Department of Health

A Framework for mental health research

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Foreword

One in four of us experience mental health problems but many do not receive the support they need. There are stark inequalities; people living in poverty, in poor physical health, and from minority communities are disproportionately affected. As public attitudes begin to improve, and stigma starts to reduce, the need to prioritise mental health in the research community has never been clearer.

Despite the urgency and scale of this challenge, mental health research has lagged behind many other areas in terms of priority, funding, and therefore discoveries. This means that improvements in prevention and care are progressing too slowly.

The Mental Health Taskforce laid out the immediate steps that should be taken to improve support and make the most of our existing knowledge. However, accelerating mental health research and creating a strong ambition for change is essential to achieve parity between mental and physical health in the longer term.

There is great, and justifiable, optimism that the UK can and should do better in mental health research. We are world-leaders in peer research and patient involvement, digital development, neuroscience and functional imaging, epidemiology, and research with children. Research led programmes have shown the effectiveness of large scale access to talking therapies (IAPT), and anti-stigma programmes (Time to Change). We must build on these strengths to achieve change but we must also increase our ambition.

Currently expertise is concentrated geographically, and we must support a major push to spread this more widely. We must be bold in setting clear goals to improve the prevention and treatment of mental illness, challenge the scientific community to deliver the tools for these goals, and then support them to do so. The potential is enormous – research has already led to remarkable reductions in death and disability from many major physical health conditions.

This Framework has been developed to improve co-ordination and focus on areas where mental health research is likely to translate into significant health benefits. It has been developed in collaboration with people who have mental health problems, academics in mental health research and research funders. They have come together to identify the barriers that need to be overcome and opportunities that we must seize. They found that basic foundations need to be laid so that mental health research can flourish.

There have been major initiatives to reach a consensus on the most pressing scientific priorities in mental health, in particular the ROAMER collaboration. This Framework does not seek to replicate these. Instead, it makes a number of recommendations which include increasing the capacity and diversity of the mental health research community, promoting innovative research in a wider range of settings, and strengthening patient and public involvement.

We cannot underestimate the challenge ahead. This is a first step, but there is much

more work needed to increase the funding available, involve more people in the research process, and ensure that new knowledge is accessible to people delivering and using services. This will require close collaboration between researchers, funders, voluntary sector, and the government. As always, people with experience of mental health problems must be involved at every stage of the process.

We are grateful for the contributions of everyone who has joined in the development of this Framework. We are optimistic that the UK can make substantial short, medium and long-term advances in research leading to the essential transformation in mental health.

Jeremy Hunt, Secretary of State for Health

Paul Farmer, Chief Executive of Mind

Chris Whitty, Chief Scientific Adviser

1. Executive summary

This *Framework for Mental Health Research* has been developed in response to a recommendation in the *Five Year Forward View for Mental Health* published in February 2016 by the independent Mental Health Taskforce. It offers a collective view of how mental health research should move forward over the next decade. The UK needs to consider how research can take advantage of exciting new developments in medicine, science and technology in the coming years to make a real difference to people's lives. Implementation of research evidence is another important issue – greater implementation would accelerate progress.

Development of the Framework was co-ordinated by the Department of Health between February 2016 and November 2017. This report and its recommendations reflect the discussions of the steering group, working groups, stakeholder workshops and wider engagement and builds on previous mental health research prioritisation work. Details of contributors are provided in Annex 8.2.

Mental health problems are widespread in the UK and affect people throughout the life-course. **Section 2** describes the impact mental health problems can have on individuals, and the wider societal and economic consequences. It considers some of the socioeconomic factors which increase the risk of developing a mental health problem. It also recognises the need for research to focus on children and young people; three-quarters of mental health problems start before the age of 18. Developing a mental health problem at a young age can have life-long adverse consequences, affecting emotional and social development, educational achievement and chances of employment.

Section 3 'Why mental health research matters' emphasises the importance of research in driving innovation in mental health care and in bringing hope for the future. Research improves our understanding of the causes and risk factors for mental health problems, supports promotion and prevention initiatives helping people to stay well, underpins the development and evaluation of new forms of support (psychological, social, cultural and pharmacological), and provides evidence on how innovative approaches can be put into practice in the healthcare system and in wider settings. Case studies in this section illustrate the UK's strengths in mental health research and the difference UK-based research has already made.

The importance of involving people with mental health problems at all stages of research is the focus of **Section 4**. Involvement improves research, for example by increasing recruitment, improving study design and ensuring the use of the most relevant outcome measures. This is an area where the UK has made advances, and there is an opportunity for our mental health research community to continue to lead in developing and establishing best practice. There is scope to increase diversity in involvement, increase co-production and user-lead research, and to promote greater

consistency in involvement requirements across UK research funders.

Four working groups supported the development of the Framework. Each focused on an area of mental health research (basic science; translational research; population and health services research; research on children and young people). **Section 5** summarises the views from each group, in particular highlighting areas of UK strength, and suggestions for how the UK's mental health research system could be improved.

Section 6 reviews the current barriers to mental health research in the UK and identifies future research opportunities. The importance of taking a life-course approach to mental health research is emphasised, and the value of involving of people with mental health problems in research is again highlighted. The need for securing closer integration of mental and physical health research to maximise research capacity, and for improved alignment in national research infrastructure (including cohorts and biobanks) to support mental health research is outlined.

The full potential of data collection and informatics for mental health research has yet to be realised. The digital era offers vast opportunity, but there is a need for greater consensus on outcome measures, increased use of NHS data and wider dataset linkage beyond healthcare settings.

Research funding mechanisms must be sufficiently flexible to promote translational research and interdisciplinary studies, and must enable innovative research in a range of settings. Renewed support is important to ensure the engagement of not only the pharmaceutical and digital sectors, but all industries relevant to mental health, such as care home providers. Ways in which the regulatory and governance requirements could be improved are identified, as is the need to expand the size and diversity of the research community.

The Framework concludes **in Section 7** with ten recommendations to address the barriers and opportunities identified in Section 6. Implementation of these recommendations will require collaborative action from stakeholders across the UK's mental health research community over the next decade and beyond. The recommendations are intended to improve coordination and strengthen the focus on areas where mental health research is likely to translate into significant health benefit for the UK and worldwide.

RECOMMENDATIONS

Recommendation 1: Life-course approach

Stakeholders: Research funders, PHE, NHSE, NHS Digital.

Mental health research needs to take a life-course approach with an emphasis on prevention and early intervention at all stages of life, understanding how and why mental health problems emerge and improving treatment and support.

Funding programmes should encourage research at the periods during which mental health problems can be prevented (particularly in the perinatal period and during childhood and adolescence) and encourage understanding of the causes and progression of mental health problems. The use of a range of methods to address questions around social inequality as well as standard approaches, such as cohorts, should be encouraged.

In adopting a truly life-course approach to mental health research, there is a need to involve organisations beyond traditional mental health services. This

includes local authorities and education providers, workplaces, social care and the voluntary sector.

Recommendation 2: Patient and public involvement (PPI)

Stakeholders: Research funders, HRA, INVOLVE, Universities, Charities.

Patient and public involvement in mental health research should continue to be strengthened and systematically embedded throughout research regulation, ethics and governance, shaping and determining research questions, assessment of research proposals and research evaluation.

User-led research as an emerging discipline, generating new knowledge and investigating things that matter on a day to day basis to people experiencing mental health problems, should continue to be strengthened. So too should co-production in research, combining expertise of practitioners, healthcare commissioners, service users, carers, policy makers and researchers together within multi-disciplinary research teams.

There is a need to make involvement more representative particularly by increasing inclusion of children and young people and people with protected characteristics. Involvement in basic research should be strengthened and requirements for involvement harmonised across research funders.

Recommendation 3: Mental and physical health

Stakeholders: Research funders, PHE, NHSE, Industry.

Strengthening the connections between physical and mental health research should be a priority. This should include:

- Routine assessment by applicants, reviewers and funding committees of the relevance of research to mental health in all life-science funding applications and reporting in final reports and institutional reviews.
- Routine capture of mental health outcome measures in studies of physical health including prevention research (and the converse, routine capture of physical outcome measures in mental health research).
- Research which spans physical and mental health such as: understanding mechanisms behind the mortality gap in severe mental illness; side-effects of medication; ethnicity; immunology and mental health; addictions/compulsive disorders and physical health.

Recommendation 4: Co-ordination and infrastructure

Stakeholders: Research funders, PHE, NHSE, Industry, Universities, Voluntary sector, National Audit Office.

Greater co-ordination and leadership of mental health research activity is needed across the UK between public research funders, universities, industry, charities and the wider voluntary sector.

Initially, building on the existing work of MQ, a portfolio review of UK mental health research funders, including the Medical Research Council (MRC) and National Institute for Health Research (NIHR) should be published and made openly available with a gap analysis to inform future investment.

