Title: **Impact Assessment of the expansion of talking therapies services as set out in the Mental Health Strategy** **Lead department or agency:** Department of Health **Other departments or agencies:**	**Impact Assessment (IA)**
	IA No: 7026
	Date: 24/01/2011
	Stage: Final
	Source of intervention: Domestic
	Type of measure: Other

Summary: Intervention and Options

What is the problem under consideration? Why is government intervention necessary?

Depression and anxiety disorders are serious and debilitating conditions, associated with significant human and economic costs. The NICE Guidelines state that people diagnosed with these conditions should be offered evidence-based talking therapies as an effective treatment; this is also what most people with these problems want. The IAPT Programme roll-out, begun in October 2008 following the Spending Review 2007, has successfully trained therapists and rolled out talking therapies services largely for working age adults across England, to approximately 60% of the population. Full national roll-out was always expected to take six years and many people still do not have access to these services. Further funding is necessary to complete the roll out and ensure that services can be developed to broaden access to other important groups.

What are the policy objectives and the intended effects?

An expanded talking therapies programme will allow an estimated 400,000 more people per year to be treated and an estimated 100,000 more per year to recover than currently, and help correct the currently unequal access suffered by some groups. This will ultimately deliver important benefits to individuals, the NHS, and the wider economy. These include: health and wellbeing gains for those who recover from common mental health problems; NHS savings through reductions in healthcare usage by those who recover; exchequer savings through helping people attain, regain or retain employment and move off welfare benefits; and economic gains to employers through reduced sickness absences.

What policy options have been considered? Please justify preferred option (further details in Evidence Base)

1) Do nothing

2) (Preferred option) Expand the provision of talking therapies services across England, by: a) completing the roll out of adult talking therapies services; b) developing and initiating a stand-alone programme to extend access to psychological therapies for children and young people (CYP), and c) developing and piloting appropriate, effective, and evidenced services for older adults and those with physical long term conditions, medically unexplained symptoms, and severe mental illness.

Option 2, the proposed programme, is shown to deliver a strong positive net-benefit to society, and is also shown to deliver net cost savings to the wider public sector. As a result, it is the preferred option.

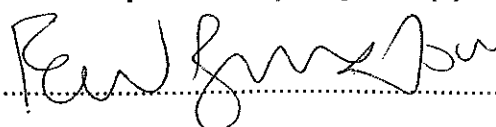| **Will the policy be reviewed?** It will be reviewed.	**If applicable, set review date:** 09/2013
What is the basis for this review? PIR Plan	**If applicable, set sunset clause date:** N/A

Are there arrangements in place that will allow a systematic collection of monitoring information for future policy review?	Yes

Summary: Analysis and Evidence

Description:

Expand talking therapies services in line with the Mental Health Strategy

Price Base **Year** 2010	PV Base **Year** 2011	Time Period **Years** 6	Net Benefit (Present Value (PV)) (£m)		
			Best Estimate: 4,640		

COSTS (£m)	**Total Cost** (Present Value)
Best Estimate	**966**

Description and scale of key monetised costs by 'main affected groups'

A large majority of the costs are associated with completing the roll out of adult talking therapies services across the country (£966m opportunity cost), including training psychological therapists and provision of services. In addition, there will be costs associated with the expanded provision of employment advice and support services.

Other key non-monetised costs by 'main affected groups'

There will be costs associated with the development of psychological therapies for children and young people, and those with physical long term conditions and severe MH conditions. However, these costs are likely to be small over the next four year period relative to the cost of completing the roll out of adult talking therapies services.

BENEFITS (£m)	**Total Benefit** (Present Value)
Best Estimate	**5,606**

Description and scale of key monetised benefits by 'main affected groups'

The key monetised benefits arise from completing the roll out of adult talking therapies services and employment advice services. These include savings to the NHS (in the form of reduced healthcare usage by recoverers), tax and benefits savings to the wider exchequer from people regaining or retaining employment, Quality Adjusted Life Year gains to individuals, and benefits to employers in the form of reduced sickness absences.

Other key non-monetised benefits by 'main affected groups'

The development of services for children and young people, and those with physical long term conditions and severe mental illness is expected to broaden the scope of talking therapies and realise key benefits further ahead. However, these areas are at an early stage of policy development and so possible benefits have not been quantified at this stage.

Key assumptions/sensitivities/risks	**Discount rate (%)**	3.5%*

In determining whether the proposed intervention is net saving or not (either to the NHS or wider exchequer), the key assumptions include the recovery rates with and without treatment, the costs of providing treatment, and the possible reduction in healthcare usage that can be achieved through helping someone achieve recovery from their common mental health condition. The QALY again achievable on recovery also has a large impact on the overall cost-benefit results. The key assumptions are considered in turn in sensitivity analysis contained within the evidence base.

* In line with DH IA Technical Guidance, health benefits measured in QALYs are discounted at 1.5% per annum.

Direct impact on business (Equivalent Annual) £m):			In scope of OIOO?	Measure qualifies as
Costs: 0	**Benefits:** 0	**Net:** 0	No	N/A

Enforcement, Implementation and Wider Impacts

What is the geographic coverage of the policy/option?	England
From what date will the policy be implemented?	01/04/2011
Which organisation(s) will enforce the policy?	DH and NHS Commissioning Board
What is the annual change in enforcement cost (£m)?	0
Does enforcement comply with Hampton principles?	Yes
Does implementation go beyond minimum EU requirements?	N/A

	Traded:	Non-traded:
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)	0	0

Does the proposal have an impact on competition?	No

	Costs:	Benefits:
What proportion (%) of Total PV costs/benefits is directly attributable to primary legislation, if applicable?	0	0

	Micro	< 20	Small	Medium	Large
Annual cost (£m) per organisation (excl. Transition) (Constant Price)	N/A	N/A	N/A	N/A	N/A
Are any of these organisations exempt?	N/A	N/A	N/A	N/A	N/A

Specific Impact Tests: Checklist

	Impact	Page ref within IA
Statutory equality duties[1] Statutory Equality Duties Impact Test guidance	Yes	37
Economic impacts		
Competition Competition Assessment Impact Test guidance	No	7
Small firms Small Firms Impact Test guidance	No	7
Environmental impacts		
Greenhouse gas assessment Greenhouse Gas Assessment Impact Test guidance	No	7
Wider environmental issues Wider Environmental Issues Impact Test guidance	No	7
Social impacts		
Health and well-being Health and Well-being Impact Test guidance	Yes	8
Human rights Human Rights Impact Test guidance	No	37
Justice system Justice Impact Test guidance	No	7
Rural proofing Rural Proofing Impact Test guidance	No	7
Sustainable development Sustainable Development Impact Test guidance	No	7

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[1] Public bodies including Whitehall departments are required to consider the impact of their policies and measures on race, disability and gender. It is intended to extend this consideration requirement under the Equality Act 2010 to cover age, sexual orientation, religion or belief and gender reassignment from April 2011 (to Great Britain only). The Toolkit provides advice on statutory equality duties for public authorities with a remit in Northern Ireland.

Evidence Base

Table of Contents

References

No.	Legislation or publication
1	Mental Health Strategy 2010, supporting document – Talking Therapies: a four-year plan of action
2	Impact Assessment of Improving Access to Psychological Therapies (IAPT) Implementation Plan
3	Layard, R., Clark, D., Knapp, M., Mayraz, G. (2007). 'Cost-Benefit Analysis of Psychological Therapy'. Centre for Economic Performance. CEP Discussion Paper No 829, October 2007.
4	McCrone, Paul et al. (2008) Paying the Price: The Cost of Mental Health Care in England to 2026. London: Kings Fund. http://www.kingsfund.org.uk/research/publications/paying_the_price.html
5	British Household Panel Survey, Waves 17 and 18, 2008 and 2009. University of Essex. Institute for Social and Economic Research
6	McManus, S and Meltzer, H and Brugha, TS and Bebbington, PE and Jenkins, R (2009) Adult Psychiatric Morbidity in England, 2007: Results of a Household Survey. The NHS Information Centre for Health and Social Care

A. What is the problem under consideration? Summary of analytical narrative

A.1 Characterise the underlying problem *(its symptoms and the diagnosis).*

1. Depression and anxiety disorders are serious and debilitating conditions, associated with significant human and economic costs. The NICE Guidelines say that people diagnosed with these conditions should be offered evidence-based talking therapies as an effective treatment; this is also what most people with these problems want. Before the Improving Access to Psychological Therapies (IAPT) Programme, which began in October 2008, psychological therapy services for people with depression and anxiety disorders were patchy, often not evidence-based and with inconsistent quality standards. The programme brought in a robust evidence-base, a stepped model of care, a workforce trained to national curricula and the routine monitoring of patient reported outcome measures at every contact. In the first three years to the end of March 2011, the programme will have successfully trained therapists and rolled out talking therapies services for working age adults across England, to approximately 60% of the population. However, many people still do not have access to these services. Further funding is necessary to complete the roll out and ensure that services can be developed to broaden access to other important groups.

A.2 Summarise and put into context the analytical narrative

2. '*Talking Therapies: a four-year plan of action*' is a supporting document to the Mental Health Strategy 2011 and sets out plans to expand provision of talking therapies services on a national, comprehensive basis. First, the roll out of adult talking therapies services and coordinated employment advice and support services, started in the last Spending Review period, is to be completed to ensure there is full service capability and that people over 65 are accessing the services appropriately as they have so far been under-represented among the patients treated. Secondly, plans are set out to develop and pilot services for those who currently suffer unequal access, including children and young people, people with physical long term conditions or medically unexplained symptoms, and people with severe mental illness. A stand-alone programme is to be initiated to extend access to NICE-approved and, where NICE guidelines are pending, 'best evidence' based psychological therapies for children and young people (CYP). These proposals were announced as part of the Spending Review 2010, and represent a priority of the Coalition Government's approach on mental health.

3. A cost benefit analysis of the proposals for an expanded talking therapies programme is set out in the following sections. This demonstrates that the interventions are not only highly cost-beneficial, but also expected to be cost saving to the public sector and can deliver important cost savings to the NHS. The evidence base draws on a number of sources, including academic mental health literature, national publications, the IAPT Impact Assessment which made the case for the initial programme, NHS Reference Costs, and importantly, site-level data taken from existing services. The key references are set out on page 6.

B. What are the policy objectives and the intended effects (the treatment goals)?

4. It is intended that services will be able to treat an estimated 400,000 more people per year than currently, and allow an estimated 100,000 extra people per year to recover from their common mental health problem. Further, the *four-year plan of action* includes proposals to help correct the current unequal access suffered by some key groups. Four key principles have been identified for the expanded programme:

- better access to services;
- clinical improvement/recovery for those treated;
- improved social and economic participation for those treated; and
- better patient choice and satisfaction about treatment.

5.   Alongside broadening choice and access to therapies for which there is a clear patient demand, the expanded talking therapies programme is intended to deliver important benefits to individuals, the NHS, and the wider economy:

- Health gains for those who recover from common mental health problems as a result of treatment;
- NHS savings through reductions in healthcare service usage by those who recover;
- Tax and benefits savings to the exchequer, through helping people attain, regain or retain employment and move off Employment Support Allowance and other welfare benefits; and
- Economic gains to employers through reduced sickness absences.

C.   What policy options have been considered? (Possible treatments)

6.   **Option 1**, the 'Do Nothing' option, involves maintaining the provision of talking therapies services at existing roll out. These services will be included in PCT baselines from 2011/12, so there is no further specific funding required for this option.

7.   While the roll out thus far has been successful and has delivered on expectations, it only represents a point midway through the originally planned six-year expansion phase. As a result, there will be only approximately 60% of the proposed long-run capability by the end of March 2011; a significant proportion of adults still do not have access to NICE-approved psychological therapy. Further, existing provision does not adequately meet the needs of certain key groups, including children and young people, older adults, and those with physical long term conditions or severe and enduring mental illness.

8.   **Option 2**, the preferred option involves expanding the provision of talking therapies services across England, by:

a)   completing the roll out of adult talking therapies services, including promoting services for older adults

b)   developing and initiating a stand-alone programme to extend access to psychological therapies for children and young people (CYP); and

c)   developing and piloting appropriate, effective, and evidenced services for older adults and those with physical long term conditions, medically unexplained symptoms, and severe mental illness.

D.   Impacts, Costs and Benefits of Option 2

9.   This section sets out an assessment of the preferred option, the proposed talking therapies programme. Firstly, there is a brief discussion of the delivery mechanism, possible risks to the programme, and possible unintended impacts. Each component of the programme is considered in detail in turn, with the key assumptions, costs and benefits analysed separately for each. Further, overall costs and benefits are calculated, with key inputs and assumptions tested later in sensitivity analysis. A brief assessment is made of the impact on equalities, with detailed discussion included in the separate *'Analysing the Impact on Equalities of Talking Therapies: a four-year plan of action'* (AIE)[2].

D.1   Delivery mechanism, risks, and unintended impacts

10. Delivery mechanism: The proposed talking therapies programme will be delivered by the NHS at a local level, with limited assistance from the Department of Health (DH) and/or the NHS Commissioning Board.

