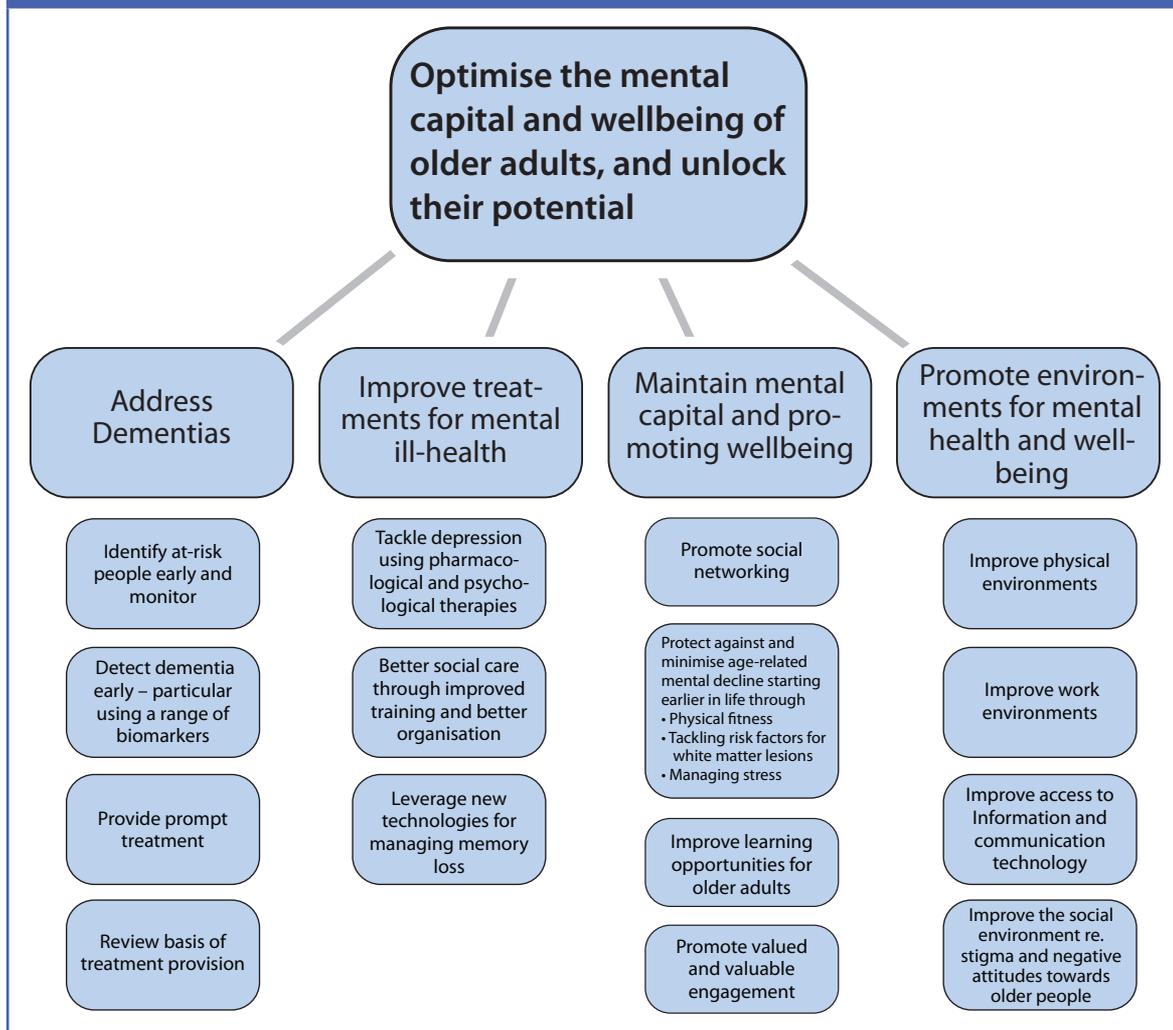
The remainder of the chapter then focuses on the specific choices and interventions that could help to address the future challenges (see Figure 6.3). A strong case for priority for interventions for dementia has already been made elsewhere<sup>362</sup>. Therefore, the focus in Section 6.2 is on what Government could usefully do in response, specifically in the early stages before the disorder is advanced. Next, treatments to address a wider spectrum of mental health problems in older adults are considered in Section 6.3; these will also be important, not least because older people experience poorer access to treatments for some disorders. Wellbeing and the under-utilisation of the mental capital of older adults are then addressed in Section 6.4. Here it will be seen that the two are closely linked; many of the interventions that seek to address one, also have substantial benefits for the other.

However, interventions by themselves are not enough. It is also important to foster living environments for older people in which their mental capital and wellbeing can

<sup>362</sup> McCrone et al. (2008); Knapp et al. (2007)

flourish. For this reason, four important aspects of their environment are discussed in Section 6.5: physical surroundings; work (for those in paid or unpaid employment); information and communications technology (ICT); and societal attitudes.

**Figure 6.3: Interventions identified as being important ways to support the wellbeing and mental capital of older adults**



## 6.1 Three strategic principles

### 6.1.1 Governance fit for the challenges ahead

Government already places a great deal of emphasis on older adults – as evidenced by initiatives such as “Opportunity Age”. However, the size of the future challenges implies the need to ensure that the systems of governance are sufficient for the task ahead. Key questions for policy-makers are:

*Does the current priority assigned to older adults adequately reflect future increases in their numbers and their growing influence within society?*

As the number of older adults increases as a proportion to the working population (see Figure 6.2), there will inevitably be profound consequences for the Exchequer and wider prosperity. Moreover, as we move towards 2071, one in every three voters could be over 65 (see Figure 6.1). As such, older adults will inevitably constitute an increasingly potent force.

***Are current structures for governance adequate to address the challenges ahead?***

To be most effective, many interventions will need a cross-Governmental approach: in some cases one part of Government may need to invest with another benefiting; in others, departments will need to work together and in partnership with their agencies; and in some cases, interventions may have long payback timescales. A good example of a long payback timescale is education in the early years: this could promote attitudes and lifestyles that affect mental health through life, and could subsequently help preserve mental capital in older age, with benefits for the health and care systems.

Unlocking the potential benefits from such cross-cutting and long-term interventions raises fundamental issues and challenges for existing systems of governance – and implies the need for the highest possible lead, capable of catalysing action across Government (Chapter 7 considers this in more detail).

***What about governance at regional level?***

Regions vary considerably in their demography, economic and industrial activities, and their cultural identities. They require increasingly diverse and sophisticated response by Government to address their needs. Recognising this, the North East is now developing an innovative model in which representatives of voluntary and statutory regional bodies are coming together to form the North East Forum on Ageing – “Years Ahead”, with very strong representation by and for older adults<sup>363</sup>. The Forum will consider how best to further the mental capital and wellbeing of older adults in that part of the country, and act as a body to catalyse and champion action. A regional Foresight analysis will extend this Project and use it to inform the work of the Forum. If successful, these developments could inform action in other regions.

***Is the profile for governance affecting older adults adequate?***

Some sectors of society are represented by highly visible and focused parts of Government; notably, children and families. However, whilst many areas of Government are concerned with older adults, the profile of a single champion for old people is arguably less. The importance of this is more than a matter of presentation. The high visibility of such a focus for older adults within Government has the potential to play an important role in underlining the importance attached to the mental capital and wellbeing of older adults, and also in encouraging the perception of older adults as a valued group in society.

**6.1.2 Involving older adults in prioritising, developing and delivering interventions**

Wellbeing is ultimately subjective, and no one knows better than older adults what their own priorities and needs are. As such they constitute a substantial resource for designing, planning, and implementing initiatives to promote their mental capital and wellbeing. It therefore makes sense to involve them at the heart of policy development and its implementation. In so doing, this strategic approach would promote more effective and better-focused interventions, and would itself act as a vehicle to unlock the potential that older adults embody.

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<sup>363</sup> This includes: voluntary/community and private sector bodies operating at regional level and managed through a Partnership Board which includes representation from the Association of North East Councils, Care Services Improvement Partnership (CSIP), Department for Work and Pensions, Regional Development Agency, the Strategic Health Authority and Newcastle Hospitals NHS Trust. It also includes representatives from the NE’s leading centres of research in ageing, such as Newcastle University’s Institute for Ageing and Health and the Department of Health’s Biomedical Research Centre on Ageing (a partnership between Newcastle upon Tyne Hospitals NHS Foundation Trust and Newcastle University).

Three examples are provided to illustrate how this approach could work:

- Broad consultation: the current Foresight Project supported a major workshop of the North East Forum on Ageing involving 200 older adults. This occasion was used to seek their views on what they valued in terms of wellbeing, and what interventions, policies and action might usefully support their wellbeing in the future. For example, it considered: opportunities for lifelong learning; opportunities to retrain; the links between work and wellbeing; and practical ways to facilitate opportunities for older adults who want to work.
- Involvement in governing bodies: in the North East Regional Forum on Ageing, half of the Board members consist of older adults appointed by organisations such as Elders Councils from across the entire region.
- Involvement at local level: a suggestion is made below that “silver stewards” are appointed to be involved in looking after and developing local spaces so that they specifically meet the needs of older adults (see Section 6.5.1).

### 6.1.3 The need for a sustained strategy across the lifecourse

Previous chapters have shown that in many aspects of mental capital, mental health and wellbeing, problems are allowed too often to develop before they are addressed<sup>364</sup>; yet substantial gains can be realised by adopting a long-term strategy which prevents problems developing at the outset. This is equally true in promoting mental capital and wellbeing in older adults. For example:

- Interventions in the education of the young could affect their cognitive reserve and promote a positive attitude to lifelong learning. These could help protect against age-related cognitive decline.
- Interventions in the workplace focusing on older workers could help to create the right environments for training and working which could enable those individuals to continue their productive and stimulating working lives: for the benefit of themselves, their employers, and the state.
- Promoting healthy lifestyles in middle age that help to maintain cognitive function in later life: for example, exercise to improve vascular factors.

However, a strategy to optimise mental capital and wellbeing in old age, and which adopts a long-term and lifecourse approach, will need to be sustained over several decades. For example, some of the interventions suggested below imply the need for a shift in attitudes towards older adults within society. Such changes could take many years to develop.

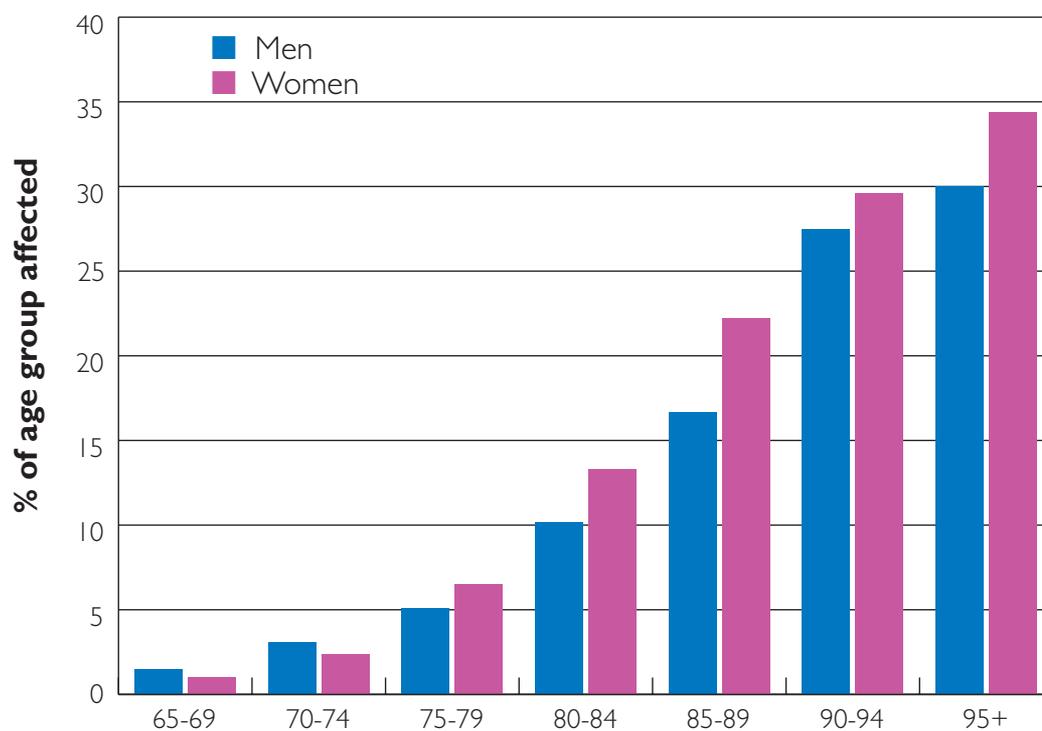
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364 For example, learning difficulties in children (Chapter 3) and mental health problems in adults (Chapter 4).

## 6.2 Dementia

As previously mentioned, the number of people affected by dementia in the UK could double to 1.4 million over the next 30 years, with substantial impacts on those affected, their families and carers. Over this period, it is estimated that the cost the UK could increase from £17 billion per year today, to over £50 billion<sup>365</sup>. This increase is due to a combination of two factors: first, the proportion of people who experience dementias rises rapidly with age (see Figure 6.4); and secondly, the age of the population is rapidly increasing (see Figure 6.1): the number living beyond 80 could nearly double to 5.4 million by 2031, and more than treble to 9.5 million by 2071<sup>366</sup>. Alzheimer's disease (AD) in particular (see Figure 6.5), accounts for around 60% of dementias<sup>367</sup>, with age being the biggest risk factor. In common with other dementias, the attendant social costs will be very onerous for those affected, their families and society.

**Figure 6.4: The consensus estimates of the population prevalence of late onset dementia**



Source: Knapp et al. (2007).

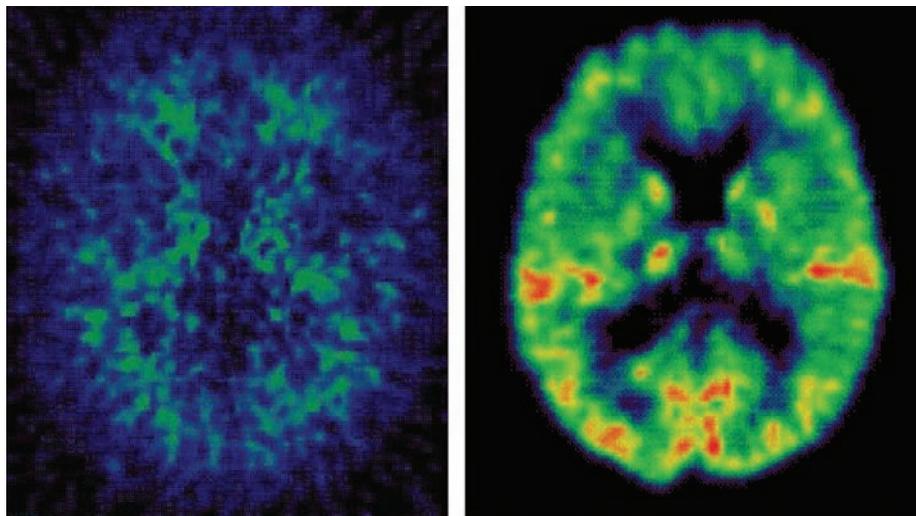
Whilst current treatments (cholinergic enhancers) have only modest effects on AD, the Project's analysis has shown that future developments in science, particularly involving early diagnosis coupled with the introduction of new treatments, have considerable potential to deliver substantial savings to social and healthcare costs, and improvements in patient wellbeing. There would also be some wider economic benefits because of the reduced burden on public and informal care services.

<sup>365</sup> Knapp et al. (2007)

<sup>366</sup> Office for National Statistics (2008)

<sup>367</sup> See <http://www.alzheimers.org.uk/>

**Figure 6.5: PET PIB amyloid imaging of the brains of two patients with Mild Cognitive Impairment (MCI). The patient on the left had stable MCI whereas the patient on the right had MCI that later progressed to AD. Neuroimaging clearly shows significant differences between two people with clinically indistinguishable symptoms at the time of imaging**



*Courtesy of N Fox, D Brooks, H Archer.*

There is considerable ongoing investment in new treatments, specifically by the pharmaceutical industry: this is being informed by advancing research into the molecular biological mechanisms underlying Alzheimer's disease. Medications with curative or preventive effects on the underlying molecular biological mechanisms may become available in the next 10 years. Statins, now used widely, could also prevent atherosclerotic dementia and have some effect on Alzheimer's disease. However, these developments will not be enough in themselves to ensure that the full benefits are realised: the Department of Health's initiative to construct a comprehensive strategy for addressing dementia is therefore a welcome development.

### 6.2.1 The importance of biomarkers

Within such a strategy, a key technology that has shown its significant value in other areas<sup>368</sup> involves the use of "biomarkers". Biomarkers for AD include cognition, neuroimaging and specific proteins in plasma or cerebral-spinal fluid (CSF). These could be used to detect dementias very early in the course – even before the symptoms become apparent. There are several reasons for their importance:

- It makes sense to detect early and act to arrest (or even reverse) any decline before substantial and irreparable damage is caused to the brain – biomarkers will be key to this. In contrast, once dementia is advanced and the individual has irretrievably lost mental capacity, the benefits of treatment would be much more limited.
- If new treatments are to be tested successfully and brought to market, then the industry will need to identify people at early stages of dementia for trials. Without the capacity for early detection, much wider (and more costly) trials would be needed.

<sup>368</sup> For example, in cancer biology and cardiovascular disease: Gerszten and Wang (2008); Sawyers (2008)

- Once the efficacy of treatments is established, people in the early stages need to be identified so they can undergo treatment as soon as possible.
- Biomarkers can also play a valuable role in identifying individuals who are at particular risk from dementias, so that they can be monitored more closely for the diseases. Current and future research is making this possible for effective biomarkers at an individual level, rather than just for differentiation of groups.

Because of their importance, the Project has specifically focused on biomarkers by commissioning scientific reports and hosting a major international Round Table of experts and stakeholders<sup>369</sup>, and through economic analysis. Appendix C provides further details of the work; the key conclusions for Government and stakeholders are below.

### 6.2.2 Biomarkers: the case for Government action

Identification and validation of biomarkers is a costly process, and while pharmaceutical companies potentially have a financial interest in their development, the regulatory process and the potential benefits to competing companies makes investment in this area high-risk. Also, successful basic research involves very clear externalities which patenting would largely vitiate. So while clear statements and guidance by the regulatory agencies on their approach to evidence obtained using biomarkers, and trials that use such evidence, would help encourage private investment in their development, these market failures mean that investment would be less than optimal without public sector funding and other support.

The most suitable form of public support, whether funding directly or in partnership with the private sector, will depend on how near-market the research is deemed to be. Basic research which is not near-market needs to be funded predominantly by the public sector unless charitable foundations can be relied on to undertake it. But the relatively low level of charitable funding of mental health (compared with cancer and heart disease, for example), suggests that this is unlikely. Partnership arrangements might be a more promising approach for nearer-market research.

### 6.2.3 The need to prioritise

Because there are a considerable number of biomarkers (see Appendix C), and because of the costs of their development, there is a case for interested parties (industry and academia) to come together to agree which biomarkers should be prioritised for development. It is therefore suggested that suitable bodies (such as the Medical Research Council (MRC), the Wellcome Trust, and the Association of the British Pharmaceutical Industry – ABPI) consider forging a consensus on priorities. This would be helpful in any case, since close linkages between biomarker research and the emerging treatments is likely to ensure a closer match between what the biomarkers can offer, and what is needed for emerging treatments.

Consideration could also be given by the research community to the development and use of a common cohort of people for trials: it was argued at the Round Table that this approach could yield cost savings. Further discussion is needed to establish if such an approach would be practicable.

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<sup>369</sup> See Appendix A for details of those involved in the Round Table

## 6.2.4 Making new treatment regimes available

Developments in biomarkers and treatments will not be sufficient in themselves to lead to success in meeting the challenge of dementia. Their potential benefits will be heavily contingent on the extent to which new treatment regimes are made available, and that will itself depend on the way in which benefits and costs are analysed by the National Institute for Clinical Excellence (NICE).

Detailed analysis within the Project has shown that there is a good case to review how decisions are made so that the greatest benefits can be realised across the UK. In particular, current decisions do not fully take account of indirect impacts (for example, relating to the wellbeing of families and carers, and the productivity of carers). It is beyond the scope of this Project to resolve these issues, particularly since any changes could have implications substantially beyond mental health. However, key arguments are outlined in Chapter 7 with a view to informing and stimulating further discussion of this critically important issue by stakeholders.

## 6.3 Addressing mental ill-health in older adults

Whilst tackling the future prevalence of dementia in older people is a major challenge, other forms of mental disorder are also a cause for concern: depression is a notable example (see below). Moreover, older adults presently have poorer access to treatments for certain mental disorders compared with younger adults; this therefore implies the need for specific targeted action to prevent this shortfall continuing into the future.

Key aspects of the changing context for mental ill-health in older adults include: increasing life expectancy; increased risk of cognitive, physical and sensory impairments; chronicity of disorders; previous multiple treatments for mental disorder; and passage through a developmental phase associated with issues of retirement from work, bereavement, ensuing social isolation and increasing closeness to death.

These evolving circumstances could have substantial implications for the provision of treatments and services, not least because any resource and organisational implications will be amplified by the rapidly increasing number of older adults over coming decades. It will therefore be important to plan ahead to meet the evolving demand.

In considering treatments and services, the Project has drawn upon the expert papers on treatments for mental health in adults (in general) that were commissioned (see Chapter 4), and two further papers specifically considering older adults<sup>370,371</sup>. Possible interventions were also discussed in a workshop involving leading experts. While it was clear that treatments for older adults cover the same range as for younger adults, including pharmacological, psychological, and social approaches, the following specific points were identified.

### 6.3.1 Pharmacological and psychological treatments

Whilst depression in older adults is not more common than in younger adults, it is generally less often diagnosed or treated promptly in primary care. This is partly because it is seen as an “understandable” feature of old age. As a result, depression in

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370 See Project discussion paper: Scharf (2008). *Community-level ‘interventions’ aimed at reducing/preventing mental ill health amongst older adults*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk)

371 See Project discussion paper: Woods (2008). *Individual interventions for older adults – mental health and recovery*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk)

older adults can become severe and intractable, requiring considerable use of antidepressants and sometimes electro-convulsive therapy (ECT). However, the decision to treat should not be based on perceived causes but on severity and chronicity. There is a case to address this failing, even without the impetus of the need to prepare for the implications of increasing numbers of affected older adults.

The efficacy of psychological therapies, such as cognitive behavioural therapy, is now established, and they could have an expanding place in the treatment of older persons. They will be particularly useful for anxiety and depression, for example, in relation to transitions, loss of roles, and care-giving issues. For these reasons, clinical psychologists in the specialist area of old age or older clinical psychologists with greater life experience may be more effective in delivering these psychological therapies to older persons requiring them. However, there is evidence that in the past, older adults have experienced less access to these therapies compared with other sectors of the population; as in the case of depression, the reasons for this shortfall should be analysed and addressed.

The increasing numbers of older adults in the future will inevitably lead to growth in the demand for carers. Maintaining good wellbeing in these will be important if they are to provide effective standards of care. The provision of psychological and social support to caregivers will therefore be important.

Memory aids, cognitive training, cognitive enhancing drugs, and rehabilitation could be provided for managing memory loss in older adults. There will also be resource implications for treating common physical health problems and chronic physical disease in the growing numbers of older adults – not just to improve physical wellbeing, but also to reduce the substantial effect that these conditions have on mental wellbeing.

### 6.3.2 Social care

The same need for integration of general practice and social care that was recommended in Chapter 4 applies to older persons. There will also be a need to support their independence and autonomy both in their own homes, and in institutional care; this is because such independence and autonomy are strongly linked to mental wellbeing (achieving this will require improved coordination between health and local authorities).

“Recovery” for older adults includes living with disability, the need for relapse prevention, allowing time for life-changing decisions, and rehabilitation. It would be useful if older adults could be involved and consulted more in decisions regarding treatments and services – as mentioned above, engendering a sense of control and influence is important in promoting their wellbeing.

### 6.3.3 Education

Ensuring well educated staff (commissioners, managers and front-line professionals) will have high leverage in delivering high-quality care. The promotion of training in the following areas would be particularly useful: the role of the primary care team in anticipating and preventing ill-health; using the levers of Continuing Professional Development (CPD) delivered by professional organisations; strategic use of the champions of older adults; the use of interdisciplinary approaches to ageing in basic and post-basic training and CPD; orienting of managers and commissioners to the needs of older adults; the differing mental health needs of ethnic groups and long-term migrants;

and greater responsiveness to the wishes and choices of older adults. Greater public education for anticipating and preventing ill-health would also be useful.

### 6.3.4 Organisation of care

Older adults have an equal right of access to good services as younger people. In delivering more responsive and timely services for older adults, there would be considerable merit in strengthening the following aspects of the organisation of health and social care:

- Management of complex and long-term conditions could be improved by strengthening capacity for multidisciplinary assessment and management in primary care (for example, by the use of the WHO primary care guidelines), as well as through specialist care to address co-morbidity and social issues. The use of community matron schemes to manage mental health would also be useful.
- Improving planning and coordination of mental health services for older people, between managers and commissioners in health and local authorities in relation to both primary and secondary care, and with other stakeholders from the mixed economy of care, including voluntary organisations.
- The National Service Framework could usefully be strengthened through strategic intervention from Government, commissioners and management to address shortfalls in the availability and range of services for older adults, including: acute, long term, rehabilitation, and community-based services.

## 6.4 Promoting mental capital and wellbeing in older adults

The evidence is clear that the talents, skills and experiences of older adults are vastly underused, and this can adversely affect both their mental wellbeing and the maintenance of their mental capital and capacity. Without strong and sustained action, this situation is likely to continue into the future to the detriment of older adults, their families, communities and wider society. This section therefore particularly considers interventions that seek to address this shortfall. They are grouped according to priority areas that have been determined through reviewing evidence, and by consultation with older adults (as mentioned above).