This should lead to better alignment of mental health infrastructure and resources including: capacity for investigation of animal models, translation of basic neuroscience, deep phenotyping, informatics and bio-banking. The mental health components of national research resources should be progressively strengthened, including through the use of web-based and mobile record linkages.

Recommendation 5: Data, informatics and virtual populations

Stakeholders: Research Funders PHE, NHSE, NHS Digital, HRA, Industry, Universities.

Informatics projects should be established and supported by investments to expand the use and linkage of digital data in mental health research. These should build on the potential of the Clinical Record Interactive Search (CRIS) and of electronic health records (EHRs). Links with national datasets across sectors including social care, education, welfare and justice should be promoted.

Digital technologies such as social media, wearable sensors, smart phone apps, virtual reality and artificial intelligence should enable new approaches to generate research data and provide supportive interventions:

- Virtual/digital recruitment platforms for mental health research should be established drawing from routine healthcare, educational and crowd-sourced data providing populations for observational and experimental studies.
- Platform(s) should support the identification of risk factors and high-risk populations and should develop new methods to generate targeted/enriched cohorts focused on specific risk factors, health problems or age periods.

Recommendation 6: Flexible funding

Stakeholders: Research funders.

Novel, seamless funding mechanisms should be established to stimulate linked programmes of mental health research across the translational interfaces. This includes adopting novel trial procedures (e.g. adaptive trials) that also allow or test for patient preferences.

Funding mechanisms should:

- Be sufficiently flexible to enable forward and back translation of findings within a single programme (for example programmes should span pre-clinical and clinical research and/or social research).
- Promote collaboration between disciplines and across sectors (e.g. education, housing, voluntary sector).

Funders should also consider novel processes to bridge support for existing research programmes to reduce delay across translational interfaces.

Recommendation 7: Emerging interventions and alternative settings

Stakeholders: Research funders, PHE, Department for Education, Home Office, DWP, DCMS, Local Authorities, Voluntary Sector, research academics.

Funding programmes should promote research to enable the development and evaluation of new and alternative approaches to prevent mental health problems or support people with them. There should be increased focus on interventions in children's centres, schools, workplaces, prisons, care homes and voluntary and/or community-led centres (e.g. refuge/crisis centres).

New research methods must be developed and a more diverse research community established to facilitate research in such settings. As interventions may not immediately transfer across or between settings, systematic implementation research should be encouraged to enable local adaptation and adoption.

Recommendation 8: Industry engagement

Stakeholders: Research funders, Industry, BEIS.

Industry engagement in mental health research should be encouraged across the pharmaceutical, digital, engineering, design and technology sectors through a suite of initiatives including:

- Increased incentives to re-invigorate industry loans of research tools (including drug libraries and other molecules such as positron emission tomography (PET) ligands).
- Funding schemes to support academic collaboration with micro, small and medium-sized enterprises (SMEs) and the involvement of patients to focus on experimental medicine approaches and to develop, tools, standards and quality of health related products. These should facilitate research tool donation and intellectual property (IP) agreement.
- A focus on research with sectors emerging as important to mental health such as care home providers and the data analytic sector.

Recommendation 9: Regulation, ethics and governance

Stakeholders: Research Funders, Home Office, HRA, RECs, MHRA/EMA, Local Authorities, Universities.

Procedures for the regulation, governance and ethical oversight of mental health research should be streamlined to expedite studies. There should be a focus on streamlining the regulation, ethics and governance of: animal research, experimental medicine, clinical trials, population research and observational research involving large datasets. Research ethics committees should have mental health specific expertise on their panels and involve experts by experience and mental health clinicians in reviewing mental health research studies.

Recommendation 10: Capacity building

Stakeholders: Research funders, NHSE, academic research community. Universities and their linked teaching Trusts, NHS Trusts, Voluntary & Community sector.

Sustained effort is required to progressively expand UK mental health research capacity and make this a more diverse and representative workforce, particularly at senior levels. A greater focus on mental health research should be encouraged across the total life-science research workforce and other relevant disciplines.

Initiatives should include:

- Recruiting wider multidisciplinary research expertise (from other medical specialities and groups such as: anthropologists, data scientists, chemists, engineers, statisticians, geographers, sociologists, economists, criminologists, educationalists, clinical trialists, population scientists, improvement scientists).
- Strengthening clinical–academic research capacity across the mental health professions (including in academic psychiatry, nursing, clinical psychology, social work).
- Expanding the existing mental health research community through practical measures to build the careers of service users as researchers and, increase and maintain the involvement of people with experience of mental health problems, carers and those within voluntary and community groups.
- Fostering research fellowships partnered with industry sectors.
- Strengthening research awareness and participation amongst healthcare practitioners and those supporting

people with mental health problems (including general practitioners, nurses, health visitors, midwives, occupational therapists social workers, pharmacists, psychologists, public health practitioners, relatives and carers).

- Encouraging Universities and their linked teaching hospital Trusts to grow their mental health research portfolios, challenging stigma at an institutional level.
- Increasing support for mental health researchers throughout their careers (including mentoring schemes for early career researchers, and incentives for Universities to invest in senior investigators).
- Encouraging funders and researchers to include within all life-science research outcome measures relevant to mental health.

2. Mental health of the UK population

2.1 Mental health in the UK

Mental health problems are widespread in the UK population and affect people throughout the life-course.[1] In the most recent national household survey one in six adults (17%) in England – about one woman in five, and one man in eight – reported they had a common mental problem within the last week.[2] Almost half of adults in England (35.2% of men and 51.2% of women, 43.5% total) also reported that, in their lifetime, they have had a diagnosable mental health problem.[3] There were over 6,000 deaths from suicide in the UK in 2015, and suicide is now the leading cause of death for young men.[4,5] The extent of mental health problems is broadly similar across the UK, although there are minor national variations (Table 1). People from lower income groups are more likely to develop mental health problems.[6,7]

Table 1: National Survey data on mental health

England	17% of adults reported they had a common mental health problem within the last week.[8]
Northern Ireland	17% of respondents showed signs of a possible mental health problem.[9]
Scotland	16% of adults exhibited signs of a possible psychiatric disorder.[10]
Wales	13% of adults were found to be currently receiving treatment for a mental health problem.[11]

Improvements in the prevention and treatment of mental health problems have been much slower than in other common health conditions, including cardiovascular disease (heart disease and stroke) and cancer. The remarkable progress in other disease areas has been built on a very strong, science-driven, evidence base. There is already evidence that scientific discovery can similarly lead to improvements in mental health outcomes.[12] For example, a recent cost-effectiveness review of services to promote mental health and wellbeing identified eight evidence based areas of work.[13] The UK government has therefore prioritised mental health including research into the prevention and treatment of mental health problems.

Mental health problems are varied and often disabling. In 2013, the Chief Medical Officer's report on public mental health recognised 'mental illness... as the largest single cause of disability' which 'represents 28% of the national disease burden in the UK'.[14] There are indications of a continued growth in the impact of mental health problems; for example the rates of common mental disorders in women in England have increased steadily since 2000.[15] The extent of mental health problems in the UK is also part of a wider global picture; mental health problems are one of the main causes of global disease burden now accounting for a fifth (21.2%) of years lived with disability worldwide.[16]

The impact of a particular mental health problem on an individual's overall health and life will vary considerably. However, some outcomes are widely recognised. For example:

- People with severe mental health problems have a life expectancy that is, on average, 20 years less for men and 15 years less for women, than the general population.[17] This has been described as an 'unacceptably large premature mortality gap' and 'one of the greatest health inequalities in England'.[18,19] There is potential to reduce this excess mortality through improvements in both mental and physical health care.[20]
- Mental and physical health problems interact. Research by the King's Fund found that 46% of people with a mental health problem had a long-term physical health problem, and conversely that 30% of people with a long-term physical health problem also had a mental health problem.[21]
- Alcohol and/or drug misuse often co-exist with mental health problems. It has been estimated that 75% of users of drug services and 85% of users of alcohol services experience mental health problems.[22] People with co-existing substance misuse and mental health problems face significant barriers in accessing mental health and or drug and alcohol services, sometimes requiring both services simultaneously.[23,24]
- Employment is lower among people with mental health problems. Only 43% of people with mental health problems are in employment, compared to 74% of the general population (in the UK aged 16-64).[25]

2.2 Socio-economic factors

There is evidence of significant inequalities between different groups in the population in relation to mental health.[26] It is accepted that exposure to unfavourable social, economic and environmental circumstances, inter-related with gender, increases the risk of developing mental health problems.[27,28] For example:

- Socioeconomic disadvantage (e.g. low education, unemployment, poverty or deprivation) is associated with increased risk of mental health problems.[29]
- People in marginalised groups are at greater risk of mental health problems, including people from black, Asian and other minority ethnic backgrounds, lesbian, gay, bisexual and transgender people, disabled people and people who have had contact with the criminal justice system, among others.[30] Research has found that Black Caribbean and African adults are estimated to be twice as likely to experience psychotic disorders.[31]
- Having a stable place of residence is important to maintaining good mental health and can support recovery from mental health problems. 80% of homeless people surveyed in England in 2014, reported that they had mental health issues, with 45% having been diagnosed with a mental health condition.[32] Population surveys have found that social isolation is associated with depression and anxiety.[33]

In 2014, the World Health Organization described the need to 'raise the priority given to the prevention of mental disorders and to the promotion of mental health through action on the social determinants of health'.[34]

Whilst there is evidence that public knowledge and attitudes have become less negative towards people with a mental health problem in the UK in recent years, people with mental health problems, and also their carers and families, continue to experience inequality, social exclusion and discrimination.[35,36] . Negative attitudes towards mental health problems can also extend to the perception of the research and provider communities, making mental health care and research a less attractive career choice.[37,38]

2.3 Mental health of children and young people in the UK

It has been estimated that half of lifetime cases of diagnosable mental health problems begin by 14 years of age and 75% of mental health problems start before the age of 18.[39,40] Developing a mental health problem at a young age can have life-long adverse consequences, affecting emotional and social development, educational achievement and later chances of employment.[41]

The most recent national surveys of child and adolescent mental health, in 1999 and 2004, found that 10% of children and young people (aged 5-16 years) had a clinically diagnosable mental health problem, which equates to 2-3 children in every class.[42] A more recent report from the Office for National Statistics found that one in eight children surveyed in 2011-12 and aged between 10 and 15, reported symptoms of mental health problems.[43]

Adverse conditions in early life, including child maltreatment and neglect, are associated with a high risk of mental health problems later in life, greater severity of mental health problems, increased recurrence across the life-course, and poor treatment response.[44,45] There is consensus that childhood trauma is significantly involved in the development of depression in adulthood.[46] Family circumstances and quality of parenting have a significant impact on risk of developing mental as well as physical health problems. In contrast, interventions in childhood can prevent the development of mental health problems in adults, for example, effective treatment of conduct disorders in children reduces the incidence of adult mental health problems.[47]

2.4 Costs of mental health problems to the UK

Alongside personal consequences, and the direct costs of health and social care service provision, mental health problems have wider economic impact across the UK through loss of productivity, sickness absence and the need for provision of welfare support. Costs are also incurred within the education system.[48]

Estimates indicate that the total economic and social costs of mental health problems range between £70-£100 billion annually (~ 4.5% of gross domestic product) with some estimates as high as £105 billion and given the rise in prevalence, these costs are set to rise.[49,50] In 2015, mental health-related issues were found to lead to approximately 17.6 million days' sick leave, or 12.7% of the total sick days taken in the UK.[51]

In 2013, two-thirds of adult recipients of Employment and Support Allowance (ESA), a form of welfare support provided to people who are ill or disabled to support them to work, or to meet the costs of ill health for those unable to work, were recorded as having a common mental health problem.[52]

Conversely, effective early treatment can reduce economic impacts of mental health problems. For example, a recent analysis found that for every pound invested in the

treatment of children and young people with depression, £32 of savings in overall public costs of care could be achieved.[53]

2.5 The Five Year Forward View for Mental Health and the role of research and innovation in driving change

The Five Year Forward View for Mental Health (5YFVMH) was published in February 2016.[54] This report, from the independent Mental Health Taskforce to the NHS in England, set out a series of recommendations to improve the experiences and outcomes of those with mental health needs in England. It built on the Future in Mind report, which in the previous year had articulated how access to high quality mental health care could be made easier for children and young people.[55]

The 5YFVMH indicated the 'delivering better care to more people … requires the development of new ways to improve the quality and productivity of services.' Also highlighted was the crucial role of the community and voluntary sector in supporting groups currently underserved by existing services, e.g. children and young people, older people, lesbian, gay, bisexual and transgender people, black, Asian and ethnic minority communities.[56]

The 5YFVMH recognised the importance of research and innovation in driving change, and the taskforce had heard support for 'more research involving experts-by-experience, looking at what matters most to people in relation to prevention and care or support.' It stated that mental health research should follow the roadmap set out in the ROAMER project,[57] which identified the following priorities:

1. Research into mental disorder prevention, mental health promotion, and interventions in children, adolescents, and young adults
2. Focus on the development and causal mechanisms of mental health symptoms, syndromes, and wellbeing across the lifespan (including older populations)
3. Develop and maintain international and interdisciplinary research networks and shared databases
4. Develop and implement better interventions using new scientific and technological advances
5. Reduce stigma and empower service users and carers in decisions about mental health research
6. Establish health-systems and social-systems research that addresses quality of care and takes into account sociocultural and socioeconomic contexts and approaches

The 5YFVMH recommended that the Department of Health should publish a report in one year setting out a 10-year strategy for mental health research.[58]

In January 2017, the Government's response to the 5YFVMH accepted this recommendation.[59] Development of this document was led by the Department of Health to provide a framework for mental health research, taking into consideration UK-wide issues and proposing a set of recommendations. This work was developed with patient and public groups (see section 8.2), mental health charities and foundations, academic experts and major research funders.

2.6 Process of Framework development

2.6.1 Steering group and working groups

Development of the Framework was overseen by a steering group chaired by the Chief Scientific Adviser for the Department of Health. The steering group was supported by four expert working groups which generated the Framework's interconnecting themes and recommendations. Each group focused on an area of mental health research and was co-led by a clinical academic professor and service user research expert:

- Basic science;
- Translational research;
- Population and health services research;
- Children and young people.

The membership of the steering and working groups is set out in Section 8.1.

2.6.2 Further input and review

Development of the Framework was informed by input from a range of additional stakeholders and sources, including:

- Discussion with stakeholders conducted by working group members and the secretariat (see section 8.2).
- Relevant publications (see section 8.3) including:
  - Widening cross-disciplinary research for mental health (2017).[60]
  - MRC Strategy for Lifelong Mental Health Research (2017).[61]
  - What Research Matters for Mental Health Policy in Scotland (2015).[62]
  - Implementing Bamford: Knowledge from Research.[63]
  - Research priority setting programmes for mental health research (see section 8.4).

The draft framework and emerging recommendations were also reviewed through a series of independent stakeholder events (see section 8.2).

3. Why mental health research matters

3.1 Mental health research in the UK – an opportunity for improving our current leadership

Research provides the evidence to make a real difference to people's lives and health outcomes. It provides hope that better understanding and support can and will be found. All the remarkable major advances in health that have led to current improved physical health and longevity have been based on multiple strands of basic and applied research. The UK is making mental health a priority and this Framework's ambition is to accelerate understanding of mental health and support for people with mental health problems through major advances in science.

Research and innovation in mental health can:

- improve understanding of the causes and risk factors for mental health problems, helping the population to stay well, building emotional resilience and coping strategies for managing poor mental health;
- develop and evaluate social, prevention, psychological, pharmacological and biological interventions, treatments and supports for people with mental health problems;
- determine how innovative treatments, support and management, including self-help and digital, can most effectively be put into practice, in the healthcare system and in community, workplace and domestic settings.

The UK itself is recognised internationally as a leader in MH research, and has driven notable developments in discovery, methods, measurements and analysis. The UK leads in efforts in understanding mental health from the perspectives of those with experience of mental health problems through our investment in processes supporting patient-public involvement (PPI) in research. UK strengths include genetics, longitudinal cohorts and other epidemiological studies, bioinformatics, neuroscience, neuroimaging, computational biology, psychological, behavioural and cognitive research, co-produced and user-led research and development of social interventions, and clinical studies and trials – both large and small.

The NHS is a unique resource for research – both as a source of research data (including NHS England's Improving Access to Psychological Therapies Programme (IAPT)[64] and NHS Digital's Mental Health Services Data Set (MHSDS))[65] and as a setting in which new interventions can be studied. Its potential for the study of mental health problems and population wellbeing must be fully realised. The MRC, the NIHR and UK-based foundations and charities including the Wellcome Trust are among the world's leading funders of internationally-leading research. The National Institute of Health and Care Excellence (NICE) is a further UK

strength which has led to global recognition of the UK as a leader in evidence review and evidence-based care.[66] Rigorous and objective analysis of evidence will continue to be essential in driving improvement in mental health treatments and outcomes.