11. Local level NHS organisations (PCTs and in future GP Consortia) have responsibility for ensuring that services are delivered to end-users, and will retain flexibility about how best these should be organised and structured. In most situations, it is expected that the NHS will maintain and develop service provision organically, through recruiting, training, and employing therapists and other staff, and providing services to patients 'in-house'. However, they will also have choice and flexibility to contract services out to third party service providers, and indeed this happens in many circumstances already. Local level NHS

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[2] http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_123759

organisations will also be responsible for collecting individual patient data, a key feature of successful talking therapies services.

12. DH and/or the NHS Commissioning Board, with assistance from the regions, will have responsibility for developing and piloting new services, overseeing the completion of the roll out of existing services, and managing data collection from individual sites. Further, it will oversee the national training programme to ensure that syllabuses represent best practice.

13. The successful provision of talking therapies is included in the 2011/12 NHS Operating Framework, which the local NHS is expected to deliver.

14. Pending the establishment of the NHS Commissioning Board, DH is putting in place transitional arrangements to enable delivery of the programme, which includes some continuation of an existing central team.

15. Risks: There are two key types of risk; a) risks to the continuing running of the programme itself, and b) risks of the programme delivering either lower benefits or incurring higher cost than expected. The latter type of risk is considered in more detail in sensitivity analysis in Section D.3.9; it is concluded that the proposed talking therapies programme is estimated to be cost-beneficial under all variations tested in the key cost/benefit assumptions. The following key risks have been identified which fall into category a):

   - There is currently uncertainty over how funding for talking therapies will be allocated to PCTs (and later GP Consortia). It is likely that this will not be ring-fenced as has been the case in the past. If so, there is a risk that the NHS will not allocate the expected amount on talking therapies, as the allocation is likely to be subsumed into the general PCT allocation and funds could be diverted to other priority areas. This will need to be managed through the new NHS Operating Framework, which instructs PCTs to deliver talking therapies services.
   - At present, there is no clarity on how the central and regional talking therapies functions will be structured beyond March 2011. Without a well-functioning central team (regardless of where it is located) and regional teams to support implementation and data validation locally, there is a danger of the talking therapies roll out stalling or not making the progress intended. Also, there is a danger of specific care models for older people, children and young people, those with long term conditions or medically unexplained symptoms and those with severe mental illness not being developed or piloted, or best practice not being disseminated across the country (see Paragraph 14 above about transitional arrangements being put in place).

16. Unintended impacts: There are not expected to be any negative unintended health impacts as a result of the programme; it is plausible that there may be an unintended positive effect on physical health and wellbeing through increased social participation following successful treatment (no attempt has been made to quantify this).

17. There are not expected to be any other significant unintended impacts, in terms of on small firms, competition, greenhouse gas emissions, or wider environmental impacts. As discussed in Section D.3.4 below, it is intended that increased talking therapies provision will help to reduce healthcare usage elsewhere in the health system, including in secondary care.

D.2   Overall costs and benefits

18. This section provides an overall assessment of the cost/benefit of expanding to full roll out. The results are presented in two distinct ways; firstly only costs and savings are examined to determine the net effect on the NHS and overall public purse; secondly full costs and benefits are examined to estimate the overall impact on society. The full costs and benefits are presented in the summary tables at the front of the Impact Assessment.

D.2.1   Costs and savings results

19. The expected costs and savings of the talking therapies programme for the years 2011/12 to 2014/15 are presented in Table 1 below.

Table 1: Overall costs and savings analysis results

	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	Total (undiscounted)	Total (present value)
Adult talking therapies	£53m	£104m	£139m	£133m	£0m	£0m	**£428m**	**£402m**
Psychological therapies for children and young people	Not quantified*	Not quantified*	Not quantified*	Not quantified*	£0m	£0m	**Not quantified***	**Not quantified***
Talking therapies for people with LTCs and MUS	Not quantified*	Not quantified*	Not quantified*	Not quantified*	£0m	£0m	**Not quantified***	**Not quantified***
Total costs	**£53m**	**£104m**	**£139m**	**£133m**	**£0m**	**£0m**	**£428m**	**£402m**
Healthcare savings - adult talking therapies	£1m	£20m	£54m	£86m	£97m	£47m	**£305m**	**£272m**
Healthcare savings - LTCs and MUS	Not quantified*	Not quantified*	Not quantified*	Not quantified*	Not quantified*	Not quantified*	**Not quantified***	**Not quantified***
Total healthcare savings	**£1m**	**£20m**	**£54m**	**£86m**	**£97m**	**£47m**	**£305m**	**£272m**
Tax gains	£1m	£21m	£56m	£90m	£102m	£49m	£319m	£285m
Welfare savings	£1m	£11m	£29m	£47m	£53m	£25m	£165m	£147m
Total public sector savings	**£4m**	**£51m**	**£139m**	**£223m**	**£252m**	**£120m**	**£788m**	**£704m**

Net healthcare savings	**-£130m**
Net public sector savings	**£302m**
Healthcare saving per pound spent	**£0.68**
Pubic sector saving per pound spent	**£1.75**

* The costs (and benefits) associated with psychological therapies for children, young people and those with LTCs and MUS will be small relative to the cost of completing the roll out of adult talking therapies.

20. The programme is expected to cost an estimated £402m present value and deliver NHS savings of £272m present value over the next SR period, 2011/12 to 2014/15. This equates to £0.68 healthcare savings for every £1 spent on the expansion. As a result, implementing the talking therapies programme represents excellent value for money for local commissioners as an evidenced way of delivering real health benefits to patients.

21. Once savings to the tax and benefits system are included, the programme is expected to be strongly cost saving to the overall public purse, with a net saving of an estimated £302m. This represents a public sector saving of £1.75 for every £1 spent.

22. It should be noted that the costs and benefits of developing services for children, young people and those with long-term conditions and medically unexplained symptoms have not been quantified at this stage, as these areas are at an early stage of policy development. However, these costs will be small relative to the cost of completing the roll out of adult talking therapies.

23. Further, the overall estimated cost of completing the roll out of the adult talking therapies programme is slightly higher in the IA (£428m undiscounted over the period 2011/12 to 2014/15) than in the funding plans set out in the Spending Review 2010, £397m undiscounted over the period 2011/12 to 2014/15[3]. This difference of £31m represents additional overheads that may have to be borne by the local NHS as a result of the expansion, including (among others) additional office accommodation and therapy rooms, a possible small increase in anti-depressant medication for new patients undergoing combination therapy, and management/administration such as HR or reception staff. In many instances, these resources may already be in place anyway, in which case the additional investment required by the local level NHS will be minimal. These costs are, however, still relevant for the IA (alongside the training, salaries and on-costs of the therapists themselves), as they represent resources which are required to deliver the estimated benefits of the programme, and could arguably be put to alternative use elsewhere

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[3] This funding has been allowed for in PCT allocations but final spending is subject to local discretion.

otherwise. However, from a funding perspective, these are not costs that would typically be directly attributable to the talking therapies programme.

D.2.2   Cost benefit analysis results

24.   The cost benefit analysis evaluates all quantified impacts on society, including costs and savings to the NHS, savings to the wider exchequer, health benefits to individuals, and reductions in sickness absences for employers. Gains arising from the proposed psychological therapies programme for children and young people, and the development of services for those with severe mental illness, have not been quantified.

25.   Consistent with DH IA Technical Guidance, costs and savings to the exchequer are reported as opportunity costs, and therefore a 2.4 multiplier is applied.[4] [5] The full cost benefit analysis results are then presented in Table 2 below, and include all quantified societal benefits.

Table 2: Overall costs benefit analysis results

	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	Total (undiscounted)	Total (present value)
Opportunity cost of intervention	£127m	£249m	£333m	£318m	£0m	£0m	£1,028m	£966m
Healthcare savings (opportunity cost)	£3m	£47m	£129m	£206m	£233m	£112m	£731m	£653m
Tax gains (opportunity cost)	£4m	£50m	£135m	£216m	£245m	£117m	£766m	£684m
Welfare savings (opportunity cost)	£2m	£26m	£70m	£112m	£126m	£60m	£396m	£354m
Health benefits	£18m	£254m	£690m	£1,108m	£1,253m	£599m	£3,923m	£3,735m
Reduction in sickness absences	£1m	£13m	£36m	£57m	£65m	£31m	£202m	£181m
Total benefits	£28m	£390m	£1,059m	£1,699m	£1,922m	£919m	£6,018m	£5,606m
Net benefit								£4,640m
Benefit/cost ratio								5.80

26.   The overall talking therapies programme is expected to deliver **a net benefit of an estimated £4.6bn**. The robustness of these results is examined in sensitivity analysis in Section D.3.9.

27.   The remaining sections set out the case for each of the individual components of the programme in more detail, including the assumptions and evidence base on which the cost benefit analysis results are founded.

D.3   Completing the roll out of adult talking therapy services

D.3.1   Introduction

28.   The roll out of adult talking therapies over the last three years as part of a six-year delivery plan has created services in some places and not others. Equally, some services still have some way to go to become established, to deliver the quality standards expected, and reach full capacity. By the end of March 2011, approximately 60% of adults will have access to IAPT adult talking therapy services and

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[4] From IA Interim Technical Guidance, Paragraph 86: *'For exchequer costs (costs that have ultimately to be funded by taxpayers including costs falling on the DH budget, costs falling upon Other Government Departments and upon local authorities, including reductions in tax yield), it should be assumed that the opportunity cost of £1 of exchequer funding is £2.40. This is because it is estimated that the government foregoes the purchase of a Quality Adjusted Life Year, a QALY, or a benefit of equivalent social value, for each £25,000 cost, and that QALYs have a monetary value of around £60,000 to the public. Further explanation and examples of this calculation are set out in Section IVe.'*
[5] From IA Interim Technical Guidance, Paragraph 88: *'Government cost-savings, if they are cash-releasing, should be valued for the opportunities afforded to purchase additional QALYs (at £25,000 each) and monetised at the estimated social value of a QALY (£60,000). If they are not cash-releasing, an estimate should be made of the value of the benefits that will in fact be secured by the savings (e.g. if additional capacity is made available in a hospital, but capacity is not flexible, the result may be a decline in waiting times, which should be valued as such).'*

around 3,700 new therapy workers will have started or completed their training. Further funding is needed to complete the roll out to full capability.

29. A core part of completing the roll out will involve training. Cohorts of trainees will be recruited in each of the next three academic years to bring the total of additional therapy workers to approximately 6,000. Top-up training to help existing, qualified therapists in the other four NICE-approved modalities for treating depression (apart from Cognitive Behavioural Therapy) will continue. These modalities are: Interpersonal Therapy, Counselling for Depression, Brief Dynamic Interpersonal Therapy, and Couples Therapy. This includes ensuring that the characteristics of the new adult talking therapy services, namely, the collection of sessional outcome data to allow local clinical outcome monitoring and national reporting, is a key feature of all these treatments.

30. The economic case for completing the roll out of adult talking therapies services is set out below.

D.3.2   Modelling the expansion of adult talking therapies services

31. This section models the expansion to full roll out across England, and provides estimates of the number of people expected to begin treatment, complete treatment, and recover.

D.3.2.1   Patient flow assumptions

32. Scale of common mental health problems in England: There are an estimated 6m adults in England who have common mental health problems, of whom approximately 2.5m have moderate or severe problems such as severe depression or posttraumatic stress disorder, and 3.5m have milder problems. Of these, approximately 2.75m seek assistance from a GP in a year.[6]

33. Numbers in contact with NHS services: *Paying the Price*[7], a report assessing the current and future costs of mental health care in England, provides useful information on the number of people with common mental health problems who are in contact with NHS services, broken down by category, severity of mental health problem, and type of treatment received. This estimates that there were 805,504 people with depression and 1,121,760 people with anxiety in contact with NHS services in 2006/7. For depression, it is estimated that of those in contact, 618,627 have moderate/severe mental health problems[8]; the implicit assumption is that the remaining 186,877 (or 23%) of those in contact have mild mental health problems. In the absence of better information, the same proportion is assumed for anxiety as well. On this basis, it is possible to calculate a split of the total number of people with common mental health problems in contact with NHS services; **1,480,139** for moderate/severe and **447,125** for mild.

34. This fits with an understanding of the nature of unmet need in England; a substantial proportion of those with milder common mental health problems are either unwilling to come forward or do not have access to a choice of appropriate treatment, and are thus left untreated.

35. Patients treated before the roll out started: *Paying the Price* also provides information on the numbers of patients who were treated in the years before the roll out began (2006/7 is used as a reference). It estimates that 34.5% of those with depression in contact did not receive treatment that year[9], i.e. 65.5% did receive treatment, and that 45.8% of those with anxiety in contact did not receive treatment that year[10], i.e. 54.2% did receive treatment. In the absence of information split by severity, it is assumed that the proportions receiving treatment are the same for both moderate/severe and mild. On this basis, the total numbers receiving treatment in the reference year are estimated as **872,140** for those with moderate/severe mental health problems, and **263,459** for those with mild mental health problems.