However, as in the case for other age groups, the research concerning the effectiveness of interventions is patchy and incomplete, although those that are highlighted below are drawn from areas where the evidence is strongest. This does not mean that efficacy should be regarded as questionable, merely that it has not been much tested, which itself reflects a long history of low priority. Further research will be important if further effective interventions are to be identified and developed – this is considered further in Chapter 7.

### 6.4.1 Promoting social networking

Scientific and other evidence shows the importance of social networking in promoting mental capital and wellbeing in older adults, and indicates three specific types of intervention that are successful:

- Group interventions involving educational and social activity, targeting social isolation and loneliness.

- Volunteering<sup>372</sup>.
- Interventions that promote trusting relationships, frequent contacts with friends, and which seek to improve the quality of social relationships<sup>373</sup>.

However, evidence for the efficacy of other social interventions such as home visiting and befriending schemes remains unclear.

Developments in information and communications technology have the potential to broaden and deepen social networking for older adults – particularly since a large cohort of people who are literate in information technology (IT) will move into retirement over the next 20 years. It may also be of particular benefit for those who have limited mobility or are housebound for whatever reason: the introduction of the SAGA social networking site, Saga Zone, is an example of such an ICT (information and communications technology) social networking system, which is specifically designed for older adults.

#### 6.4.2 Reducing age-related mental decline

Current research is addressing the underlying causes of natural cognitive decline which occurs with age in the absence of specific diseases. Whilst these ageing effects are greatly exaggerated in the popular mind, they are nonetheless important, not least because increased lifespans in the future will mean that their effects will deepen over longer time. Scientific and other evidence suggests a number of ways to protect against them:

- Physical fitness (as measured by a combination of lung function, grip strength and walking speed) contributes to cognitive ability after adjustment for true prior ability<sup>374</sup>. The most proactive steps an individual can take to ensure cognitive vitality in later life are likely to include adopting cognitively-protective lifestyles, consisting of concerted effort to reduce cardiovascular risk factors and disease, and increased activity and engagement.
- Addressing the factors that affect white matter lesions: the effect of such lesions to lifetime cognitive ageing is relatively large, and independent of prior cognitive ability<sup>375</sup>. Combating their determinants is one direction of intervention: this includes hypertension and other vascular risk factors, such as diabetes<sup>376</sup>.
- Managing stress: worse cognitive ageing is associated with greater evidence of chronic exposure to stress<sup>377</sup>.

It is never too early to adopt a healthy and protective lifestyle – the decline in the brain starts many years before old age. So a key message is for individuals to take a long-term view and not wait until older age before taking action. However, as in other areas of public health (such as obesity), achieving substantial changes in public attitudes and behaviours is likely to take sustained effort over many years.

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372 Wheeler et al. (1998)

373 Barry and Jenkins (2006) Ch. 3

374 Deary et al. (2006)

375 Deary et al. (2003); Leaper et al. (2001)

376 Deary et al. (2003); Murray et al. (2005)

377 Seeman et al. (2001)

### 6.4.3 Promoting learning for older adults

The evidence shows that learning can help to promote wellbeing, and protect against normal cognitive decline with age<sup>378</sup>. And when it takes place in social settings, it can promote wellbeing indirectly through social networking (see above).

However, older adults are much less likely to participate in learning than are younger people; there is a particularly sharp decline in participation when people retire. Indeed, some survey data suggests that the proportion of older adults who take part in educational activities has fallen in recent years<sup>379</sup>.

There are currently two factors that are inhibiting learning for older adults and which should be addressed in any long-term strategy to mitigate cognitive decline:

- The first relates to the focus of current initiatives and the consequential lack of resources – this is in part because the cost-benefit considerations that underlie funding provision do not currently take into account the wider (and measurable) benefits to health and wellbeing for engagement in learning. In 2000, the Performance and Innovation Unit recommended that the Learning and Skills Council (LSC) should consider the needs of older adults as part of its overall strategy<sup>380</sup>. However, because of other policy priorities, the LSC has focused chiefly on younger people and people in employment – and especially on those who currently lack any qualifications up to Level 2. If this approach continues, it could mean that older adults are effectively excluded from publicly-funded provision. While many will flock to voluntary and commercial provision, from reading groups to the University of the Third Age, the least advantaged and most vulnerable will remain untouched by organised learning activities. It would be useful if the LSC could review this situation with a view to considering strengthening the emphasis on older adults in its strategy.
- Also, current support for vocational training and formal qualifications can disadvantage many older adults, who require a different approach in the acquisition of new skills.

Two specific ideas arose in discussion with experts and stakeholders and are particularly worthy of consideration by the LSC:

- The promotion of innovative partnerships with care facilities such as residential care homes, to provide learning opportunities for vulnerable adults who are unable to travel to public, private or voluntary provision in the community. For example, First Taste, a registered charity, aims to enhance the quality of life for older people in care homes and day centres by using qualified and experienced tutors to deliver more than 550 learning sessions annually in care settings in the Derbyshire Dales. Initiatives such as this should be rolled out on a wider scale.
- New developments in information and communications technology also present considerable potential to further ongoing learning in older adults<sup>381</sup>. For example, the Department for Innovation, Universities and Skills (DIUS) has funded UK Online centres, established to help improve the access to and use of IT, providing people with access to the internet and e-learning in some 6,000 UK Online centres. Further work should be undertaken to ensure older adults are able to make the most of such opportunities.

378 For more detailed discussion of continuing education in older adults, see Project reports: Feinstein et al. *Learning through life: Future challenges*; and Dewe and Kompier. *Wellbeing and work: Future challenges*; Appendix E refers

379 Aldridge and Tuckett (2008)

380 Performance and Innovation Unit (2000)

381 Laurillard et al. (SR-A12); Appendix E refers

#### 6.4.4 Valued and valuable engagement – enabling people to work on if they wish

If older adults are able to engage in interesting, useful and stimulating (paid or unpaid) work, everyone could benefit:

- The mental capital and wellbeing of the individual would be enhanced through promoting social networking and physical mobility – both of which are important in maintaining mental capital and protecting against “normal” age-related cognitive decline; there is also evidence that participating in valued activity would itself promote wellbeing<sup>382</sup>.
- Business would benefit by being able to make continued use of the mental capital and experience of the older person, and by reducing ‘churn’ in staff, with its attendant recruiting costs.
- The state would benefit through reduced cognitive decline and better wellbeing and mental health.

In addition to benefits to the individual from increased prosperity, to the business (by being able to use the skills and experience of the older person), and to the state through taxes, there are benefits to wellbeing simply from being valued and contributing to society.

There is clearly considerable potential for older adults to be engaged in helping and supporting other older adults – for example, by transferring skills between each other. However, there is also considerable potential for older adults to engage in inter-generational work – see box.

#### **Texas: an example of inter-generational work where everyone benefits**

A parenting intervention in Texas where seniors supported the trained parenting coaches providing home visits to participating families was discussed at a Foresight expert workshop (April 2008). The role of the seniors was not to give coaching, but to identify the economic and social needs of involved families and advise them of relevant resources. The seniors usually visited participating families in pairs, and ended up developing their own social network and building a strong resource for the families. The seniors benefitted from this social engagement, and their mental capital was protected by the mental stimulation and physical mobility which protected against decline. Indeed, because parenting practices had to be negotiated across participating ethnic groups, the scheme was also found to promote social cohesion across groups that otherwise had limited contact.

This important example shows how the older adults, instead of being regarded as a burden on society, are able to use their mental capital to generate benefits across society and across the generations. Nevertheless, this scheme has not been systematically evaluated by the Project. As noted in a recent report of the National Foundation for Educational Research (NFER)<sup>383</sup> and in a DSCF review<sup>384</sup>, despite many promising reports of benefits from intergenerational practices, research evaluations are lacking in this area.

382 See Project paper: Aked et al. (2008). *Five ways to well-being: the evidence*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk)

383 Springate et al. (2008)

384 DCSF (2008)

## 6.5 Environments to promote mental capital and wellbeing

Whilst Section 6.4 considers a wide range of possible interventions to maintain and promote good mental capital and wellbeing in older adults, it will also be important to develop appropriate environments to enable their effective implementation.

It is beyond the scope of this report to set out all the key characteristics for every relevant environment. However, the following sub-sections explore some important issues that could usefully be developed further within a comprehensive strategy for mental capital and wellbeing in older adults.

### 6.5.1 The physical environment

In work commissioned by the Project, a comprehensive review was undertaken of the existing literature relating to the effect of the physical environment on mental capital and wellbeing<sup>385</sup>. This meta-analysis identified three key factors, all of which have been found to substantially contribute to mental health and wellbeing in everyone, not just older adults:

- The quality of the fabric of the physical environment at different scales – from urban to site scales: for example, the design and construction of buildings, the spaces between buildings (such as parks) and associated infrastructure; the maintenance and regeneration of spaces and places.
- The quality of the ambient environment: for example, acoustics, lighting and air quality, as well as temperature, colour, ventilation and humidity.
- The psychological qualities associated with the physical environment: including our perceptions of density and crowding, sense of safety and fear, and wayfinding.

Some features, such as access to nature, having views of nature, natural sunlight, and having plants in offices and homes, contributed to both the second and third factors.

Workshops were also held to: identify future trends in the physical environment<sup>386</sup>; discuss their effect on MCW; and in the light of these trends, identify possible interventions that would specifically enhance or promote MCW in older adults<sup>387</sup>. These workshops involved practitioners in architecture, urban planning, development, finance, healthcare and education and academics.

The following provides a summary of some of the interventions that were suggested, and places them in the context of perceived trends in the physical environment. They are provided here as a stimulus to further discussion, and as a basis for further consideration by stakeholders.

#### *The needs of old people at the heart of a long-term strategy for the physical environment*

As the number of older adults increases substantially in the UK over the next six decades (Figure 6.1), the existing urban and rural infrastructure will need to be adapted so that the needs of these people are met. For example, issues of access, transport, amenity and security will substantially affect the wellbeing of older people. And

385 Cooper et al. (SR-DR2); Appendix E refers

386 Ibid

387 Cooper et al. (2008). *The Impacts of the Physical Environment on Mental Capital and Wellbeing: Ideas for the Physical Environment to Improve Mental Wellbeing in Older People*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

enhancing or hindering mobility will affect their physical activity – an important factor in maintaining mental capital<sup>388</sup>.

Workshop participants therefore advocated that the needs of older adults with regard to the physical environment should be placed at the heart of planning processes. Moreover, they argued a reversal of the current trend to “short-termism”: a long-term and strategic approach is needed to realise the greatest benefits, particularly in view of the long time-constant in changing the physical environment.

### *Improve access and “reach-ability” to public spaces*

For older adults to remain physically, socially, culturally and mentally active, they must be able to experience a variety of environments, including public, open and natural spaces<sup>389</sup>. Access is key, and can present particular problems for senior citizens.

It would be useful if planners and urban designers could systematically audit how such spaces are located and designed, so that they can be easily reach by foot and via other modes of transport. Local access at a fine-grain resolution is required. Ideally: green space should be both visible and accessible from every older person’s home (e.g. within 500 metres – ideally within 300 metres – of all homes); have meeting areas suitable for older adults; and be designed to promote accessibility, safety and amenity. In some cases this will require re-thinking the connections made to and from green spaces (e.g. pedestrianising areas around green spaces and reviewing multiple transport options to and from natural areas).

Such initiatives would build on initiatives like the Department for Environment Food and Rural Affairs’ (Defra) Environmental Action fund or Community Spaces – a £50 million open grants programme (Big Lottery-funded); and also Ecominds, for which the mental health charity Mind has been granted £8.8 million of Lottery funding to support environmental projects that improve the mental health and wellbeing of people with direct experience of mental distress.

### *Public, open and natural spaces: capitalising on the knowledge and skills of older adults*

Some of these spaces embody important aspects of local social and cultural history which also affect people’s sense of place and belonging. However, as mentioned above, such spaces can also present particular issues for older adults in terms of their access, safety and amenity.

Such spaces could usefully have a “silver steward” who works with planners and designers to ensure it meets the needs of older adults; who helps to look after it; and acts as repository of local knowledge and history (e.g. organising a campaign where oral histories and ancestries are recorded). Older adults could also usefully be involved in assessing public spaces, as suggested above.

### *Upgrade existing neighbourhoods*

The quality of the built environment has a significant impact on wellbeing<sup>390</sup>. Greater emphasis could usefully be given in new homes to the provision of easy access to an outdoor space for sitting, associated with that home. These issues could be incorporated into a revised version of Government’s national strategy for housing in an ageing society (“Lifetime Homes, Lifetime Neighbourhoods”), published in 2008.

388 Hendrickx and van der Ouderaa (SR-E24); Appendix E refers

389 Ulrich (1979), (1981), (1983); Lewis and Booth (1994); Armstrong (2000); Oswald et al. (2007)

390 Freeman (1984); Caspi et al. (1987); Halpern (1995); Evans et al. (2000)

### *Mitigate community fragmentation*

The fragmentation of communities is an important trend that would continue to affect social networking and wellbeing in the future. This is because mental health problems in older adults are associated with experiencing alienation<sup>391</sup>, feeling less happy and healthy, and experiencing isolation and loneliness<sup>392</sup>. For example, too often, disused buildings and the spaces between them are re-claimed for uses that are incompatible with the needs of the community, including older adults who may see those places as lifelines to the outside world. Moreover, vital services and infrastructure (e.g. community centres, rubbish bins next to benches on main roads, public toilets) are often lost to contextually-incompatible and insensitive development.

The UK regulatory planning system is one way of addressing this trend<sup>393</sup>. Greater emphasis could also be placed on ensuring that older adults living around disused buildings and spaces, and in neighbourhoods experiencing regeneration, have a greater and more effective say as to how those places should be used. In particular, every neighbourhood could incorporate the functions and places that will allow older adults to meet and socialise within walking distance, such as local shops or a village hall.

### *Better training provision for decision-makers*

If the needs of older adults are to be adequately addressed in the planning and design process, then the people making strategic decisions about different environments (e.g. transport and highways planners) could be provided with better training so that they better understand the current and future needs of the ageing population in the UK. As with other groups (e.g. disabled people), design “solutions” are too often bolted on, rather than considered from the beginning. Again, older adults could usefully be involved in the provision of that training.

## 6.5.2 Work environments

Widespread benefits could result if older adults had greater opportunities to engage in valued and valuable work, as highlighted above. Indeed, the demographic age-shift implies that using the skills and expertise of older adults could become increasingly important for the wider prosperity of the country. However, as demonstrated in Chapter 2, the world of work is changing, and this will have profound implications for mental health and wellbeing for everyone. While many of the interventions suggested in Chapter 5 are relevant to older adults, the following suggests are interventions that could contribute to a strategy specifically to engender opportunities for older workers:

- There is a case for Government to review the right of older adults to continue working. One might envisage older adults having the right to make such a request, perhaps coupled with a requirement for employers to consider and negotiate where possible.
- An alternative approach would be to encourage employers to employ older workers, over and above existing legal requirements. Here it would be useful to educate employers so that they appreciate the potential benefits in continuing to employ older workers. The benefits are diverse and include the use of their broad experience and knowledge and cost savings due to a reduction in finding and training new staff. Older workers will be ideally placed to assist in the design

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391 Amick and Kviz (1974)

392 Moore (1975)

393 Barry and Friedli (SR-B3) – Appendix E refers; the use of information and communications technology was also identified as a further way of combating social fragmentation.

and delivery of goods and services to meet the future burgeoning market of older adults.

- There is a need to ensure that employers understand how to match the work and working environment to the needs of older adults – both for the wellbeing of the individual, and to promote good productivity. In particular, they need to explore how flexible working for older workers can be managed through redesigning jobs, by reconsidering the boundaries imposed by traditional notions of work, promoting occupational health, and work-life balance.
- There is particular scope for the extension and development of “middle years” and “pre-retirement” training. This should emphasise personal development and life choices, with a focus on the opportunities for continuing employment and lifelong learning, as well as leisure and volunteering opportunities.
- Employers need to recognise the importance of investing in the training of older workers so that lifelong learning becomes a reality; and understand the training needs of older adults – both with respect to the content of the training, and its delivery. Both will be important for ensuring that the skills level of older workers remains relevant and meet the needs of organisations.
- Besides continuing in work, there will be a need to ensure mobility requirements of older workers so they are able to adjust to future changes in the labour market. An idea here would be to create “employment centres” (physical and online) to: advise older adults on the best options that suit their circumstances; to help them find work – either paid or unpaid (for example, in schools, community centres, libraries); and possibly to help them adapt to new work.

Finally, the economic consequences of ignoring the older worker, their match with the market and their power as consumers, may be an equally high-risk strategy as ignoring their skills and knowledge and the contribution they can make to organisational performance<sup>394</sup>.

### 6.5.3 Information and Communications Technology

ICT has considerable potential to promote the mental capital and wellbeing of older adults in the future. In particular, it can provide a physically safe and convenient environment for a range of activities and services that some older adults might otherwise find difficult to access: for example, because of restricted mobility or because they perceive their local environments to be unsafe. Examples that have been mentioned above include:

- Social networking.
- Learning.
- Engaging in paid and unpaid work.

In addition, ICT has the potential to promote good health in older adults, for example, through in-home monitoring and advice, thereby reducing the negative effects of poor health on mental wellbeing. However, as in other uses of ICT within society (such as banking and shopping), it will be important to ensure privacy and confidentiality.

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394 Turner and Williams (2005)

Whilst a cohort of IT-literate people will move into older age over the coming years, ICT is currently used less by older adults<sup>395</sup> compared with other age groups. For example: in England currently only around 50% of those over 52 and 20% of those over 75 own a personal computer; and individuals who use the internet at least once a week are 79%/77% (males/females) between ages 16 and 24, 61%/55% between 25 and 54, and 31%/19% between 55 and 74<sup>396</sup>. Therefore, an important question is: what needs to be done to create an ICT environment that will help older adults to flourish, and what is the role of Government in enabling this? The following are suggested for further consideration by stakeholders<sup>397</sup>:

### ***Ensuring all older adults have the opportunity to benefit from ICT***

The costs of owning and using ICT can be substantial, particularly for older adults on very limited income. However, whilst the provision of equipment and bandwidth to the home might have relatively large up-front costs, longer-term benefits could be substantial – both for the individual and the state. For example, ICT facilities could assist in the management of healthcare, and by allowing older adults to live in their own homes for longer, avoid the considerable costs associated with institutional care.

It has been beyond the scope of the Project to perform a detailed analysis of the economic and non-economic costs and benefits of supporting ICT for older adults. However, if a “digital divide” is to be avoided, such an analysis could usefully consider the circumstances in which the following could be justified:

- Provision of equipment and bandwidth to the home.
- Provision of equipment, bandwidth and instructional support in communal spaces (such as community centres and village halls).
- Social services could provide a minimum essential level of connectivity infrastructure as part of the process of adapting homes for older adults.
- Provision of training and support. This will be important in ensuring that the benefits of any subsidies and services are fully realised.

In all of the above, older adults could themselves be employed: for example, by advising other older adults on equipment and services, and helping them with basic training. This in itself could help to break down a stereotypical view of older adults, as well as providing a useful source of employment or activity.

### ***Supporting the use and maintenance of technology***

Continuing support will be essential, particularly for those who are not familiar with using ICT. Without this, even new equipment could lie unused as soon as problems occur.

Older adults themselves could play a key role in ongoing support services. Indeed, this would be desirable, since they are more likely to understand the issues, concerns and problems their peers may be experiencing. Support could relate to:

- Maintaining hardware and software.
- Assisting in resolving hardware and software problems.

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395 Banks and Leicester (2006)

396 Eurostat (2007)

397 For a more detailed discussion of ICT and older adults, see Johnson and Huppert. (2008). *ICT and its role in promoting wellbeing in older people*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

- Mentoring on use of equipment – for example, introducing the user to new services and helping them to become familiar with them.

### *Developing hardware, software and services for older adults*

Much ICT is of questionable standard in terms of usability and interface design. Designers do not always consider user requirements, and when consideration is given to user-related issues the focus is often on particular user groups (for example younger users) or specific contexts (for example office environments). Users are often under-utilised in the design process and technologies are far too often deployed untested and arguably, prematurely. The end result is that technology can be unnecessarily difficult to use by older adults.

The robustness and reliability of technology can also be inadequate: and when a technology performs unreliably there is a follow-on impact on the user's degree of trust in the technology and their own sense of self-efficacy<sup>398</sup>.

It will be important to address these issues if older users are to have the trust, confidence and perseverance to make full use of their ICT equipment. The key point is that older adults should not be required to adapt to technology; rather, technology should be adapted to their needs.

There is therefore a case for Government to consider the following:

- Encouraging business to recognise the considerable potential in developing and supplying ICT specifically for the growing market of older users.
- Encouraging and facilitating the involvement of older adults in the design, development and testing of ICT equipment, software and services – particularly those that are intended to be accessible to older users<sup>399</sup>.
- Promoting accelerated research and development that will identify how ICT can be improved to allow greater accessibility for older adults. For example, this could include exploring devices and interfaces that are more aware of the user and more able to respond to the user: this is one approach of addressing problems around the difficulties experienced by some older adults with ICT interfaces.
- Promoting research into the means by which design can make ICT more appealing to older users. Fields such as affective design focus on designing products and interfaces so that they are pleasant and rewarding to use. If ICT technology is designed to provide older users with a positive affective experience, then the wellbeing-related benefits of using ICT will be more readily realised.

Finally, in some cases, it may be desirable to consider requiring greater usability testing and the meeting of minimum design and accessibility standards in certain domains associated with instrumental activities of daily living (for example ICT interfaces on public transport, such as ticket machines). This legislation could take a form similar to that used to manage minimum World Wide Web accessibility requirements (as detailed in the Disability Discrimination Act (1995) Part III).

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398 Sanchez et al. (2006)

399 Ibid

#### 6.5.4 Societal attitudes

As indicated above, in the absence of specific brain-related diseases, the adverse effects of intrinsic ageing on memory and capacity for intellectual work are greatly exaggerated in the popular mind; this has been demonstrated repeatedly by psychological testing. The resulting negative stereotyping of older adults by society, including their peers, is a critical factor in the massive waste of mental capital in the later decades of life. These attitudes are slowly beginning to change, although much remains to be done.

Negative attitudes to older adults have parallels with the stigma attached to mental ill-health. The Project has used a systems approach to analyse the problem and to provide fresh insights on how to change people's attitudes (see Section 4.7). A similar analysis could usefully be used to inform how best to address attitudes to older adults, and the results developed into an integrated long-term strategy. However, in the absence of such research, the following ideas are suggested:

- The best people to demonstrate the considerable potential of older adults are older adults themselves. One idea would be to raise the profile of older adults who are continuing to demonstrate high levels of achievement (as opposed to honouring them for past achievements). By celebrating such excellence, they would provide role models for other older adults, and high-profile "ambassadors" to the rest of society.
- In the world of work, economic analysis could be used to demonstrate the considerable potential and benefits of older workers.
- The particular potential of older adults to help and connect across generations could be showcased.
- Tackling attitudes in Government are equally important. Departments could be specifically encouraged to harness the potential of older adults in their initiatives. Training and case examples (such as the Texas child development example – see box above) could help here.

## Key messages

Life expectancy is increasing by around five hours each day: By 2071, about one in every three people over the age of 16 could be 65 or older. This will create substantial challenges for older people, their families and for wider society: this suggests the need for Government to review the priority and systems of governance associated with older people, and to develop a long-term strategy that is cross-Governmental and which adopts a lifecourse approach.

Key challenges include:

- **Dementia** – the prevalence is closely linked to increasing age. It will be important to monitor and detect it early (particularly through a range of biomarkers); and, as treatments become available, to promote the provision of prompt treatment to arrest its decline before individuals become incapacitated.
- **Other mental disorders** – such as depression will also raise substantial concerns. Because older adults presently have poorer access to treatments for certain mental disorders compared with younger adults, there will be a need for targeted action to prevent this shortfall continuing into the future.
- **Addressing the massive under-utilisation of the mental capital of older people.** Older people themselves have the potential to turn round this situation through: better social networking; addressing the risk factors associated with age-related mental decline; continuing learning; and by engaging in valued and valuable employment.
- **Promoting environments for older people to flourish** – for example, the physical environment, work and ICT.

Finally, there is a need to promote different attitudes within Government and in wider society. We need to rethink concepts such as “older age”, the transition from work to retirement, and also the concept of retirement itself. And we need a much greater focus on the positive potential of older people, to address the stigma associated with “old age”.

## **7 Key choices for policy makers**

**7.1 Societal values that underpin our choices**

**7.2 Economics of mental capacity and wellbeing and possible interventions**

**7.3 Implementation and governance**

**7.4 Research**



## 7 Key choices for policy-makers

This chapter considers issues that will influence the choices that policy-makers need to make today and in the future:

- The need to match decisions with the changing aspirations and values of UK society.
- Using economic assessment so that it promotes decisions that allow the greatest benefits.
- How to ensure that the mechanisms are in place to enable choices and policies to be implemented.
- Key choices for new research: to enable the best decisions to be taken now and in the future.

## 7 Key choices for policy-makers

Previous chapters have set out future challenges facing policy-makers and the evidence available on possible interventions to address them. In doing so, the potential for substantial economic savings and improvements to people's wellbeing have been identified. However, realising the greatest benefits will not be straightforward for several reasons.