Translation of research findings into meaningful advances in treatment and support is a vital stage of the research pathway. Better interventions are clearly needed to make substantive and meaningful change for future generations. UK research strengths, coupled with important advances in technology, represent a huge opportunity for the UK to continue to lead globally in mental health research, and expand on current scope and ambition. At the same time it is important to recognise that the UK mental health research base, whilst of high quality, is relatively small and geographically concentrated compared to many other areas of medicine, with a limited number of people trained in both research and psychiatry or related disciplines. This puts a limit on the speed at which expansion of research can occur whilst maintaining excellence in some important areas. Strengthening and broadening the skill base, and encouraging the wider life-science community to invest in mental health research is essential. It is a goal of this Framework to provide a vision for what we can achieve together, and a route to improving mental health research infrastructure in the UK that will support this sector to thrive.

3.2 Case studies

The UK's strengths in mental health research span the research pathway from basic scientific discovery to the implementation of novel treatments.

3.2.1 The importance of social support and interventions

Mental health problems have many causes, and they change people's lives in different ways.[67] They impact on relationships with family and friends, opportunities in education and work, access to housing and how communities respond. There is also a need to avoid discrimination, paternalistic relationships and prejudice towards people with mental health problems and against other identity characteristics, including sexuality, ethnicity and age and race and migrant status and educational level; for example, learning disability.

The UK is a leader of the field in using epidemiological studies to understand variations in the incidence of mental health problems[68] and follow up with social programmes such as those tackling bullying in childhood[69] and social isolation.[70,71] We are also leading methodological developments for co-produced studies[72] and survivor research.[73]

Advances in understanding and addressing social inequalities and multiple disadvantages include work in the UK to:

- Reduce discrimination.[74]
- Tackle domestic violence.[75]
- Reduce violence victimisation, particularly in young people.[76,77]
- Address poverty, childhood abuse and neglect.[78,79]
- Develop mental health employment support programmes.[80]

- Take a strengths based, person centred approach to recovery.[81]

Research is helping to unpick how these relate to each other and how people affected by mental health problems can, with the right support and actions, thrive and lead the lives they want to.[82]

3.2.2 Improving psychological treatments

The development of evidence-based psychological treatments has been one of the major mental health research achievements of the past 50 years. The Improving Access to Psychological Treatments (IAPT) initiative has delivered unprecedented access to therapies such as cognitive behavioural therapy (CBT).[83] CBT is amongst the most effective treatments for conditions where anxiety or depression is the main problem.

UK researchers are now exploring new ways to improve and extend psychological treatments including:

- Better targeting of psychological and pharmacological treatments for people with depression leading to better outcomes and more effective use of resources.[84]
- Reducing the impact of treatment resistant depression through combination treatment: Adding CBT to antidepressant treatment may reduce symptoms and improve quality of life.[85]
- Psychological therapies for young people with eating disorders: An enhanced form of CBT, already known to be effective for adults with eating disorders, has similarly been found to be effective for young people.[86]
- CBTp for psychosis, developed in the UK, can improve outcomes, led to NICE guidelines and is now implemented across the world.[87]
- Brief interventions in schools can reduce symptoms of depression, anxiety and conduct disorder in young people. Brief CBT may be effective in reducing general symptom severity in young people.[88]

3.2.3 Data save lives

A commitment to the collection of health data, whether routinely within the NHS (e.g. IAPT, Hospital Episode Statistics (HES), MHSDS, Public Health England Profile Data), directly from clinicians (e.g. the National Confidential Inquiry into Suicide and Homicide) or via cohort studies (such as the Millennium Birth Cohort or Generation Scotland) has resulted in the establishment of world-leading data resources in the UK. Researchers use these data to learn more about mental health problems, to study how healthcare is provided, and to drive improvements in healthcare.

In the case of mental health problems, data are enabling us to:

- Understand the course of mental health problems throughout the life cycle and understand the efficacy of the range of interventions currently on offer.
- Tackle early mortality in severe mental illness: people with severe mental health problems have a lower life expectancy than otherwise healthy adults.[89] This evidence has underpinned work in NHS Trusts to improve health outcomes for those with severe mental health problems with an initial focus on checks for diabetes, heart disease and cancer.
- Prevent suicide and self-harm: People with a history of self-harm, suicide attempts or under the care of mental health services are most vulnerable in the first three months post-discharge from hospital.[90,91] Studies suggest that a stronger focus around crisis care, such as the measures recommended in the Crisis

Care Concordat, and research on what works for whom in suicide prevention may clarify ways in which we can end these tragic losses.[92]

3.2.4 Insights from genetic studies

Fast-moving technology has made it possible to study the genetics of mental health problems in large populations. UK researchers are leading programmes of work and making key contributions to an international effort through the Psychiatric Genomics Consortium (PGC) which has already identified over 128 genetic risk factors for mental health problems.[93] Some of these risk factors are shared by people with bipolar disorder, major depressive disorder and schizophrenia.

Findings from PGC studies confirm that genetics are only part of a complex set of factors that interact across the lifespan, affecting a person's vulnerability to mental health problems. These results are leading the research community to think in new ways about the biological factors that increase vulnerability to mental health problems, and providing tangible pathways for work towards better treatments.[94]

3.2.5 The importance of brain development in adolescence

Adolescence is the time of development in which social relationships and the environment have a strong influence on brain and behaviour. It is also the time when mental health problems often emerge. Scientists in the UK are part of a growing group of researchers studying normal structure, function and development processes of the adolescent brain[95,96] – research that will help us better understand how disturbances in these processes might lead to the emergence of mental health problems.[97]

This work is showing how the adolescent brain differs from the adult brain and suggests that there may be specific windows of risk as well as opportunities for intervention during adolescence. We now need a more precise understanding of how brain development during this period relates to increased vulnerability to mental health problems, and a better understanding of how we might redesign our approaches to address the mental health problems of adolescents. Such research will be critical if we are to prevent the longer-term consequences of mental health problems.

4. Public involvement and making research matter

4.1 Involvement in research

Involvement of people with mental health problems, including many with experience of mental health services, in mental health research has increased in the UK with 'substantial advances being made in a relatively short time'.[98,99] It is now an area in which the UK has perhaps the most systematic approach world-wide. It includes involving members of the public in all stages of the research process, in activities such as priority setting, defining research outcomes, selecting research methodology, recruiting participants, interpretation of research findings and dissemination of results.[100,101] There is also increasing co-produced and user-led research which underlines the significance of people's expertise through experience, and encourages collaboration and a commitment to shared principles and values.[102,103,104,105,106,107] This is an area for further development.

The value and importance of involvement is supported by evidence that it improves research, for example by increasing recruitment, improving study design and ensuring the use of relevant outcome measures.[108] There is evidence that mental health research studies which involve patients and the public throughout the research process are more successful; for example they are likely to reach recruitment targets and impact is more likely to be achieved where patient and public involvement is well-planned and people are involved early.[109,110] Involvement also supports the ethical design and conduct of research, and tools have been developed to enhance the quality of reporting patient and public involvement.[111,112,113] Likewise, programmes such as the James Lind Alliance in the UK, that are built upon co-production principles, have been established to involve patients, carers and practitioners in identifying research questions around particular mental health topics of direct relevance and potential benefit to them (see section 8.4).[114]

We need to strengthen the evidence base of the effectiveness, outcomes and impact of patient involvement for each stage of the research process and put measures in place to ensure quality and appropriate involvement strategies are delivered in practice.[115]

The National Institute for Health Research (NIHR) has recently set out a national vision for the involvement of people in research as '*a population actively involved in research to improve health and wellbeing for themselves, their family and their communities*'.[67]

This vision gives the UK mental health research community an opportunity to lead in developing and establishing best practice in mental health research. Including the need, in mental health research, for:

- Greater involvement of children and young people, and men;
- Greater involvement of people with protected characteristics, including people from black, Asian and other minority ethnic backgrounds;

- Inclusion of wider community perspectives;
- Greater public involvement in basic science relating to mental health;
- Greater involvement in translational mental health research to ensure implementation of the knowledge generated;
- Greater co-produced and survivor research/user-led research;
- Greater consistency of requirement for PPI involvement across research funders.

5. Working group summaries

5.1 Introduction

The remit of the working groups was to look at the overall system for undertaking and delivering mental health research in the UK and how it could be improved. Key points are summarised here under the headings of the four working groups. The full discussion papers produced by the working groups will be made available on-line. The four working group summaries are not designed to be linear or priority ordered.

5.2 Basic science

Basic science research uses hypothesis-driven experimental designs to determine the causal mechanisms behind the functioning of the human body in health and illness.[116] In relation to mental health problems, it includes laboratory studies with cell cultures, animal studies, using systems and circuit neuroscience and cellular-molecular based methods, to increase our ability to understand the mechanisms that underlie mental health conditions.