36. Breakdown by treatment type: Of those treated in the 2006/7 reference year, it is relevant to know the breakdown into different types of treatment. For these purposes, three broad categories are of interest; medication only, talking therapy only, and combination therapy of both medication and talking therapy.

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[6] London School of Economics and Political Science. Centre for Economic Performance. Mental Health Policy Group (2006). The depression report: a new deal for depression and anxiety disorders [online] London: LSE research. Available at http://eprints.lse.ac.uk/archive/00000818

[7] McCrone, Paul et al. (2008) Paying the Price: The Cost of Mental Health Care in England to 2026. London: Kings Fund. http://www.kingsfund.org.uk/research/publications/paying_the_price.html

[8] McCrone, Paul et al. (2008) Paying the Price: The Cost of Mental Health Care in England to 2026, Para 2, Page 27. London: Kings Fund.

[9] McCrone, Paul et al. (2008) Paying the Price: The Cost of Mental Health Care in England to 2026, Figure 20, Page 28. London: Kings Fund.

[10] McCrone, Paul et al. (2008) Paying the Price: The Cost of Mental Health Care in England to 2026, Figure 39, Page 44. London: Kings Fund.

37.	*Paying the Price* provides information for all those in treatment, but does not make a distinction between different levels of severity. To provide a broadly reasonable reference point, the IA assumes that the split of treatment for depression corresponds to moderate/severe. Hence, using the information from Figure 20, Page 28 of *Paying the Price*, **46%** of moderate/severe patients treated are assumed to receive medication only, **13%** are assumed to receive talking therapy only, and the remaining **41%** are assumed to receive combination therapy.

38.	The analysis also assumes that the split of treatment for anxiety, found in Figure 39, Page 44 of *Paying the Price*, corresponds to mild, albeit with some modification. In particular, it is assumed that no mild sufferers will undergo combination therapy; on this basis, **64%** of mild sufferers in treatment are assumed to receive medication only, with the remaining **36%** assumed to receive talking therapy only. This is by necessity a simplification, and it is acknowledged that the evidence underpinning it is not altogether robust. However, the assumptions are primarily to provide an estimate of the reference point on which adult talking therapy expansion has taken place, and do not materially affect the overall conclusions.

39.	Numbers completing treatment: Finally, it is necessary to determine what proportion of those who begin treatment go on to complete it, as recovery rates (discussed later) are only assumed to be for completed treatment. Expert judgement has indicated that, as a best estimate, there is a 30% drop out rate for those on medication only and a 20% drop out rate for those receiving talking therapy or combination therapy. No breakdown is provided by severity; hence these drop out rates are applied equally to moderate/severe and mild in the absence of more detailed information.

40.	Patient flows before the roll out started: Using the inputs and assumptions above, it has been possible to arrive at an estimate of the number of people starting and completing treatment for the 2006/7 reference year, split by treatment type and severity of mental health problem. This is provided in Table 3 below.

Table 3: Patient flows in 2006/7 reference year (rounded)

	2006/7 reference year	
	Mod / severe	**Mild**
Numbers starting treatment		
Medication only	400,000	170,000
Pre-IAPT talking therapy only	110,000	90,000
Combined pre-IAPT talking therapy and medication	360,000	0
Total starting treatment	**1,140,000**	

Numbers completing treatment		
Medication only	280,000	120,000
Pre-IAPT talking therapy only	90,000	80,000
Combined pre-IAPT talking therapy and medication	290,000	0
Total completing treatment	**850,000**	

41.	There is no more recent information on the scale of national provision before the roll out of IAPT adult talking therapies started in 2008/9 (under the IAPT programme), nor information on historic growth rates of service provision. Hence, this 2006/7 reference year is considered the best estimate of service provision in 2007/8 as well.

### D.3.2.2	Patient flows at the existing roll out

42.	The next stage is to map the roll out of adult talking therapy services that have been achieved so far onto the 2006/7 reference year, up to the end of 2010/11 as part of the IAPT programme delivery for the 2007 Spending Review period. This forms the presentation of the 'existing roll out'. So far, there are IAPT-accredited services in almost all PCTs; however, levels of service provision are patchy, with near full capability in some areas but limited capability in others. The assumption under Option 1 above is that the existing roll out will be maintained at its end of 2010/11 service capability on an ongoing basis; this represents the 'do nothing' option, the best estimate of what is expected to happen in the absence of expansion to full roll out.

43.	The following paragraphs therefore set out the assumptions and source information that have been used to model the patient flows under the existing roll out, which is then assumed to continue in future years in

the absence of the proposed further expansion. It should be noted that there is robust information on the number of service users in existing IAPT services, from data collections held by the national IAPT team.

44. Introduction of IAPT adult talking therapy services by the end of 2010/11: By the end of 2010/11, three years into the expansion, the roll out will have reached a service capacity to treat approximately **500,000 patients per year**, either moderate/severe or mild. This is what the government committed to under the previous Spending Review Settlement, and represents a best estimate of service provision going forward from 2011/12 in the absence of any further expansion to full roll out (i.e. under Option 1). It should be noted that there is strong evidence from data collections held by the national IAPT team that this target of 500,000 service users per annum will be met, based on data returns for the first two quarters of 2010/11 and the growth trajectory of IAPT services so far.

45. So far, approximately 3,700 therapists have been trained or are in training to reach this service capacity.

46. Patient flow characteristics of IAPT adult talking therapy: IAPT adult talking therapy is intended to meet a clear gap in existing service provision and current patient need, for patients with mild mental health problems who are otherwise not accessing appropriate treatment. On this basis, **2/3** of IAPT service users are expected to have mild mental health problems and require low intensity treatment, with the remaining **1/3** expected to have moderate/severe mental health problems requiring high intensity treatment. This represents a clear move from the mix of service users undergoing pre-IAPT talking therapy treatment.

47. In other respects, the patient flow characteristics of IAPT services are expected to be the same as for pre-IAPT. In particular, of those moderate/severe sufferers undergoing talking therapy treatment, 76% are expected to do so as part of combination therapy (with medication). For mild sufferers, none are expected to undergo combination therapy. Further, drop out rates are expected to be the same for IAPT talking therapy as pre-IAPT talking therapy.

48. Displacement of pre-IAPT treatment: A core assumption of the economic modelling is that there will be some displacement of pre-IAPT adult talking therapy with IAPT adult talking therapy. Not all IAPT services will be for new patients (i.e. patients who would not have been treated with pre-IAPT services otherwise); in some cases, GPs will inevitably refer patients to an IAPT service where previously they would have referred those patients for a pre-IAPT talking therapy service where it was available. Similarly, there will be instances of self-referral to IAPT talking therapy where previously those patients would have gone to their GP and sought pre-IAPT services through more traditional routes. Little is known about the extent to which the expansion of IAPT services represents entirely new service provision or has come (and will come) at the displacement of pre-IAPT service provision. When the programme began, IAPT services were expected to be additional to psychological therapies that existed already but experience shows that the local NHS has in a number of cases taken the opportunity to review and adjust its psychological therapy provision. In addition, there are instances of existing services and therapists becoming IAPT-accredited. So, based on expert opinion, **14%** of the expansion is assumed to arrive through displacement (or accreditation) of pre-IAPT talking therapy, with the remaining 86% assumed to be completely new service provision of patients who would not be treated otherwise.[11]

49. Where displacement does occur, it is assumed that this does not affect the patient decision as to whether to have combination therapy or talking therapy alone. Also, displacement is assumed to happen proportionately across both moderate/severe and mild sufferers.

50. In contrast, there is assumed not to be any displacement of medication only with IAPT talking therapy. This is a modelling simplification; in reality, there is likely to be some displacement due to the increase in patient choice; however, it is not felt that this would have a significant impact on the results.

51. Using the assumptions above, a best estimate has been constructed of the patient flows at the end of 2010/11 service capability, under the existing roll out. This involves 500,000 patients starting IAPT talking therapy per annum of whom 70,000 would have started pre-IAPT talking therapy otherwise. In the absence of any further expansion of the roll out from 2011/12 onwards, it is assumed that these patient flows will continue in steady state on an ongoing basis; this is shown in Table 4 below.

52. This represents the 'do nothing' option, the baseline against which the further expansion can be evaluated.

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[11] There is considerable uncertainty about this assumption, and it has a substantial effect on the estimated scale of overall provision and hence the magnitude of the cost-benefit results. As a result, variations are tested in sensitivity analysis in Section 3.8; these find that there is variation in the size of the overall costs and benefits, but no effect on the overall conclusions.

Table 4: Patient flows from maintaining existing roll out (rounded)

	2011/12		2012/13		2013/14		2014/15		2015/16		2016/17 +	
	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild
Numbers starting treatment												
Medication only	400,000	170,000	400,000	170,000	400,000	170,000	400,000	170,000	400,000	170,000	400,000	170,000
Pre-IAPT talking therapy only	110,000	50,000	110,000	50,000	110,000	50,000	110,000	50,000	110,000	50,000	110,000	50,000
Pre-IAPT talking therapy combination	340,000	0	340,000	0	340,000	0	340,000	0	340,000	0	340,000	0
Total pre-IAPT talking therapy	490,000		490,000		490,000		490,000		490,000		490,000	
IAPT talking therapy	40,000	330,000	40,000	330,000	40,000	330,000	40,000	330,000	40,000	330,000	40,000	330,000
IAPT talking therapy combination	130,000	0	130,000	0	130,000	0	130,000	0	130,000	0	130,000	0
Total IAPT talking therapy	500,000		500,000		500,000		500,000		500,000		500,000	
Total starting treatment	1,570,000		1,570,000		1,570,000		1,570,000		1,570,000		1,570,000	
Numbers completing treatment												
Medication only	280,000	120,000	280,000	120,000	280,000	120,000	280,000	120,000	280,000	120,000	280,000	120,000
Pre-IAPT talking therapy only	90,000	40,000	90,000	40,000	90,000	40,000	90,000	40,000	90,000	40,000	90,000	40,000
Pre-IAPT talking therapy combination	270,000	0	270,000	0	270,000	0	270,000	0	270,000	0	270,000	0
Total pre-IAPT talking therapy	390,000		390,000		390,000		390,000		390,000		390,000	
IAPT talking therapy	30,000	270,000	30,000	270,000	30,000	270,000	30,000	270,000	30,000	270,000	30,000	270,000
IAPT talking therapy combination	100,000	0	100,000	0	100,000	0	100,000	0	100,000	0	100,000	0
Total IAPT talking therapy	400,000		400,000		400,000		400,000		400,000		400,000	
Total completing treatment	1,200,000		1,200,000		1,200,000		1,200,000		1,200,000		1,200,000	

D.3.2.3   Patient flows under full roll out

53. It is proposed that at full roll out, **900,000 patients** across England will be able to access IAPT talking therapy per annum. This is based on an intention to be able to provide NICE-approved psychological therapies to all who want them; it is estimated that around a third of the 2.75m depression and anxiety sufferers would choose talking therapy services if they were readily available. This builds on the existing 500,000 roll out, and ensures that there is full geographic coverage with mature and capable adult talking therapy services in every location. The training of 2,300 therapists will facilitate this, in addition to the 3,700 therapists already trained up to the end of 2010/11.

54. The expansion to full roll out is assumed to happen linearly over **three years**, so that full roll out will be achieved by 2013/14. It is assumed that steady state will be maintained beyond this point.

55. All other patient flow assumptions are the same as under the existing roll out: 14% displacement of pre-IAPT talking therapy and no displacement of medication only; and 2/3 of expanded service provision is

low intensity treatment for those with mild mental health problems, with the remaining 1/3 high intensity treatment for those with moderate/severe mental health problems.

Table 5: Patient flows under full roll out (rounded)

	2011/12		2012/13		2013/14		2014/15		2015/16		2016/17 +	
	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild
Numbers starting treatment												
Medication only	400,000	170,000	400,000	170,000	400,000	170,000	400,000	170,000	400,000	170,000	400,000	170,000
Pre-IAPT talking therapy only	100,000	40,000	100,000	20,000	100,000	10,000	100,000	10,000	100,000	10,000	100,000	10,000
Pre-IAPT talking therapy combination	330,000	0	330,000	0	320,000	0	320,000	0	320,000	0	320,000	0
Total pre-IAPT talking therapy	470,000		460,000		440,000		440,000		440,000		440,000	
IAPT talking therapy	50,000	420,000	60,000	510,000	70,000	600,000	70,000	600,000	70,000	600,000	70,000	600,000
IAPT talking therapy combination	160,000	0	190,000	0	230,000	0	230,000	0	230,000	0	230,000	0
Total IAPT talking therapy	630,000		770,000		900,000		900,000		900,000		900,000	
Total starting treatment	1,680,000		1,790,000		1,910,000		1,910,000		1,910,000		1,910,000	
Numbers completing treatment												
Medication only	280,000	120,000	280,000	120,000	280,000	120,000	280,000	120,000	280,000	120,000	280,000	120,000
Pre-IAPT talking therapy only	80,000	30,000	80,000	20,000	80,000	10,000	80,000	10,000	80,000	10,000	80,000	10,000
Pre-IAPT talking therapy combination	270,000	0	260,000	0	260,000	0	260,000	0	260,000	0	260,000	0
Total pre-IAPT talking therapy	380,000		360,000		350,000		350,000		350,000		350,000	
IAPT talking therapy	40,000	340,000	50,000	410,000	60,000	480,000	60,000	480,000	60,000	480,000	60,000	480,000
IAPT talking therapy combination	130,000	0	160,000	0	180,000	0	180,000	0	180,000	0	180,000	0
Total IAPT talking therapy	510,000		610,000		720,000		720,000		720,000		720,000	
Total completing treatment	1,290,000		1,380,000		1,470,000		1,470,000		1,470,000		1,470,000	

56. Additional patient flows: Of particular relevance is the *additional* patient flows that will be achieved from expanding to full roll out over existing roll out. This allows a comparison of the proposed roll out with the 'do nothing' option, and provides a basis on which costs and subsequent savings and benefits can be calculated. Table 6 below presents the additional patient flows, calculated by subtracting the results in Table 4 from the results in Table 5 above.