- First, policy decisions made today may have long-term implications. They therefore need to reflect the evolving values and aspirations of society, or be sufficiently flexible to adapt to change (see Section 7.1).
- Secondly, many of the interventions suggested have diverse benefits which could accrue across different sectors of society over years or even decades, and which span the interests and priorities of more than one Government department. This broad perspective presents particular issues for economic analysis to inform decision-making (see Section 7.2).
- A further issue is whether existing systems of governance will be able to make and effectively implement decisions that may flow from the findings of this report, or whether these systems might usefully be modified (see Section 7.3).
- Finally, this Chapter considers priorities for future research – recognising its considerable potential to further inform the choices that need to be taken over the next few years (see Section 7.4).

### 7.1 Societal values that underpin our choices

Society in the UK is changing ever faster in response to a range of factors such as globalisation, new technology, migration and the demographic age-shift. As part of this evolution, societal values and expectations are also changing. This raises two major implications for policy-makers:

- First, some of the choices that need to be made today may lead to interventions which affect the mental capital and wellbeing of individuals over many years and even decades. Therefore, decisions made today need to accommodate future expectations and values of society.
- Secondly, some of the interventions suggested in this report may need to be implemented over many years. This is particularly true of those that seek to change current attitudes and behaviours. However, the evolving values and attitudes of society may themselves affect the viability of certain interventions – for example, due to changes in societal priorities or changes in ethical perspectives.

It is impossible to predict how society and its values will change in the future; therefore it is important that decisions concerning interventions that are made today embody sufficient flexibility to adapt to future change.

As indicated in Chapter 1, the Project has developed three future scenarios (see Appendix B). These have been used to consider how important societal factors could affect mental capital and wellbeing in the UK in the next 10-20 years. In particular, these scenarios embody different, but equally plausible, sets of societal values. They essentially

sample the future “possibility space” and have helped to frame important issues and questions which should form a backdrop for consideration of this report:

- How should societal values be reflected in the balance of support (economic and social) provided to the different stages of life, particularly as intergenerational tensions could develop because of the demographic age shift? For example, the “Gerentopolis” scenario embodies a society with large numbers of older adults who exercise substantial influence, and who enjoy strong support from the rest of society. In contrast, in “Metaverse 2030”, support for younger people is emphasised, and in “Rock, Scissors and Paper”, all ages are equally supported.
- To what extent will societal values constrain scientists in freely performing research and in developing possible solutions to future challenges? For example, some areas of science are beset with areas of public controversy which consequently affect the pace of development, and also the introduction of applications. Examples include stem cell research, genetically-modified organisms, and the collection and use of personal data. (The pace of development and the application of science is one of the key factors that characterise the three scenarios of Appendix B). In the context of mental capital and wellbeing, this issue could have substantial influence – for example, on the development of new biomarkers, drugs and other treatments for mental disorders.
- How should resources be distributed between: diagnosing and treating those with the most chronic or acute problems; preventing problems developing; and shifting the overall level of wellbeing for the entire population? Also, to what extent will there be disagreement about these priorities across different social groups? These issues could particularly influence decision-making in areas relating to mental ill-health (see Chapter 4).
- How will society value the relative importance of factors such as wellbeing, social inclusion and social cohesion compared with economic prosperity? For example, this will be particularly important in areas such as education (see Section 7.2.3).
- To what extent will the UK population accept and embrace personal responsibility for their own developing future? This could be an increasingly important consideration in areas such as learning through life, and also in old age.

## 7.2 Economics of interventions for promoting mental capital and wellbeing

This section considers the economic case for action and assesses the broad options that have been put forward in previous chapters.

Poor mental health and low mental capital impose both social and economic costs. They reduce the quality of life, both for those directly affected and for those who care for them, and they place demands on public services. They increase the chances of poor physical health. And they reduce the strength of the economy, because of adverse impacts on both employability and productivity. Various studies have attempted to quantify the economic costs involved, and there have been some (less robust) attempts to quantify wider social and wellbeing costs:

- The annual impact of mental ill-health in 2002-2003 has been estimated as £77 billion for England<sup>400</sup>, a figure which includes wider impacts on wellbeing.

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400 Sainsbury Centre for Mental Health (2003)

- A recent report from the King's Fund puts the total economic cost of mental illness in England at £49 billion in 2007.
- About 40% of incapacity benefit in 2007/2008 is estimated to reflect mental illness, equivalent to around £5 billion.
- Fernandez and Forder<sup>401</sup> estimate the wellbeing cost of cognitive impairment and depression among older adults to be £14-21 billion, while Knapp et al.<sup>402</sup> estimate the total economic cost of dementia in 2005-06 to be £17 billion (including informal care); a figure that could rise to £50 billion within 30 years<sup>403</sup>.

In total these cost estimates range from 3.5% to 7% of gross domestic product (GDP). Over 16% of the adult population are currently affected by common mental disorders, and the prevalence of some disorders can be expected to rise in the future. The ageing of the population, for example, means that the numbers of older adults suffering from dementia is likely to rise substantially, and it can be expected that the total costs of mental ill-health will rise both in absolute terms and relative to GDP. Adding in economic costs associated with low levels of mental capital among those not suffering formally from mental illness would raise these numbers significantly, and the wider social costs involved are almost certainly understated. By contrast, addressing mental health only accounts for approximately 13% of NHS spending.

### 7.2.1 The general case for intervention

These very high and rising costs suggest that action to improve mental capital and wellbeing could have very high economic and social returns, but they are not sufficient in themselves to establish the case for further intervention. In a country like the UK one must first ask whether the market, left to itself, is likely already to be delivering fully satisfactory outcomes; however, the discussion in this chapter demonstrates that the answer to that question is undoubtedly no. There is a clear case in principle for Government intervention and, importantly, evidence that there are additional cost-effective measures which it can take, where the economic and social benefits are likely to exceed the costs involved.

The economic rationale for Government intervention to improve mental capital and wellbeing is based on a combination of equity and efficiency arguments. Equity considerations suggest that those who are particularly prone to suffer from stigma, reduced wellbeing and economic loss because of mental health problems or learning difficulties should not be required to bear those losses without appropriate support for themselves or for their informal (often family) carers. As already discussed, such people are often among the poorer in society.

There are two main efficiency arguments for intervention:

- **External costs.** There is good evidence that mental health and learning problems lead to wider social and economic costs which go beyond the effects on the individuals most immediately affected: examples include the wider costs for the economy in terms of lost output; increased demand on public services; and also the costs to society of possible anti-social behaviour and crime. In the context of work, good workplace conditions and investment in training yield benefits that are

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401 Fernandez and Forder. (2008). *Estimating a monetary value of the disutility associated with mental health problems among older people*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

402 Knapp et al. (2007)

403 Service costs alone are put by Fernandez and Forder at £12 billion.

wider than the pure financial and economic benefits to businesses, so are likely to be undersupplied. Individual investment in skills also brings wider benefits to society which people are unlikely to give full weight to in their decisions. Thus investment in this area is likely to be sub-optimal in the absence of Government support or incentives.

- **Information failures.** Incomplete or asymmetric information is endemic in this area. The stigma attached to mental illness is a form of information failure. For those affected by mental health problems, information about causes, consequences and treatment is likely to be incomplete, irrespective of whether the underlying causes are genetic, social or economic, and whether in the workplace or in wider society. Health professionals' information is also incomplete in these areas, although their knowledge will generally exceed that of sufferers. Employees may not fully understand the impacts of workplace conditions on their wellbeing, nor the best means of treating or dealing with them, and employers may not be fully aware of the implications of workplace conditions for the success of their business (although awareness of this is increasing, at least in large organisations). The economic and wider welfare benefits for adults themselves from learning, and other steps they can take to maintain mental capital over their lifecourse, may not be fully apparent; and even insofar as it is, they may take decisions which discount future benefits too heavily. Education professionals lack full information on the risk factors for learning difficulties, and the importance of early learning experiences.

There are also merit good<sup>404</sup> arguments for Government intervention when private decisions appear not to be consistent with the wider social good. A good example is the tendency for people to discount unduly heavily the (known) long-term consequences for their future mental capital and wellbeing that flow from lifestyle choices such as alcohol and drugs, and from decisions about skills and training over the lifecourse<sup>405</sup>. Lack of competition and incentives also provides a rationale for intervention. Hospitals and Primary Care Trusts (PCTs) may not face strong enough incentives to provide sufficiently good care in a timely fashion to those suffering mental health problems, not least given the stigma attached by many members of the public to this form of illness. Insurance markets provide minimal alternatives to public provision because moral hazard and adverse selection are particular problems in this area<sup>406</sup>. And the potential problems with competition in the supply of drugs across the health service, given the limited number of companies involved, the incentives they have to maximise the returns on their existing drugs and the pervasive use of patents, may raise the cost of mental health treatments beyond what many of those affected can afford.

The appropriate form of intervention depends in principle on the nature of the market failure involved. Information failures suggest a need for education campaigns for the public, guidance on best practice for practitioners, and funding for basic research e.g. into risk factors, biomarkers and generic treatments. Basic research is close to being a pure public good. The classic economic remedy for externalities is internalisation of the costs or benefits involved into prices facing the public, but in practice this would be difficult in health markets such as this. Often the most direct and well targeted

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404 Merit goods are goods (or services) which a government may choose to supply, or require people to consume, on wider social grounds even though individuals left to themselves may not always choose to do so. Examples include education and seat belts.

405 In technical terms, private discount rates generally exceed the social rate.

406 Frank and McGuire (2000)

approaches are direct Government provision or regulation. The possible interventions identified in the Project draw upon these different approaches.

Government is, of course, already intervening to address problems associated with mental health and mental capital. But there is very good reason to believe that additional measures are needed. As seen above, NHS resources are heavily skewed towards treating physical illness, whereas, for example, the balance of incapacity benefits suggests that mental illness accounts for a much higher proportion of health-related economic losses. Also, the next section cites evidence that mental health problems affect general wellbeing at least as profoundly as do physical health problems. Thus there is *prima facie* evidence that health care resources are misallocated, while at the same time there is evidence that further interventions, not only in mental health but also in measures to improve mental capital, would probably yield benefits well in excess of costs.

The key question to consider next, therefore, is which types of Government intervention are likely to generate the largest net benefits, and how certain we can be that they will do so. First, some general intervention issues are considered.

### 7.2.2 General considerations

The trajectory of an individual's mental capital and wellbeing through life is potentially subject to a range of reinforcing mechanisms and feedbacks. There is good scientific evidence that the adverse effects of mental health problems and learning difficulties often build up and feed on themselves if left untreated. Conversely, prompt and effective treatment can help to establish a virtuous cycle of improvement. Mental health problems in the early years have a strong tendency to persist into adulthood, and the costs involved can cumulate over many years. Furthermore, the value that society places on good mental and physical health, and the quality of life more generally, rises over time as standards of living grow; but so does the cost of treatment. Nevertheless, there is a strong *prima facie* argument, based on the science, that *early identification and treatment* will lead to better overall outcomes than waiting until the symptoms and problems become clearly evident and damaging.

However, the cost of early action has to be borne by current taxpayers, and society generally tends to put a lower weight on the same costs incurred later. This is largely because people will expect generally to have higher incomes at that later time, and will therefore be better able to pay. For early identification, it is necessary to balance two considerations: the cost of stigmatising those who are diagnosed early, who may also suffer greater psychological and economic costs (for example, higher insurance premia); and the benefits of more effective treatment. It is also necessary to weigh the potential costs of false positive and false negative identifications. The optimal pattern and timing of intervention may well vary across different conditions.

A related issue concerns the appropriate balance of resource devoted to universal, selective and highly-targeted prevention and treatment. From one perspective, universal prevention involves deadweight costs since it is applied to many people who are not at high risk. However, the argument for universal prevention is that it does not just prevent illness in those who are at high risk, but that it also strengthens wellbeing and shifts the population distribution of symptoms to the left, thus reducing the numbers of cases of illness. The only way to determine the extent of the benefit and the appropriate balance is to conduct randomised controlled trials (RCTs) to enable the costs and benefits of a range of different interventions to be evaluated.

The overall message of the economic literature is that, given the wide-ranging costs of mental ill-health which are potentially spread over many years, and given the corresponding benefits of positive mental health, the case for effective early identification and treatment is very strong. For example, there is evaluation evidence suggesting that early treatment for psychosis can deliver better outcomes, as one might expect<sup>407</sup>. Other estimates<sup>408</sup> suggest that pre-school parenting programmes to deal with child conduct problems and disorders need to achieve a success rate of only 2-4% for them to deliver value for money. And as described below, effective programmes to tackle learning difficulties in children are shown to offer high rates of return, especially if those in disadvantaged communities can be reached successfully. A crucial ingredient for delivering successful outcomes in the longer term is ensuring that interventions are consistent and persistent, with tailored support from birth through to adolescence and, where needed, into adulthood.

An important analytical issue is how much weight to give to *quality of life improvements* relative to purely *economic and financial benefits* in assessing possible interventions in this area. This is relevant in a number of contexts, but perhaps most obviously in assessing the relative merits of interventions which improve the lot of those with the prospect of many future years of economically productive life, compared with those, often in later life, who do not, but whose wellbeing may nevertheless be significantly improved. The literature does not allow us to draw unambiguous conclusions about wellbeing effects in this context, mainly because comparative valuations of the impacts of different mental health states on individual quality of life are less well-established and robust than for different physical health states<sup>409</sup>. Nevertheless, some key points have emerged which are relevant.

First, the evidence indicates clearly that mental health problems affect general wellbeing at least as profoundly as physical health problems, particularly when looked at from the perspective of patients rather than the general public<sup>410</sup>. There is evidence that patients tend to adapt to adverse physical health conditions, so that their wellbeing is less affected in the longer term than in the short term, but this may be less true for mental health patients<sup>411</sup>. Estimates of the value of better mental health also appear greater, relative to better physical health, when examined in the context of overall wellbeing, rather than in purely health-focused studies.

There is some evidence that the value attached by people to good health varies over the lifecycle, with higher values in mid-life, when individuals are more likely to have family responsibilities, and also when retirement provides opportunities for additional leisure and other activities that rely on good health<sup>412</sup>. There is also evidence that such values vary with socio-economic status. But, as in other contexts, equity considerations suggest that these value differences should be ignored for policy purposes. It would not be appropriate to give less weight to people's health problems because they are poor or old, though the practical implication of assessing the impact of interventions in terms of economic and health benefits spread over the lifecycle tends to favour interventions earlier in life which can generate long-lasting improvements.

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407 McCrone and Knapp (2007)

408 Friedli and Parsonage (2007)

409 Measures of positive wellbeing are not readily available, but there is scope to develop such measures.

410 See, for example, Dolan (2007) and Layard (2005)

411 The relatively higher weight given by patients to mental illness, by comparison with physical illness, is consistent with the well-documented stigma attached by the general public to mental illness.

412 Dolan (2000)

### 7.2.3 Specific interventions examined in the Project

Previous chapters have identified a number of promising avenues through which interventions by Government may deliver significant improvements in mental capital and wellbeing. A full economic assessment would examine possible interventions which address, so far as is possible, the underlying factors contributing to problems in this area; including social and economic deprivation, and trends in family structure and social attitudes, education and culture. Such interventions have the potential to deliver the greatest benefits, though perhaps also to involve the greatest costs. However, detailed economic assessment of major societal changes of this kind is beyond the scope of this Project.

The economic studies commissioned here have focused on more downstream interventions in three broad areas: treatments or other measures which address various dimensions of mental illness; measures to improve conditions in the workplace; and options to address specific learning difficulties. The quality of the evidence that has been brought to bear in these areas is uneven, and while the *prima facie* case for intervention may often appear strong, only in few cases has it been possible to generate robust assessments of value for money.

The evidence available on potential economic benefits is relatively good, because the economic costs associated with poor mental capital and wellbeing can be measured explicitly; for example, in terms of lower earnings or employment, absenteeism and presenteeism, care costs, benefit savings or additional tax revenues. However, even for this type of benefit, the actual impacts of particular measures often cannot be estimated with a high degree of certainty. In general, there is insufficient evaluation evidence on their effectiveness to assess the extent to which potential benefits might be delivered in practice. For example, as discussed below, even in the case of workplace interventions, strong assumptions have to be made to generate benefit-cost ratios (BCRs), and in most cases BCRs cannot be calculated.

Beneficial effects on individual wellbeing are significantly more difficult to measure than economic effects, still less to value in money terms, for comparison with intervention costs. While all the types of intervention considered in the Project, if effective, are likely to generate such wellbeing benefits, only the economic study on depression has attempted to value them. For other interventions it is only possible to hazard plausible guesses, perhaps extrapolating the result from the Sainsbury 2003 study<sup>413</sup> that wellbeing benefits for those with the potential to work are likely to be of similar size to economic benefits. Where explicit valuation is attempted, the usual approach is to adopt the NICE hurdle value of £30,000 per quality-adjusted life year (QALY)<sup>414</sup>.

Similar problems arise with wider social impacts, such as reductions in crime and anti-social behaviour. Although the study of those with learning difficulties was able to quantify some impacts of this kind, such as on truancy and contact with the police, none of the commissioned studies attempted to value even the potential scale of wider social benefits. On the basis of the evidence presented in Jenkins et al. (2008)<sup>415</sup>, it can be assumed that they are likely to be positive, and possibly substantial, and it should be possible to establish broadly what society would be willing to pay to achieve them, given available analysis and data.

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413 Sainsbury Centre (2003)

414 NICE (2008)

415 See Project report: Jenkins et al. *Mental health: Future challenges*; Appendix E refers

Given these difficulties, it has not been possible to establish robust and comprehensive estimates of value for money, in either absolute or comparative terms, for most of the interventions examined in the economic studies commissioned for the Project. The key conclusions are summarised below for each case.

### *(i) Treatment of depression*

Public provision and incentives for the treatment of depression in the UK are currently insufficient to meet evident needs, with many sufferers not being treated. The study by Knapp et al. (2008)<sup>416</sup> examines the case for extending best practice treatment more widely. It looks not only at economic and fiscal impacts, but also wider impacts on wellbeing based on QALYs. The estimated BCR of treatment for depression in line with the NICE guidelines, compared with no specific treatment, is very high (over 30) with wellbeing effects, as seen in the Sainsbury Centre for Mental Health Study<sup>417</sup>, accounting for almost half the benefits. The BCR would probably be even higher when the effects are cumulated over time and other social benefits are included<sup>418</sup>. Although the gross cost of increasing coverage of sufferers from its current level of 53% to 100% may be around £100 million a year, the flow-backs to the exchequer from extra revenue and reduced service and benefits expenditure would much more than outweigh this, by a factor of five or more.

Although these estimates are inevitably subject to some uncertainty, the evidence base in this area is comparatively robust. In particular, there is a good deal of evaluation evidence for depression treatments<sup>419</sup>. It is therefore safe to conclude that additional provision for treatment of depression in this way would represent excellent value for money. This is in line with the conclusion of other studies<sup>420</sup>.

This is a clear case for treatment of depression where more widespread use of best practice treatments offer the prospect of high returns. Similar conclusions almost certainly apply to the treatment of other common mental disorders such as anxiety and phobias. More generally, there is likely to be a strong economic case for better adherence to NICE guidelines on best practice across the board of mental health. For example, Cognitive Behavioural Therapy (CBT) is one commonly applied component of best practice treatment for depression, and can also be applied effectively in treating other conditions e.g. anxiety and psychosis; it is just one form of psychological therapy which RCTs have shown to be effective.

### *(ii) Treatment of dementia*

In contrast to depression, there is insufficient economic evidence to provide a firm view on the cost-effectiveness of different current treatments for dementia, still less the value for money they offer. NICE has examined the economic case for various current drug treatments and, somewhat contentiously, has found that some do not offer good value for money. But while NICE does attempt to measure and value QALY gains for those receiving treatment, it takes no account of benefits such as reductions in important care costs, and the economic impacts on unpaid family carers. There have been cost-effectiveness studies of non-drug therapies, but to our knowledge there have been no published full cost-benefit analyses of any dementia treatments, still less of

416 Knapp et al. (2008). *Better treatment responses to depression: Economic consequences*. A paper prepared for the Project and available from [www.foresight.gov.uk](http://www.foresight.gov.uk).

417 Sainsbury Centre for Mental Health (2003)

418 These estimates would not assume, unrealistically, that all those treated who benefit in the short term would be permanently cured

419 Knapp et al. (2008)

420 See, for example, LSE (2006) and Layard et al. (2007)

measures which might permit earlier identification in this area. There seem to be no estimates of potential economic benefits of interventions which might keep older adults active for longer.

The case specifically on value-for-money grounds for devoting additional resources to current dementia treatment does not appear as strong as for depression treatment (which is particularly strong). New treatments may offer the prospect of better outcomes, as described in Section 6.2, but in any event quality of life improvements are particularly hard to measure for those with cognitive impairment, and these and other benefits for dementia sufferers are likely to be sustained at best over relatively few years on average, by comparison with treatments for those of working age. Economic benefits are likely to be a smaller proportion of total benefits than for many interventions which help younger people. Savings in care costs need to be allowed for, but benefits from increased economic activity, by either the patients themselves or their carers, seem unlikely to be very substantial. So the main rationale for increasing resources in this area is the expected increase in numbers affected as the population ages, and in the associated care costs; the latter put at well over 300% or more by Comas-Herrera et al.<sup>421</sup>. That case is further strengthened to the extent that the science in chapter 6 indicates a realistic prospect of better treatments becoming available.

The general case for measures which permit earlier detection or identification of the risk of dementia is considered below in the discussion of biomarkers. Given the scale and rising trend of dementia costs, this has the potential to deliver much more substantial benefits than current treatment options.

### (iii) Debt

A recent empirical study by Jenkins et al.<sup>422</sup> shows that debt is a particularly strong risk factor for mental health problems, even when other socio-economic influences including income are controlled for. However, there is good reason to believe that lending institutions do not take full account of the external costs of lending heavily to people who are at risk of developing such problems. A second study<sup>423</sup> shows the relationships between different forms of debt, types of financial hardship and types of mental disorder; in so doing, it demonstrates the potential public health impact of debt in relation to mental disorder. In the light of these findings, Foresight therefore convened a stakeholder workshop on debt and also commissioned an economic study<sup>424</sup>: that study replicates the Jenkins et al. cross-sectional findings<sup>425</sup> using a different statistical approach, and then quantifies the resulting impact of debt on health service costs. Using evidence from the literature and from the Foresight workshop on debt<sup>426</sup>, it then examines the effectiveness of advice services designed to help reduce uncontrolled debts, and brings together all these strands of analysis in a decision analytical model to analyse their cost-effectiveness.

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421 Comas-Herrera et al. (2008). *Dementia: Projected expenditure implications of changes in incidence, survival and disability*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

422 Jenkins et al. (2008a)

423 Jenkins et al. (2008b)

424 Knapp et al. (2008). *Debt, mental health and cost-effectiveness of interventions*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

425 Jenkins et al. (2008b)

426 Hurlston and Jenkins (2008). Report of the Project workshop on debt and mental health. Available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

Most types of debt problem are found to be positively associated with psychiatric morbidity<sup>427</sup>, and for many individuals the association appears, perhaps surprisingly, to be stronger for people with higher incomes. As expected, health service costs increase with morbidity. However, it is possible to draw only tentative conclusions about the cost-effectiveness of interventions to help address debt problems. Empirical work in this area is beset by a number of difficulties, not the least of which is that causation between mental health problems and debt runs in both directions, so that interpretation of associations in the data is ambiguous. There is also very little quantitative evidence on the effectiveness of interventions to help reduce uncontrolled debt: considerable reliance has to be put on non-controlled studies and just one small-scale randomised controlled trial which was not focused on the mental health context.

Despite these empirical problems, and the fact that the study does not consider in any detail the wider economic (including labour market) and wellbeing impacts, it is possible to draw the tentative conclusion that interventions in this area may offer value for money. Not-for-profit debt advisory services may be self-financing with relatively little public sector support, and the evidence of effectiveness, imperfect though it is, is positive. The sensitivity analysis in the report suggests relatively low effectiveness thresholds for interventions to become cost-saving for the public sector, and are lower still for them to be value for money when wider economic and wellbeing benefits are taken into account.

#### *(iv) Workplace measures*

There is plenty of evidence referred to earlier that work itself is generally beneficial for mental health<sup>428</sup>, and that well designed measures to help people with mental health problems into work offer high returns<sup>429</sup>. Also, there is convincing evaluation evidence from North America and Europe (including the UK) that high returns can be expected from additional emphasis on supported employment schemes such as Individual Placement and Support, which are shown to deliver both long-lasting economic benefits and clinical improvements<sup>430</sup>.

However, as Chapter 5 explains, conditions in the workplace can also cause stress and exacerbate mental health problems. The economic arguments for workplace measures have already been discussed above, and Chapter 5 proposes a range of possible interventions. A study by London Economics<sup>431</sup> focuses on three broad types:

- Increased Primary Care occupational health services.
- Annual stress and wellbeing audits by companies.
- Extension of flexible working arrangements.

The analysis in the study focuses on conventional economic and financial impacts for individuals, businesses and the public sector, and no attempt is made to assess the importance of individual wellbeing and wider social benefits<sup>432</sup>. However, the establishment and quantification of causal relationships between these interventions

427 Jenkins et al. (2008b)

428 Waddell and Burton (2006)

429 Bond (2004)

430 See, for example, Bond (2004)

431 London Economics (2008). *Cost-benefit analysis of work and wellbeing interventions*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

432 Crime impacts were apparently examined, but found to be small and are not reported.

and actual (rather than potential) economic outcomes did not prove possible. As the report says, “attributing the extent or incidence of particular outcomes to work-related factors is almost impossible ... there is little information on either the effectiveness or relative effectiveness of the various initiatives ... and we have therefore had to rely on a range of assumptions validated by the Foresight Expert Panel ... rather than research evidence.”