The explosion of knowledge and understanding in basic science, as well as in 'big data' and psychiatric genetics presents huge opportunities over the next decade. The UK has strengths in many key research areas including imaging, animal models and molecular biology. There are also promising ways that research could capitalise on discoveries in psychiatric genetics. These include research that attempts to look at mental health problems in great detail ('deep-phenotyping' studies). This research will also help us to reappraise the utility of psychiatric diagnosis classification schemes into research into underlying mechanisms in mental health.

Key points:

- The availability of better animal models, including approaches involving behavioural, genetic, viral transduction, immunological and patient-derived stem cell methods, requires a more multi-disciplinary approach, more closely integrated with clinical studies. This is essential to enable their effective evaluation, translation into treatments, and the search for effective predictive markers of illness.
- Basic research is an area where Patient and Public Involvement (PPI) is underdeveloped, and there are inconsistent requirements for PPI amongst research funders (see section 4).
- The withdrawal of some of the pharmaceutical industry from the field of mental health research[117] has removed investment (with potential drugs for mental health conditions having higher failure rates) and reduced career opportunities for young researchers. With investment, significant progress could be made within the next decade to encourage re-engagement by industry (see section 6.8).

- Bureaucratic obstacles that currently hamper mental health research, animal research and clinical and experimental medicine studies could also be significantly reduced by a reappraisal of current thinking and practice (see section 6.9).

5.3 Translational research

Translational mental health research investigates how discoveries can help to improve prevention, produce better treatments or promote mental health and wellbeing. It uses evidence from clinical trials, epidemiology and basic science in two directions to understand the mechanisms for making these improvements: the cycle of forward- and back- translation.

Key points:

- The UK has strong discovery sciences; these encompass psychological therapies (talking and digital), social factors in mental health, the life/physical sciences, psychopharmacology, and fields such as statistics, informatics and computation. The UK is excellent in many aspects of the translational fields of epidemiology, psychology, imaging genetics, and experimental studies into the mechanisms of new treatments.
- There are opportunities for greater utilisation of new technology including, internet, tablet and mobile phone apps and wearable technologies for assessment and delivery of treatments for mental health problems.
- Patient and Public Involvement (PPI) in UK translational mental health research is second-to-none. It improves the research focus and process, and highlights problems such as the artificial divide between research on teenagers and young adults. It could extend its positive influence to research governance, the legal framework for translational research and ethical matters (see section 4).
- Combined with research infrastructure supplying very detailed information on large groups of people with and without mental health problems (as happens for other illnesses), and on their environments, the UK can be world beating in translational mental health research (see section 6.4).
- The NHS provides a unique opportunity to translate innovations into help for the people who need them. Improved coverage, quality and use of routinely collected health service data will release huge potential for large-scale experimental (including trials) and observational studies (see section 6.5).
- Challenges include effective collaboration across many different industries, and securing funding arrangements flexible enough to allow integration across disciplines, organisations and research approaches (see section 6.6).

5.4 Population and health services research

Population and health services research provides an evidence base for primary and secondary prevention of mental health problems and the delivery of the most effective services for people with established mental health problems. Our health systems and data sources provide an ideal test-bed to develop a robust evidence base on the prevention of mental health problems.

Key points:

- A step change in prevention could be achieved with research platforms which focus on critical time periods

(e.g. pregnancy and birth, adolescence) and provide efficient means to recruit large numbers of participants for both observational and interventional research (see section 6.1).

- There are many strengths in UK population and health services research, including a commitment to Patient and Public Involvement (PPI), co-production and user-led research, strong inter-disciplinary working, digital capability and excellence in cohorts, trials and mental health informatics (see section 4).
- There are numerous opportunities to leverage these strengths to accelerate progress in the short to medium term, especially by providing mechanisms to assist mental health researchers to work effectively together and pool resources. National infrastructures are needed to deliver PPI; to expand research informatics infrastructure; and to raise the profile of mental health to ensure it is always considered when national medical research investments are made (see section 6.4). There is also a need to focus efforts on sustaining an interdisciplinary research workforce (see section 6.10).
- Research on services and prevention also needs to take account of the changing landscape of service delivery, with more interventions provided by the third sector. There is a need to build research expertise and provide research tools in such settings (see section 6.7).

5.5 Children and young people

With the majority of mental health problems having their roots in childhood, research is needed to understand the causal risk factors that precipitate the development of mental ill health and identify and develop interventions that prevent and treat mental health problems in children and young people. There are considerable opportunities to make significant strides in mental health research in children and young people within the next decade. This also has positive implications for improving mental health throughout the subsequent life-course.

Key points:

- A digital data platform could be established in the relatively short-term (2-3 years) and some developments have already taken place.[118] This could provide immediate cross-sectional and short-span longitudinal data relevant for CYP's mental health research. (see section 6.5).
- This platform could also enable on-going longitudinal data collection and could be used to set-up 'virtual cohorts' to provide longitudinal data with deep phenotyping measures, vastly increasing our understanding of mechanisms of emerging mental health problems and resilience (see section 6.5)
- Systematic implementation and evaluation of alternative treatments and delivery models could also be achieved, enabling assessment of their efficacy in reducing mental health problems and public health costs (see section 6.7).
- Implementation research, together with research into causes and maintenance of stigma, could deliver improved understanding of barriers to treatment seeking and acceptability of services (see section 6.10).
- It is also possible to achieve a significant improvement in CYP patient and public involvement, including a more diverse set of CYP in PPI representation and research agenda setting (section 4).

6. Barriers and opportunities

Continued delivery of world-leading mental health research across the UK over the next decade will require opportunities to be taken and current barriers to be overcome.

6.1 Life-course approach

The UK has led in the adoption of a life-course approach in physical and mental health and there is a significant opportunity to capitalise on UK investments in this area.[119,120] This approach involves studying physical and social risks during gestation, childhood, adolescence, young adulthood, midlife and old age that affect subsequent health.[121] This approach is based on understanding that there are critical periods of growth and development when environmental exposures have a greater impact on health, and on long-term health outcomes, than at other times.[122] In addition, there is evidence of sensitive stages in childhood and adolescence when social and cognitive skills, habits, coping strategies, attitudes and values – that can strongly influence health in later life – are more easily acquired.[123]

A life-course approach is particularly valuable in mental health research as:

- The wider determinants of mental health problems are diverse, including adversity in childhood (such as physical, sexual and emotional abuse or neglect) as well as socio-economic context, social relationships and health behaviours. A life-course approach allows both social and biological explanations for mental health problems to be integrated.
- It can help to identify chains of risk that can be broken and particular times when intervention may be especially effective.[124] This may be during key life transitions (e.g. during exam periods, when leaving home, starting work, having children or retiring).

A life-course approach is also essential for the development of preventative approaches to mental health problems and population wellbeing. It is recognised that preventive public mental health interventions should begin in pregnancy and 'efforts to understand and alleviate mental disorders of adulthood must take into account a life-course perspective'.[125]

6.2 Patient and public involvement

There are opportunities for the UK mental health research community to continue to develop best practice, seeking to establish new models for patient and public involvement in studies from basic science to public health research. Known barriers include funding to pay for involvement at the research proposal stage, time required to do involvement well across the research pathway, and training of people with diverse expertise to get involved in research.[126] Embedding PPI appropriately in all mental health research studies is the objective. (see Section 4).

6.3 Mental and physical health

Mental and physical health are closely dependent on each other (see section 2.1).[127] However a disconnect between mental and physical health is evident not only across healthcare service provision and commissioning, but also in the public health and research sectors.

Mental ill health also contributes to health inequality as it is also associated with the risk of heart disease, stroke, cancer and premature mortality. Physical health problems in people with mental health problems can result from cardio-metabolic side effects of drug treatments, lifestyle factors, and possibly factors common to mental and physical illness risk, such as inflammatory processes.[128] By the same token, individuals with chronic medical conditions such as diabetes, heart failure, and chronic obstructive pulmonary disease have double the rate of depression of the general population. [129,130]

In the health services, separation in the approaches and location of treatment can result in poorer physical health outcomes for people with mental health problems, and conversely in poorer mental health outcomes for people with physical illnesses, particularly for those with long-term conditions.[131] Targeting of the Improving Access to Psychological Therapies (IAPT) programme towards people with long-term conditions is one step towards overcoming this divide.[132]

Separation in research is evident in that mental health outcomes are too frequently overlooked in physical health research. This can be a consequence of data being held in separate systems (i.e. in mental health trusts). There is a significant opportunity to help expand mental health research capacity by encouraging routine collection of some mental health outcome measures in studies of physical health.