Table 6: Additional patient flows from full roll out over existing roll out (rounded)

	2011/12		2012/13		2013/14		2014/15		2015/16		2016/17 +	
	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild
Numbers starting treatment												
Medication only	0	0	0	0	0	0	0	0	0	0	0	0
Pre-IAPT talking therapy only	-1,000	-10,000	-3,000	-20,000	-4,000	-40,000	-4,000	-40,000	-4,000	-40,000	-4,000	-40,000
Pre-IAPT talking therapy combination	-5,000	0	-10,000	0	-10,000	0	-10,000	0	-10,000	0	-10,000	0
Total pre-IAPT talking therapy	**-20,000**		**-40,000**		**-60,000**		**-60,000**		**-60,000**		**-60,000**	
IAPT talking therapy	10,000	90,000	20,000	180,000	30,000	270,000	30,000	270,000	30,000	270,000	30,000	270,000
IAPT talking therapy combination	30,000	0	70,000	0	100,000	0	100,000	0	100,000	0	100,000	0
Total IAPT talking therapy	**130,000**		**270,000**		**400,000**		**400,000**		**400,000**		**400,000**	
Total starting treatment	**110,000**		**230,000**		**340,000**		**340,000**		**340,000**		**340,000**	
Numbers completing treatment												
Medication only	0	0	0	0	0	0	0	0	0	0	0	0
Pre-IAPT talking therapy only	-1,000	-10,000	-2,000	-20,000	-4,000	-30,000	-4,000	-30,000	-4,000	-30,000	-4,000	-30,000
Pre-IAPT talking therapy combination	-4,000	0	-10,000	0	-10,000	0	-10,000	0	-10,000	0	-10,000	0
Total pre-IAPT talking therapy	**-10,000**		**-30,000**		**-40,000**		**-40,000**		**-40,000**		**-40,000**	
IAPT talking therapy	10,000	70,000	20,000	140,000	30,000	210,000	30,000	210,000	30,000	210,000	30,000	210,000
IAPT talking therapy combination	30,000	0	50,000	0	80,000	0	80,000	0	80,000	0	80,000	0
Total IAPT talking therapy	**110,000**		**210,000**		**320,000**		**320,000**		**320,000**		**320,000**	
Total completing treatment	**90,000**		**180,000**		**280,000**		**280,000**		**280,000**		**280,000**	

57. Table 6 above shows that there will be an extra 400,000 people per annum starting IAPT treatment once steady has been reached, and 60,000 fewer people starting pre-IAPT treatment. This creates an additional 280,000 patients completing treatment overall from the expansion of service provision.

58. The increase in IAPT service provision, both through new patients treated and displacement of pre-IAPT talking therapy, is also shown graphically in Figure 1 below.
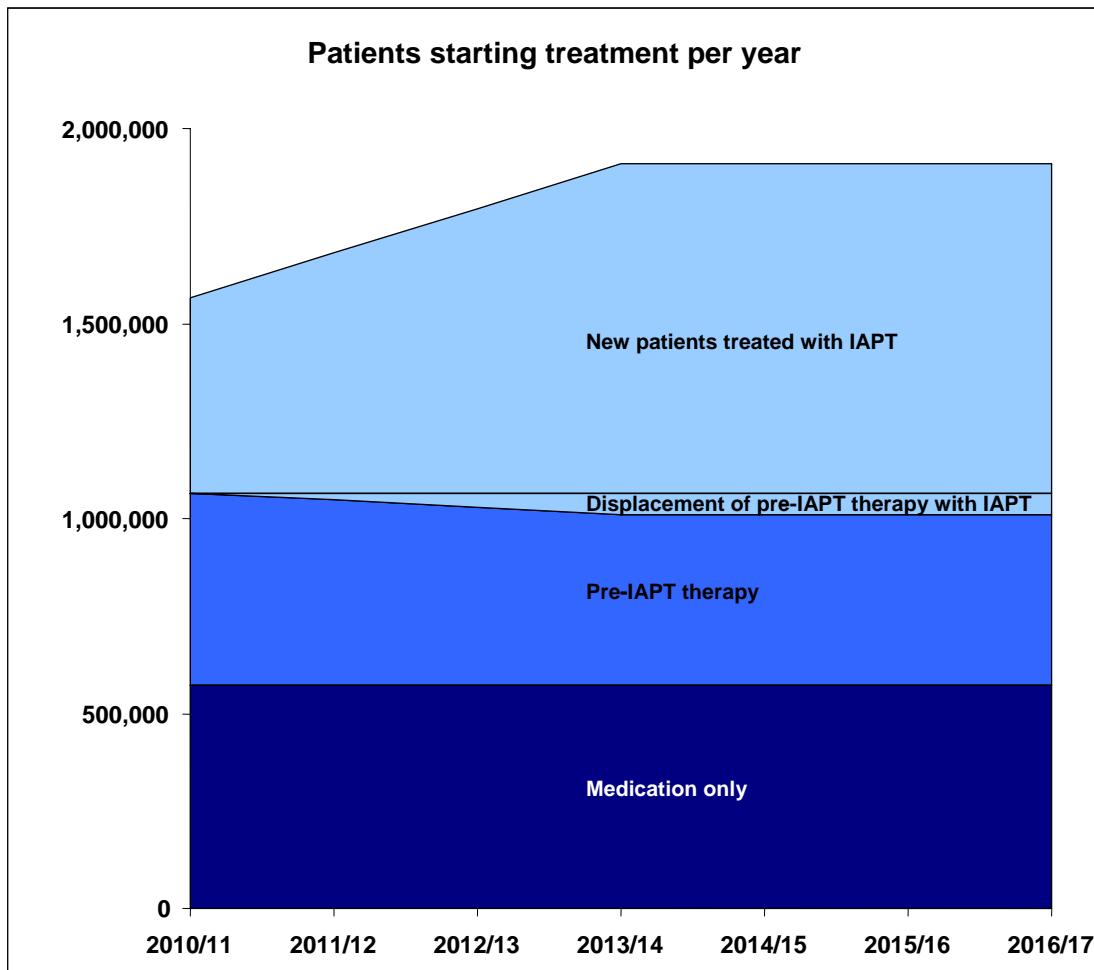
Patients starting treatment per year

Figure 1: Increase in service provision through expansion to full roll out

D.3.2.4   Recovery rates

59. In determining the health and economic benefits of completing the roll out of adult talking therapy, it is necessary to estimate what proportion of those who complete treatment will go on to recover from their common mental health condition, and over what timescale that recovery will be achieved. This section sets out the assumptions that underpin the estimated number of extra people who will recover as a result of the expansion.

60. In all instances, recovery is only assumed possible if treatment is completed; those who drop out of treatment before completion are assumed not to have any health or economic benefit. This is a conservative assumption; in practice there may be small improvements in mental health or wellbeing of those who do not complete treatment which are not captured by the analysis.

61. How recovery is defined: For the purposes of estimating recoverers for calculating economic benefits, recovery is defined as a sustained transition from caseness[12] for a common mental health condition at the start of treatment to a lack of caseness after treatment has been completed. It is recognised that many common mental health conditions are spectrum disorders, whereby a definition of caseness only captures some of the detail as to how someone's mental health or wellbeing may improve. However this simplification is not considered to be biased in one direction or another when calculating health and economic benefits. For some patients, a loss of caseness may not constitute a full recovery even when the definition indicates that it does, but for others, there may be improvements in mental health or wellbeing that are not captured in the modelling due to a loss of caseness not being achieved.

62. Sustained recovery from medication only: The short-term recovery rate for medication only is estimated as 54%, taken from *Paying the Price*, '*percentage of those treated whose health improves*'[13]. However, not all of those who experience a short-term improvement in their mental health and wellbeing will exhibit a sustained recovery. The relapse rate for those on medication only is estimated to be 40%. Hence, the

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[12] Caseness is defined as a formal diagnosis of a mental health condition by a clinician, or symptoms which would warrant a formal diagnosis if one were undertaken.
[13] McCrone, Paul et al. (2008) Paying the Price: The Cost of Mental Health Care in England to 2026, Figure 20, Page 28. London: Kings Fund.

sustained recovery rate, for calculating economic benefits, can be estimated as the short term recovery rate multiplied by the proportion who do not relapse, i.e. 54% x (100% - 40%) = **32%**.[14]

63. <u>Sustained recovery from talking therapy and medication combination therapy</u>: The short-term recovery rate for talking therapy and medication combination therapy is estimated as 72%, taken from *Paying the Price*, '*percentage of those treated whose health improves*'[15]. The figure of 72% is reported as the same for both psychotherapy/counselling and CBT; on this basis, the short-term recovery rate is assumed to be the same for both pre-IAPT and IAPT talking therapy. In the absence of any other information, this is the most reasonable approach to take; it means that no health benefit or loss is being assumed for instances where pre-IAPT talking therapy is displaced with IAPT talking therapy.

64. Again, not all of those who experience a short-term improvement in their mental health and wellbeing will exhibit a sustained recovery. Based on IAPT site-level data, the relapse rate for those on any form of talking therapy is estimated to be 5%, substantially lower than for medication only. Hence, the sustained recovery rate can be estimated as 72% x (100% - 5%) = **68%**.

65. <u>Sustained recovery from talking therapy only</u>: The short-term recovery rate for talking therapy only is estimated as 51%, taken from *Paying the Price*, '*percentage of those treated whose health improves*'[16]. The figure of 51% is reported as again the same for both psychotherapy/counselling and CBT; on this basis, the short-term recovery rate is assumed to be the same for both pre-IAPT and IAPT talking therapy. Again, the relapse rate for those on any form of talking therapy is estimated to be 5%; hence, the sustained recovery rate can be estimated as 51% x (100% - 5%) = **48%**.

66. This is consistent with recovery rates exhibited at the IAPT pilot sites, Newham and Doncaster, which showed that 50% recovery is achievable, and with randomised control trials for CBT. For the roll out of IAPT services so far up to the third quarter of 2010, the patient reported recovery rate is at around 39% on an overall basis. However, this has been increasing as sites move towards maturity; hence 50% is considered reasonable as a long-term target. Different recovery rates are explored in sensitivity analysis.

67. <u>Sustained recovery without treatment</u>: It is well established that many people with common mental health problems recover naturally without the need for treatment. On this basis, it is unreasonable to attribute economic benefits of recovery to *all* those who recover having undergone treatment; those who would have recovered anyway should be subtracted from the calculations. *Paying the Price* provides information on the proportion of people with depression or anxiety whose health improves without treatment; 30% for depression[17] and 26% for anxiety[18]. To be conservative, the modelling assumes the higher of these two estimates, 30%. Again, not all of those who experience a short-term improvement in their mental health and wellbeing without treatment will exhibit a sustained recovery. Consistent with the estimate for medication only, it is assumed that there is a 40% relapse rate without treatment. On this basis, the sustained natural recovery rate can be estimated at 30% x (100% - 40%) = **18%**.

68. <u>Comparison with original Impact Assessment</u>: It is valuable to verify whether the assumptions about recovery, central to the overall analysis, are consistent with the work of Layard et al (2007)[19], which provided a foundation for the original IAPT Impact Assessment. This work assumes that *'in the two years after treatment ends, a treated patient will spend 6.5 months extra being well.'* The calculation can be replicated using the modelling assumptions in this business case by comparing the sustained recovery rate from talking therapy only with the sustained natural recovery rate:

Extra months well on average = 24 x (48% - 18%) = 7.2 months

Hence there is good consistency with the original business case; very similar estimates have been arrived at for calculating benefits despite the different source data and methodology underpinning them.