The estimated cost of the individual interventions examined are put at £95-135 million for extending occupational health services (borne by the public sector), £60-170 million for wellbeing audits, and £70 million for flexible working (both borne by private and public sectors). The analysis suggests benefit-cost ratios (BCRs) in the range 1.5 -3.5: the highest estimated returns are for the extension of flexible working rights and duties to cover all workers. Wellbeing audits are estimated to offer the lowest returns, though implementation of low-cost measures suggested by such audits could raise net benefits, with occupational health services in the middle of the range. However, all these BCR estimates are based on strong and untested assumptions about effectiveness, which means that they are speculative.

Were these interventions to be effective, they could be expected to deliver individual wellbeing benefits as well as economic benefits. If, as the work on depression by Knapp et al.<sup>433</sup> and the Sainsbury Centre for Mental Health<sup>434</sup> suggest, these were of similar size, the BCRs could be almost double those cited in the study. And there may also be wider economic and social benefits which are not covered in the study. So the wider BCRs for these workplace interventions, going beyond the direct economic benefits, could be of the order of 3-7, which compare well with returns to Government intervention other areas – such as transport schemes, which are expected to deliver benefit-cost ratios of 2 upwards.

However, this latter conclusion is no more robust than the underlying estimates in the report which, as described above, are highly speculative. Although the assumptions adopted are based on informed expert opinion about effectiveness, that doesn't guarantee their robustness. More robust evaluation data is ideally needed, perhaps derived from initial piloting of measures such as occupational health services, before one can be reasonably sure that satisfactory returns will be obtained. Nevertheless, it is fair to describe interventions in the workplace along these lines as potentially very cost-effective. Programmes focusing on early diagnosis and intervention for employees with depressive symptoms have been shown in US and Australian literature to offer rates of return around the top end of the range indicated by the London Economics study<sup>435</sup>, suggesting that measures in this general area, if not necessarily these precise options, may offer very good value for money<sup>436</sup>. Against this, it must be noted that employers themselves have a direct interest in promoting good mental health among their employees, because of the favourable impact on their bottom line, without intervention from Government.

#### (v) *Specific learning difficulties*

Chapter 3 summarises the scientific evidence on learning difficulties and discusses a range of possible interventions to address them. The economic rationale for

433 Knapp et al. (2008). *Better treatment responses to depression: Economic consequences*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

434 Sainsbury Centre for Mental Health (2003)

435 London Economics (2008). *Cost-benefit analysis of work and wellbeing interventions*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

436 Hilton (2005); Wang et al. (2007)

intervention through public provision is clear-cut, as already discussed. The study by Challen et al.<sup>437</sup> examines further the economic and wider social consequences of specific learning difficulties, and assesses the possible returns to education programmes targeted on this problem. Good evidence is provided on the first set of issues (the potential economic and social consequences) with data from the British Cohort Study and the Longitudinal Survey of Young People used to examine the impacts of low literacy and numeracy skills and reports of attentional difficulties at age 10-11. These skill deficiencies may or may not reflect identified “specific learning difficulties” such as dyslexia, dyscalculia and Attention Deficit Hyperactivity Disorder (ADHD), so estimates of the impacts on educational attainment, truancy and behaviour, and labour market outcomes in the study, effectively apply to those “at risk” of having SLDs but who are not necessarily diagnosed as such.

Adverse impacts are identified most consistently for ADHD, but also in most cases for those at risk of dyslexia and dyscalculia. Expected lifetime earnings are estimated to be reduced by £45,000-115,000 for the individuals affected, admittedly under fairly strong assumptions. However, no attempt is made to value other social outcomes or measure wider quality-of-life impacts (e.g. using QALYs), though the truancy and behaviour results in the study are indicative of the former and, as in the other cases examined in the Project, the latter are likely to be important and could be of comparable size to the labour market effects.

This evidence is used to indicate the potential size of the economic impacts of remedial interventions, in effect providing upper bounds. However, comprehensive cost-benefit analyses were not possible, both because causation is difficult to establish, and because available UK evaluation material (for example, on the effects of teaching programmes for dyslexia) is of limited value because basic requirements are not met. The impacts of such programmes for those with specific learning difficulties, and controlling for the different quality of the teachers involved, have not been reliably established beyond a couple of years.

However, there is good evaluation data for early-learning programmes in the US literature. Reynolds<sup>438</sup> estimates BCRs of 10 for early education, and Heckman<sup>439</sup> cites a BCR of nearly 9 for the Perry pre-school programme for disadvantaged children; the latter may well be exceeded when further follow-up studies allow longer-term benefits to be taken into account. Heckman also cites work by Cunha et al.<sup>440</sup> which shows rates of return to investment in human capital highest for pre-school children and declining with the age of first intervention.

The conclusion is that learning programmes and programmes which improve the home and early-learning environment potentially deliver very substantial benefits given the strong relationship between basic skills and lifetime labour market outcomes, particularly if intervention starts early. Also, the evidence that such measures deliver wider social and wellbeing effects strengthens the case for action. However, there is a need for more evaluation of suitable programmes in the UK. The same conclusion about value for money can be drawn in relation to development of techniques which

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437 Challen et al. 2008. *The economic consequences of “specific learning difficulties” and the cost-effectiveness of prevention strategies*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

438 Reynolds et al. (2002)

439 Heckman (2006)

440 Cunha et al. (2005)

permit early identification of relevant genetic and neurological risk factors, as described in Goswami<sup>441</sup>, which can enhance the effectiveness of teaching programmes.

Chapter 3 also considers the evidence on helping children to flourish via interventions to improve wellbeing in the early years and at school. Interventions designed to promote the mechanisms whereby independent learning develops were shown to be effective in longitudinal studies<sup>442</sup>. These interventions focused on ways of interacting with children i.e. child-focused, non-directive, non-restrictive, language-rich, that enhance children's psychological, emotional and social development. As these interaction styles also contribute to independent learning, they have considerable potential to deliver high economic as well as social returns. However, there is a lack of economic evidence on value for money and an absence of comparisons, for example regarding the relative merits of measures focused on improving the wellbeing of children themselves and of teachers. Finally, children's mental health is briefly considered in Chapter 3. Here an integrated approach which involves teachers, pupils, parents and the wider community appears most effective.

#### (vi) Other interventions

Various other areas have been identified in previous chapters where Government intervention may be desirable, but in these cases the economic case has not been examined explicitly. For example, they include environmental measures to improve mental capital and wellbeing, the use of information and communications technology (ICT) to aid older adults, and an increased role of technology in learning. The underlying scientific studies suggest that significant benefits could potentially be obtained from well-designed measures addressing the market failures involved. However, in these as in other cases, there is a crucial need for more evidence. Evaluation material is scant and often not fit-for-purpose, and causation is difficult to establish. There is more evidence of associations than of quantified causal relationships.

The study of *environmental impacts* on mental health by Cooper et al.<sup>443</sup> concludes that the weight of evidence on types of impact and the environmental features involved is sufficiently strong that it should be used to examine the possibility of devising beneficial interventions. One obvious role for Government is to take steps to increase public awareness. A step beyond that would be to examine the case for regulatory or administrative changes affecting the key transmitters – such as noise, crowding, lighting, accessibility and safety – where the costs seem likely to be low relative to the potential for mental health benefits.

The study considers a set of possible interventions focused on helping older adults. Partly they entail increasing their involvement, e.g. “silver stewards” for open spaces, and “silver” support groups for free technology training to relieve isolation. Other suggestions include extending Home Information Packs to consider accessibility issues, and planning measures focusing on the needs of older adults in communities. None of these initiatives is costed, nor their likely impact assessed, but they provide a starting point for further development work.

The science set out in Appendix C suggests considerable scope for the development of biomarkers which could assist assessment of risk factors, diagnosis and treatment of

441 See Project report: Goswami. *Learning difficulties: Future challenges*; Appendix E refers

442 Landry (2005)

443 Cooper et al. (2008). *The impacts of the physical environment on mental capital and wellbeing: ideas for the physical environment to improve mental wellbeing in older people*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

*depression and dementia*. Such developments have the potential to enable earlier and more effective treatment of these conditions, thus delivering substantial improvements in patient wellbeing. There would also be substantial economic benefits in the case of depression (mainly because of the resulting increase in economic activity of those who are helped) and also, to a lesser extent, with dementia (because of the reduced burden on public and informal care services, and perhaps some additional economic activity). Better identification of risk factors could also help pharmaceutical companies to reduce the costs of drug identification and clinical trials.

However, identification and validation of biomarkers is a costly process, and while pharmaceutical companies potentially have a financial interest in their development, the regulatory process and the potential benefits to competing companies makes investment in this area risky for them. Successful basic research would generate very clear external benefits which patenting would largely vitiate. Whilst clear guidance by the regulatory agencies (regarding their approach to evidence obtained using biomarkers, and to trials that use such evidence) would help to encourage private investment in biomarker development, these market failures mean that investment would be less than optimal without public sector funding and other support.

The precise form of most suitable public support, whether funding directly or in partnership with the private sector, will depend on how near-market the research is deemed to be. Basic research which is not near-market needs to be funded predominantly by the public sector unless academics or charitable foundations can be relied on to undertake it. However, the latter may be unlikely due to the relatively low level of charitable funding of mental health research (by comparison with cancer and heart disease, for example), perhaps because of the stigma of mental illness. Partnership arrangements might be a more promising approach for nearer-market research.

Johnson and Huppert<sup>444</sup> identify three broad areas in which *ICT* can be expected to enhance the wellbeing of older adults: social networking, cognitive function and health. There is a lack of quantitative information on the importance of social networks for wellbeing and longevity, but well-developed and validated measures of cognitive function are available. Conventional forms of cognitive training for older adults have shown clear, quantifiable and long-term benefits<sup>445</sup>, and *ICT* is likely to be a more efficient and effective method for this kind of training. Similar considerations apply in the case of health benefits. The study does not examine potential costs of an *ICT* programme for the elderly, so no assessment of cost-effectiveness is possible. However, the clear potential benefits of such a programme suggest a strong case for working up and appraising possible options.

The study by Laurillard et al.<sup>446</sup> makes a good case in principle for public funding of additional research in *technologies geared to meeting educational needs*. It illustrates the way technology can be expected to contribute to learning through life, and argues that policy in this area should be driven by educational needs rather than what currently emerging technologies, driven by other commercial priorities, can deliver. It proposes a substantial increase in R&D support for the lifelong learning sector, underpinned by a policy context aligning strong funding with the intention to exploit new technologies. This recommendation is not backed up by any assessment of value for money, but it

444 Johnson and Huppert. (2008). *ICT and its role in promoting wellbeing in older people*. A paper prepared for the Project and available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

445 See, for example, Ball et al. (2002)

446 Laurillard et al. (SR-A12); Appendix E refers

can be regarded as a persuasive approach to addressing the information failures involved and the potential external benefits from research in this field, provided the creation of a better market and incentives for such education-oriented outputs is not possible (the best approach).

Feinstein et al.<sup>447</sup> explore ways in which *education and learning* can make a more effective contribution to wellbeing at all stages of the lifecourse. There is a large literature on economic rates of return to education for both children and adults: high rates of return suggest the possibility of excellent value for money for interventions in this area: for example, for educational qualifications and basic skills; and for some forms of adult learning, particularly work-based but off-the-job training<sup>448</sup>. However, although there is evidence that learning also generates a range of wider social and wellbeing benefits, there is comparatively little evidence on their scale and value.

Government is already very heavily focused on improving education and skills, and various mechanisms are put forward in the Field study for delivering further improvements. Among the possibilities on which particular emphasis is placed are improving the wellbeing of teachers, and measures to increase the demand for adult learning and skills by both individuals and employers. Possible mechanisms include awareness campaigns, financial incentives and direct funding. A range of encouraging evaluation data is cited but no explicit estimates of value for money are presented. Nevertheless, it is not doubted that this is an area of major importance for wellbeing in society.

#### 7.2.4 Priorities

When Government assesses policy options for improving mental capital and wellbeing, economic analysis has the potential to indicate which are likely to offer value for money, in the sense that benefits would outweigh the costs involved, and which combination of measures would deliver the best overall outcome within limited budgets. It can also provide a clear rationale for decisions whether or not to intervene, and it can assess the economic conditions, including incentives, under which such interventions are likely to be most effective.

Unfortunately, this is an area in which the evidence base required to assess whether interventions are likely to be cost-beneficial for the UK is poor. A very high priority is therefore to improve that evidence base, with increased emphasis on identification of quantitative causal relationships and rigorous evaluation of policies and measures. Piloting of promising new options should be considered as a way of shedding further light on cost-effectiveness and narrowing options for wider roll-out.

Nevertheless, the available evidence suggests that action in a number of areas may be good value for money. The evidence is strongest for:

- Increased provision for depression treatments and other best-practice mental health treatments identified by NICE, and measures which help identify those in need of treatment.
- Effective early interventions to address learning difficulties and help children flourish, including well-designed pre-school parenting programmes for children from disadvantaged backgrounds.

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447 See Foresight report: Feinstein et al. (2008). *Learning through life: Future challenges*; Appendix E refers

448 See, for example, Blundell et al. (1996), (2004)

- Well-designed work placement, support and intervention programmes to help those with mental health problems.

In addition, the ageing of the population and the sheer scale of the expected increase in the cost of treating and caring for the elderly make a persuasive case for increasing the resources devoted to this area. Meeting these additional costs will impose additional financial burdens on those in work, but improving health will increase the scope for doing so without the need for raising tax rates.<sup>449</sup>

All the above areas are priorities for action. The economic evidence is weaker, but nevertheless suggestive, for measures identified in this report to improve workplace conditions, increase adult learning, and promote environments for older people to flourish – for example, the physical environment, work and ICT. And finally, there are some options with potentially massive but very uncertain benefits, such as the development of biomarkers. A key priority in most of these areas is further detailed development work to identify the most promising options and assess value for money.

### 7.3 Implementation and governance

The breadth of the perspectives that have been produced in this report has raised the possibility of new policies and interventions that cut across the interests of Government departments, across society, and across the lifecourse. This in turn poses questions about implementation and whether the present systems of governance are sufficient to enable the greatest benefits to be realised, both for the individual and for wider society. Given the very broad scope of mental capital and wellbeing, how can Government best introduce a lifecourse approach, while making the most of current strategies and initiatives? Specific issues are outlined here as a stimulus for further debate.

#### 7.3.1 Better coordination and incentives

A key issue relates to how the actions of Government departments should be coordinated, and how they might be incentivised to work together to deliver this lifecourse approach. For example:

- Substantial benefits resulting from resources deployed on mental capital and wellbeing could accrue to departments such as the Home Office and the Treasury rather than to the spending departments concerned (such as the Department of Health, or the Department for Children, Schools and Families).
- Benefits might accrue many years or decades in the future, timescales which may be outside of the usual time-horizon of particular spending departments.
- The incentives provided to individual Government departments when addressing their policy areas, may not give sufficient weight to mental capital and wellbeing issues. Simply improving the appraisal of policies and interventions so that the implications for mental capital and wellbeing are better assessed, is unlikely to address this deficiency.

Similar problems arise at local level, for example in coordination of primary and social care, and in the care of looked-after children. Therefore, mechanisms to improve co-ordination and to develop effective incentives need to be explored both at the level of central Government and local government.

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449 HM Treasury (2008)

Within central Government, at least half of the thirty departmental Public Service Agreements (PSAs) led by eight separate departments, have potential implications for mental capital and wellbeing, but not all of them recognise this explicitly. Inclusion of mental capital and wellbeing considerations specifically in these PSAs (or their successors), supported by appropriate Key Performance Indicators and monitoring frameworks, should be considered. More radical steps are:

- To develop a new PSA across Government directed at improving mental health, perhaps building on or supplementing the Cabinet Office's PSA 16 on social exclusion, reporting to a lead Minister.
- The development of an over-arching mental capital and wellbeing measure akin to the Communities and Local Government's (CLG) Index of Multiple Deprivation. The aim would be to avoid the potentially distortionary incentives associated with individual indicators.

Both these options should be explored further.

At the local level, possible improvements include improved working arrangements between local government service providers: for example, better coordination of services for looked-after children<sup>450</sup>; and better coordination of social and occupational care with Primary Care<sup>451</sup>.

### 7.3.2 Strengthening governance

Whatever the precise mechanisms adopted, serious and concerted senior leadership will be required to ensure that mental health and mental capital issues are given consistent and enhanced priority across Government. This may or may not involve creation of new or reformed Government institutional arrangements, and should not rule out the possible involvement of third sector organisations in delivery if appropriate. But in any event, there is a strong case for designating a Minister in a central department to lead on the combined mental capital and mental wellbeing agenda. In particular, this Minister would play a critical role in ensuring that appropriate incentives are developed and implemented, as outlined above, and in ensuring that effective and coordinated action results.

There is also a case to strengthen the system of governance in specific areas relating to mental capital and wellbeing, and for specific sectors of the population. A case in point relates to the increasing numbers of older adults and the need to unlock their mental capital and improve their wellbeing<sup>452</sup>. However, in this case, addressing problems that affect older people are likely to require interventions much earlier in life, as well as in areas such as learning, work, and mental health care. Therefore, a key requirement will be to ensure that the relative merits of interventions affecting specific groups of the population or specific aspects of mental capital and wellbeing, are still considered *together* so that the inevitable trade-offs are properly taken into account to optimise outcomes across society and through life.

### 7.3.3 Interdependencies and interactions

Achievement of any overarching objectives to improve mental capital and wellbeing will necessarily be dependent on the effectiveness of the kind of evidence-based

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450 See Chapter 3

451 See Chapter 4

452 See Chapter 6

interventions suggested in this report. However, there may be interdependencies and interactions between the various policy areas and interventions identified in the Project; these need to be considered when assessing the costs and benefits of individual measures.

For example, improvements in adult learning and better handling of learning difficulties may influence the incidence of mental illness and the success of treatment programmes, as well as increasing the success of ICT programmes for older adults. Low basic skills may reflect a variety of social factors and mental health states, e.g. deprivation and depression, as well as specific learning difficulties. These interdependencies are among the reasons why available research in these areas has often been unable to quantify impacts and establish causation for the poor economic and other outcomes associated with mental ill-health. They suggest potential interactions between interventions in this area, and hence a possibility that the beneficial impacts of a package of measures in different policy areas would prove different (in either direction) from the sum of the effects for individual measures.

#### 7.3.4 Who intervenes, and who benefits

Improvements in some areas of policy appear to offer win-win situations for individuals or private companies, suggesting that relatively little Government intervention might be needed. For example, greater take up of possible opportunities for adult learning and improvements in workplace conditions might be examples of improvements in mental health and mental capital that are associated with financial benefits rather than costs for those concerned. However, information failures and transactions costs can often inhibit such improvements, in just the same way that not all people invest in financially beneficial measures to improve energy efficiency. In such cases there may be a pay-off for low-cost Government measures to improve awareness and provide low-level incentives.

Nevertheless, the Government should not fall into the trap of thinking that if the private sector bears the bulk of the costs of particular measures to improve mental health, these are therefore particularly worthwhile. They may enable Government departments to implement more measures within the budget constraints which they face, but they still need to be subject to proper scrutiny of net benefits, allowing fully for private sector implementation and other costs, and assessment of wider benefits.

As already noted, many benefits of potentially worthwhile interventions are reflected in economic benefits which *increase* Government revenues: in some cases, for example in the treatment of depression, these far outweigh the public spending involved. Government needs to be sufficiently flexible in determining its spending plans to allow for such benefits, if sub-optimal decisions on priorities are to be avoided.

#### 7.3.5 Using the science and evidence of MCW to inform governance

Government could improve mental capital and wellbeing across the lifecourse by systematic use of the extensive scientific and other evidence exposed in this Project. For example, they could be used to inform and strengthen the design of PSAs, or their successors. Also, there is a range of current and future cross-cutting work programmes in Government, such as that on social mobility, which would be well placed to absorb the findings of this report. Further, with regard to inter-generational issues, there are opportunities for major current and future departmental initiatives which are focused on the one hand on children and families, and on the other on the ageing population, where important synergies and their implications could be exposed and acted upon. This would have implications for inter-departmental working.

The pervasive impacts of socio-economic, cultural and environmental conditions on mental capital and wellbeing have been highlighted in various scientific reviews for the Project. They demonstrate the need to widen the range of circumstances in which factors affecting mental health and mental wellbeing are taken into account in: economic appraisals of public sector policies and projects; and in guidance and regulation of relevant private sector activities. However, in both cases, more evidence is required to do this effectively.

One way in which this can be done is by funding research which addresses these needs. In particular, methodologies for assessing impacts in economic appraisals need to be developed further. Additional information is needed on: the costs and benefits of any potential new measures affecting the private sector; and more generally the actual impacts, as opposed to the potential benefits, of interventions of the kind considered in this Project. NICE already assesses some of the economic and wellbeing-related impacts of mental health treatments, but impacts on care costs and families and other wider economic effects also need to be taken into account. In the next section, we turn to priorities for research.

## 7.4 Research

This section looks across the findings of the Project and suggests a small number of priority areas for research. In some cases, these suggestions reinforce the importance of existing research programmes. However, in others, new research is needed: by strengthening existing programmes; or through a new integrated research programme.

First, however, a general comment. Despite the extensive review of scientific and other evidence base within this Project, there remain many uncertainties about the cost-effectiveness of many prospective interventions relating to mental capital and wellbeing. This is inevitable in such a complex and broad area. Thus:

- Wherever practicable, there is a need to subject proposed interventions to rigorous economic appraisal, so that the expected balance of costs and benefits can be determined.
- Evidence for the efficacy of a range of interventions identified in this report is incomplete. In such cases, the implementation of new interventions may require a careful step-by-step approach involving the use of trials to clarify uncertainties and advance understanding. The development of this approach which generates “practice-based evidence” may require commitment and support at senior level.
- There is a need for thorough evaluation of existing and new interventions. Evaluation procedures should always be built into trials and subsequent roll-out.

### 7.4.1 Longitudinal cohort studies

High-quality evaluation and research in this area frequently requires good quality longitudinal data to enable the effects of risk factors and interventions to be tracked over the lifecourse; this will be seen repeatedly below. However, currently there is a shortage of suitable data. This is partly because longitudinal data are more expensive to acquire than cross-sectional data. Also, funding constraints are limiting development of existing surveys and instigation of new ones.

Government should consider updating and strengthening the centrally-managed cross-Government strategy for the funding, collection and analysis of longitudinal data. To be

most effective, these longitudinal studies would need to be long-term; the Project has consistently shown that the effects of many factors on MCW can take place over many years or even decades. There could also be substantial added value in undertaking long-term cohort studies on an EU basis: comparisons between countries could help in separating out the effect of important socio-economic factors.

#### 7.4.2 Flourishing: how to optimise mental capital and wellbeing through life

Improving mental capital and wellbeing through the lifecourse is essential if people are to be able to realise their potential and flourish. However, our understanding of the factors which enhance or deplete people's mental capital and wellbeing is limited in many critical areas. Research is needed to generate better evidence for policy-makers. In particular, an important objective should be to distinguish between correlative and causative relationships amongst different factors thought to influence MCW.

A longitudinal cohort approach is one way of achieving this (drawing on Section 7.4.1 above). This could entail following a particular age group, for example, children. However, to maximise the benefit of the research across the population, there is a strong case for studying people at a range of ages: for example, someone who is 50 years old today will have different socio-economic and educational experiences to a 50-year-old in, say, 2050, so the factors that are important for the two individuals may differ.

#### 7.4.3 Understanding developmental mechanisms

The Project has emphasised the importance of early environments and of understanding the developmental mechanisms at work in them, both for learning difficulties and for creating a disposition to learn. Multidisciplinary longitudinal studies involving genetics, neuroscience and behaviour are needed to deepen our understanding of causes and effects, and to inform improved screening for difficulties and the quality of interventions. Studying basic sensory processing across typical and atypical development is likely to improve our understanding of co-morbidities (why some children have more than one learning difficulty). Intensive study of children who do not respond to intervention may also yield important insights, as may the identification of biomarkers for learning difficulties.

#### 7.4.4. Understanding risk factors for mental disorders and learning difficulties

Analysis of a wide range of evidence in this report shows the critical importance of prevention, early detection and treatment of mental disorders and learning difficulties. In particular, there is a pressing need to gain a better understanding of the mechanisms of causation for specific risk factors.

There is a strong case to establish a sustained cross-Governmental programme of longitudinal qualitative and quantitative studies, to include national surveys of mental health covering both positive mental health and mental ill-health, (using cognitive, biological and genetic markers), as well as causes and consequences in all sectors. These studies would consider the general population as well as important vulnerable groups for example, prisoners, looked-after children, carers and the homeless. The programme should promote the linkage of administrative records and neighbourhood and community indicators, to individual and household survey data. This would enable longitudinal trends to be monitored, and the assessment of impacts of Government policies on issues such as social inclusion and debt management. It would also seek to answer important questions such as those concerning children exposed to environmental pollutants or hazards, and outcomes of young abusers of alcohol or drugs.

#### 7.4.5 Biomarkers

It is crucial that key stakeholders and funders of research cooperate with researchers to prioritise the development of biomarkers (see Appendix C). This is important to improve diagnosis of disorders, and to promote the development, trial and use of new treatments.

Particularly important targets for biomarkers include:

- Biomarkers for learning difficulties in children (see Chapter 3).
- Biomarkers for depression (see Chapter 4).
- Biomarkers for Alzheimer's disease (see Chapter 6).

To be most effective, this research would need to be planned in association with those who are developing treatments – as discussed in the following section.

#### 7.4.6 New approaches to the prevention and treatment of mental disorders

There is a need for randomised control trials to determine the cost-effectiveness of universal prevention of mental disorders in children and adults, and to determine the appropriate balance between prevention and treatment services. Also, for prevention, cost-benefit modelling should investigate the appropriate balance between interventions that are universal (for the whole population), selective (for certain demographic groups such as women, people at work), and indicated (key vulnerable groups such as lone mothers, prisoners and looked-after children).