6.4 Co-ordination and infrastructure

Although the UK has research strengths in many underlying topics, disciplines and approaches relevant to mental health, progress is currently limited by the lack of integration across the breadth of the research community. This includes a lack of flexible funding mechanisms to enable multi-disciplinary approaches in mental health, for example, joint clinical-basic studies and studies across the health and social care interface. A lack of infrastructure to support joint working means that investigators, groups and centres tend to collaborate on an *ad hoc* basis, around particular programmes or grants, rather over the longer term. There are both cultural and practical challenges in establishing long-standing collaborations.

In addition, national infrastructure for mental health research needs strengthening and greater alignment to address particular research questions ('horizontal alignment') and to achieve translation ('vertical alignment').

- *Cohorts:* The UK has a strong tradition of epidemiological research including national surveys and birth cohort studies.[133,134] More modern UK birth cohorts, such as ALSPAC are now moving into the period of life-course where mental health outcomes are becoming apparent, so their full mental health research value has yet to be realised.[135] Cohorts such as Born in Bradford, with inter-agency record linkage, will be extremely informative.[136] Existing cohorts and those potentially available in future, through capture of routine NHS and other data sets, need strategic planning and public confidence to better enable mental health research. There is also scope for

greater harmonisation of mental health measures between existing cohorts and other population resources. Such harmonisation may also contribute to greater reproducibility of mental health research findings.

- *Access to tissues:* Alongside access to data (see section 6.5), mental health research depends on the availability of biological samples such as blood, brain imaging scans and genetic material, often from large numbers of participants. Routine brain scanning and blood sampling in the mental health context is not yet in place across the NHS. This is a lost opportunity.
- *Bio-banking:* Research capacity has been limited by a lack of dedicated mental health biobanks accessible to the NHS, and because national research infrastructure such as UK Biobank, which has in time assembled important resources relevant to mental health, have tended to engage later in this field.[137]

6.5 Data, informatics and virtual populations

The full potential and opportunity of data collection and informatics for mental health research has yet to be realised. Across all forms of collection there is a need to ensure that data sets are harmonised and inclusive of a broad range of demographics (including consistency of coding across all protected characteristics) so that inequality and multiple disadvantage can be pro-actively addressed. Careful consideration needs also to be given to consent and data sharing issues, recognising the need for greater access to diverse datasets for a wider audience of mental health researchers.[138]

- *Routine outcome measures:* Consistently collected outcome and experience measures enable research and have been shown to drive improvement in the quality of healthcare in areas such as cardiovascular disease and stroke. However, only one sector of mental health services (the Improving Access to Psychological Therapies (IAPT) services[139]) has to date adopted and mandated the use of a set of routine, patient-rated outcome measures. In other mental health services there is little agreement as to which measures should be routinely used, and debate continues around the use of condition-specific and/or general measures. In addition, measures mandated for mental health service commissioning (e.g. Health of the Nation Outcome Scales, HoNOS[140]) may be unsuited to either clinical or research communities. Research on new, simple outcome and experience measures is underway and should build towards adoption of core sets which can be used both for healthcare and research across the lifespan.[141,142]
- *Clinical informatics:* Mental health services have been leaders in the use of digital data and there have been important advances in the use of electronic mental health records in research active trusts, together with new means of collating and using information (such as the Clinical Record Interactive Search (CRIS) and the Dementia Clinical Record Interactive Search (D-CRIS)[143,144]). However, there remains potential for far greater use of 'live' NHS data streams. The separation of mental health and physical health secondary care services, and a lack of wider awareness of excellence in mental health informatics, can result in missed opportunities around the inclusion of

mental health in national informatics initiatives.

- *Digital data and platforms:* The digital era offers new opportunities for facilitating data collection, supporting mental health promotion strategies including self-management, enabling early diagnosis, improving treatment and facilitating access to ongoing support for people with mental health problems. Approaches including social media or wearables can make research more accessible (especially for younger people and people in rural areas). However, digital approaches can risk excluding some groups, for example those with poor digital literacy, learning difficulties, differences in cultural interpretation or limited access. Effort is needed to ensure participation and subsequent engagement is as inclusive as possible.[145]
- *Dataset linkage:* Understanding of mental health problems and their social and environmental aspects will require greater linkage of diverse datasets, including across health, education, social care, welfare and justice systems. There is a need for greater harmonisation across data sets to enable linkage. Careful consideration must be given to ensure consent for data sharing.

6.6 Flexible funding

Analysis by the UK clinical research collaboration (UKCRC) has shown that, in contrast to many other disease areas, the proportion of research spending on mental health in the UK is below the relative burden of disease.[146] The overall annual spend by major public and charitable UK funders on research related to mental health in 2014 was calculated at £112.3 million, around 5.8% of the research spend across all health categories.[147]

The majority of public and charity mental health research funding in the UK (82.6% in 2014) comes from three major funders, the National Institute for Health Research (NIHR), the Medical Research Council (MRC) and the Wellcome Trust. The remainder is provided by other Research Councils, Government bodies and the charity sector.[148,149] The growth of new charities dedicated to funding mental health research such as MQ and McPin, is most welcome.

It has been reported that the extent of charitable funding of mental health research in the UK is well below that for conditions (including cancer and cardiovascular disease) where general public donations more than match government investment.[150] Yet, support for a transformation in mental health care is growing; targeted government action and mental health awareness campaigns are changing the public's perception of mental health.[151] The increase needed in public funding will only come about if the stigma associated with mental health continues to be challenged.

There are also concerns around the withdrawal of pharmaceutical investment from this field and the consequent impact on industrial-academic support and collaboration for mental health research in the UK (see section 6.8).

More broadly, there is a need for initiatives and partnerships between funders to promote interdisciplinary, translational and basic-clinical research studies. There is also a need for a diversity of funding to build the evidence base around holistic and alternative approaches to mental health and wellbeing. Innovative funding schemes need to be explored for research into mental health.

6.7 Emerging interventions and alternative settings

Asset based community development approaches recognise the importance of social capital resources found within communities for promoting population level wellbeing and good mental health for everyone.[152] New approaches to supporting people with mental health problems are also emerging including community based peer support.[153] This requires undertaking research within ordinary communities, taking studies beyond academic and healthcare settings into everyday spaces, and driving understanding of people's support needs in environments representative of their experience. This includes settings such as schools, places of worship, sports clubs, workplaces, prisons, voluntary and/or community-led centres, shelters for the homeless and crisis/refuge centres (including those for women) and care homes for the frail elderly. There are also important opportunities to research and develop innovative forms of support for use during critical time-periods within existing health and care services, for example low-intensity interventions which can provide initial support for people on mental healthcare waiting lists.

Community and voluntary groups are an invaluable source of support for people with mental health problems. These groups can act as leaders in providing innovative and culturally relevant support to communities and warrant further research. However, practical barriers to research in these settings may mean that such approaches are less likely to be systematically evaluated. In turn this can delay wider scale implementation of new models of support.

To facilitate research in a broader range of settings there is a need for the continued development and uptake of a wider range of research methods. For example, action research, ethnography, quality improvement programmes, qualitative studies and participatory research methods may all be appropriate for addressing critical research questions in a reasonable timescale within real world settings. Strengthening the implementation of research evidence and good practice into a range of settings where people seek support is equally important. There needs to be greater emphasis on service delivery staff being supported to be research literate and in making research findings accessible and relevant for local implementation.

6.8 Industry engagement

Active academic-industrial collaboration across a number of sectors (including pharmaceutical, digital, engineering, design and technology) will be essential to maximise UK potential to develop new forms of treatment and support for people with mental health problems.

The pharmaceutical sector has undergone significant change with many larger companies scaling back mental health research portfolios. However, there are important opportunities to build on the ongoing activity of small and medium sized pharmaceutical and biotechnology companies as well as to stimulate large scale re-investment. These include:

- Initiatives to invigorate loans of research tools (including drug libraries and other molecules such as positron emission tomography (PET) ligands).
- New partnerships between academic, industrial and regulatory partners to develop more sensitive measurement tools and biomarkers for use in clinical studies and trials.

- New targets derived from genetic discoveries and improved human and animal stem cell models.
- Investigation of the potential repurposing of drugs.
- Increased support for industry-academic posts (including post-doctoral Fellowships) to develop capacity.

The digital sector has an increasingly important role to play, both in enabling new means of data collection for research as well as driving the development of forms of virtual support.[154] This is an area of potential growth. Academic collaborations with digital and computing companies and national data research infrastructure including the Alan Turing Institute[155] will be important to support digital sector engagement in mental health.