69. <u>Total recovering due to treatment</u>: Using the sustained recovery rates set out above, it is possible to estimate the total number of people recovering due to treatment from both maintaining the existing roll

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[14] As the number of people completing medication only is assumed not to change as a result of the expansion, the medication only sustained recovery rate has no bearing on the final cost benefit results. However, it is included for completeness.
[15] McCrone, Paul et al. (2008) Paying the Price: The Cost of Mental Health Care in England to 2026, Figure 39, Page 44. London: Kings Fund.
[16] McCrone, Paul et al. (2008) Paying the Price: The Cost of Mental Health Care in England to 2026, Figure 20, Page 28. London: Kings Fund.
[17] McCrone, Paul et al. (2008) Paying the Price: The Cost of Mental Health Care in England to 2026, Figure 20, Page 28. London: Kings Fund.
[18] McCrone, Paul et al. (2008) Paying the Price: The Cost of Mental Health Care in England to 2026, Figure 39, Page 44. London: Kings Fund.
[19] Layard, R., Clark, D., Knapp, M., Mayraz, G. (2007). 'Cost-Benefit Analysis of Psychological Therapy'. Centre for Economic Performance. CEP Discussion Paper No 829, October 2007.

out and expanding to full roll out. Taking the difference between the two provides the additional recovery due to expansion alone, relevant for calculating health and economic benefits. This is presented in Table 7 below.

70. <u>Duration of recovery</u>: In determining the overall magnitude and timing of health and economic benefits, and importantly savings to the NHS, it is necessary to make assumptions about the duration of recovery. Consistent with the work of Layard et al (2007)[20], the duration of recovery for the calculation of benefits and savings is limited to only **two years**. This is designed to improve the robustness of the case; little is known about longer-term recovery rates with treatment, and importantly, less still about longer-term recovery rates <u>without</u> treatment as a basis for comparison. This is a conservative assumption; in practice, many patients may go on to make a sustained recovery across the life course without any future problems, and may never have fully recovered from their mental health problems without effective treatment.

71. <u>Full year equivalent recovery</u>: To apportion the health and economic benefits to the appropriate years in later sections, it is necessary to map how treatment in a particular year translates into recovery in future years. As a simplification, it is assumed that all patients start treatment six months through a particular year.[21] Further, talking therapy treatment is assumed to last five months on average.[22] On this basis, successful treatment is assumed to result in:

- one month of recovery in the year of treatment;

- a full year of recovery in the financial year after treatment; and

- 11 months of recovery in the second financial year after treatment.

Hence, there is a short time lag before the majority of health and economic benefits are realised.

72. This allows for the estimation of a 'full year equivalent' recovery profile, which maps to when benefits are realised. The full year equivalent recovery in a given year will be equal to 11/12 of the number who recover due to treatment started two years earlier, plus 12/12 of the number who recover due to treatment started one year earlier, plus 1/12 of the number who recover due to treatment started that year.[23] The full year equivalent recovery profile from expansion alone is then equal to the difference between the full roll out and the existing roll out, given in Table 7 below.

73. <u>FYE recovery of the working age population</u>: Further, it is necessary to estimate what proportion of recoverers will be in the working ages in order to calculate exchequer tax and benefit savings. Up until now, the roll out of talking therapies as part of the IAPT programme has been almost exclusively targeted towards working age adults, with only approximately 4% of patients so far over the age of 65. However, it is intended that services going forward will be tailored to incorporate older adults as well. As a conservative estimate, it is assumed that 86.7% of recoverers will be in the working ages, which is the estimated proportion of those with common mental health problems who are 16-64.[24] To some extent this is likely to be an underestimate; a long term target is 88% based on the age-profile of common mental health sufferers (see Section D.5 for further details).

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[20] Layard, R., Clark, D., Knapp, M., Mayraz, G. (2007). 'Cost-Benefit Analysis of Psychological Therapy'. Centre for Economic Performance. CEP Discussion Paper No 829, October 2007.

[21] In reality, patients will start treatment all throughout a particular year with an approximately even spread. Therefore, there will be some underestimation of benefits in the first year, and some overestimation of benefits in the third year; however, the simplification only affects the timing of benefits, not their overall magnitude (without discounting).

[22] Five months is based on the average length of time for high-intensity treatment (13 weekly sessions with some gaps). Low intensity treatment for mild sufferers may be shorter; however, five months is still selected to be conservative. This only affects the timing of benefits, not their overall magnitude.

[23] Therefore, the full year equivalent recovery in 2011/12 is based on the number of recoverers in 2009/10, 2010/11, and 2011/12. Information for 2009/10 and 2010/11 is not contained within the tables; for reference, there was roll out of IAPT talking therapy for an estimated 300,000 patients in 2009/10 and 500,000 patients in 2010/11.

[24] Source: British Psychiatric Morbidity Survey 2007 for prevalence estimates of common mental health problems by age, and ONS for overall population data.

Table 7: Increase in recovery from full roll out over existing roll out (rounded)

	2011/12		2012/13		2013/14		2014/15		2015/16		2016/17 +	
	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild
Numbers who recover having completed treatment												
Medication only	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Pre-IAPT talking therapy only	-1,000	-5,000	-1,000	-10,000	-2,000	-14,000	-2,000	-14,000	-2,000	-14,000	-2,000	-14,000
Pre-IAPT talking therapy combination	-3,000	0	-5,000	0	-8,000	0	-8,000	0	-8,000	0	-8,000	0
Total pre-IAPT talking therapy	**-3,000**	**-5,000**	**-6,000**	**-10,000**	**-10,000**	**-14,000**	**-10,000**	**-14,000**	**-10,000**	**-14,000**	**-10,000**	**-14,000**
IAPT talking therapy	4,000	34,000	8,000	69,000	12,000	103,000	12,000	103,000	12,000	103,000	12,000	103,000
IAPT talking therapy combination	19,000	0	37,000	0	56,000	0	56,000	0	56,000	0	56,000	0
Total IAPT talking therapy	**23,000**	**34,000**	**45,000**	**69,000**	**68,000**	**103,000**	**68,000**	**103,000**	**68,000**	**103,000**	**68,000**	**103,000**
(Natural recovery otherwise)	**(6,000)**	**(11,000)**	**(11,000)**	**(22,000)**	**(17,000)**	**(33,000)**	**(17,000)**	**(33,000)**	**(17,000)**	**(33,000)**	**(17,000)**	**(33,000)**
Total recovering due to treatment	**14,000**	**19,000**	**28,000**	**37,000**	**42,000**	**56,000**	**42,000**	**56,000**	**42,000**	**56,000**	**42,000**	**56,000**
Full year equivalent (FYE) recovery profile												
FYE recovery - referred this year	1,000	2,000	2,000	3,000	3,000	5,000	3,000	5,000	3,000	5,000	3,000	5,000
FYE recovery - referred last year	0	0	14,000	19,000	28,000	37,000	42,000	56,000	42,000	56,000	42,000	56,000
FYE recovery - referred two years ago	0	0	0	0	13,000	17,000	26,000	34,000	38,000	51,000	38,000	51,000
FYE recovery total	**1,000**	**2,000**	**16,000**	**22,000**	**44,000**	**59,000**	**71,000**	**95,000**	**84,000**	**112,000**	**84,000**	**112,000**
FYE recovery – total working ages	**1,000**	**1,000**	**14,000**	**19,000**	**38,000**	**51,000**	**62,000**	**82,000**	**73,000**	**97,000**	**73,000**	**97,000**

74. The time lag is demonstrated in the increase in FYE recovery between expanding to full roll out and maintaining at existing roll out; there is very little difference in 2011/12, and yet the difference keeps growing until 2015/16, two years after steady state service provision has been reached. This is shown graphically in Figure 2 below.
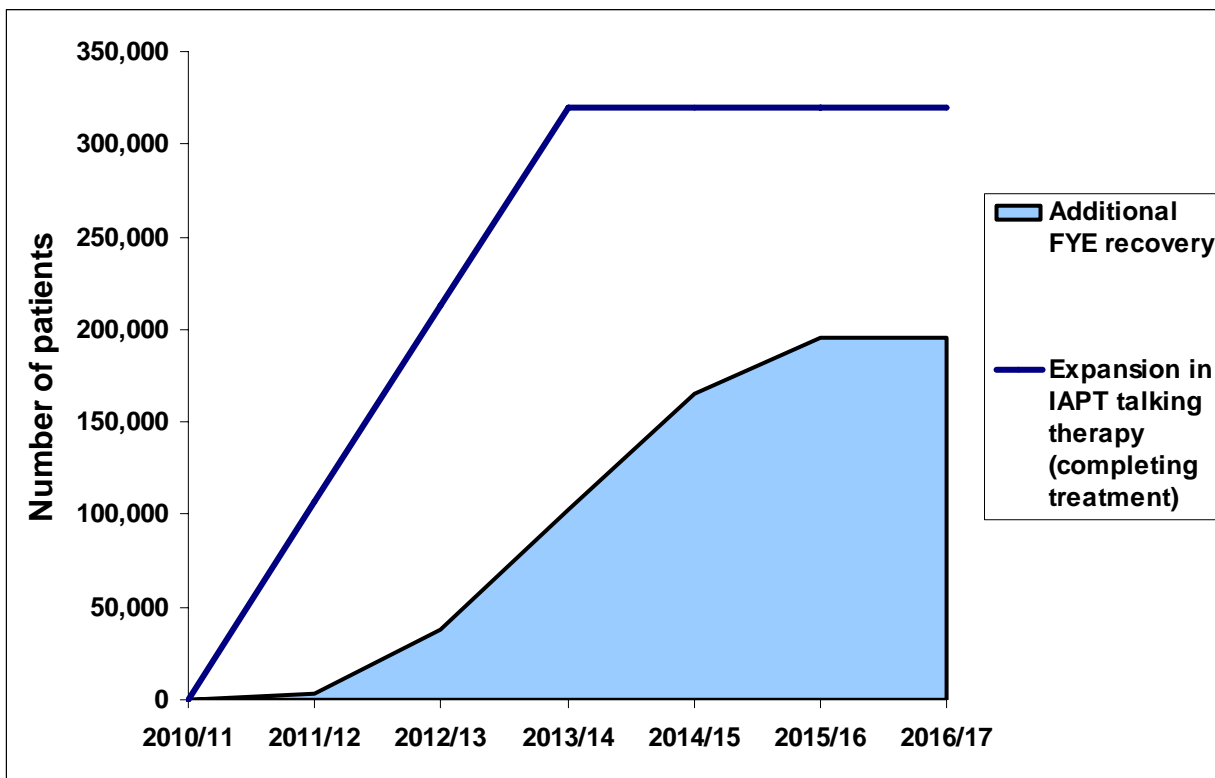
Figure 2: time lag of additional FYE recovery following expansion to full roll out

D.3.3 Costs of adult talking therapies

75. The main costs of completing the roll out of adult talking therapy services are those directly associated with training and employing therapists, employment advisers, and other staff (or third party service providers) involved in service delivery. In circumstances where talking therapy is provided with medication in combination therapy, there may also be some additional medication cost. Further, in the patient flow modelling, it was assumed that there will be 14% displacement of pre-IAPT talking therapy with IAPT talking therapy; this represents a cost offset for expanding to the full roll out.

D.3.3.1 Costs – assumptions

76. Patient flows for calculating costs: It is assumed that the full costs of treatment are incurred for all those completing treatment, and half of the costs of a full course of treatment are incurred for all those who start but do not complete. People can drop out of treatment at any time, and hence, in the absence of robust information on average sessions/medication uptake for those who start but do not complete treatment, those who start but do not complete can be expected to undergo half of the number of sessions on average.

77. Inflation indices: Where source data or assumptions on pay and prices are taken from earlier years, they are inflated to 2010/11 prices using the best available inflation index. Costs and benefits in all future years are also presented in 2010/11 prices. This provides a consistent basis for estimating the costs and benefits of the expanded roll out. For pay, the Average Earnings Index[25] is used for the years where it is available, 2006/7 to 2009/10. The GDP deflator[26] is used for 2010/11, with the assumption that NHS pay rose 2.5% faster than the GDP deflator per annum. For prices, the HCHS prices index[27] is the best available source for NHS prices information, and covers the years 2006/7 to 2008/9. The GDP deflator is used for 2009/10 and 2010/11, with the assumption that NHS prices rose 2% faster than the GDP deflator per annum. On this basis, the pay and prices indices used in the modelling are presented in Table 8 below, showing the uplift for each year to 2010/11.

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[25] Source: Table 3, (Average Earnings, excluding bonuses, Whole Economy seasonally adjusted) AverageEarningsIndexDec09_Jan10.xls, downloaded 21 April 2010
[26] http://www.hm-treasury.gov.uk/d/gdp_deflators.xls
[27] Unit Costs of Health and Social Care 2009, Page 175, Table 2

Table 8: Pay and prices indices used in the modelling to uplift to 2010/11 prices

From	Prices	Pay
2006/07	1.158	1.142
2007/08	1.138	1.103
2008/09	1.082	1.064
2009/10	1.043	1.048
2010/11	1.000	1.000

78. Cost of medication: The annual cost of medication is estimated to be £56.34 in 2006/7 prices, with no distinction made between those with mild or moderate/severe mental health problems, taken from *Paying the Price*[28]. This is inflated to **£65** in 2010/11 prices.