New medications are needed to fill identified gaps in treatments for major disorders, including: anti-psychotics (greater efficacy, benefits on cognition, fewer side effects); antidepressants (greater efficacy); mood stabilisers (greater efficacy, fewer side effects); neuroprotective agents for Alzheimer's disease; improved approaches for addiction; longer-acting oral formulations; and novel rather than “me-too” drugs. There is also a need for further research to develop more effective and safe cognitive-enhancing drugs for the cognitive symptoms of many of the neuropsychiatric disorders and for brain injury. In addition, studies are needed on combinations of treatment modalities, including psychological therapies, pharmacotherapy, and social (e.g. employment, education, relationships) recovery interventions.

#### 7.4.7 New technology and its impact on people's mental capital and wellbeing

New technology has been considered in many parts of the Project, for example: for learning; for addressing learning difficulties; for new ways of working (such as virtual environments); and for social networking, for example in older adults. There is a strong case for giving priority to research that would assess the potential uses of such new technologies through the lifecourse, and its impacts on individuals, families (e.g. parent-child relations), and in the work and learning environments.

#### 7.4.8 Personal responsibility through the lifecourse

Several parts of the Project have identified a range of skills, attitudes and behaviours as crucial for an individual to flourish and prosper within society in the future. They include: executive function skills to enable people to control their own behaviour; the disposition to learn, train and retrain through the lifecourse; resilience skills to cope with stress and life events; the importance of fostering wellbeing; and attitudes and behaviours to promote a healthy lifestyle and protect against decline in old age. These

can generally be considered as life skills that would enable the individual to take control of their own development, emotions, and path through life.

A programme of research is suggested to investigate systematic relations between these skills, to determine how they can best be developed, and placed in the context of their possible use and benefits through the lifecourse; for example by adopting an inter-generational focus and using both quantitative and qualitative outcome measures. Importantly, the focus of this research programme should be informed by, and linked to, any long-term cross-Governmental strategy on mental capital and wellbeing that results from this report.

#### 7.4.9 Extending the Foresight approach – to regions and beyond the UK

The Project has taken a national view. However, many of the factors that affect mental capital and wellbeing differ substantially between different areas of the country – for example, wealth, the work available in the locality, demography, local cultures and cultural attitudes. There is therefore a strong case to extend and adapt the work of this Project to inform local policies and initiatives<sup>453</sup>.

#### Key messages

Developing and implementing effective and sustainable strategies for optimising mental capital and wellbeing will present significant challenges for policy-makers. Consideration of these should underpin decision making:

- Some decisions may have very long-term effects. It will therefore be important to take a clear view of how society's expectations and values may evolve; and to ensure sufficient flexibility to respond to change.
- Where possible, decisions should be taken on the basis of a rigorous assessment of cost and benefits. But some important benefits may not be easily or fully captured by standard cost-benefit analysis. Aspects of wellbeing, social cohesion, and social equity are examples; it will be important to take a view of the importance of these as compared to purely economic benefits.
- For some interventions, there is already a strong economic case. However, for others, the situation is more complex: for example, when the benefits are spread across many decades, across society, or across the interests of many Government departments. The development of new economic measures should be considered in such cases.
- Some decisions may be difficult to implement with existing systems of governance; however, keeping these unchanged will not be zero cost: both the decisions and their implementation could then be sub-optimal.
- Whilst developments in science have been substantial, many uncertainties inevitably remain. A cornerstone of any strategy should therefore be to build further upon our understanding and evidence base – particularly by strengthening the centrally managed cross-Government strategy for the funding, collection and analysis of longitudinal data.

<sup>453</sup> It was remarked in Chapter 6 that this is already intended in the North East for issues affecting older people.

## **8 Conclusion – next steps for Government**

**8.1 The critical importance of our mental capital and wellbeing**

**8.2 Meeting future challenges and opportunities: a roadmap for action**

**8.3 Concluding remarks**



## **8 Conclusion – next steps for Government**

This chapter looks across the report and draws out the major implications for Government. In particular, it identifies what needs to be done to translate the findings into a long-term integrated approach that would enable the greatest possible benefits and savings to be realised. Detailed interventions are not considered, as they have already been discussed in the preceding chapters.

## 8 Conclusion – next steps for Government

New advances in science have transformed our understanding of the diverse factors that affect mental capital and mental wellbeing through life. This report has drawn upon these developments to identify the considerable opportunities and challenges facing the UK over the next 20 years and beyond, and to assess how they might be met. In so doing, it has taken a broad perspective to provide new thinking.

However, scientific analysis by itself is not enough. The substantial savings and diverse benefits that could result from this report will only be realised if the findings are translated into pragmatic and practical action. Drawing on Chapter 7, this chapter summarises the next steps that Government could take to help achieve these important goals.

The emphasis here is on action at a cross-Governmental and strategic level. Individual interventions are not discussed in detail as these they have been considered in preceding chapters, and can be assessed by Government departments and their experts in a relatively straightforward manner: in fact, this consideration has already begun; the Project findings have begun to inform a range of current Government initiatives, as illustrated in Table 8.1<sup>454</sup>.

### 8.1 The critical importance of mental capital and wellbeing

This report has highlighted the vital importance of mental capital and mental wellbeing for everyone – affecting each person's path through life. Moreover, it has shown that they are vitally important for the healthy functioning of families, communities and society. Together, they affect behaviour, social cohesion, social inclusion, crime and prosperity.

Important drivers of change have been identified which will affect the UK over the next 20 years and beyond. Some will make demands on our mental capital, requiring new skills and expertise. Some will create substantial threats to our mental health and wellbeing. And some will offer new opportunities for people to learn, develop and flourish (see Chapter 1 and Table 8.2 which provides a summary).

Assessing how to manage these opportunities and threats has been a key aim of this Project. Here, it has been shown that policies and choices need to address both *positive* and *negative* aspects of mental capital and wellbeing. For example:

- Learning difficulties are conservatively estimated to affect about 10% of children and can profoundly affect their outcomes in life.
- Common mental disorders such as depression and anxiety are estimated to affect about 16% of the adult population, and 40-50% in highly vulnerable populations. Moreover, estimates for the economic costs range from £49 billion per year in England, to £77 billion (when wider impacts of wellbeing are included).

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<sup>454</sup> Further details of these can be found in the Project Stakeholder Engagement document, available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

Conversely:

- Positive mental health embodies vital personal resources such as the ability to develop and sustain satisfying personal relationships and the ability to cope with adversity (resilience). It also contributes to a person's capacity to contribute to their family, communities and society at large.
- The opportunities offered by learning through life can transform people's prosperity and wellbeing into old age.

Table 8.1 Examples of Government initiatives that are already being informed by the Project		
Part of Government	Initiative	Engagement
Cabinet Office Strategy Unit and relevant lead Government Departments	Childcare and Families	The Strategy Unit and others in central government, including HM Treasury, have drawn upon Project science evidence papers and emerging findings, shared ahead of publication, to develop their analysis of strategic issues in these areas
	Economic Prosperity	
	Life Chances	
	Health Team	The Project emerging findings have informed ongoing work, particularly in the areas of improving health and wellbeing at work, and older people's services
Department for Work and Pensions/Strategy Unit/Department of Health	Strategy for an Ageing Population	The Project science evidence base and emerging findings have informed the initial analysis and scenario-building work
Department for Work and Pensions/ Department of Health	Government response to the Dame Carol Black Review of the health of Britain's working age population	The emerging Project findings, shared ahead of publication, are informing this work
	Mental Health and Employment Strategy	The Project has informed strategy development work through the sharing of emerging findings and the lead Project expert's membership of the Strategy High-level Steering Group

Table 8.1 Examples of Government initiatives that are already being informed by the Project (continued)		
Department of Health	Dementia Strategy	The emerging Project findings, shared ahead of publication, have contributed to the development of the National Dementia Strategy, which is due for publication in November
Department for Children Schools and Families	Child Health Strategy	The Project has shared its science evidence base and emerging findings
	Various	DCSF has welcomed the resonance of the Final Project report with its ongoing work on children's health and wellbeing; the role of families; the review of the primary curriculum; and the review of the child and adolescent mental health services. It will consider the report's findings as it takes forward these areas of work
Department for Innovation, Universities and Skills	Wellbeing Strategy	The Project findings have provided a central input to the development of the Department's internal strategy on wellbeing
Cabinet Office	Internal work and wellbeing issues	The Project lead expert on wellbeing and work has input Project science evidence and findings into internal work on wellbeing issues

**Table 8.2 Major drivers of change affecting the UK in the future****The demographic age-shift<sup>455</sup>**

Increasing life expectancy will create two major challenges:

- How to ensure that growing numbers of older people maintain the best possible mental capital, and so preserve their independence and wellbeing. Dementia will have major impacts on individuals, carers and families, though mental disorders such as depression and anxiety will also be important.
- How to address the massive under-utilisation of the mental capital of older adults, and how to reverse the continued negative stereotyping of older age.

**Changes in the global economy and the world of work<sup>456</sup>**

- Economic growth in countries such as China and India, new technologies, and globalisation will continue to present major challenges to business, and to our increasingly knowledge- and service-based economy.
- Skill levels (both high and low) in the UK workforce will be critical to competitiveness and prosperity, and to their ability to compete in the global market for skills.
- Demands for increased competitiveness will combine with changing family commitments, such as the two earner family and increased need to care for the elderly. They will have major implications for work-life balance and the wellbeing of workers and their families<sup>457</sup>.

Overall, a major challenge will be to balance the demands of increasingly intensive work, whilst preserving and nurturing wellbeing.

**The changing nature of UK society**

The evolving mix of cultures, changing family structures, and changing patterns of migration, will drive the need to connect better across cultural groups and across generations. Several aspects of mental capital and wellbeing could contribute: learning through life; new approaches to flexible working at work; and encouraging the involvement of older people in intergenerational activities<sup>458</sup>. Success could create a virtuous cycle of opportunity, social inclusion and social cohesion. However, inequality of opportunity could fuel a cycle of tensions between different groups in society.

**Changing attitudes, values and expectations of society**

We increasingly expect more from life than living healthier and longer; “wellbeing” has become one of today’s buzzwords. A major issue will be to decide on the values and expectations that we are aiming to meet; and determining the balance of responsibility for action – between the state, employers, families and individuals<sup>459</sup>.

455 See Chapter 6

456 See Chapter 5

457 See Chapter 2, section 2.5

458 See Chapters 5 and 6

459 See Chapter 7, section 7.1

Table 8.2 Major drivers of change affecting the UK in the future (continued)

**The changing nature of public services**

The trend in recent years has been towards a model of public services based on greater levels of personal choice, active citizenship, personal responsibility, and “co-production”. To work most effectively, these models of service/client relationship will require the greatest number of the public equipped with the mental capital and disposition to participate. This calls for an ambitious policy approach that aims to foster mental capital and wellbeing across the whole population.

**New science and technology**

These will create substantial opportunities for improving how we develop our mental capital and promote mental wellbeing, e.g. in addressing learning difficulties and mental disorders; new technology for learning enabling the personalisation of education; and new information and communication technology enabling people to flourish by changing how we socialise, work and learn. However, a major challenge will be ensuring equality of access to the benefits, so that the new technology reduces rather than widens social inequalities.

**8.2 Meeting future challenges and opportunities: a roadmap for action**

The full benefits offered by this report cannot be realised by a piecemeal approach by individual parts of Government. Instead, a step change in both social and economic outcomes could be achieved through a more strategic and visionary approach involving:

- Better use of scientific and other evidence to prioritise and link interventions that affect mental capital and wellbeing through the lifecourse.
- Better use of economic analysis to allocate resources more effectively across departments.
- New approaches to governance, to enable spending departments to be incentivised to work together to deliver within a common framework.

Realising those greater benefits will not be easy. Chapter 7 has shown that there will be substantial difficulties that would need to be overcome, particularly relating to the three areas listed above. For this reason, the following suggests a number of practical steps that constitute a roadmap for further action:

- a. *There needs to be a high level commitment and lead in Government to oversee the development and effective implementation of this new approach.*

This will be vital to integrate policies and interventions effectively across the lifecourse, and across the interests of delivery departments. It will also be important to mesh this over-arching approach with the many existing initiatives and policies. The intention would be to bring the many existing initiatives together within a common vision and framework, to reassess the balance of priorities, and to identify and address gaps.

***b. Government needs to act now to prepare society for future challenges, and to prevent problems affecting individuals becoming long-term<sup>460</sup>.***

For example:

- We need to prepare today's children so that they are set on the best possible trajectories to meet the challenges ahead. The early years of development are critical.
- In some areas where the situation is set to worsen, such as the growing number of older people at risk of dementia and cognitive decline, we need to act decisively; protective lifestyles need to be established now for those in middle age.
- We need to address problems affecting people's mental capital and wellbeing (e.g. relating to learning difficulties and mental health), so that they do not become entrenched and so that we avoid their impact over coming decades.

***c. The new strategic approach needs to be informed by an early debate to decide its breadth, and the values and expectations of society that it will seek to address<sup>461</sup>.***

For example, issues such as the balance of roles and responsibilities between the State, the individual and employers will be important. Also, there is a case for Government to engage with the wider society to agree priorities. For example, it will be important to be clear about the relative value of issues such as economic prosperity, wellbeing, social cohesion and inclusion, so that clear principles for the division of resources can be determined.

***d. Work should be commissioned to provide economic assessments of potentially worthwhile interventions<sup>462</sup>.***

This will be crucial so that benefits of policies and interventions are maximised – both across society (for example, to include the impacts on carers and business), and across the lifecourse. This may require the development of new economic evidence relating to the societal values and expectations that the strategy will seek to address.

***e. New ways of incentivising Government departments need to be worked out, so that effective and sustained action results<sup>463</sup>.***

In particular, it will be important to build upon the existing Public Sector Agreement framework to better address the issue of a given department resourcing interventions that address the priorities and interests of other departments.

***f. Where possible, the development and implementation of the new approach should be inclusive.***

This suggestion recognises the trend towards more active citizenship. A particular example concerns older adults: they should play a central role in developing and implementing the components of the strategy that affect them.

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460 See Chapters 3 – 6

461 See Chapter 7, Section 7.1

462 See Chapter 7, Section 7.2

463 See Chapter 7, Section 7.3

- g. A mechanism should be adopted to oversee the rigorous use of science and other evidence.*

This will be important to inform choices made within the new approach; and to promote the effective use of economic analysis and randomised control trials to assess interventions.

- h. When new policies and interventions are developed for optimising mental capital and wellbeing, their implications for social equity and social inclusion should be systematically assessed.*

For example, the promotion of mental capital and mental wellbeing could be used explicitly as a tool to reduce divisions and exclusion in society. However, it could have the opposite effect if only certain groups were able to benefit. Access to new technology for learning is a clear example: if available to all, it could unlock opportunities for the disadvantaged, but if only available to the privileged, it could widen social divisions.

- i. There should be a long-term commitment to build upon the existing science and evidence base, and to address areas of uncertainty in understanding.*

Since the new approach and its implementation would be founded upon the scientific and other evidence, addressing gaps and uncertainties will be important. Specific areas of further research have been suggested. However, a strategic need that cuts across Government would be to update and strengthen the long-term strategy for large-scale, longitudinal studies.

### **8.3 Concluding remarks**

When a Foresight project is started, it is not known where the scientific and other evidence will lead. Here, it has provided a vision of a future that is beset with many major challenges and uncertainties. As has been shown, everyone will be affected, from conception through into old age; and the implications will pervade every level of society: individuals, families, business and wider society.

Two consistent themes have emerged throughout: on the one hand the considerable vulnerability of our mental resources and mental wellbeing to those challenges, but on the other hand, the potential of those very same resources to adapt and meet those challenges, and indeed to thrive. Therefore, because of the central importance of mental capital and mental wellbeing to the future of individuals and the country, this Project has shown that together, they should have a strengthened place at the heart of policy development in Government.



# Appendix A: Experts and stakeholders involved in the Project

The Government Office for Science would like to thank the members of the Project's Science Co-ordination Team for overseeing all the technical aspects of the project; as well as the many other experts and stakeholders who have provided advice and who have contributed to the work. These are listed below. In addition, we are grateful for the informal advice that we have received, in particular from officials across Government.

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<sup>464</sup> Professor Cary Cooper is a Director of Robertson Cooper Ltd, a University of Manchester spin-off company working in the field of organisational health and wellbeing. He is also President of the British Association of Counselling and Psychotherapy and of ISMA. He is also patron of the National Bullying Helpline, and an ambassador for the Samaritans.

<sup>465</sup> Professor Barbara Sahakian consults for several pharmaceutical companies and for Cambridge Cognition. She also has shares in CeNeS.

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Professor Sir David King	Former Government Chief Scientific Adviser	Formerly of the Government Office for Science
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Dr Ken Boston	Chief Executive	Qualifications and Curriculum Authority
Mrs Anita Charlesworth	Former Director, Public Services	Formerly of HM Treasury
Mr Simon Denegri	Chief Executive	Association of Medical Research Charities
Professor Ian Diamond	Chief Executive	Economic and Social Research Council
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Mr Peter Horn	National Director	Care Services Improvement Partnership
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Ms Emma Lindsell	Head of the Health Team	HM Treasury
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Ms Margaret Salmon	Former Chief Executive	Formerly of the Sector Skills Development Agency
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Professor Catherine Peckham, CBE	Professor of Paediatric Epidemiology, Institute of Child Health	University College London
Ms Melanie Pitt	Health Spending Team	HM Treasury
Professor Cathy J. Price	Professor of Cognitive Neuroscience, Wellcome Trust Centre for Neuroimaging	University College London
Mr Andrew Price	Skills PSA Delivery Unit	Department for Innovation, Universities and Skills
Mr Hugh Pullinger	Head of Older People and Ageing Society Division	Department for Work and Pensions
Mr Wolf Reik	Head of Laboratory	The Babraham Institute
Mr Simon Ridley	Team Leader, Education, Children and Culture Team	HM Treasury
Dr Deborah Rutter	Research Manager	Care Services Improvement Partnership
Professor Tom Schuller	Director of the Independent National Inquiry into the Future of Lifelong Learning	National Institute of Adult Continuing Education
Professor Jim Stevenson	Emeritus Professor	University of Southampton
Professor Robert Turner	Director	Max Planck Institute for Human Cognitive and Brain Sciences, Germany
Ms Anita Wadhawan	Private Secretary to Professor Louis Appleby	Department of Health
Mr Stephen Witt	Research and Reviews Team, Strategic Analysis	Department for Children, Schools and Families
Professor Daniel Wolpert	Professor of Engineering, Cambridge Neuroscience	University of Cambridge
Dr Kenneth R. Wood	Deputy Managing Director	Microsoft Research Cambridge
<b>Government Office for Science</b>		
Professor Sandy Thomas	Head of Foresight	
Ms Jane Mardell	Deputy Head of Foresight	
Mr Robert Bernard	Project Coordinator	
Dr Wahid Bhimji	Project Manager	
Mr Derek Flynn	Project Leader	
Ms Jane Hoy	Former Project Manager	
Ms Jane Jackson	Strategy, Policy and Finance Adviser, Foresight	
Dr Hannah Jones	Project Manager	
Ms Sheila McCreary	Former Project Manager	
Ms Neha Okhandiar	Communications Manager, Foresight	
Mr Michael Reilly	Research and Knowledge Manager, Foresight	
Mrs Anjum Shah	Executive Assistant	

# Appendix B: Future scenarios

A fundamental issue for any futures project is how to explore future uncertainty. As mentioned in Chapter 1, one of the futures techniques used in the present Project has been to develop three alternative 'future scenarios'.

It should be stressed that the purpose of these scenarios has not been to predict the future of mental capital and wellbeing in the UK, nor to suggest how present policies might change in the future. Instead, all three are designed to be equally plausible, and they have been used to explore how the challenges associated with how mental capital and wellbeing could evolve in the UK in different ways. They also constitute a tool that stakeholders could consider using to assess the robustness of choices and interventions against future uncertainty.

This appendix briefly outlines the basis of the three scenarios and presents three vignettes that have been written to illustrate their content. These are only intended to provide a flavour of the three: a more detailed description of the scenarios and the rationale for their construction will be available through [www.foresight.gov.uk](http://www.foresight.gov.uk).

## B.1 The basis of the scenarios

The scenarios are constructed around the following principles:

- They are intended to be 'policy neutral' as far as possible i.e. they should not assume particular policies for mental capital and wellbeing being substantially changed or introduced.
- None of the scenarios are intended to encapsulate a society that was 'better' or 'worse' than the others – each embodies desirable and less desirable characteristics.
- They are formed around a combination of three factors that were chosen to be both important to the future of mental capital and wellbeing in the UK, but which could evolve in uncertain ways – 'critical uncertainties' (see below).
- The scenarios are set around 2020 in the UK.

The three critical uncertainties are:

1. **Impact of science and innovation.** This is affected by a range of factors such as: the speed of advancement of science; public attitudes concerning its use; its level of penetration in daily life; and also the intent behind the technology (e.g. protection or treatment).
2. **Perceived security of the external environment.** This broadly captures the extent to which the world in which people live is perceived to be safe and secure, and the extent to which people feel they have control over their own lives. This particularly influences mental wellbeing.
3. **Lifecourse perspective in UK society.** This reflects the extent to which society emphasises and supports particular age groups (e.g. children or older adults), or instead aims for a more equitable approach across the lifecourse. Such values have potentially profound impacts on a range of environments: work, leisure and education.

Each of the three scenarios is based on different outcomes for each of the above. The three are:

**A. 'Rock, scissors and paper':**

Impact of science and technology	HIGH
Perceived security of external environment	HIGH
Lifecourse perspective	WHOLE LIFE

**B. 'Metaverse 2020':**

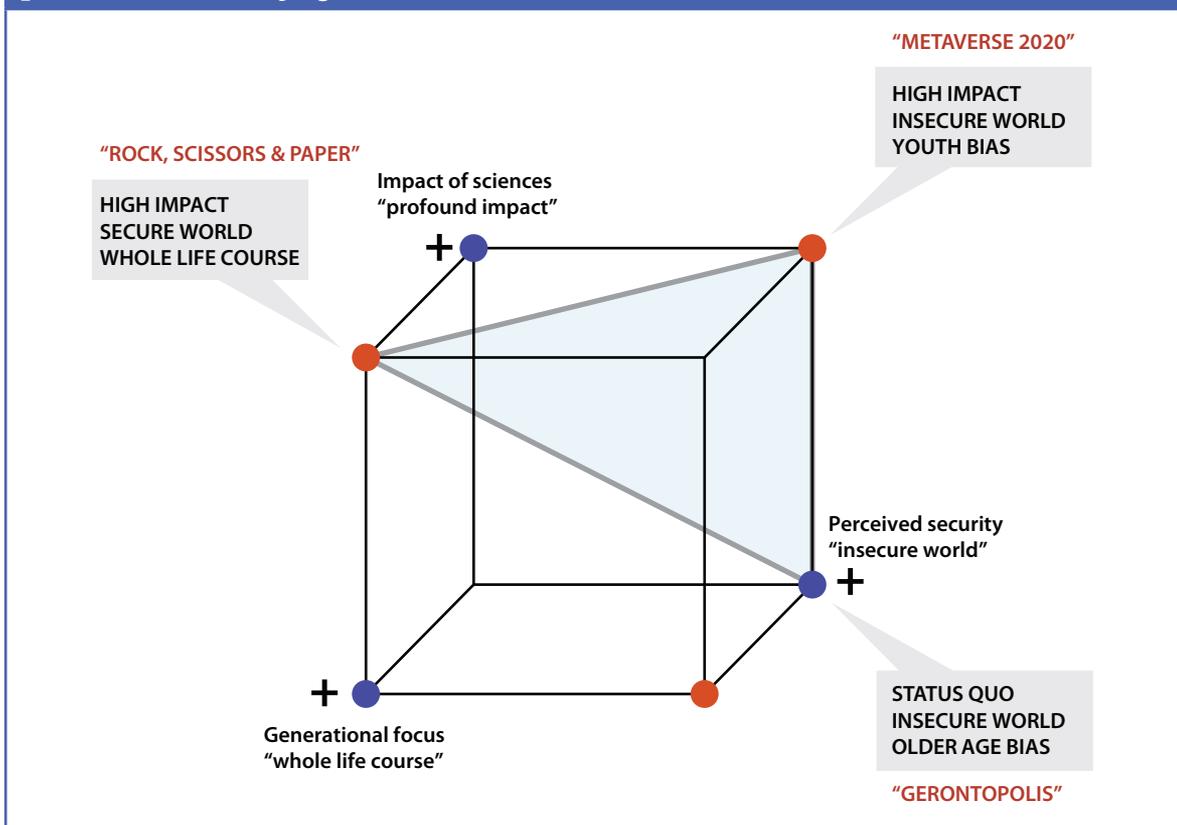
Impact of science and technology	HIGH
Perceived security of external environment	LOW
Lifecourse perspective	YOUTH BIAS

**C. 'Gerontopolis':**

Impact of science and technology	STATUS QUO
Perceived security of external environment	LOW
Lifecourse perspective	OLDER AGE BIAS

Figure B.1 shows the position of the three scenarios in a future "possibility space". Also, in order to illustrate the three scenarios, the following sections (B.2 – B.4) provide narrative vignettes for each.