6.9 Regulation, governance and ethics

Regulatory and governance barriers across the research pathway can delay progress:

- Research in human psychopharmacology, which is seeking to understand the action or potential therapeutic uses of psychoactive drugs (such as opiates, benzodiazepines and serotonergics and novel mechanisms) is difficult to conduct due to the need for compliance with multiple regulations.[156] These include the Misuse of Drugs Act (1971),[157] the European Clinical Trials Regulations,[158] the requirements of medicines regulators and ethical review. The recent Psychoactive Substances Act (2016) may add further complexity.[159] Each in isolation has a logic but the combined effect is greater in some areas of mental health than for physical health.
- Research involving protected species of animals is regulated in the UK by the Home Office in accordance with the Animals (Scientific Procedures) Act 1986.[160] There is concern from the research community that the current regulatory process in the UK – which is principally intended for the important aim of ensuring animal welfare – has in practice become disproportionate and unduly bureaucratic. This may place the UK at international disadvantage in basic research, and may also act as a disincentive to early career researchers, although it is not an issue unique to mental health.
- In relation to translational research in health, social care and educational settings, researchers view governance procedures as onerous and rate-limiting, despite work to streamline processes. For example, difficulties in establishing all approvals not only significantly delays research, but may make some unfeasible and untimely. The new UK policy framework for health and social care research sets out the principles of good practice in the management and conduct of health and social care research and its intention is to remove unnecessary bureaucracy for researchers.[161]
- There is concern that NHS Research Ethics Committees (RECs)[162] are unduly cautious in the mental health field, for example, in relation to studies addressing suicidal thoughts, intent or plans despite systematic review evidence that asking such questions has no effect on subsequent risk.[163] Greater involvement of mental health clinicians and people with experience of mental health problems on RECs is a potential means of developing relevant expertise and supporting decision-making. Access to independent ethical review requires streamlining for research conducted outside academic and clinical institutions, e.g. voluntary

sector led research. The informal requirement of many RECs that research participants in mental health research studies must be recruited through a care co-ordinator, rather than directly, is a further barrier to initiation of research studies and needs review.

- As the potential for greater dataset linkage expands, consent around the collection, use, confidentiality and security of data relating to mental health is a key concern of research participants. Transparency about how information is collected, shared, used and ultimately destroyed is essential. Equally, barriers to data access can delay or prevent research, and there is a need for a proportionate approach and clear governance. Recent progress in this area includes new provision for follow up in the recent Adult Psychiatric Morbidity Survey (APMS).[164]

In the longer term, there is need to ensure that any novel ethical considerations relevant to mental health research that arise are addressed, for example, how ethical review is approved in interdisciplinary research.

6.10 Capacity building

The UK's capacity to deliver mental health research is constrained by the current scale of its workforce.[165] There is a need to expand the research community in terms of both size and diversity, and to strengthen it by attracting researchers from a broader pool of expertise and encourage focus from more of the total life-science research capacity on mental health. In addition, there is a need to improve the recognition of the importance of research to service users, carers and clinicians and their engagement and involvement with research in any capacity.

In addition, researchers from a wide variety of disciplines are required. Expertise should be drawn in from other medical specialities and a diverse range of other disciplines such as: anthropologists, data scientists, chemists, engineers, statisticians, geographers, psychologists, sociologists, economists, criminologists, educationalists, clinical trialists, population scientists, improvement scientists. The mental health research community can also be built through the increased involvement of service-user researchers, people with experience of mental health problems, and those within voluntary and community groups.

There are significant barriers in the clinical academic career pathways in mental health research. Points in these pathways where greater support is needed to maintain capacity include post-doctoral research fellowships, the transition to academic clinical lecturer and establishment at senior lecturer level. Established academics have an important role in supporting capacity building by acting as role models and providing mentoring and support to attract and retain students and trainees. There are particular concerns about capacity in academic psychiatry, including a lack of psychiatrists with complementary training in basic sciences such as the neurosciences, psychopharmacology, informatics, epidemiology, genetics etc.[166,167] There is also a need to promote service user research leadership and research leadership in the wider mental health and primary care workforce, e.g. mental health nursing, social work and general practice.

More can also be done to strengthen research awareness, literacy and participation amongst healthcare practitioners and those supporting people with mental health problems (including general practitioners, nurses, health visitors, midwives, occupational therapists social workers, pharmacists, psychologists, public health practitioners, relatives and carers).

Discrimination is still encountered by people with mental health problems, their carers and families. It can act as a barrier to mental health research. One of the consequences of discrimination is that, just as people with mental health problems can delay seeking access to support and treatments, they can also be reluctant to engage with research. This can make it difficult for researchers to recruit and retain study participants, making research harder to conduct and the field overall seem less attractive. Indeed, stigma may also deter some people from becoming mental health researchers.

Mental health discrimination intersects with stigma and discrimination experienced by other groups. There are important opportunities through the media, and through campaigns such as 'Time to change' (which focuses on reducing mental health discrimination) and 'OK to ask' (which encourages people to ask about their research opportunities) to promote increased participation in mental health research.[168,169]

7. Conclusion and recommendations

The UK is internationally recognised as a research leader, with a proven track-record in mental health research. By harnessing developments in science and technology, our mental health research community has a real opportunity to play a leading role in driving forward innovation and making a significant difference to millions of people.

We must aspire to:

- Make significant progress in addressing mental health inequalities, bringing parity with physical health closer;
- Accelerate the pace of change in the development of innovative forms of prevention and support for people with mental health problems, and in the rate that these are implemented;
- Enable the development of innovative research methodologies and widen the range of settings in which mental health research takes place;
- Ensure greater diversity within the mental health research community, enabling more people to contribute their experience and knowledge to deliver change.

This framework has been developed to improve coordination and strengthen focus on areas where mental health research is likely to translate into significant health benefit. Its implementation will require collaboration from stakeholders across the UK's mental health and wider life-sciences research community over the next decade and beyond.

Recommendation 1: Life-course approach

Stakeholders: Research funders, PHE, NHSE, NHS Digital.

Mental health research needs to take a life-course approach with an emphasis on prevention and early intervention at all stages of life, understanding how and why mental health problems emerge and improving treatment and support.

Funding programmes should encourage research at the periods during which mental health problems can be prevented (particularly in the perinatal period and during childhood and adolescence) and encourage understanding of the causes and progression of mental health problems. The use of a range of methods to address questions around social inequality as well as standard approaches, such as cohorts, should be encouraged.

In adopting a truly life-course approach to mental health research, there is a need to involve organisations beyond traditional mental health services. This includes local authorities and education providers, workplaces, social care and the voluntary sector.

Recommendation 2: Patient and public involvement (PPI)

Stakeholders: Research funders, HRA, INVOLVE, Universities, Charities.

Patient and public involvement in mental health research should continue to be strengthened and systematically embedded throughout research regulation, ethics and governance, shaping and determining research questions, assessment of research proposals and research evaluation.

User-led research as an emerging discipline, generating new knowledge and investigating things that matter on a day to day basis to people experiencing mental health problems, should continue to be strengthened. So too should co-production in research, combining expertise of practitioners, healthcare commissioners, service users, carers, policy makers and researchers together within multi-disciplinary research teams.

There is a need to make involvement more representative particularly by increasing inclusion of children and young people and people with protected characteristics. Involvement in basic research should be strengthened and requirements for involvement harmonised across research funders.

Recommendation 3: Mental and physical health

Stakeholders: Research funders, PHE, NHSE, Industry.

Strengthening the connections between physical and mental health research should be a priority. This should include:

- Routine assessment by applicants, reviewers and funding committees of the relevance of research to mental health in all life-science funding applications and reporting in final reports and institutional reviews.
- Routine capture of mental health outcome measures in studies of physical health including prevention research (and the converse, routine capture of physical outcome measures in mental health research).
- Research which spans physical and mental health such as: understanding mechanisms behind the mortality gap in severe mental illness; side-effects of medication; ethnicity; immunology and mental health; addictions/compulsive disorders and physical health.

Recommendation 4: Co-ordination and infrastructure

Stakeholders: Research funders, PHE, NHSE, Industry, Universities, Voluntary sector, National Audit Office.

Greater co-ordination and leadership of mental health research activity is needed across the UK between public research funders, universities, industry, charities and the wider voluntary sector.

Initially, building on the existing work of MQ, a portfolio review of UK mental health research funders, including the Medical Research Council (MRC) and National Institute for Health Research (NIHR) should be published and made openly available with a gap analysis to inform future investment.

This should lead to better alignment of mental health infrastructure and resources including: capacity for investigation of animal models, translation of basic neuroscience, deep phenotyping, informatics and bio-banking. The mental health components of national research resources should be progressively strengthened, including through the use of web-based and mobile record linkages.

Recommendation 5: Data, informatics and virtual populations

Stakeholders: Research Funders PHE, NHSE, NHS Digital, HRA, Industry, Universities.

Informatics projects should be established and supported by investments to expand the use and linkage of digital data in mental health research. These should build on the potential of the Clinical Record Interactive Search (CRIS) and of electronic health records (EHRs). Links with national datasets across sectors including social care, education, welfare and justice should be promoted.