79. The £65 annual cost of medication is assumed to be incurred for all those taking medication, regardless of whether it is taken on its own or part of combination therapy. Hence, the sum of all those taking medication is the population of relevance for calculating the overall cost.

80. Estimating the cost of talking therapy: In general, the cost of talking therapy, whether pre-IAPT or IAPT, will largely be made up either of staff salaries plus overheads[29], or charges made to third party private service providers where services are contracted out. Costs of providing talking therapy at a local level may vary depending on the facts and circumstances of local service provision. However, from a national perspective, it is necessary to use weighted average costs to average across specific payment mechanisms or service configurations. This will typically take the form of a unit cost, for example on a per session basis.

81. Cost of pre-IAPT talking therapy: Information on the cost of pre-IAPT talking therapy is relatively limited. Use is made of an aggregate estimate of the cost of a course of counselling or psychotherapy in *Paying the Price*[30], which is given as £971 in 2006/7 prices.

82. Then, it is necessary to make a division between the cost of treatment for moderate/severe and mild mental health problems. It is assumed that a course of treatment for mild mental health problems is 20% of the cost of a course of treatment for moderate/severe mental health problems. This is consistent with IAPT talking therapy, and reflects the additional sessions required, longer session length, and additional experience of the practitioner. To work out the absolute costs on the basis of this assumption, use is made of information in *Paying the Price* on the number of people in contact with mental health services split between moderate/severe and mild, the overall cost of treating those people, and subtracting out the number and cost of treating those on medication only. This gives best estimates for the cost of pre-IAPT talking therapy as £1,121 for moderate/severe and £220 for mild, in 2006/7 prices. These costs are then inflated to **£1,298** and **£255** in 2010/11 prices.

83. Again, the cost of pre-IAPT talking therapy is assumed to be the same regardless of whether it is provided on its own or part of combination therapy. Hence, the sum of pre-IAPT talking therapy only and pre-IAPT talking therapy combination therapy is the appropriate basis for determining the overall costs.

84. Costs of IAPT talking therapy: The costs of IAPT talking therapy are estimated based on the average number of sessions required and expert opinion on the cost per session. The numbers of sessions required are based on experience from Newham and Doncaster, and later broadly corroborated by wider IAPT data. For treatment of those with mild mental health problems, it is assumed that four sessions will be required at an average cost of £32.50 per session, in 2009/10 prices. For treatment of those with moderate/severe mental health problems, it is assumed that 13 sessions will be required at an average cost of £55.20 per session; the higher cost per session reflects a longer session length with a more experienced and senior practitioner. These are complete costs, reflecting not only the salaries of therapists, but also on-costs to employers (National Insurance contributions and pension contributions), overheads (HR and administration, etc), and capital charges (therapy rooms/office space). Uplifting to 2010/11 prices using the Pay index[31] in Table 8, the assumed costs of a course of treatment are **£754** for those with moderate/severe mental health problems, and **£136** for those with mild mental health problems. It is assumed that there are constant returns to scale, so that these costs per course stay

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[28] McCrone, Paul et al. (2008) Paying the Price: The Cost of Mental Health Care in England to 2026, Page 29. London: Kings Fund.

[29] This will be in situations when a PCT employs a therapist directly. Overheads may include occupancy costs, office services and administration, materials, and employer pension and National Insurance contributions.

[30] McCrone, Paul et al. (2008) Paying the Price: The Cost of Mental Health Care in England to 2026, Page 29. London: Kings Fund.

[31] The Pay index is the appropriate inflator as the large majority of the cost of IAPT talking therapy will be in the salaries of psychological therapists.

constant regardless of the overall level of service provision. In practice, it may be possible for costs to fall slightly as provision increases if the local level NHS can take advantage of economies of scale or scope, thereby reducing the proportionate cost of overheads or capital charges.

85. In deriving an accurate estimate of the incremental cost of the additional roll out, it is important that the cost of IAPT talking therapy is reasonable and consistent in its own right. However, it should also be proportionate and consistent with the cost of pre-IAPT talking therapy, as part of the overall cost of the roll out is offset by displacement of pre-IAPT talking therapy services. Expert opinion suggests that the costs are proportionate to the functionality of the services provided; it is reasonable that IAPT talking therapy is modelled to be less expensive, as it can occasionally be computer or telephone-based, and generally takes place in a primary case setting. While pre-IAPT talking therapy is generally primary care led, it can also take place in a secondary care setting with higher associated cost. At an individual or PCT level, whether displacement of pre-IAPT with IAPT happens to be cost saving or not will depend on the facts and circumstances of the specific service provision.

86. Again, the cost of IAPT talking therapy is assumed to be incurred regardless of whether it is provided on its own or part of combination therapy. Hence, the sum of IAPT talking therapy only and IAPT talking therapy combination therapy is the appropriate basis for determining the overall costs.

87. <u>Cost of training</u>: Cohorts of trainees will be recruited in each of the next three academic years to bring the total of additional CBT therapists to approximately 6,000. This equates to approximately 800 additional therapists per year. Top-up training to help existing, qualified therapists in the other four NICE-approved modalities for treating depression (alongside Cognitive Behavioural Therapy) will continue. These modalities are: Interpersonal Therapy, Counselling for Depression, Brief Dynamic Interpersonal Therapy, and Couples Therapy. The numbers of therapists in these modalities are hard to estimate at this stage, as levels of top-up training will be determined locally; an assumption of 190 therapists trained per year has been used (excluding attrition).

88. Based on information from the national IAPT team, the cost of training is estimated at **£5,000** per trained low-intensity therapist, and **£10,000** per trained high intensity therapist. Training costs for the other four modalities are estimated at approximately **£3,000** per trained therapist. It is assumed that the number of therapists will increase linearly in the three years to full roll out, so that the training costs for expansion will be spread evenly across 2011/12, 2012/13, and 2013/14. In addition, there is likely to be some attrition of existing therapists, requiring additional training for replacements. It is estimated that the attrition rate is 10% overall, and double for low-intensity therapists than for high-intensity therapists. Therefore, the attrition rate is assumed to be 14% for low-intensity therapists and 7% for high-intensity therapists. These attrition rates are then applied to the expansion profile of therapists to determine the expected amount of maintenance-level training needed each year.

89. Based on the assumptions above, the cost of training (both for expansion and maintenance of the number of therapists), is estimated to be £9m in 2011/12, £10m in 2012/13, £10m in 2013/14, then dropping to £3m in 2014/15 onwards once steady state has been reached.

90. <u>Cost of employment advisers and employment support coordinators</u>: It is widely accepted that work is generally good for mental health – including for people with mental health conditions. Evidence shows that the longer people are absent from or out of work, the more likely they are to experience depression and anxiety.

91. However, too many of the target group are not in employment and so miss out on the advantages that work offers – for example, only 54% of people with a common mental health condition are in work. Furthermore, of the 2.6m people currently on out-of-work health-related benefits, around 42% are claiming primarily because of mental health conditions. Mental ill health accounts for around 200,000 new claims for health-related benefits (a third of the total) each year.

92. Timely, coordinated health and employment interventions can help people to gain and retain employment, reduce avoidable job loss and help people to return to work from benefits. Completing the roll out of adult talking therapies includes funding proposals for dedicated employment advice and support services, which are to be an integral part of the wider talking therapies services themselves. It is assumed that these services will help to consolidate some of the improvements in health and social and economic participation generated by talking therapy, or in rare cases be an alternative for therapy itself. As a result, it is assumed that the savings from the coordinated employment advice and support services (arising to both the healthcare system and the wider exchequer) are incorporated into the savings estimated in Sections D.3.4 and D.3.5.

93. Employment advice and support services are to be rolled out in stages, following successful pilots, the evaluation of which is due to be published in March 2011. This is estimated to cost **£11m in 2011/12, £29m in 2012/13, and £31m in 2013/14 and 2014/15**.

D.3.3.2   Costs of expanding to full roll out

94. The estimated cost of expanding to full roll out of adult talking therapies services (above the ongoing cost of the existing roll out) is given in Table 9 below. A breakdown reveals that there is expected to be a small amount of additional medication (through new moderate/severe service users undergoing combination therapy), and some cost offset through displacement of the more expensive pre-IAPT talking therapy.

95. Overall costs increase in the first three years as service provision expands, and then fall back slightly once the full workforce of new therapists has been trained, to reach a steady state additional cost of £133m per annum from 2014/15 onwards.

Table 9: Additional cost of expanding to full roll out (undiscounted)

	2011/12		2012/13		2013/14		2014/15		2015/16		2016/17 +	
	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild
Upfront training cost	£9m		£10m		£10m		£4m		£4m		£4m	
Medication cost	£2m	£0m	£3m	£0m	£5m	£0m	£5m	£0m	£5m	£0m	£5m	£0m
Pre-IAPT talking therapy cost	-£7m	-£3m	-£15m	-£6m	-£22m	-£9m	-£22m	-£9m	-£22m	-£9m	-£22m	-£9m
IAPT talking therapy cost	£30m	£11m	£60m	£22m	£91m	£33m	£91m	£33m	£91m	£33m	£91m	£33m
Employment advice and support	£11m		£29m		£31m		£31m		£31m		£31m	
Total additional cost	**£53m**		**£104m**		**£139m**		**£133m**		**£133m**		**£133m**	

96. Of most relevance for the Impact Assessment is the cost over the next Spending Review period, 2011/12 to 2014/15. Over this time, the overall cost is £428m undiscounted and **£402m present value** (discounting future years at 3.5% per annum[32]). It should be noted that these estimated costs corroborate very well with another approach for calculating the costs of expanding to full roll out, done by calculating the cost of training and then employing the additional approximately 2,400 therapists, adding on on-costs, overheads, and capital charges borne by the local NHS. These additional costs (on top of the basic salaries and training fees) may include employer National Insurance contributions, employer pension contributions, office accommodation and therapy rooms, and management/administration.

97. From a financial perspective, the additional funding requirement relative to what is due to go in PCT baselines from 2011/12 onwards may also be of relevance. This baseline is calculated on the basis of 2010/11 activity levels and costs, and includes an estimated £9m training cost to expand to the existing roll out which would not be incurred on an ongoing basis. Therefore, relative to what is due to go in PCT baselines, the additional costs are £9m lower per annum than that reported in Table 9 above, i.e. **£124m** per annum once steady state is reached.

D.3.4   Healthcare savings

98. Untreated depression and anxiety disorders are associated with increased healthcare usage – not only ongoing consultations and treatment in relation to the specific mental health condition, but also increased healthcare usage more generally.[33] Increasing the treatment of these disorders through the expansion of IAPT talking therapy services will help to reduce this usage, delivering important cost savings to the

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[32] Costs and savings are discounted at 3.5% per annum in line with DH Impact Assessment Guidance and the HM Treasury Green Book (reference: http://www.hm-treasury.gov.uk/data_greenbook_index.htm).
[33] Layard, R., Clark, D., Knapp, M., Mayraz, G.(2007). 'Cost-Benefit Analysis of Psychological Therapy'. Centre for Economic Performance. CEP Discussion Paper No 829, October 2007.

NHS. This section sets out the likely cost savings achievable through completing the roll out of IAPT adult talking therapy services, as well the source data and assumptions which underpin them. Further, an extensive analysis of the increased healthcare usage by people with common mental health problems is set out in Annex B.

D.3.4.1 Healthcare savings – assumptions

99. <u>Reduction in healthcare usage</u>: Recovery from a common mental health problem is estimated to lead to average annual reductions in healthcare usage per person as follows:

- 1.59 GP consultations;

- 0.36 outpatient procedures; and

- 0.73 inpatient bed nights.

A full description of the analysis underpinning these estimates is set out in Annex B.

100. The analysis of healthcare usage set out in Annex B does not differentiate between those with moderate/severe or mild mental health problems. Therefore, in the absence of other information, it is assumed that the annual reductions in healthcare usage apply to all recoverers equally. In reality, it is likely that moderate/severe sufferers will have been higher service users (much higher in some cases), so that they may consequently have higher reductions in healthcare usage upon recovery. However, this is not considered to have an effect on the overall cost benefit results; it just means that results for either moderate/severe or mild alone should not be treated as accurate in their own right (hence they have not been presented).

101. It is recognised that there will be substantial variation in the actual profile of savings between individual patients; some may have very substantially reduced usage whereas others may have no reduced usage at all. However, the average saving represents a best estimate of future savings, and is therefore of most relevance.

102. <u>Estimating the savings from reducing healthcare usage</u>: The savings from reducing healthcare usage are estimated by multiplying the average reductions in usage set out above by national average unit costs. Unit cost information is taken from PSSRU Unit Costs of Health and Social Care 2008/9, and then uplifted to 2010/11 prices using the prices index in Table 8 above.