**Figure B.1: The position of the three chosen scenarios in the future "possibility space" formed by the 3 key uncertainties: impact of science, perceived security, generational focus**



## B.2 Rock scissors and paper: narrative vignette

“It’s 9:30am and I am watching my 10-year-old daughter as she is intently contemplating a 40” screen. Her teacher is annotating a series of arithmetic exercises Sarah has just submitted. ‘Going to school’ has actually become a quaint expression for the diversified activity of building knowledge and skills. Sarah spends her time learning a wide range of things in a variety of settings: she has three personal tutors (Miss Sally for language, Miss Deborah for arithmetic and Nigel for her violin lessons); she is a member of two learning clubs; and takes online Illustrator classes. I’ve also encouraged her to sacrifice her Saturday mornings to help out at a local meeting centre for older adults. Not only does it add credits to her ‘samaritan account’ (from which she will be able to withdraw care when she’s old), she also hears plenty of good stories.

Sarah’s experience is typical of the fluid, slightly messy existence that many from all ages have gravitated towards. The linear, institutionalised conception of schooling, of career and indeed of life in general, has given way to a much more personal mix of choices, environments and experiences. It is also much more entrepreneurial.

It has not been a smooth ride. We’ve had our share of trouble. Around 2012, climate change started to wreak havoc all over the place. Institutional actors did not respond effectively. But people started to build houses, villages and later on, complete cities on water. That’s the spirit of our times: self-reliant, entrepreneurial, pragmatic. Most of us are resigned to the fact that it’s a jungle out there. One just has to live with that. We’re never going to understand it; we’re never going to control it. So, it’s about being responsive and about going with the flow. And I don’t think we’re worse off for it.

I’m now working mainly as a freelance computer graphics designer. I’m doing some teaching and tutoring of young designers on the side. And I’m running a little gallery selling my own as well as some of my students’ personal work. However, I’m keeping my professional commitments in check. We’re in it for the long haul. Given that I have a reasonable chance of living to 100, I want to stay sharp, if at all possible, until the very end. Life has become more of a continuum: it’s an evolving mix of work and non-work from very early on to very late in life. It’s a bit like the children’s game of rock, scissors and paper. Adolescence, adulthood, old age: none is really dominant.

One has to take responsibility, of course: Sarah and I stick to a low calorie-diet, my iMove office chair gently takes care of the surplus on my energy balance sheet and I submit to regular cardio-vascular, cancer, dental and brain checkups. That’s one of the things one has to learn to live with: one always has an eye on a dashboard, whether it is related to personal health, to domestic energy consumption, or to the myriads of financial accounts in the various overlapping networks one is part of.

Yes, life has become a good deal messier, for all of us. Work, relationships, financial resources, generations and geographies have all become more amalgamated. It’s not hard contractual arrangements that keep everything together; but the softer bonds of peer-pressure.

Big business and big government are still around, of course, but there is much less organisational activity carried out within them compared to the beginning of the century. And even these big organisations have had to adjust a lot, to convince talented people to work for them.

Storytelling has also resurfaced as an important glue. Many of us chronicle our whole life in MyLifeBits; capturing events, conversations, sounds and images via our SenseCam

and adding those to digital detritus such as mails and blogs. Not only is it a great memory stimulant, it also helps me to keep track of people and of the way I spend my time, and it gives me fresh material for my 'life book'."

### B.3 Metaverse 2020: narrative vignette

"My father started to be really worried when he didn't find his daily newspaper on his doorstep anymore. He had become so used to the intimate crackle of his printed copy of the *National Herald* that the decision to keep only the (paying) virtual news channel came as a profoundly disagreeable shock. From an economic point of view it was not a difficult decision, of course. Online readership had already topped circulation of the print edition in 2009. Myriads of online advertisement channels had been steadily chipping away at revenues. And by 2013, only 23% of the subscription base, most of them 60 and older, were asking for a hard copy. And so they put the presses to a halt.

This has been just one in a long series of poignant anecdotes, showing how the older generations are getting progressively disconnected from what is happening in the world. With each successive generation of the internet, an age cohort has been left behind, oblivious of the vast potential offered by the new technology. The ninety-somethings who are still around today probably never sent an email. Those around age 75 – my father being amongst them – are managing their bank affairs online but have hardly exploited the internet's potential for building social networks and for learning. Those 15 years my senior may have been blogging, photosharing and chatting for three decades, but they never really caught on to the idea of creating avatars to colonise virtual worlds. Older adults tend to see Second Life as a kind of game, or worse, as a consensual hallucination ('an infantile load of rubbish', as my father grumbles), whilst the younger generations consider it a communications technology, just like the telephone. Except they don't communicate by voice, but by shared experiences.

I'm 43 myself, and I'm trying hard to hang on to what's happening in 3D-internet. I'm still attached to our old flat computer screens but today's youngsters, stereoscopic iMerse glasses perched on their noses, spend more time 'flocking' in one of the hundreds of virtual worlds of the Multiverse, socialising, performing, learning, gaming, making money, or just pleasantly wasting their time. Second Life, the oldest of these worlds around, currently has 700 million subscribers and around 0.3 million square miles of real estate under management.

The lure of these virtual worlds is understandable. Many feel like an eternal garden party. Outside, in the real world, it seems more of a mess. The climate has turned really nasty, the planet's scourged by geopolitical strife and conflict, gangs roam the streets of our cities. Second Life, on the other hand, is simply beautiful: avatars are above-average handsome, nobody suffers from disabilities, the weather's gorgeous, and we have four stunning sunsets a day. There's real money to be made too, and in a much more congenial environment than in real life. Nobody bosses you around; the sky's the limit, really. The Metaverse economy is now set to eclipse Earth's economy in less than 10 years' time.

The gap between the pre-Metaverse and post-Metaverse generations is quickly widening. The older generation sees its opportunity space shrinking every day. They complain that big swathes of society have stopped caring about the real world. It's more than just a difference in internet proficiency: a deep cleft in values is fracturing society. Parents see their children slipping away into their self-made, enchanting and

seemingly risk-free world. The young live vicariously, scorning cornerstone middle-class values of property, good looks and career.

Another rift has opened between the connected and the non-connected. In 2015 the electromagnetic spectrum was auctioned off to an oligopoly of just three media moguls. The dazzling, once-in-a-lifetime windfall profit for Government was a very welcome infusion of resources. But the net result was that commercial entities became the ultimate arbiter of who is admitted within the electronic gates of the Metaverse. Sadly, many of the country's poorest and least educated citizens have been left outside.

But can we blame Government for selling out to big business? Can we blame people for selling their souls to the Metaverse? Consider this: there is an avatar in Second Life that is powered by six adults, all residing at a day-care centre for physically disabled people in Manchester. They purchased an island, decorated it, started selling poetry: 'We feel like the rest of the world as we've never felt before'. When I tell this to my father, he just stares at me."

#### **B.4 Gerontopolis: narrative vignette**

"This is a simple tale of demographics. The end of WWII initiated a victory party that lasted 20 years and begot a very particular kind of human being: the so-called baby boomer. This populous generation was raised on television, popular music and a brazenly consumerist ethos. Exhausted by decades of hard work in the beehives of the increasingly global economy, this age cohort moved into the new millennium with the firm intention to make good use of its accumulated wealth. During the first decade of the 21st century, a large contingent of these front-end boomers (those born between 1946 and 1958) went into retirement. Indeed, not only the boomers were ageing. Society as a whole was rapidly growing older too. The effect of people living longer and having fewer children – well below the replacement rate of 2.2 per woman – was exacerbated by the size of the baby boomer generation. And so, today, in 2020, 65-year-olds are on the verge of overtaking the under-25s for the first time.

That is, in a nutshell, why we are living in a world today where playgrounds are much quieter than they used to be and classrooms increasingly empty, where symphony orchestras – rehearsing the familiar old repertoire – thrive, and where personal health coaches, nutritionists, therapists and financial planners swarm out to help the ageing boomers to deal with their fear of infirmity, death and pensions.

Not only is the over-65 cohort a receptive target for the wellbeing, security and cocooning industries, it has also developed into a very potent political force. The over-65s are numerous and they have shown themselves to be twice as likely to vote as the younger generations. Their consumerist ethos has spilled over into the political realm and so politicians find these voters notoriously fickle. Hence, pension and healthcare reform has been stuck in a rut for ages.

But the tide is turning. Older adults are losing their licence to indulge. The young increasingly resent the harsh working conditions in a knowledge economy that has to compete head-to-head with the brightest minds in Asia and Latin America. They have not been able to benefit from the generous pension arrangements of their older peers. Younger workers have been relegated to less generous schemes or none at all. Companies with huge pension deficits have been trying to cut benefits, a move fiercely resisted by pensioners but usually supported by existing employees wanting to hold on to their jobs.

For a long time the younger workers acquiesced because they were so caught up in their desire to catch up with the older members of society. However, the siren song of total commitment to an economically productive life as a prerequisite for a quiet, comfy old age is losing its spell.

More worryingly, when confronted with ever-increasing taxes, rising energy, food and property prices and a receding retirement age, they don't express their disenchantment in a ballot. The younger generations just pack their suitcases and leave the gerontopolis behind in search of a better deal. Sunny climes and lower taxes prove to be the main attractions for those moving abroad. Those that stay are often dispirited and feel mentally unwell to cope with the rigours of life.

A deeply disquieting atmosphere has settled over the country. Distrust pervades intergenerational relationships. The ageing boomers suddenly find themselves stuck on top of a crumbling cliff. Now is the time for the whole of society to reflect on a new deal to equitably distribute resources, power and opportunities across society."

# Appendix C: Biomarkers

A recurring theme throughout the Project has been the considerable potential of earlier and better detection of mental disorders, coupled with prompt action to manage their progression. Where current treatments are available (e.g. antidepressants for depression) this is particularly effective, but it is also important for future treatments such as neuroprotective agents for dementia. A key tool in our scientific armoury to help achieve this is the biomarker.

An international Round Table involving experts, stakeholders and business was therefore held in 2008 to review the state-of-science of biomarkers; to assess the potential for meeting the challenges of today and the future; and to debate what needs to happen to realise the greatest benefits.

The workshop focused on a range of biomarkers relevant to two disorders: depression (particularly because of its substantial and pervasive effect on society), and cognitive decline (recognising the growing importance of this as the population ages). This appendix presents the key findings.

## C.1 Biomarkers of depressive disorders

**Key messages:** In the UK, as many as one in six adults suffer a common mental disorder such as depression at any one time<sup>466</sup> and The World Health Organization (WHO) recognises that internationally, depression is the leading cause of years lived with disability. However, despite the prominence of depression in today's society, our understanding of the disorder is currently based upon description of patterns of behaviour and clinical symptoms. These are subjectively assessed by a psychiatrist using clinical guidelines or structured screening instruments to establish a diagnosis and severity. A more optimal understanding and diagnosis of mood disorders would incorporate the underlying neurobiology, featuring objective biological markers (biomarkers) that could be measured, for example, to confirm diagnosis, assess disorder characteristics (e.g. severity and likelihood of recurrence), and predict treatment response. Use of such tools would revolutionise the ways in which depressive illnesses are classified, diagnosed and treated, and therefore have enormous socioeconomic benefits to patients, Government and pharmaceutical industries. Realising this potential will require consensus between different stakeholders, and prioritisation in the development of biomarkers. Partnerships between Government, public and charitable funding agencies and biopharma could help to share the enormous cost associated with biomarkers and ensure that their development will be used to the benefit of all sectors of society.

Depression tends to be a chronic, relapsing disorder that severely reduces mental wellbeing. Patients can face many years of debilitating suffering and often have several major episodes of depression during their lifetime. At its worst, this can result in suicide – there are estimated to be 850,000 depression-linked suicides each year globally. As a consequence of these demographic characteristics, depression has considerable socioeconomic impacts; the direct costs of treating depression in England alone were estimated to be £370 million in 2000, but the actual cost of depression would have

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466 Bird (1999)

been much higher. For example, this figure does not include the 110 million days of incapacity benefit that were claimed as a result of depression in the same year, nor the unofficial reduction in productivity often associated with a depressed worker<sup>467</sup>.

There is evidence that depression is set to become a greater problem in the future. For example, depressive disorders may be appearing earlier in life in people born in recent decades compared to the past<sup>468</sup>. Despite the magnitude of the problems that depression causes in our society, there is still a lack of knowledge of the underlying neurobiological basis of the disorder, and how to best diagnose it and provide treatment. The reasons for these shortcomings are multifactorial. In addition to the sheer complexity of central nervous system cell biology, they include the lack of direct tissue accessibility to the brain, and the daunting fact that the neurobiology of human cognition and behaviour is currently understood to only a rudimentary level, meaning that our comprehension of cognitive-emotional disorders like depression is also limited.

Depression can take many forms, and can vary in its severity, duration and clinical presentation. Major depressive disorder (MDD) — the commonest form of depression — is diagnosed by a psychiatrist using DSM-IV<sup>469</sup> (or another diagnostic classification system such as ICD-10), which is based on a set of subjective clinical criteria that broadly represent symptoms of depressed mood or loss of interest. For example, patients may report feelings of sadness, hopelessness, worthlessness or guilt. Additionally, they may suffer from insomnia, loss of appetite, poor concentration, or lack of interest in hobbies and pleasurable activities (anhedonia). In severe cases, patients can also experience suicidal thoughts or ideation and psychomotor agitation or retardation.

Using the DSM-IV guidelines for diagnosing depression is notoriously problematic: they are subjective, difficult to measure and interpret, affected by confounding factors and may fluctuate in severity on a daily basis. Further, the umbrella term of depressive disorders not only includes MDD but also includes other depressive subtypes such as bipolar disorder in which episodes of depressive symptoms may be interspersed with periods of elevated mood or mania. The overlap in symptoms of different forms of depression means that diagnosis is difficult and misdiagnosis is common.

There is a limited range of treatment options for MDD. Psychological therapies, such as Cognitive Behavioural Therapy (CBT), are effective in mild to moderate depression, but these are not always available and pharmacological treatment is recommended for moderate to severe depression. Many of the pharmacological treatments available have a similar mechanism of action — that is, by increasing levels of monoamine neurotransmitters (dopamine, noradrenaline and serotonin) in the brain, levels of which are thought to be reduced in depressed patients. Older, first-generation antidepressants such as tricyclic antidepressants have rather non-specific action (so-called “dirty drugs”); they generally increase many neurotransmitters indiscriminately, and have other unwanted adverse effects, e.g. dry eyes and constipation. By contrast, newer treatments have targeted the increase of a single neurotransmitter, such as selective serotonin reuptake inhibitors (SSRIs), but are still not without side effects. Antidepressants are effective in around 50% of patients and some patients will fail on several treatments, which is perhaps expected given the highly variable symptom compilation used to define depression, and the highly variable course of the illness. However, the “trial and error” approach used in prescribing antidepressants is an enormous clinical problem

467 Thomas and Morris (2003)

468 Klerman and Weissman (1989)

469 American Psychiatric Association (1994)

because most antidepressant treatments are characterised by a lag of 6–8 weeks (of unknown cause) between the onset of treatment and clinically observable improvement in depression. This lag is likely to relate to serotonin's role in promoting positive emotional processing, but that time is required for patients to relearn or learn new patterns of adaptive social interaction and behaviour. Therefore, even after the difficulties of making a correct diagnosis of depression have been overcome, it may take many more months to find an effective therapy.

### C.1.1 Biomarkers for depressive disorders

As illustrated, having only DSM-IV guidelines to manage depression severely hampers our capacity to diagnose, monitor and treat the disorder. An approach that has proved successful for other diseases such as cardiovascular disease and cancer, is the identification of objectively measurable biological markers (biomarkers) that can be evaluated as indicators of normal biological processes, pathogenic processes, or pharmacological responses to a therapeutic intervention.

In the context of depression, biomarkers could be used to:

- identify individuals in the population at high risk of becoming depressed.
- improve the diagnosis of depression (i.e. provide objective measures for diagnosis).
- differentiate between depressive illness subtypes (i.e. MDD and bipolar disorder).
- predict treatment outcomes (e.g. responders to SSRIs).
- predict treatment tolerability (i.e. those that may suffer unacceptable side effects).

This section focuses on novel genetic, proteome-based blood and plasma markers, objective measures of cognition and neuroimaging techniques – these are all promising modalities for identifying biomarkers for depressive disorders. As well as improving clinical treatment of depression, biomarkers would also be enormously beneficial to the pharmaceutical industry in developing new antidepressants. For example, if a biomarker can provide a reliable indicator of disease severity, then it could be used to evaluate the efficacy of new therapies. A Round Table on biomarkers for neuropsychiatric disorders was held as part of the consultation in producing this report, where participants (see Appendix A for a list of attendees) discussed challenges and solutions of biomarker development for depressive disorders. The specific advantages and barriers to developing any particular modality of biomarker (i.e. genetic versus neuroimaging) will be considered later in the context of biomarkers for dementia in Section C.2. The practical challenges of adopting a biomarker into clinical practice, discussed later in the context of dementia, are, however, likely to be similar for any prevalent disease.

#### *Markers for risk of depression*

The causes of depression are variable and involve a complex interplay of many genetic and environmental factors. Family and twin studies have been used to estimate up to a 50% genetic component (heritability) for depression. However, the genetic basis of depression is complex and polygenic, and perhaps as a consequence of this, genes for major depression have not been consistently identified, despite intense and costly efforts to do so. One strategy that may aid this search for underlying genes is to identify endophenotypes, or intermediate phenotypes for depression. These are objective and heritable biological measurements or traits, unseen by the unaided eye, that are more directly related to genetic effects than the more distal clinical diagnosis.

They can be considered to represent markers of increased genetic risk for a disorder. Endophenotypes must therefore be heritable, state-independent (found consistently in patients even during asymptomatic periods), and occur more frequently in patients and their healthy first-degree relatives (unaffected individuals who are at increased genetic risk of the disorder) compared to their rate of occurrence in the general population.

There are many putative endophenotypes for MDD, including abnormalities in REM sleep, cognition, brain function and structure, and dysfunction in the serotonergic or catecholaminergic pathways in the brain<sup>470</sup>. Endophenotypes for bipolar disorder have also been identified<sup>471</sup>. However, it is important that these candidate endophenotypes are now validated, e.g., to assess and confirm their heritability. Successful identification of endophenotypes would mean these markers could be used to help classify diagnostic subtypes and to inform genome-wide studies searching for genes underlying depression.

In addition, there appear to be individual differences in susceptibility to depression, stemming from variations in how people respond to environmental stress or trauma – termed resilience. Although the neurobiological basis of resilience is unknown, there is emerging evidence that some neurochemical factors such as neuropeptide Y and dehydroepiandrosterone are important in the mediation of reactions to stress and resilience, and several structural and functional neuroimaging studies suggest that regions of the extended limbic system are likely to play key roles in determining resilience<sup>472</sup>.

The discovery of endophenotypes for depression or markers for resilience may provide clues to genes involved with increased risk of suffering depression. This knowledge could be used to improve mental health and wellbeing, for example, at-risk individuals could receive additional counselling following traumatic events. If we can develop a clearer understanding of the neural basis of this resistance to neuropsychiatric disorders, then methods to enhance resilience might be found.

### *Markers for improving diagnosis*

Biomarkers could transform the way in which depressive disorders are diagnosed. For example, DSM-IV criteria confirm that a central component of depression is impaired cognitive function: criterion 8 states that a depressed individual may have “diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others)”. Sensitive and objective tests of cognitive function are now available, such as the Cambridge Neuropsychological Test Automated Battery (CANTAB)<sup>473</sup> that could be used in definitively confirming that a patient has cognitive dysfunction and in more precisely characterising the nature of the impairment.

Clinicians also require better tools for distinguishing between different forms of depression at diagnosis. Recent work has shown that functional neuroimaging (functional magnetic resonance imaging, fMRI) could be used as a diagnostic aid in differentiating between unipolar depression (UPD) and bipolar disorder. For example, measuring brain activity using fMRI in the left amygdala and ventromedial prefrontal cortex in response to being shown happy or sad faces allows reliable separation of UPD and bipolar disorder<sup>474</sup>. This is of important clinical relevance as it can help when

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470 Hasler et al. (2004)

471 Hasler et al. (2006)

472 Elliot et al. (SR-E7); Appendix E refers

473 [www.camcog.com](http://www.camcog.com)

474 Phillips and Vieta (2007)

deciding which treatments might be required for the individual as both disorders are treated differently, e.g. the use of lithium and anticonvulsants like carbamazepine is helpful in bipolar disorder but rarely prescribed for UPD. Neuroimaging techniques have also been used to identify patients with a subtype of depression called vascular depression, or sub-ischemic depression (SID)<sup>475</sup>, which in contrast to MDD, has a vascular aetiology. Clinically, these patients display very similar symptoms to those of MDD, but individuals with SID are at increased risk of stroke and often refractory to first-line antidepressants. Older adults with a history of hypertension are at risk of developing SID; it might therefore be beneficial to scan such people if they develop depressive symptoms, to exclude a diagnosis of SID.

### *Markers for antidepressant treatment outcomes*

Currently, clinicians' choice of antidepressant is based on a trial and error approach. It would be enormously advantageous to be able to predict the optimal antidepressant treatment to which a patient is most likely to respond, so the patient does not have to endure this time-consuming treatment trial and unnecessary side effects. There are also new antidepressants in development with novel mechanisms of action, as well as non-pharmacological treatments such as CBT, and in cases of more severe treatment-resistant depression, electroconvulsive shock therapy (ECT) or deep brain stimulation. So clinicians have increasing treatment options for depression, but they require guidance on how to use these appropriately.

Findings from the STAR\*D (Sequenced Treatment Alternatives to Relieve Depression) study conducted in the US, in which 2,000 newly-diagnosed patients with MDD were systematically trialled on different therapies until an improvement in symptoms was measured, show that genetic factors appear to play a role in treatment outcome. Genetic testing of patients in the STAR\*D cohort identified variants in the serotonin 2A receptor that are strongly predictive of a positive SSRI treatment outcome<sup>476</sup>. Additional genes associated with treatment response have recently been reported. This kind of information could be used to inform clinical decisions.

There are other promising biomarkers of SSRI responsiveness that could be used in combination with, or as an alternative to, genetic markers. Over the last decade, structural and functional neuroimaging has consistently found differences in the subgenual anterior cingulate that predict treatment responsiveness to SSRIs<sup>477</sup>.

### *Markers for predicting adverse side effects*

Many patients report experiencing side effects when taking SSRIs, which most commonly include insomnia, sexual dysfunction and weight gain. Reports have also indicated that a small proportion of people (~5%) treated with SSRIs experience suicidal ideation while taking this medication. In the US, this led to a Black Box warning being placed on SSRIs and the number of people prescribed the drug subsequently declined. Unfortunately, this has coincided with an increase in suicides related to depression in the US, most likely related to reduced administration of SSRIs<sup>478</sup>. Recent findings have indicated that the susceptibility to suicidal ideation may have a genetic basis and be due to polymorphic variation in a small number of glutamatergic genes<sup>479</sup>. The capability to predict those that are at risk of suicidal ideation when taking SSRIs would allow these drugs to be prescribed with greater confidence to the majority of

475 Krishnan et al. (1997)

476 McMahon et al. (2006)

477 Mayberg et al. (1997); Chen et al. (2008)

478 Hammad (2007)

479 Laje et al. (2007)

patients; whilst for those patients identified at risk of ideation, alternative treatments can be considered. There are ongoing analyses of the STAR\*D cohort to find genetic biomarkers associated with other side effects.

### *Biomarkers for drug discovery*

Although there are different treatments available for MDD, the majority of antidepressants work by the same mechanism (by increasing levels of one or more monoamine neurotransmitters), and the discovery of more effective therapies with novel mechanisms of action and fewer side effects is urgently needed. Incorporating biomarkers into clinical trials could catalyse the arrival of new therapies.

Many depressed patients show improvement of clinical symptoms even when treated with placebo. This high rate of placebo responders is problematic to the pharmaceutical industry because many potential drugs fail during later phase trials due to having no significant increase in efficacy over placebo. Indeed, the effectiveness of approved antidepressants over placebo has even been questioned<sup>480</sup>. Strategies to modify the way trials are conducted so as to compensate for the placebo effect have included a placebo lead-in phase and exclusion of patients that respond during this period, but this has been inadequate to reduce the effect of placebo during pharmacological trials.

The pharmaceutical industry would benefit greatly from the identification of biomarkers that allowed fewer heterogeneous cohorts of patients to be recruited into clinical trials. For example, if patients could be recruited into trials for new antidepressants on the basis of DSM-IV guidelines, but excluded from the trial if they possessed a biomarker indicating they were a 'placebo responder', this would mean that shorter, smaller and less expensive trials could be run that still retained sufficient power to produce statistically significant results. Similarly, only including patients that are likely to be SSRI responders in trials (on the basis of genomic and/or neuroimaging biomarkers) may allow smaller trials that compare the efficacy of different SSRIs. Conversely, patients with treatment-resistant depression could be useful for discovering novel drug targets and developing antidepressants with novel mechanisms of action.