Digital technologies such as social media, wearable sensors, smart phone apps, virtual reality and artificial intelligence should enable new approaches to generate research data and provide supportive interventions:

- Virtual/digital recruitment platforms for mental health research should be established drawing from routine healthcare, educational and crowd-sourced data providing populations for observational and experimental studies.
- Platform(s) should support the identification of risk factors and high-risk populations and should develop new methods to generate targeted/enriched cohorts focused on specific risk factors, health problems or age periods.

Recommendation 6: Flexible funding

Stakeholders: Research funders.

Novel, seamless funding mechanisms should be established to stimulate linked programmes of mental health research across the translational interfaces. This includes adopting novel trial procedures (e.g. adaptive trials) that also allow or test for patient preferences.

Funding mechanisms should:

- Be sufficiently flexible to enable forward and back translation of findings within a single programme (for example programmes should span pre-clinical and clinical research and/or social research).
- Promote collaboration between disciplines and across sectors (e.g. education, housing, voluntary sector).

Funders should also consider novel processes to bridge support for existing research programmes to reduce delay across translational interfaces.

Recommendation 7: Emerging interventions and alternative settings

Stakeholders: Research funders, PHE, Department for Education, Home Office, DWP, DCMS, Local Authorities, Voluntary Sector, research academics.

Funding programmes should promote research to enable the development and evaluation of new and alternative approaches to prevent mental health problems or support people with them. There should be increased focus on interventions in children's centres, schools, workplaces, prisons, care homes and voluntary and/or community-led centres (e.g. refuge/crisis centres).

New research methods must be developed and a more diverse research community established to facilitate research in such settings. As interventions may not immediately transfer across or between settings, systematic implementation research should be encouraged to enable local adaptation and adoption.

Recommendation 8: Industry engagement

Stakeholders: Research funders, Industry, BEIS.

Industry engagement in mental health research should be encouraged across the pharmaceutical, digital, engineering, design and technology sectors through a suite of initiatives including:

- Increased incentives to re-invigorate industry loans of research tools (including drug libraries and other molecules such as positron emission tomography (PET) ligands).
- Funding schemes to support academic collaboration with micro, small and medium-sized enterprises (SMEs) and the involvement of patients to focus on experimental medicine approaches and to develop, tools, standards and quality of health related products. These should facilitate research tool donation and intellectual property (IP) agreement.
- A focus on research with sectors emerging as important to mental health such as care home providers and the data analytic sector.

Recommendation 9: Regulation, ethics and governance

Stakeholders: Research Funders, Home Office, HRA, RECs, MHRA/EMA, Local Authorities, Universities.

Procedures for the regulation, governance and ethical oversight of mental health research should be streamlined to expedite studies. There should be a focus on streamlining the regulation, ethics and governance of: animal research, experimental medicine, clinical trials, population research and observational research involving large datasets. Research ethics committees should have mental health specific expertise on their panels and involve experts by experience and mental health clinicians in reviewing mental health research studies.

Recommendation 10: Capacity building

Stakeholders: Research funders, NHSE, academic research community. Universities and their linked teaching Trusts, NHS Trusts, Voluntary & Community sector.

Sustained effort is required to progressively expand UK mental health research capacity and make this a more diverse and representative workforce, particularly at senior levels. A greater focus on mental health research should be encouraged across the total life-science research workforce and other relevant disciplines.

Initiatives should include:

- Recruiting wider multidisciplinary research expertise (from other medical specialities and groups such as: anthropologists, data scientists, chemists, engineers, statisticians, geographers, sociologists, economists, criminologists, educationalists, clinical trialists, population scientists, improvement scientists).
- Strengthening clinical–academic research capacity across the mental health professions (including in academic psychiatry, nursing, clinical psychology, social work).
- Expanding the existing mental health research community through practical measures to build the careers of service users as researchers and, increase and maintain the involvement of people with experience of mental health problems, carers and those within voluntary and community groups.
- Fostering research fellowships partnered with industry sectors.
- Strengthening research awareness and participation amongst healthcare practitioners and those supporting

people with mental health problems (including general practitioners, nurses, health visitors, midwives, occupational therapists social workers, pharmacists, psychologists, public health practitioners, relatives and carers).

- Encouraging Universities and their linked teaching hospital Trusts to grow their mental health research portfolios, challenging stigma at an institutional level.
- Increasing support for mental health researchers throughout their careers (including mentoring schemes for early career researchers, and incentives for Universities to invest in senior investigators).
- Encouraging funders and researchers to include within all life-science research outcome measures relevant to mental health.

8. Annexes

The lists below include many of the contributors who agreed to be named. We apologise for any errors or omissions.

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Steering group

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- Mr Gregor Henderson, Director of Wellbeing & Mental Health, Public Health England
- Mr Paul Farmer CBE, Chief Executive Officer, Mind
- Ms Cynthia Joyce, Chief Executive Officer, MQ
- Professor Sir Simon Wessely, President, Royal College of Psychiatry
- Dr Vanessa Pinfold, Chair, Alliance of Mental Health Research Funders
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- Dr Thomas Kabir, Co-chair, Working Group 1, Basic Science
- Professor Peter Jones, Chair, Working Group 2, Translational Research
- Ms Delphine van der Pauw, Co-chair, Working Group 2, Translational Research
- Professor Matthew Hotopf, Chair, Working Group 3, Population and Health Services
- Ms Clare Dolman, Co-Chair, Working Group 3, Population and Health Services
- Professor Essi Viding, Chair, Working Group 4, Children and Young People
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Stakeholder Workshops

Facilitated by	*Date*	*Location*
Mind	22/02/17	Cardiff
Mental Health Foundation	24/02/17	The Manchester Centre for Women's Mental Health, Manchester University
Mind	01/03/17	Cambridge
Mental Health Foundation	03/03/17	London
Academy of Medical Sciences	15/03/17	Academy of Medical Sciences

Additional Contributions:

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- Alliance of Mental Health Research Funders
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- Ricks Llewellyn-Davies, MH Policy Lead, DH

- Lyn Romeo, Chief Social Worker for Adults, DH
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- Zoë Gray, Director of INVOLVE
- Julia Gault, Deputy Director Family Policy, Department for Work and Pensions
- Dr Neil Ralph, Health Education England
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- Elly De Decker, Big Lottery
- Professor Miranda Wolpert, Anna Freud Centre, UCL
- Professor Ian Young, Chief Scientific Advisor, Northern Ireland
- Professor Andrew Morris, Chief Scientist, Scotland
- Professor Jon Bisson, Director Health and Care Research, Wales

8.3 Recent research reports and reviews

MRC Delivery Plan 2016-2020 (2016).[173]

Mapping UK mental health research funding and its contribution to global funding (2016).[174]

What Research Matters for Mental Health Policy in Scotland (2015).[175]

UK Mental Health Research Funding (2015).[176]

Implementing Bamford: Knowledge from Research (2011).[177]

Review of Mental Health Research – Report of the Strategic Review Group 2010 (2010).[178]

Strategic Analysis of UK Mental Health Research Funding (2005).[179]

MRC's Strategy for Lifelong Mental Health Research (2017).[180]

Widening cross-disciplinary research for mental health (2017).[181]

8.4 Research priority setting in mental health

A number of programmes in Europe and the UK have sought to identify research priorities in mental health. These include:

- The Roadmap for Mental Health Research in Europe (ROAMER) programme. Founded in 2011 to establish an agenda for mental health research in Europe, the programme identified six overarching priorities.[182,183,184]
- The James Lind Alliance (JLA) brings patients, carers and clinicians together in priority setting partnerships (PSPs) to identify and prioritise the top ten unanswered questions, about the effects of treatments in a specific research area.[185] A series of PSPs in mental health research have considered: Schizophrenia

(2011),[186] Depression: ARQ (2016),[187] Bipolar priority setting (2016)[188] and Autism (2016).[189] Further PSPs are underway considering psychological treatments, digital technologies for mental health and mental health in children and young people.[190]

- 'Have your say' conducted in 2016 to inform the priorities for mental health related research sponsored by the Economic and Social Research Council (ESRC).[191]
- 'New Mind Network' – Work to support the Development of the New Mind Research Roadmap by the Engineering and Physical Sciences Research Council (EPSRC).[192]

The public engagement findings of the 5YFVMH taskforce were published in September 2015.[193] The engagement findings indicated that:

- People wanted mental health research to be equitably funded, and to have parity with other areas of health research.
- There should be 'much more research led by experts by experience looking at what matters most to people in relationship to prevention and treatment'.
- There were calls for more research into the long-term effects of psychiatric medication.[194]

The taskforce also concluded that:

- Understanding the causes of mental ill health, including social and psychological factors, was considered a priority for research funding.[195]

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