Table 10: National average unit costs in 2010/11 prices

	National average unit cost (uplifted to 2010/11 prices)
GP consultations	£38
Inpatient bed nights	£533
Outpatient procedures	£200

103. On the basis of the above, it is possible to estimate the annual savings per recoverer attributable to successful treatment:

Table 11: Expected average savings per recoverer per annum in 2010/11 prices

	Annual savings per recoverer (2010/11 prices)
GP consultations	£60
Inpatient bed nights	£387
Outpatient procedures	£72
Total	**£519**

104. One uncertainty surrounds the appropriate unit cost to use when determining the level of savings. In the absence of further information about the specific type of healthcare usage that is reduced, national averages have been used. However, there is an argument that it may generally be more routine treatment that is avoided, either in terms of mental health services or general NHS treatment, rather than the highly complex treatment which pushes up the national average. As a result, the use of lower quartile national unit costs instead is explored in the sensitivity analysis in Section D.3.9. Having said this, common mental health problems are highly prevalent in people with physical long-term conditions, such as diabetes, COPD, and ischemic heart disease. Successful treatment of these groups through the expansion of IAPT talking therapy services may help to avoid high cost treatment, e.g. through reducing admissions for acute angina or myocardial infarction.[34] Therefore, using the national average is considered reasonable as a base case.

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[34] Moore RKG et al. A Brief Cognitive-Behavioral Intervention Reduces Hospital Admissions in Refractory Angina Patients. J Pain Symptom Manage. 2007 Mar;33(3):310-316

105. <u>Comparison with original Impact Assessment</u>: At the time of the original Impact Assessment for IAPT, little was known about the possible reductions in healthcare usage through successful treatment of common mental health conditions. Layard et al (2007), upon which the original Impact Assessment was founded, assumes that the overall savings to the NHS would be £300 per person treated over a two year period, although acknowledges that the evidence supporting this estimate is weak.

106. By way of comparison, it is possible to derive an estimate of the NHS savings per person completing IAPT talking therapy treatment using the assumptions in this economic case:

Saving per person completing treatment = £519 x 2 x (48% - 18%) = £311

107. The assumed NHS savings are consistent with the estimates included in the original business case, despite there being a completely different set of source data and assumptions underpinning them. Therefore, this economic case can be considered to corroborate the original Impact Assessment in this regard.

D.3.4.2 Healthcare savings from expanding to full roll out

108. Table 12 below provides estimates of the annual NHS savings from expanding to full roll out, over and above maintaining at existing roll out. These are calculated by multiplying the FYE recoverers set out in Table 7 by the average annual NHS savings per recoverer set out above. As can be seen, the savings reach a peak in 2015/16, two years after the full roll out is achieved, and then maintain at this level in steady state.

Table 12: Healthcare savings of expanding to full roll out (undiscounted)

	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17 +
GP consultations	£0m	£2m	£6m	£10m	£12m	£12m
Inpatient bed nights	£1m	£15m	£40m	£64m	£76m	£76m
Outpatient procedures	£0m	£3m	£7m	£12m	£14m	£14m
Total healthcare savings	**£1m**	**£20m**	**£54m**	**£86m**	**£102m**	**£102m**

109. For the purposes of cost benefit evaluation, it is necessary to ensure that the costs map to the benefits; benefits should only be included if they occur from a corresponding cost. The cost of relevance is that associated with the additional expansion over the upcoming Spending Review period, 2011/12 to 2014/15. Correspondingly, benefits should only be included which are realisable as a result of patients who are treated in those years. Table 13 below sets out the healthcare savings of expanding to full roll out which are attributable to the additional service provision in the years 2011/12 to 2014/15. Consistent with the time profile of recovery set out in Paragraph 70, this is calculated on the basis that only 23/24 of the benefits in 2015/16 and 11/24 of the benefits in 2016/17 should be included.[35]

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[35] The overall saving in 2015/16 is made up of 11months of the 2013/14 treatments, 12 months of the 2014/15 treatments, which should both be included, and only one month of the 2015/16 treatments, which should not. The overall saving in 2016/17 is made up of 11months of the 2014/15 treatments, which should be included, and 12 months of the 2015/16 treatments and one month of the 2016/17 treatments, which should both not.

Table 13: Healthcare savings of expanding to full roll out – attributable to service provision in years 2011/12 to 2014/15 (undiscounted)

	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
GP consultations	£0m	£2m	£6m	£10m	£11m	£5m
Inpatient bed nights	£1m	£15m	£40m	£64m	£73m	£35m
Outpatient procedures	£0m	£3m	£7m	£12m	£13m	£6m
Total healthcare savings	**£1m**	**£20m**	**£54m**	**£86m**	**£97m**	**£47m**

110. The healthcare savings attributable to the additional expansion over the Spending Review period total £305m undiscounted and **£272m present value** (discounting future years by 3.5% per annum[36]). Therefore, as a base estimate, the NHS savings are expected to cover a large proportion of the overall cost of the additional roll out; in fact the net cost to the NHS is predicted to be only £130m present value over the whole period, far less than the upfront gross cost.

D.3.5   Wider exchequer savings

111. Alongside savings to the NHS in terms of reduced healthcare usage, a core part of the economic case for expanding to full roll out is the expected improvement in employability of recoverers, delivering savings to the wider exchequer in the form of additional tax receipts and reduced welfare benefits payments. Successful treatment will allow people to either retain employment (who would otherwise fall onto Employment Support Allowance on account of their health condition) or regain employment[37]. This section sets out the likely exchequer savings, as well as the key assumptions which underpin the estimates. In addition, Annex C sets out an extensive original analysis of the increased employment that can be expected after recovery from a common mental health condition, drawing on data from the Adult Psychiatric Morbidity Survey 2007.

112. It should be noted that HM Treasury Green Book Guidance generally recommends that tax and benefits payments should be excluded on the basis that they are transfers and therefore do not confer any societal benefit in themselves (beyond any equity improvements). However, transfers alter the net outcomes of the main affected groups; in this case they confer savings to the exchequer and losses to the individuals (and possibly employers). It is therefore worth including them (both the positive and the equal and opposite negative), as it is of interest what the net result of the intervention on the public finances might be. The positive exchequer savings are considered in this section, whereas the equal and opposite losses are considered as part of the net economic outcome to individuals in Section D.3.7 below.

D.3.5.1   Wider exchequer savings – assumptions

113. <u>Base for determining exchequer savings</u>: The estimate of FYE recoverers in the working ages from Table 7 is the appropriate population base for calculating exchequer savings; it is assumed that adults over 65 years are in retirement, so that there are no tax or benefits gains from this group.

114. <u>Differential employment after recovery</u>: Annex C sets out an extensive original analysis of data from the Adult Psychiatric Morbidity Survey, which estimates the effect of moderate/severe and mild mental health problems on the employment rate for working age adults, relative to having no mental health problems. By assuming that a proportion of this employment differential can be eliminated following recovery from those common mental health problems, this analysis provides an estimate of the additional employment rate made possible by successful treatment.[38] In the two years of recovery following successful treatment, the employment rate of those who recover is expected to increase by **11.4 percentage points** for those with moderate/severe mental health problems, and by **4.3 percentage points** for those with mild mental health problems. Put another way, a net 11.4% of moderate/severe recoverers and a net 4.3% of mild recoverers are expected to retain or regain employment in the two

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[36] Costs and savings are discounted at 3.5% per annum in line with DH Impact Assessment Guidance and the HM Treasury Green Book (reference: http://www.hm-treasury.gov.uk/data_greenbook_index.htm).
[37] In addition, there may be a proportion of recoverers who are able to attain employment for the first time.
[38] It is considered unrealistic to assume that all of the employment differential identified can be eliminated following successful treatment; there may be dual causality increasing the size of the effects, and there may be other confounding factors which it is has not been possible to control for. This is discussed in more detail in Annex C.

years following successful treatment. These estimates represent a refinement on the original business case; this used a simple percentage comparison, and did not control for a variety of key confounding factors such as age, gender, educational background, and underlying physical health status.

115. It should be noted that this additional employment will come about from people both retaining and regaining employment. The underpinning analysis is not longitudinal in nature, and so no estimate can be made about the relative proportion of people regaining or retaining.

116. Further, it is assumed that all additional employment represents genuine new employment, and that there is no displacement from the rest of the working population. This is based on the fact that successful treatment will raise the employability of recoverers, and hence the human capital of the economy; it is assumed that the previous unemployment is structural in nature, and not cyclical. This is an important assumption; if indeed there was some displacement of workers elsewhere, then exchequer savings from recoverers would be partially offset by losses elsewhere in the economy. Conversely, there is the possibility that the creation of new human capital may generate multiplier effects in the economy so that the benefits may exceed the exchequer gains of those regaining or retaining employment themselves. However, such a benefit is speculative and difficult to quantify.

117. Tax gains: It is assumed that people either regaining or retaining work will earn the median national salary[39] for 2010/11, £21,518, estimated from the ONS Annual Survey of Hours and Earnings.[40] Direct tax gains are then calculated from the current tax rates, allowances and thresholds as advised by the DWP, as follows:

Table 14: Direct tax gains per person from regaining or retaining employment at median national income

Assumed average salary	£21,518
Income Tax 2010/11	
personal allowance	£6,475
Taxable	£15,043
Rate of tax	20%
Income Tax gained	**£3,009**
Employee's NI contributions	
NI threshold for employees	£5,720
Taxable income	£15,798
Rate of NI for employees	11%
NI gained	**£1,738**
Employers' ERNIC	
NI threshold for employers	£5,720
Taxable income	£15,798
Rate of NI for employers	13%
NI gained	**£2,022**
Direct tax gain	**£6,769**

118. Indirect tax gains are calculated from comparing the disposable income and indirect tax rate for someone out of work with the disposable income and indirect tax rate for someone regaining or retaining employment at the median national income, £21,518.[41] These are estimated in Table 15 below.

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[39] The median is used rather than the average, as it is less susceptible to distortion by a few very high income individuals. There is an argument to suggest that recoverers who regain or retain employment may have lower incomes than the national average, due to the distribution of gender and socioeconomic status exhibited by these groups. As a result, lower incomes and hence tax gains are explored in sensitivity analysis. Having said this, the median is considered reasonable in the absence of specific information on what the actual distribution might be.

[40] The ONS Annual Survey of Hours and Earnings (ASHE) 2009, annual median salary (all workers), was used, uprated by the Average Earnings Index (141.1/139.8 for Apr 10/Apr 09).

[41] Indirect tax rates and disposable incomes are estimated using information from the DWP Fiscal Savings Model (reference needed)

Table 15: Indirect tax gains per person from regaining or retaining employment at median national income

Disposable income (in work)	£18,271
Indirect tax rate (in work)	17.06%
Indirect tax paid (in work)	**£3,117**
Disposable income (out of work)	£4,582
Indirect tax rate (out of work)	29.67%
Indirect tax paid (out of work)	**£1,359**
Indirect tax gain	**£1,758**

119. The total annual tax gain from moving someone out of work into employment, or allowing them to retain employment, is thus estimated to be **£8,526**. This is multiplied by the number of FYE recoverers and the percentage point gain in employment for each of moderate/severe and mild, to give the total estimated tax gain for each year.

120. Welfare benefit savings: It is assumed that a proportion of people regaining or retaining employment would have been paid welfare benefits otherwise, usually in the form of Employment Support Allowance; these represent a saving to the exchequer. The average saving to the exchequer is estimated by comparing the average welfare benefits received by someone in work on the median national salary, with the aggregate welfare benefits received by someone out of work, whether they receive choose (or are eligible) to receive benefits or not.

121. Using the DWP Fiscal Savings model, the average welfare benefit received by an ESA claimant is estimated to be £6,674 in 2010/11 prices, made up of Council Tax benefit, Housing benefit (both adjusted for take up and float off), and Employment Support Allowance.[42] Again using DWP estimates, it is assumed that 2/3 of individuals who are out of work receive welfare benefits. Hence, the average welfare benefit which would have been received by someone had they not regained or retained employment is assumed to be £4,449 in 2010/11 prices. Aside from child tax credit which is assumed not to change, the average welfare benefit received by someone in work is assumed to be only £40 in 2010/11 prices, made up of housing benefit and working tax credit. Hence, the average fiscal saving per person regaining or retaining employment is estimated to be **£4,409** in 2010/11 prices.

122. Comparison with original business case: The original IAPT business case drew on work of Layard et al (2007), and used a base estimate of £900 and a pessimistic estimate of £450 wider exchequer savings per person treated over the two years following completion of treatment. This new economic case estimates that the wider exchequer savings per person who regains or retains employment is £12,935 per annum. The savings per person treated with IAPT talking therapy only are thus equal to:

Savings per person treated (moderate/severe) = £12,935 x 2 x (48% -18%) x 11.4% = £885

Savings per person treated (mild) = £12,935 x 2 x (48% - 18%) x 4.3% = £334

Therefore once again there is strong consistency with the original IAPT business case, despite a refinement in the methodology and inputs used for calculating savings.

D.3.5.2   Wider exchequer savings from expanding to full roll out

123. Table 16 below sets out the estimated overall tax revenue gains and welfare benefits savings from expanding to full roll out. These are calculated by multiplying the number of FYE recoverers in each year by the differential employment rate and then by the average tax and benefit gain for each recoverer who retains or regains employment. Consistent with other areas of the economic case, wider exchequer savings are limited to only two years following successful treatment; there may also be additional longer term improvements which further strengthen the case.