### C.1.2 Integrating biomarker use into clinical practice: barriers and solutions

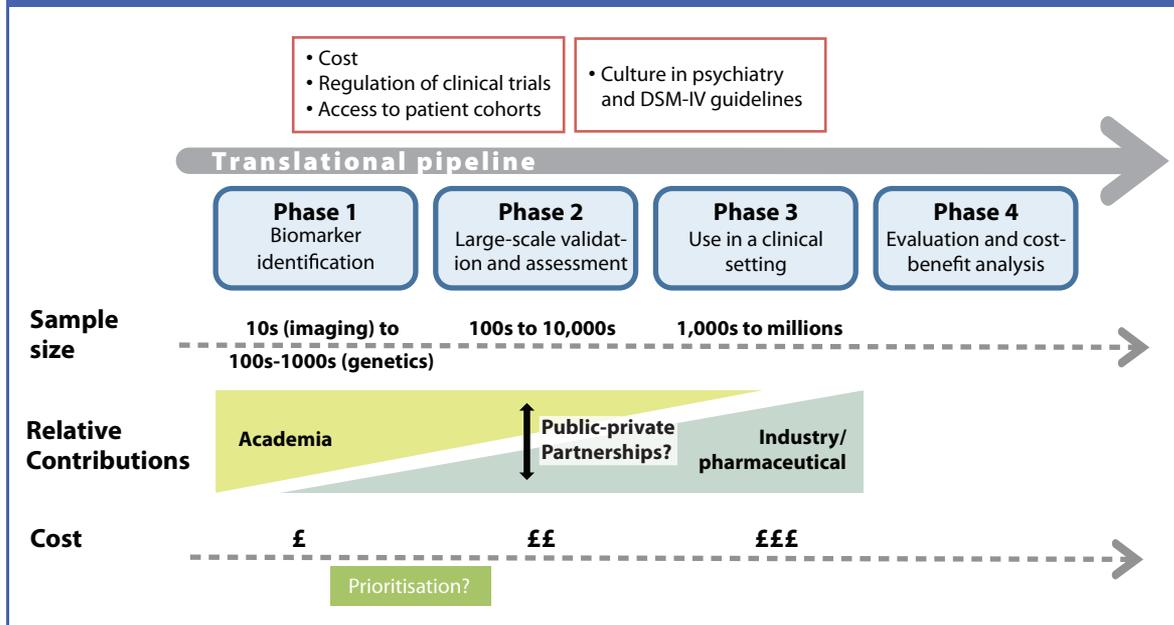
Biomarker identification and validation follows a similar pathway to that followed in drug discovery. Firstly, a novel biomarker is identified (phase 1), followed by its prospective assessment (phase 2), before large-scale validation (phase 3) and eventual economic testing in a real-world setting (phase 4); see Figure C.1. It should be borne in mind that biomarkers may have to be used in combination in order to reach a level of reliability in diagnosis that is clinically acceptable, i.e. a diagnostic test may include the evaluation of several biomarkers. Therefore, it is probable that a biomarker will be validated both separately and in combination with other markers, which adds an additional level of complexity to delivering them to the clinic.

The Round Table held as part of the consultation in producing this report, highlighted that there is an apparent bottleneck between the many biomarkers identified in the first phase, and progression to later phases and validation of these markers. The Round Table participants highlighted some key barriers and possible solutions to the current lack of biomarkers for depressive disorders available in the clinic, which are discussed in the remainder of this section.

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480 Kirsch et al. (2008)

**Figure C.1: A model of biomarker development for clinical use. Different phases of development and some characteristics are shown. The figure also shows issues (in red boxes), raised at the Round Table on biomarkers for neuropsychiatric disorders, that are slowing the progression of biomarkers for depressive disorders to phases 2 and 3. Strategies for moving forward are discussed in the main text**



*The expense of validating biomarkers is considerable, whilst there is a shortage of funding for mental health research*

Mental health charities have modest budgets for research that are not of sufficient size to support the large-scale validation of biomarkers in the same way as, for instance, can be funded by major cancer and cardiovascular charities. This leaves a funding gap for mental health research which, given the socioeconomic importance of mental health disorders, needs to be met from elsewhere. The realisation of biomarkers for depression would benefit the National Health Service (NHS) enormously, for example, by reducing the number of non-effective medications that are prescribed. Therefore, NHS-based funding incentives such as those available from the National Institute of Health Research (NIHR) and the Health Technology Assessment (HTA) programme might be ideal sources to help facilitate the validation of biomarkers. Initiatives such as the Health Innovation Fund, a £100 million collaboration between the Department of Health (DH) and The Wellcome Trust announced in October 2007, could perhaps prioritise funding for neuropsychiatric research as there are fewer alternative sources of funding compared with that available to other diseases. The Medical Research Council has had a recent call for biomarker research and may also wish to partner these initiatives.

*Advice on regulation of biomarker use in clinical trials and drug discovery is needed*

As discussed above, the pharmaceutical industry potentially has much to gain from the validation of biomarkers; for example, by recruiting fewer heterogeneous patient cohorts for trials, or measuring changes in a biomarker as an endpoint rather than changes in symptoms according to DSM-IV guidelines. However, the identification and validation of biomarkers is a costly process, and the regulatory process and the potential benefits to competing companies makes investment in this area risky. Further, successful basic research involves very clear externalities which patenting would largely vitiate. Therefore, clear statements and guidance by the regulatory agencies on their

approach to evidence obtained using biomarkers, and trials that use such evidence, are needed to help encourage private investment in their development. The risk of market failures, however, means that investment would be less than optimal without public sector funding and other support.

### *Increased accessibility to patient cohorts of sufficient size could speed up biomarker validation*

Patient and healthy control samples need to be of an appropriate size and suitably well characterised to generate reliable results that can validate the use of biomarkers. Although there are many promising reports of potential biomarkers, such as the examples provided above, many such findings can only be considered to be relatively preliminary at this stage and will require replication and further testing on a large scale. One strategy would be for the development of a single, large, publicly-available cohort that would be adopted by the research community for biomarker validation. The formation of large cohorts is clearly expensive, and this approach could prove an effective use of resources. However, agreeing on a standard set of measurements to collect, and the fact that data collected would need to be fairly general, may limit the use of a single large cohort. From studying diseases such as Type 2 diabetes, we have learnt that cohorts of tens of thousands are required to identify susceptibility genes. In order to achieve these numbers, a worldwide collaboration has been required and the pooling of many smaller cohorts. An international collaboration to generate a cohort of comparable size for depression, with each country/centre providing a number of samples of an agreed standard, could produce a valuable resource whilst sharing the expense associated with it.

In the UK, the NHS offers access to large potential cohorts of patients for depression and other mental health research; this potential resource is already being partly utilised through DH, which established The Mental Health Research Network (MHRN) in 2004 to promote use of NHS-based cohorts. The purpose of this nationwide initiative is to create the infrastructure for large well-controlled studies and clinical trials regarding mental health. A key strength of the network is that it makes its resources available to both non-commercial and commercial research. This may encourage the formation of partnerships between public and private organisations. Such collaborations require sensitive handling to ensure the intellectual property rights do not compromise academic freedom; however, at least for depression, the STAR\*D cohort in the US has exemplified how this approach can be fruitful. Expansion of the MHRN might catalyse progress in biomarker discovery; for example, could cohorts of people at risk of depression (on the basis of family history, endophenotypes or otherwise) be made available via the MHRN?

### *Culture in psychiatry and the DSM-IV limit the practical use of biomarkers*

Even where biomarkers have become commercially available, there appears to be reluctance by the medical profession to fully embrace them. For example, genetic tests for variants of P450 enzymes, which are responsible for the metabolism of many drugs including SSRIs, are commercially available and can be used to estimate the minimum dosage of a drug that will be effective and the maximum dosage that an individual can tolerate without side effects. However, these do not seem to have become well-utilised by the medical community<sup>481</sup>. This might be due to a lack of appreciation of the role genetics can play in medicine, or a perception that, despite rapid advances in pharmacogenomics, the discipline nonetheless requires further development. A further reason might be the continuing discussion about the ethics surrounding genetic testing

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481 Aspinall and Hamermesh (2007)

to measure future risk of disease, i.e. impact upon insurance premiums and the need for pre-genetic counselling. It should, however, be remembered that the purpose of genetic testing regarding P450 enzymes (or to identify SSRI responders) is to inform clinical decisions, where the diagnosis has already been made and so there are therefore comparatively few ethical issues surrounding it. A change in clinicians' mentality towards biomarkers may be catalysed by the next edition of the DSM, planned for release in 2012, which will refine the criteria for diagnosis of depressive illnesses. Consultation towards its contents is under way and there have been calls to integrate more neuroscience into edition V<sup>482</sup>. Whilst the latest edition may come too soon for the widespread incorporation of biomarkers or endophenotypes into DSM-V, it is hoped that it will recognise the promise of biomarkers and have flexibility, so that if significant advances in particular biomarkers are made, they can be utilised without having to wait for DSM-VI.

### C.1.3 A requirement for prioritisation in biomarker discovery

Given the expense in taking biomarkers from phase 1 discovery to phase 3 validation, prioritisation of biomarkers is needed to ensure efficiency in the allocation of research resources. It is highly desirable for a key stakeholder to lead in this process and bring the research and business community together with a view to fostering a consensus on priorities. Prioritisation should take a wide consensus of interested parties, e.g. from academics and industrial partners, and consider multiple criteria:

- *The size of the clinical problem that may be remedied by using the biomarker.* For example, a single reliable and validated marker that differentiates between MDD and bipolar disorder would revolutionise diagnosis especially because of the significant prevalence of bipolar disorder.
- *The extent to which a biomarker has already been characterised and developed.* The development of a particular biomarker could be held up at different stages. For example, it could be limited by: insufficient funding available to support the identification of a promising biomarker; the availability of large, well-controlled cohorts for biomarker validation; or the lack of clinical infrastructure for using the biomarker. Identifying the barrier that is most relevant to each biomarker will help to ensure that available funds can be invested effectively.
- *The availability of other biomarkers that could be used in combination to increase specificity and sensitivity.* It might be naïve to consider that a single biomarker will have sufficient accuracy for clinical use; combinations of biomarkers will probably be needed to provide reliability in diagnosis to a level that is clinically acceptable.

Finally, prioritisation should consider *the practicalities of using the biomarker in large, real-world populations*. One of the greatest challenges, and yet at the same time a major reason for the Foresight Project on Mental Capital and Wellbeing, is that depression and other mental health disorders are extremely prevalent in today's society and therefore any reliable biomarkers for these disorders will be in high demand; specialist training needs and required infrastructure will need to be identified early to allow the smooth transition of biomarkers into clinical practice.

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482 Hyman (2007)

## C.2 Biomarkers for Mild Cognitive Impairment and Alzheimer's disease

**Key messages:** Alzheimer's disease (AD) is a devastating neurodegenerative disorder that is currently poorly treated. It causes a progressive loss of cognitive functions such as the capacity to remember, think and communicate. This erosion of mental capital in AD sufferers impacts on their wellbeing as well as that of their families and carers. The greatest risk factor for AD and other less common dementias is age, and as a result of the increasing age of our population, dementia is set to become increasingly prevalent in future society. There is evidence that the general public recognises care for dementia as one of the largest current unmet health needs and the current annual cost of dementia is estimated to be £17 billion in the UK.

Over the last few years, progress has been made in characterising the pathological events that precede cognitive decline, and in particular people with mild cognitive impairment (MCI) that are at high risk of developing AD. It is now realised that dementia only occurs in AD after extensive destruction has occurred in the brain, therefore it is imperative to develop methods that allow early detection of dementia. The discovery of objective biological markers (or combinations of them) that could be used to identify those at risk of AD, or patients with early asymptomatic AD, would allow patients to be informed of their diagnosis earlier, allow them to seek support and treatment, and plan for their futures. As the search continues for drugs that more effectively treat the cognitive symptoms of AD, or even therapies that can delay or reverse the pathology of AD, biomarkers may be used in clinical trials to reduce costs and increase the likelihood of detecting effective treatments. The failure to develop therapies for AD will mean that an ever-increasing sum of money will need to be spent on dementia care. Therefore, it is now a crucial time for key stakeholders to consult and prioritise the development of biomarkers in order to maximise the chances of developing new therapies, whilst planning and preparing for how anti-dementia drugs may be funded and provided in the UK.

Dementia describes a serious deterioration in mental functions such as memory, language, orientation and judgement. Dementia can develop in younger people, although it is relatively uncommon for them. The greatest risk factor for dementia is age (see Figure 6.4). This is a substantial cause for concern because people are now living longer and the age of our population is proportionately older, meaning that dementia is set to become more prevalent in future years with enormous costs at both social and economic levels. The report, *Dementia UK*, commissioned by The Alzheimer's Society in 2007, calculated that there are currently 0.7 million people in the UK with dementia, and predicted this would increase to 1.4 million within 30 years<sup>483</sup>. The current costs were estimated to be £17 billion per year, and these could treble to more than £50 billion per year in the same timescale.

Dementia is usually diagnosed when a patient presents to their GP or a specialist in the area of neuropsychiatry with symptoms of mild confusion or memory loss, word-finding difficulties, and problems in communicating with others. There is no straightforward test for dementia and diagnosis is made using DSM-IV<sup>484</sup> or ICD-10 guidelines, often only by excluding all other causes. Patients might undergo a magnetic resonance imaging scan (MRI) to help rule out an alternative diagnosis such as brain tumour; and the GP or specialist will also need to rule out infection, vitamin deficiency, thyroid problems, the side effects of drugs and depression. As a result, GPs have difficulties in diagnosing dementia. The commonest form of dementia is Alzheimer's

483 Knapp et al. (2007)

484 American Psychiatric Association (1994)

disease (AD), which accounts for approximately two-thirds of all dementia cases, although a large number of less common diseases also cause dementia. The pathological features of AD are the presence of amyloid beta (A $\beta$ ) plaques and neurofibrillary tau tangles. However, currently, the presence of plaques and tangles can only be confirmed post-mortem so diagnosis must be based on clinical findings.

There is at present no cure for AD but several drugs are available that can ameliorate its symptoms or slow down disease progression in some people. People with AD have been shown to have a shortage of the chemical acetylcholine in their brains that can be partially reversed by the drugs Aricept, Exelon and Reminyl (these all act by inhibiting the enzyme acetylcholinesterase which normally breaks down acetylcholine). These drugs are currently only recommended by National Institute of Clinical Excellence (NICE) guidelines for people in the moderate stages of dementia, and, at a GP's discretion, for people in the early stages. A fourth drug, Ebixa (memantine), works by blocking the actions of the neurotransmitter glutamate, which can cause damage to brain cells. However, this drug is not recommended by NICE for regular treatment of AD of any severity. There is great hope that new therapies will become available in the next few years; this is highlighted by current figures reporting that there are currently 258 compounds under investigation for AD, with more than 40 of them in clinical trials<sup>485</sup>. Some of these agents show promise of ameliorating the symptoms of AD, whilst others have been termed 'neuroprotective' agents, meaning they may actually slow or halt the pathological progression of AD. It will be important to give these agents as early as possible in the treatment of AD, to maximise any potential benefit they might have and not prolong late-stage disease.

### C.2.1 Early detection of AD

Over the last few years, it has been established that by the time a patient presents with clinical symptoms of AD, their brain is already riddled with A $\beta$  plaques and neurofibrillary tangles<sup>486</sup>. In other words, the pathological changes that characterise AD commence many years before the onset of any obvious clinical symptoms (see Figure C.2 and Figure 6.5). There have been intensive efforts to discover biological markers (biomarkers) that are present in the early stages of AD, i.e. that can be detected before any clinical symptoms are present. The ability to measure these biomarkers robustly would enable patients to be given an earlier diagnosis of AD, allowing them to plan for their future, and to have earlier access to advice and support and any future anti-dementia therapies that become available.

There is a prodromal stage<sup>487</sup> associated with AD, known as Mild Cognitive Impairment (MCI). This is characterised by a persistent complaint about memory function that might be confirmed by having a decreased score (age- and education-adjusted) on a memory test, but having preserved general cognitive function, an intact ability to perform activities of daily living, and an absence of dementia<sup>488</sup>. It is known that having MCI greatly increases the risk of developing AD in the next few years, but only a proportion of people with MCI progress to a diagnosis of AD, i.e. progressive, further dementia occurs in only a subgroup of individuals diagnosed with MCI. In light of these facts, identifying individuals who will go on to convert to a diagnosis of AD (i.e. those that actually have very early or asymptomatic AD) from people with stable MCI would be particularly useful.

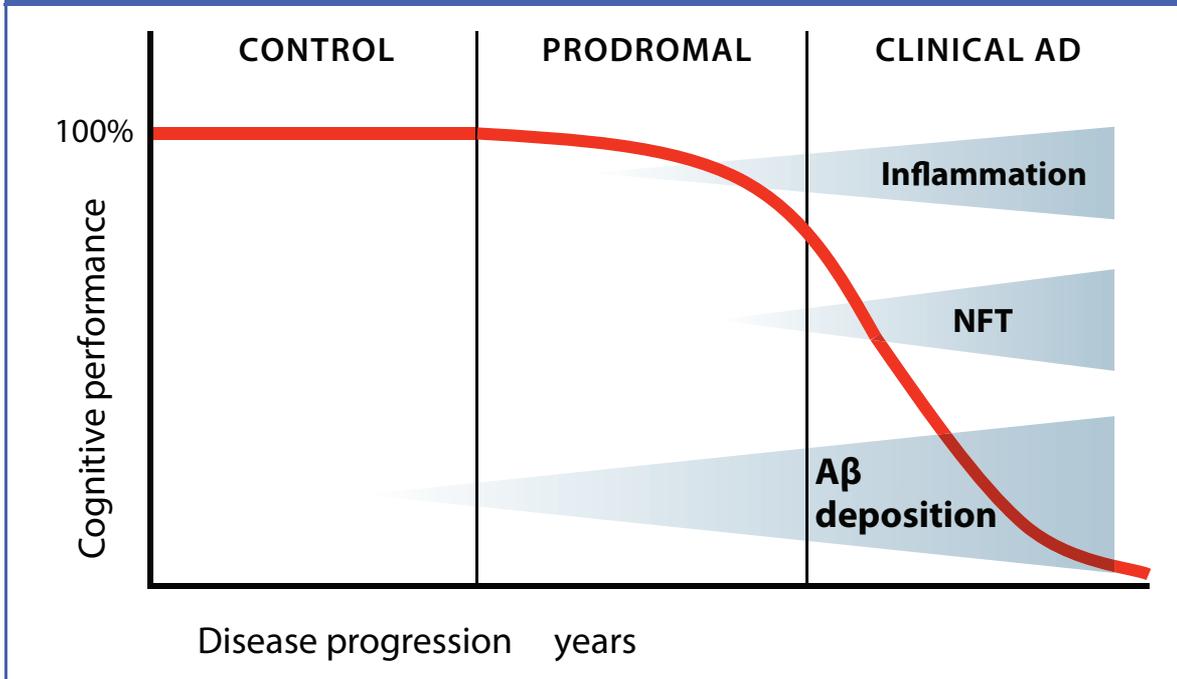
485 The Association of the British Pharmaceutical Industry (ABPI)

486 Albert and Blacker (2006)

487 The prodromal stage is defined as the initial stage of a disease.

488 Petersen et al. (1999)

**Figure C.2: The pathology of AD. A decline in cognitive performance may be preceded by signs of inflammation, the presence of neurofibrillary tau tangles (NFT) and amyloid (A $\beta$ ) plaques. The latter may be detected even in healthy patients with normal levels of cognition**



The Round Table that was held by the Project to inform consideration of biomarkers for depression (see Section C.1 above) and neuropsychiatric diseases specifically considered biomarkers for cognitive decline; see Appendix A for a list of participants). When considering dementia, the Round Table concluded that biomarkers that could be used for aiding the earlier diagnosis of dementia were of upmost importance. This section will therefore focus on progress of biomarkers for early detection of dementia, although there is also an extremely important unmet need for biomarkers to help improve other areas of dementia care. In particular, participants of the Round Table highlighted that reliable biomarkers are required to monitor disease progression, especially so that they can be used as surrogate markers in trials of novel anti-dementia drugs.

Although this Appendix focuses on AD because it is the most common form of dementia, biomarkers are required for other forms of dementia, as well as for accurate differentiation between them. Novel proteome-based blood, plasma and cerebral-spinal fluid (CSF) measures, neuroimaging markers and objective measures of cognition have emerged as candidate biomarkers for early detection of AD. Each of these biomarker modalities will be addressed in turn, considering the particular strengths and practical challenges of using the biomarker in a large real-world population.

### *Plasma markers*

A plasma-based marker that allows early detection of AD would be extremely desirable because the necessary infrastructure in GP surgeries and hospitals to collect and analyse blood samples is already in place. Furthermore, the public is familiar with the concept of blood tests to diagnose disease and such tests are considered socially acceptable. However, there is conflicting evidence as to whether such a simple plasma marker exists. For example, it has been reported that levels of amyloid in plasma from MCI patients can be used to predict those that will convert to AD, although this has not been reliably replicated. Perhaps it is more likely that a characteristic 'signature' of

altered expression of a number of proteins may be detectable in plasma in early stage AD. In 2007, a landmark study from *Nature Medicine* reported that measuring the level of 18 proteins associated with inflammation in patients with MCI could be used to predict with over 90% accuracy those that would convert to AD<sup>489</sup>. However, because of the advanced and highly sensitive equipment required to measure these protein levels, this technology is not likely to become widely used in the near future.

### **Cerebral-spinal fluid markers**

There is substantial evidence that changes associated with brain pathology during the early stages of AD may be detectable through altered levels of specific proteins in CSF. Many studies have shown that in patients with MCI, high CSF levels of tau protein as well as low levels of A $\beta$ <sub>42</sub> (a pathogenic form of amyloid) reliably predict those patients that will convert to AD<sup>490</sup>. CSF levels of phosphorylated tau (the protein that forms neurofibrillary tangles in AD) may also predict conversion. If several CSF biomarkers are measured and evaluated in combination, then a specificity of ~90% in predicting which MCI patients will progress to AD is currently achievable; this is a level that would be clinically acceptable<sup>491</sup>. A drawback is that CSF samples are collected from the base of the spine by a lumbar puncture (LP). Although these are routinely performed by neurologists in the diagnosis of some diseases such as multiple sclerosis, they require specialist training and carry a risk from complications. It is also not routine practice for psychiatrists to collect CSF samples, yet the majority of MCI patients are diagnosed and managed by psychiatrists. Ideally, a screening biomarker for dementia would involve a less-invasive technique, especially when the population is likely to be old and possibly frail. If CSF markers were to be used as biomarkers for assessing disease progression in clinical trials, the requirement for repetitive LP could limit patient recruitment for trials.

### **Neuroimaging markers**

Given the invasiveness of collecting CSF samples, neuroimaging methods using magnetic resonance imaging (MRI) or positron emission tomography (PET) imaging are attractive, as they are relatively non-invasive and well-tolerated modalities for collecting information about the brain.

MRI imaging is currently often used in AD to rule out an alternative diagnosis, but it could also be useful for positive diagnosis and for early detection. There are multiple promising biomarkers that can be identified with structural MRI. Structural MRI can be used to measure brain atrophy, either on a whole-brain basis or in specific brain regions that are affected in AD such as the entorhinal cortex and hippocampus; these measures can be used to predict progression to AD in MCI patients<sup>492</sup>. These techniques are particularly powerful when a patient is scanned several times over months or years, and changes between scans are measured. The rapid recent progress in computing technology means that the possibility of an individual undergoing several MRI scans and keeping those scans within their medical notes is now feasible. A key strength of MRI is that it has a number of different modalities available that can be used. For example, diffusion tensor imaging (DTI) allows imaging of the white matter connectivity between brain regions and has been used to show that some MCI patients have decreased neural integrity in particular areas of the brain which predicts

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489 Ray et al. (2007)

490 Blennow and Hampel (2003)

491 Hansson et al. (2006)

492 Schott et al. (2005)

progression to AD<sup>493</sup>. Activity of the hippocampus measured by fMRI is a further promising marker, as are shape changes of the hippocampus.

PET imaging may also be used for the early detection of AD. Recent technical developments have led to the generation of ligands that can be used to image the deposition of amyloid *in vivo*. Imaging with these ligands can be used to predict those with MCI that will progress to AD (Figure 6.5, chapter 6). The deposition of amyloid may be one of the earliest changes in AD, and there is growing evidence that imaging this biomarker with positron emission tomography can detect future progression of AD in individuals even before symptoms of MCI are evident. It has been found that some otherwise healthy patients with no symptoms of dementia or MCI have increased amyloid deposition in their brain and also have episodic memory impairments when tested. These very minor memory impairments may represent a prodromal stage of MCI<sup>494</sup>, which if so would push back even further the time in which early stage AD was detectable. Follow-up studies will be required to see if the healthy patients with increased amyloid deposition progress to MCI and AD.

There is also promising evidence that amyloid deposition may be used as a surrogate marker of AD progression and severity during its earliest stages, and therefore PET amyloid imaging could be of enormous benefit in evaluating new disease-modification treatments<sup>495</sup>. However, other studies have shown that the amount of amyloid in patients diagnosed with AD is relatively stable, suggesting that the deposition of amyloid occurs early in the disease and the brain has already saturated by the time clinical symptoms of dementia is present<sup>496</sup>. This gives further support to the idea that by the time AD is often diagnosed, the extent of pathology in the brain has advanced to a stage where it may be irreversible, and urges the need for diagnosis and treatment of dementia as early as possible.

Considering the practicalities of neuroimaging, scanning is becoming more affordable and more widely available in the UK, although scans are still relatively expensive. The provision of scanning facilities also varies widely across Primary Care Trusts. Use of scanners for neuroimaging will also have to compete with their use in other diseases, for example cancer, where imaging is also becoming more prominent as a diagnostic tool. Therefore, it is imperative that scanning capacity is continually assessed and increased in the UK, along with training for radiographers and specialists for analysing scans. There are ongoing efforts to automate image analysis, which would be a practical requirement of any large programme for the early detection of dementia. Academic developments such as the development of new imaging modalities and statistical analyses and modelling, and technical developments, for example, scanners that can combine different modes of imaging (e.g. PET and MRI), are pushing back the boundaries in terms of the ease and amount of information that can be collected from imaging methods.

### *Objective markers of cognition*

The major symptoms of AD are centred on a decline in memory and other forms of cognition; when the symptoms reach a level at which they impact on activities of daily living (and dementia is diagnosed), the disease has already progressed substantially. A promising area is the development of cognitive tests that are sensitive to small (subclinical) changes in cognition, which would otherwise be undetectable. These tests

493 Chua et al. (2008)

494 Pike et al. (2007)

495 Grimmer et al. (2008)

496 Engler et al. (2006)

are based on measures of episodic memory (memory of specific events or experiences in time and space) or executive function (high-level planning of action and decision-making). One such test of episodic memory, the CANTAB Paired Associated Learning (PAL)<sup>497</sup> (see Figure C.3) has been used in combination with a simple test of semantic memory (memory for meaning or facts) to predict which MCI patients will convert to AD up to three years before progression, with almost complete accuracy<sup>498</sup>. However, although the separation in scores between healthy individuals and people with AD is very good, it is not absolute and therefore cognitive tests would ideally be used in combination with other markers to achieve full predictive power. CANTAB-PAL is also sensitive to disease progression, and therefore may have value in evaluating new anti-dementia therapies. In support of this, patients with early stage AD treated with a cholinesterase inhibitor, show an improvement in test score over 12 weeks compared to those given a placebo<sup>499</sup>.

Practically, cognitive tests should ideally be relatively simple to administer, take only a short time to complete, be analysed automatically, and require minimal instruction or language so they could be implemented in multicultural society.

**Figure C.3: Cognitive testing for diagnosing Alzheimer’s disease (AD). Several objective tests of cognitive function have been shown to be predictive of progression to AD in patients with Mild cognitive impairment. One example is the CANTAB-PAL. Boxes are displayed on the screen and are opened in a randomised order. One or more of them will contain a pattern (left). The patterns are then displayed in the middle of the screen, one at a time, and the subject must touch the box where the pattern was originally located (right). If the subject makes an error, the patterns are re-presented to remind the subject of their locations. The task progresses with increasing level of difficulty and provides a number of different outcome measures that have been shown to be useful for identifying sub-clinical changes in episodic memory associated with prodromal AD**



#### *A role for genetic biomarkers in dementia?*

In addition to the promising biomarkers presented above, genes also have a role in the development of AD. The E4 variant of the apolipoprotein E (ApoE) is the most important late-onset AD susceptibility gene, although recently, additional genes have been discovered<sup>500</sup>. Considering genotype might be complementary to other biomarkers in improving the specificity and reliability of dementia diagnosis. For

497 [www.camcog.com](http://www.camcog.com); de Rover et al. (SR-EI 1), Appendix E refers

498 Blackwell et al. (2004)

499 Grieg et al. (2005)

500 Papassotiropoulos et al. (2006); Reiman et al. (2007)

example, algorithms could integrate and adjust a test score achieved on a cognitive test with particular gene variants that are known to affect an individual's memory functioning and the number of ApoE4 alleles they carry. In the short term, individuals deemed genetically 'at risk' are an ideal population for therapy intervention studies.

### C.2.2 Lessons learned from early biomarker discovery in AD and other diseases

The search for biomarkers for early detection is still in its infancy. However, a number of messages regarding approaches to therapy are emerging, and lessons can also be learned from biomarker discovery in other diseases.

***A combination of biomarkers is likely to be required for providing diagnosis to a level that is clinically acceptable.***

For example, MRI and PET imaging can both identify patients with MCI who are likely to convert to AD, but when used together they can provide complementary information that can provide a superior diagnosis<sup>501</sup>. For this reason, the development of many different types of promising biomarker should be pursued with the idea that biomarkers with considerable prognostic value may be combined with complementary markers to greatly improve diagnosis. In addition to the potential markers described, there is also interest in diagnostic biomarkers that can be detected in urine or in the metabolome<sup>502</sup>. Following further development of promising biomarkers it will be possible to establish their success alone and in combination through a series of meta-analyses.

***Whilst many biomarkers show highly significant differences between healthy, MCI and AD populations, overlap between individuals in patient groups nearly always exists and will hamper clinical diagnosis.***

It is possible that a combination of biomarkers will allow for absolute separation between disease groups, but alternatively intra-subject variation, i.e. changes in an individual's level of a particular biomarker recorded over a period of time, could be used to diagnose AD. This could be achieved in the context of a screening programme for dementia. Could, for example, people in the population deemed at risk of dementia (based on criteria of age, genetics and family history) be screened with a cognitive test every six to 12 months? Performance over time could be recorded and individuals that showed decline could then be followed up and investigated for dementia. To ease this process, could the tests be adapted so that they can be completed at home on a personal computer, over the internet or over the phone? A key unknown in this scenario would be the reliability of the cognitive test to be delivered in this non-clinical setting. A screening programme could also be envisaged with imaging, whereby, for example, serial MRI images could be taken over time and changes in total brain volume could be calculated. A threshold rate of atrophy would need to be set, whereby it was deemed worthwhile to intervene. Given the expense and demand for scanning resources, this is unlikely in the foreseeable future. However, a single scan could be made at the onset of the screening programme and used as a reference to investigate later cases of questionable AD. Continual screening for elderly people with MCI in the prodromal stage of AD would also provide enriched samples for clinical trials of anti-dementia drugs (see below).

Finding genes that are important for cognition and risk of dementia may also be useful in comprehending the heterogeneity that is seen in biomarker levels even between

501 Jack et al. (2008a)

502 A signature of molecules (metabolites) that normal and pathogenic cellular processes leave behind.

healthy individuals. For example, polymorphisms in the 5-HT<sub>2a</sub> receptor have been shown to affect performance in tasks that test short- and long-term memory, but have no effect on working memory<sup>503</sup>.

***Neuroprotective agents will need to be administered and trialled in patients with MCI or earlier stages of the disease.***

As discussed above, by the time a patient receives a diagnosis of AD, the brain is usually already loaded with amyloid plaques and neurofibrillary tangles, and therefore patients need to be identified and treated as early as possible. New drugs should ideally be trialled in patients with MCI, before the disease has progressed, so ensuring access to these patients for clinical trials should be a priority. In 2005, the Department of Health set up the Dementias and Neurodegenerative Diseases Research Network (DeNDRoN) to support clinical research. However, for AD, patients will only be recruited to join the network at time of presentation of symptoms, and this will therefore miss the early window of MCI, when early intervention could occur.

Since no large pre-existing cohort of MCI patients exists, it is difficult to conduct large trials. Research into the early stages of AD could be aided by the formation of a central database of MCI patients, perhaps identified by a screening programme as discussed above, and the collection of some core samples such as blood and demographic data. Even these basic measures would build a cohort of sufficient size reasonably quickly that could be used for genomic exploration. CSF samples and structural brain images could be collected for additional information, but at additional cost. Access to patients and samples should be made available to academics or private investors wishing to mine data to validate prospective biomarkers or to conduct well-controlled and powered clinical trials. This approach would require general consensus and acceptance as to which measures would be collected, formal protocols for data collection and analysis, and standardisation of data quality submitted to the central database, as well as ensuring such data were publicly available for use. There have been academic initiatives towards this approach. For example, the Alzheimer's Disease Neuroimaging Initiative (ADNI), an American programme, is a public-private consortium to collect serial measurements of a number of promising biomarkers from ~1,000 MCI patients over a period of five years. This multi-centre programme has agreed protocols for biomarker collection<sup>504</sup> and agreements to make data available to those wishing to use it. An EU-funded initiative, known as AddNeuroMed, started in 2007 with comparable aims and ambitions, and importantly, compatible protocols so that data may be pooled with ADNI<sup>505</sup>.

***If, and when, novel, first-generation disease-modifying treatments become available, they are likely to require chronic treatment regimes and have adverse effects.***

It will be crucial to differentiate between patients that have stable MCI, those with early stage AD, and those with another form of dementia, so as to allow more tailored use of therapies and not subject patients to unnecessary risk associated with these agents. In the long term, it may be possible to identify sub-groups of AD patients that will respond to particular therapies, as is becoming apparent for SSRI treatment of depression.

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503 de Quervain et al. (2003)

504 Jack et al. (2008b)

505 Lovestone et al. (2007)

### C.2.3 Who stands to benefit from biomarker development?

The discovery and validation of biomarkers for dementia stands to benefit all reaches of society: firstly, those with dementia, their carers and their families; secondly, the pharmaceutical industry through providing it with access to cohorts of patients with early-stage dementia in which to trial new therapies and better biomarkers to monitor the efficacy of drugs; and thirdly, Government stands to gain through reducing the large budget for care and increasing tax revenue from carers who currently cannot engage in paid employment – these resources could then be spent elsewhere to help other sectors of society. Given that biomarkers could benefit many different parties, the emergence of large public-private funded initiatives, such as ADNI and AddNeuroMed, will hopefully share the burden of the substantial costs associated with biomarker development and validation, therefore facilitating these processes.

There is much to be gained from keeping the UK at the forefront of academic discovery and validation of biomarkers. This will help to retain clinical trials in the UK and attract biopharmaceutical companies conducting dementia research to carry out research and development in the UK. This will create revenue and jobs, and will offer patients access to newer, experimental therapies. In the past, the UK invested heavily in genomic sequencing infrastructure; this has maintained the UK at the forefront of unravelling the genetics of complex diseases. Similar investment in imaging and biomarkers is perhaps needed now to keep the UK at the forefront of this field. The UK should ensure that any future requirements for specialists, radiographers, and necessary infrastructure for using biomarker screening programmes are anticipated and promote appropriate recruitment.

Despite these potential benefits from research into biomarkers for dementia, the current amount of money spent on dementia research lags behind that of other diseases in the UK: for example, only £11 per year is spent on UK research into AD for every person affected by the disease, compared to £289 per year for cancer patients<sup>506</sup>, indicating a considerable funding gap between the magnitude of the problem and the monies available for mental health research.

### C.2.4 The challenges facing the UK

Since AD causes substantial devastation, there will always be a pressure to commercialise products and deliver diagnostics to the clinic as early as possible. There is also pressure from the general public to address the magnitude of the problem that dementia poses. For example, a recent UK survey of 2,000 people revealed that AD was their third most important health concern (after cancer and heart disease), and that they would like to see both an increase in national health spending and more research into AD<sup>507</sup>.

Considering recent press releases and news stories, there are likely to be diagnostic tests for early stage AD commercially available in the next few years. These aims are admirable, but the science should be assessed on a case-by-case basis. The urgency and pressure for early diagnosis will intensify if new drugs become available. The UK should be prepared for the situation that an effective neuroprotective agent becomes available in the near future. How would the NHS decide which patients receive this therapy? Would it be prescribed to those already with AD (for which it will probably not be effective), or only for new cases of MCI; and how will it be ensured that it is available

506 <http://www.alzheimers-research.org.uk/info/statistics/>

507 [http://www.abpi.org.uk/press/press\\_releases\\_08/270308.asp](http://www.abpi.org.uk/press/press_releases_08/270308.asp)

uniformly across the country? Further, what would be required in terms of specialist training, healthcare professionals and infrastructure to provide this treatment to appropriate individuals? Previously, doctors have raised concern that new drugs are often recommended under NICE guidance, without the provision of additional money for the new treatment, or advice as to where cut-backs should be made to pay for the treatment<sup>508</sup>.

Overall, biomarkers that could provide earlier detection of AD are available now, but without effective therapies to treat the disease there is not the widespread pressure to implement them. Therefore as new anti-dementia drugs become available, the policy and planning should commence now in preparation for their arrival and to provide the necessary infrastructure.

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# Appendix D: Glossary of terms and list of acronyms

## Glossary

Because the Project has involved diverse experts from countries across the world, it has been essential to establish an agreed body of definitions that underpin the analysis:

- **Biomarkers** are objective biological measures associated with presence of a disease, increased risk for it, or response to treatment.
- **Cognitive reserve** describes an individual's resistance to impairment in cognitive – 'thinking' – processes such as memory, reasoning and attention, that may arise as a consequence of brain injury, neuro-psychiatric disorder, disease or the normal ageing process. Thus, a person with more cognitive reserve or capital starts from a better position when it comes to ageing (or other forms of impairment); they have some buffering against its effects.
- **Directiveness** is ignoring the child's focus of attention and instead directing them to focus elsewhere.
- **Developmental dyslexia** is problems with reading and spelling that cannot be accounted for by hearing or visual impairments, low intelligence, neurological damage or poor educational opportunities.
- **Developmental dyscalculia** is specific difficulties with number that cannot be accounted for by low intelligence, neurological damage or poor educational opportunities.
- **Elderly dependency ratio** is the population of pensionable age expressed as a percentage of the working-age population.
- **Executive function skills** are self-regulation skills. Executive function is a term from cognitive psychology referring to the individual's ability strategically to self-regulate or control his or her emotions, desires, beliefs, thoughts and behaviours in situations where there is cognitive conflict.
- **Functional literacy** is the ability to use reading and writing efficiently in everyday life situations.
- **Mental capital** refers to the totality of an individual's cognitive and emotional resources, including their cognitive capability, flexibility and efficiency of learning, emotional intelligence (e.g. empathy and social cognition), and resilience in the face of stress. The extent of an individual's resources reflects his/her basic endowment (genes and early biological programming), and their experiences and education, which take place throughout the lifecourse.
- **Merit goods** are goods (or services) which a government may choose to supply, or require people to consume, on wider social grounds even though individuals left to themselves may not always choose to do so. Examples include education and seat belts.
- **Phonemes** are the smallest sound units of a language whereby substitutions create new meanings e.g. cap – cup.

- **Phonology** relates to the sound structure of a language (e.g. syllable structure, rhyme, see also Phonemes, above).
- **Positive mental health** refers to a state of 'mental flourishing', which is a combination of feeling good and functioning effectively most of the time. Describing a person as being mentally healthy (or equivalently, having positive mental health) means much more than the absence of symptoms of mental illness. It should be recognised that the alleviation and control of symptoms does not in itself bring mental health. Positive mental health is equivalent to a state of good mental wellbeing (see definition below).
- **Presenteeism** is defined as the potential lost productivity that occurs as a result of an individual being less than totally productive while being at work.
- **Resilience** is an individual's successful adaptation and functioning in the face of stress or trauma. Psychological resilience is that feature of personality that allows an individual to bounce back from stress or adversity.
- **A Theory of Mind** involves a person's capacity to judge how others are thinking and feeling, based on his or her own responses in similar circumstances.
- **Wellbeing** in this report refers to 'mental wellbeing' unless indicated otherwise. It is a dynamic state in which the individual is able to develop their potential, work productively and creatively, build strong and positive relationships with others, and contribute to their community. It is enhanced when an individual is able to fulfil their personal and social goals and achieve a sense of purpose in society.
- **Zones of proximal development** refer to opportunities for supported learning that enable development beyond what could be achieved by the child acting alone.

## Acronyms used in this report

ABPI	The Association of the British Pharmaceutical Industry
AD	Alzheimer's disease
ADHD	Attention Deficit Hyperactivity Disorder
ADNI	Alzheimer's Disease Neuroimaging Initiative
ApoE	Apolipoprotein E
BCR	Benefit-cost ratio
BME	Black and minority ethnic
CAMHS	Child and Adolescent Mental Health Service
CBI	The Confederation of British Industry
CBT	Cognitive Behavioural Therapy
CLG	Communities and Local Government
CMD	Common mental disorder
CPD	Continuing Professional Development
CIPD	Chartered Institute of Personnel and Development
CSF	Cerebral-spinal fluid
DCSF	Department for Children, Schools and Families
DDA	Disability Discrimination Act
Defra	Department for Environment, Food and Rural Affairs
DeNDRoN	Dementias and Neurodegenerative Diseases Research Network
DH	Department of Health
DIUS	Department for Innovation, Universities and Skills
DWP	Department for Work and Pensions
ECT	Electro-convulsive therapy
EF	Executive function
EFA	Essential fatty acid
ESRC	Economic and Social Research Council
EU	European Union
FAS	Foetal alcohol syndrome
fMRI	functional Magnetic Resonance Imaging
GDP	Gross Domestic Product
GP	General practitioner
GO-Science	Government Office for Science
HIPs	Home Information Packs
HSE	Health and Safety Executive
HTA	Health Technology Assessment programme

ILA	Individual Learner Account
IPT	Interpersonal therapy
IT	Information technology
ICT	Information and communications technology
ITT	Initial teacher training
KPIs	Key performance indicators
LSC	Learning and Skills Council
MCI	Mild cognitive impairment
MCW	Mental Capital and Wellbeing
MDD	Major depressive disorder
MHRN	Mental Health Research Network
MRC	Medical Research Council
MRI	Magnetic Resonance Imaging
NCSL	National College for School Leadership
NFER	National Foundation for Educational Research
NHS	National Health Service
NICE	National Institute for Health and Clinical Excellence
NIH	National Institutes of Health
NIHR	National Institute for Health Research
NVQ	National Vocational Qualification
OECD	Organisation for Economic Co-operation and Development
PAL	Paired Associated Learning
PCE	Pharmacological cognitive enhancer
PCTs	Primary care trusts
PET	Positron emission tomography
PHC	Primary healthcare
PISA	Programme for International Student Assessment
POPP	Partnerships for Older People
PSA	Public service agreement
PSR	Priority service register
PYD	The Positive Youth Development model
QALYs	Quality-adjusted life-years
RCT	Randomised control trial
R&D	Research and development
SATS	Standard Assessment Tests
SEAL	Social and Emotional Aspects of Learning
SEN	Special educational needs

SES	Socioeconomic status
SfL	Skills for Life
SID	Sub-ischemic depression
SLD	Specific Learning Difficulty
SLI	Specific Language Impairment
SME	Small and medium-sized enterprise
SSRIs	Serotonin Reuptake inhibitors
TDA	Training and Development Agency for Schools
TEEM	Texas Early Education Model
TLRP	Teaching and Learning Research Programme
TUC	Trades Union Congress
UPD	Unipolar depression
ULR	Union learning representative
WEMWBS	Warwick-Edinburgh Mental Wellbeing Scale
WHO	World Health Organization

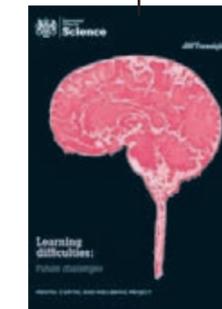
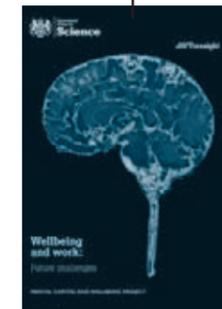
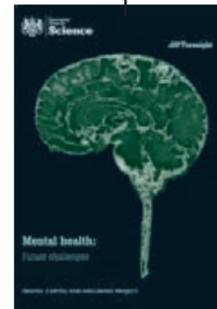
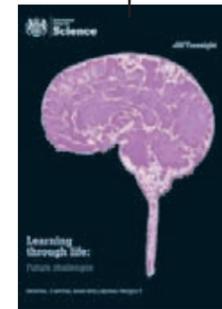
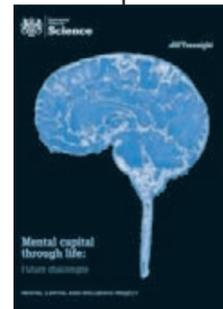
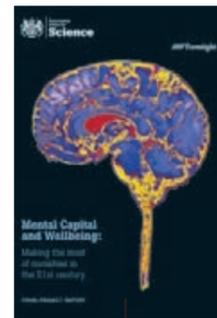
## Appendix E: Structure of the Project reports and supporting papers

The accompanying chart details the reports and papers produced by the Project. The various reports are available in the following formats through [www.foresight.gov.uk](http://www.foresight.gov.uk):

- All are available by download.
- All are also all available on CD ROM.
- The reports in the accompanying chart that are represented by icons of their front covers are also available in hard copy.

In addition to the reports and papers in the accompanying figure, a number of other discussion papers, economics papers, and workshop reports will also be made available in due course through the above website.

**Mental Capital and Wellbeing: Making the most of ourselves in the 21st century**  
Final Project Report



**Mental capital through life: Future challenges**

- SR-E1:** Neuroscience of education
- SR-E2:** Human reward
- SR-E3:** Neuroeconomics
- SR-E4:** Cognitive reserve
- SR-E5:** The adolescent brain
- SR-E6:** Behavioural economics
- SR-E7:** Resilience
- SR-E8:** Adolescent drug users
- SR-E9:** Pharmacological cognitive enhancement
- SR-E10:** Stem cells in neural regeneration and neurogenesis
- SR-E11:** Early detection of mild cognitive impairment and Alzheimer's disease: An example using the CANTAB PAL
- SR-E12:** Anxiety disorders
- SR-E13:** Neurocognition and social cognition in adult drug users
- SR-E14:** Normal cognitive ageing
- SR-E15:** Social cognition in teenagers – inclusion
- SR-E16:** HPA axis, stress, and sleep and mood disturbance

- SR-E17:** Nutrition, cognitive wellbeing and socioeconomic status
- SR-E18:** Nutrition and cognitive health
- SR-E20:** Effect of chronic stress on cognitive function through life
- SR-E21:** Depression and its toll on mental capital
- SR-E22:** Fitness and cognitive training
- SR-E24:** Effects of exercise on cognitive function and mental capital
- SR-E25:** Technology solutions to prevent waste of mental capital
- SR-E27:** Housing as a determinant of mental capital
- SR-E29:** Cognitive neural prosthetics
- SR-E31:** Cellular and molecular logic of neural circuit assembly

**Learning through life: Future challenges**

- SR-A2:** Learning at work
- SR-A3:** Skills
- SR-A4:** Participation in learning
- SR-A5:** Evidence-informed principles from the Teaching and Learning Research Programme
- SR-A7:** Estimating the effects of learning
- SR-A9:** Self-regulation and executive function
- SR-A10:** Lifelong learning across the world
- SR-A11:** Non-cognitive skills
- SR-A12:** Future technology for learning

**Mental health: Future challenges**

- SR-B1:** Genetics and social factors
- SR-B2:** Mental health of older people
- SR-B3:** Positive mental health
- SR-B4:** Mental disorders in the young
- SR-B5:** Prisoners
- SR-B6:** The homeless
- SR-B7:** Children in local authority care
- SR-B8:** The costs of mental disorders
- SR-B9:** Serious and enduring mental illness
- SR-B10:** Personality disorders
- SR-B11:** Violence
- SR-B12:** Ageing
- SR-B13:** Migrants
- SR-B14:** Substance abuse
- SR-B15:** Depression

**Wellbeing and work: Future challenges**

- SR-C1:** Workplace stress
- SR-C2:** Mental wellbeing at work and productivity
- SR-C3:** Management style and mental wellbeing at work
- SR-C4:** Flexible working arrangements and wellbeing
- SR-C5:** New technology and wellbeing at work
- SR-C6:** Stress management and wellbeing
- SR-C7:** Working longer
- SR-C8:** Leisure: the next 25 years
- SR-C9:** Training in the workplace
- SR-C10:** Careers
- SR-C11:** Violence at work

**Learning difficulties: Future challenges**

- SR-D1:** Specific language impairment
- SR-D2:** Dyslexia
- SR-D3:** Adult learning disabilities
- SR-D4:** Dyscalculia
- SR-D5:** Deafness
- SR-D7:** Genetics and diagnosis of learning difficulty
- SR-D8:** Conduct disorder and anti-social behaviour
- SR-D9:** Social cognition and school exclusion
- SR-D10:** Autism and autism spectrum disorders
- SR-D11:** Attention Deficit Hyperactivity Disorder
- SR-D12:** New technologies and interventions
- SR-D13:** Trajectories of development and learning difficulties
- SR-D14:** Early neural markers of learning difficulty
- SR-D15:** Childhood depression
- SR-D16:** Eating disorders

**Cross-Project papers**

- SR-X2:** Science of wellbeing
- SR-X3:** Neurobiology of wellbeing
- SR-X5:** Neural circuit assembly
- DR-1:** ICT as a driver of change
- DR-2:** Physical environment and wellbeing
- ER-1:** Ethics

**S1: Systems maps**

Note 1: Some reference numbers were assigned to topics; however, the reports/papers were not subsequently commissioned.

Note 2: The Project commissioned some additional “discussion papers” as referred to in the text of the final report.

These will be made available through [www.foresight.gov.uk](http://www.foresight.gov.uk) in due course.

# Appendix F: Government initiatives considered

The analysis of this report has taken account of a large number of past and present Government initiatives, reviews and strategies, as well as a number that are currently in planning. The following lists some of those that are specific to the UK, broadly grouped according to their relevance to different parts of the lifecourse<sup>509</sup>:

## Childhood and Adolescence

Child and Adolescent Mental Health Services (CAMHS) Review  
The Children's Plan  
The National Academy for Parenting Practitioners  
Sure Start  
The Rose Review of the Primary Curriculum

## Adults

Dame Carol Black's Review of the health of Britain's working age population  
Higher Education at Work – High Skills: High Value  
The Leitch Review of Skills  
Flexible Working: A review of how to extend the right to request flexible working to parents of older children  
Skills for Life  
Train to Gain  
No one written off: reforming welfare to reward responsibility  
The Race to the Top: A Review of Government's Science and Innovation Policies.

## Older people

A Recipe for Care – Not a single ingredient  
Carers at the heart of 21st-century families and communities: a caring system on your side, a life of your own  
The Dignity in Care Campaign  
Everybody's Business: Integrated mental health services for older adults: a service development guide  
Lifetime Homes, Lifetime Neighbourhoods: A National Strategy for Housing in an Ageing Society  
National Dementia Strategy  
National Service Framework for Older People  
New Deal for Carers  
Opportunity Age  
Partnerships for Older People (POPP)  
Putting People First: a shared vision and commitment to the transformation of adult social care

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<sup>509</sup> Note: this list is not intended to be exhaustive and some initiatives may be relevant to more than one category.

## **Cross-cutting**

The NHS Next Stage Review  
Our Health, Our Care, Our Say

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## Appendix C – Biomarkers of depressive disorders

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## Appendix C – Mild Cognitive Impairment and Alzheimer’s Disease

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*This report has been commissioned as part of the UK Government's Foresight Project, Mental Capital and Wellbeing.  
The views expressed do not represent the policy of the UK Government.*