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[42] Child tax credit is not included in the calculations, as this is assumed not to change in the overwhelming majority of cases for someone regaining or retaining employment.

Table 16: Exchequer savings of expanding to full roll out (undiscounted)

	2011/12		2012/13		2013/14		2014/15		2015/16		2016/17 +	
	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild
Tax revenue gains	£1.0m	£0.5m	£14m	£7m	£37m	£19m	£60m	£30m	£71m	£36m	£71m	£36m
Welfare benefits savings	£0.5m	£0.3m	£7m	£4m	£19m	£10m	£31m	£16m	£37m	£18m	£37m	£18m
Total exchequer savings	**£2.2m**		**£31m**		**£85m**		**£137m**		**£161m**		**£161m**	

124. Consistent with the principles set out in Paragraph 109 above, Table 17 below sets out only the wider exchequer savings of expanding to full roll out which are attributable to the years 2011/12 to 2014/15 inclusive.

Table 17: Exchequer savings of expanding to full roll out – attributable to service provision in years 2011/12 to 2014/15 (undiscounted)

	2011/12		2012/13		2013/14		2014/15		2015/16		2016/17	
	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild
Tax revenue gains	£1.0m	£0.5m	£14m	£7m	£37m	£19m	£60m	£30m	£68m	£34m	£32m	£16m
Welfare benefits savings	£0.5m	£0.3m	£7m	£4m	£19m	£10m	£31m	£16m	£35m	£18m	£17m	£8m
Total exchequer savings	**£2.2m**		**£31m**		**£85m**		**£137m**		**£155m**		**£74m**	

125. The exchequer savings attributable to the additional expansion over the Spending Review period total £484m undiscounted and **£432m present value** (discounting future years by 3.5% per annum[43]). Therefore, once the wider exchequer savings are considered alongside the healthcare savings, completing the roll out of IAPT talking therapy services is expected to be strongly cost saving to the public purse.

D.3.6   Health benefits

126. Layard et al (2007) argues that 'mental illness causes as much of the misery in Britain today as poverty does. …. It is our greatest hidden problem.' A key component of that is the mental ill health and suffering experienced by individuals, which go beyond more concrete measures of health usage, unemployment, or productivity loss. Therefore, a key benefit of expanding to full roll out is the ability to alleviate suffering and improve the mental health of the additional people who IAPT talking therapy services can reach. This section seeks to quantify the gains in individual health and wellbeing that can be made, using a universal and comparable metric of health status, and then monetises them to allow consistency with the other costs and benefits.

D.3.6.1   Health benefits – assumptions

127. The baseline of recovery for measuring health benefits: Consistent with the other benefits set out in the economic case, the FYE recovery profile is used as the appropriate baseline for measuring health benefits. This provides a year-on-year assessment of the additional number of people who are in a recovered state rather than a depressed/anxious state, and as a conservative assumption, limits any health benefits to two years following successful treatment. Once again, it is arguable that there are longer term gains to mental health and wellbeing which are therefore not captured.

128. The use of the FYE recovery profile means that the style of treatment does not affect the health and wellbeing gain directly; only the change in underlying health status (as defined by recovery) matters. This

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[43] Costs and savings are discounted at 3.5% per annum in line with DH Impact Assessment Guidance and the HM Treasury Green Book (reference: http://www.hm-treasury.gov.uk/data_greenbook_index.htm).

is important, as it allows the quantified difference in health and wellbeing gain from different health states to be used, as reported in health economics literature. An interesting implication is that there is assumed to be no change in mental health where there is displacement of pre-IAPT talking therapy with IAPT talking therapy; the two are assumed to offer the same gain in heath and wellbeing as the success rates of treatment (and hence movements between mental health states) are assumed to be the same.

129. <u>Quantifying the health improvement from recovery</u>: Consistent with much of health economics, and with NICE methodology, the Quality Adjusted Life Year (QALY) is used as the appropriate metric for quantifying the health improvement associated with moving from a depressed/anxious health state to a non-depressed/anxious health state as a result of 'recovery'. A QALY score is defined on the interval [0,1], with 0 representing death and 1 representing perfect health. It is often estimated for particular health states and conditions using the EQ-5D tariff, which evaluates health on five dimensions, one of which is depression/anxiety.

130. The QALY gain from an intervention can then be estimated by comparing the average QALY score with intervention against the average QALY score without intervention, and multiplying the difference by the length of time over which the change of health state is assumed to occur.[44] In this instance, it has not been possible to find suitable information on health state for moderate/severe and mild mental health problems separately; instead, an average QALY loss for depression/anxiety has been used. In reality, moderate/severe sufferers will have higher health detriments than mild sufferers, and so will have higher QALY gains upon recovery. Hence, as was the case with healthcare savings, results for either moderate/severe or mild alone should not be treated as accurate in their own right (hence they have not been presented); however the overall results can be considered reasonable as a best estimate.

131. Consistent with the original IAPT Impact Assessment, QALY estimates are based on work by Dolan et al (1995)[45]. This reports that a change from moderate depression or anxiety is associated with a QALY gain of 0.152 for those with good health across the other four dimensions, and a QALY gain of 0.071 for those with moderate health across the other four dimensions. Common mental health problems are typically associated with high levels of physical co-morbidity, and so it is reasonable to assume that a significant proportion of sufferers would report only moderate physical health rather than good physical health. As a result, the average of the two scores is taken, i.e. a gain of **0.11 QALYs** for each year of recovery following successful treatment.[46] [47]

132. <u>Monetisation of QALY gains</u>: Consistent with DH IA Technical Guidance, health gains are monetised at a societal valuation of £60,000 per QALY. Annex C of the Guidance derives this societal valuation in detail.

D.3.6.2   Health benefits from expanding to full roll out

133. The overall health benefits from expanding to full roll out are calculated by multiplying the additional number of FYE recoverers in each year by the estimated average annual QALY gain for a recoverer, 0.11. The health benefits, both in terms of QALYs and monetised, are given in Table 18 below.

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[44] It is typical to discount future years using an appropriate discount rate, in this case 1.5%.

[45] Dolan, Paul, Claire Gudex, Paul Kind and Alan Williams "A Social Tariff for EuroQoL: Results from a UK General Population Survey" CHE Discussion Paper 138 September 1995. The paper uses a a time trade-off (TTO) approach to obtain valuations. (A TTO study asks respondents to sacrifice quantity of life (i.e. life expectancy) to gain improvements in quality of life. This study involved 3395 respondents, designed to be a representative sample of the non-institutionalised population of England, Scotland and Wales, interviewed in 1993.)

[46] Given the definition of recovery – the loss of caseness following treatment – it is arguable that not all patients who are deemed to have recovered will move to 'good health' on the depression/anxiety dimension as defined by EQ5D, which could lead to an overestimation of QALY scores. However, as was discussed in Paragraph X, there will be other patients who report small improvements in their mental health or wellbeing which are not captured by the given definition of recovery. Hence, using the full QALY gain from moving away from moderate depression or anxiety seems reasonable on an average basis.

[47] This approach is favourable to the comparison of overall average QALY scores for those with or without depression/anxiety; comparison of overall averages may overestimate the health benefits achievable through successful treatment, as those with depression/anxiety are more likely to suffer physical health co-morbidity, which could not be fully alleviated (even if it might be partially improved).

Table 18: Health benefits of expanding to full roll out (undiscounted)

	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17 +
QALY gains	300	4,000	12,000	18,000	22,000	22,000
Monetised QALY gains	£18m	£254m	£690m	£1,108m	£1,308m	£1,308m

134. Consistent with the principles set out in Paragraph 109 above, Table 19 below sets out only those health benefits of expanding to full roll out which are attributable to the years 2011/12 to 2014/15 inclusive.

Table 19: Health benefits of expanding to full roll out – attributable to service provision in years 2011/12 to 2014/15 (undiscounted)

	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
QALY gains	300	4,000	12,000	18,000	21,000	10,000
Monetised QALY gains	£18m	£254m	£690m	£1,108m	£1,253m	£599m

135. There is an overall health benefit attributable to the additional expansion over the Spending Review period of an estimated 65,000 QALYs (undiscounted), and 62,000 QALYs (discounted at 1.5% per annum[48]). The overall monetised health benefit across this period, using a societal valuation of £60,000 per QALY, is estimated at £3.9Bn undiscounted, or £3.7Bn present value[49].

D.3.7   Wider economic benefits

136. Completing the roll out of IAPT talking therapy services across the country is expected to deliver benefits to the wider economy alongside the gains in health and wellbeing of those treated and savings to the NHS and exchequer. For example, depression and anxiety is one of the largest causes of sickness absence; successful treatment will help to reduce sick days of those in employment, thereby delivering important benefits to employers. Further, there may be additional economic gains to those who regain or retain employment beyond the tax and benefits savings to the exchequer, due to the higher disposable income which those people may have at their disposal.

D.3.7.1   Wider economic benefits – assumptions

137. Reductions in sickness absence: Using information from the Psychiatric Morbidity Survey 2000, as reported in Layard et al (2007), Table 4, it is estimated that the average sickness absence is 24 days per year for those with depression and 14 days per year for those with anxiety, compared with only five days per year for those with no mental disorder. Consistent with the assumptions for employment more generally, it is assumed that 60% of this differential absence can be avoided if a once-sick person becomes well. Without better information about sickness absence for different severities of mental health disorder, it is assumed that the gain for depression sufferers can be attributed to those with moderate/severe mental health problems who undergo high intensity treatment, and the gain for anxiety sufferers can be attributed to those with mild mental health problems who undergo low intensity treatment. On this basis, the annual sickness absence avoided is estimated at **11.4 days** for employed moderate/severe recoverers, and **5.4 days** for employed mild recoverers.

138. Reductions in sickness absence are only achievable for those who are employed, rather than all recoverers of working ages. Analysis of the Adult Psychiatric Morbidity Survey 2007, consistent with that undertaken in Annex C, finds that the average employment rate (full or part time) is **46%** for those with a CIS-R score of 18 or more (i.e. moderate/severe sufferers), and **63%** for those with a CIS-R score of 12 to 17 (i.e. mild sufferers).

139. As discussed in Paragraph 117 above, the median salary in 2010/11 is estimated as £21,518. There are 253 working days in a typical calendar year, and the average employee is assumed to work 228 days allowing for annual leave. On this basis, the average daily wage is estimated as **£94**. As a simplistic assumption, this is taken to be the average loss to an employer from a day of sickness absence. In

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[48] Health benefits are discounted at 1.5% per annum in line with DH Impact Assessment Guidance and the HM Treasury Green Book (reference: http://www.hm-treasury.gov.uk/data_greenbook_index.htm).
[49] Again using a discount rate for health benefits of 1.5% per annum.

reality there may be additional overheads which become underutilised through sickness absence causing further losses, and there may be additional profit lost if average productivity exceeds the wage rate; however these further losses are more questionable and very difficult to estimate.

140. Economic gains to individuals regaining or retaining employment: Successful treatment with IAPT talking therapy is likely to improve the economic wellbeing of those who regain or retain employment, as their increase in earnings relative to no treatment more than offsets their higher tax payments and loss of welfare benefits. This is a possible additional benefit of completing the roll out.

141. As mentioned in Section D.3.5 above, a decision was taken to include tax and benefits savings to the exchequer even though they are technically transfer payments. As they are transfer payments, a correct handling needs an equal and opposite loss to employed individuals to be netted off against the increase in earnings which they achieve[50]. On this basis, providing that only the net economic gain to individuals is considered (and not all the extra earnings), then the inclusion of tax and benefits savings in the overall cost benefit calculations is reasonable.

142. The net economic gain to individuals comes at the expense of a reduction in leisure time. A valuation of this leisure time is given by the reservation wage, the wage rate at which individuals are exactly indifferent between being in or out of work. Because of the complexity in estimating the reservation wage, a decision has been taken not to include any net economic gains to individuals as a result of regaining or retaining employment; these are left as an unquantified benefit.

D.3.7.2 Wider economic benefits from expanding to full roll out

143. The estimated reductions in sickness absence from completing the roll out are given in Table 20 below.

Table 20: Reduction in sick days from expanding to full roll out (undiscounted)

| | 2011/12 | | 2012/13 | | 2013/14 | | 2014/15 | | 2015/16 | | 2016/17 + | |
	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild
Sick days avoided	5,000	5,000	70,000	60,000	200,000	170,000	330,000	280,000	380,000	330,000	380,000	330,000
Monetised benefit to employers	£0.5m	£0.4m	£7m	£6m	£19m	£16m	£31m	£26m	£36m	£31m	£36m	£31m

144. Consistent with the principles set out in Paragraph 109 above, Table 21 below sets out only those reductions in sick leave attributable to expanding to full roll out in the years 2011/12 to 2014/15 inclusive.

Table 21: Reduction in sick days from expanding to full roll out – attributable to service provision in years 2011/12 to 2014/15 (undiscounted)

| | 2011/12 | | 2012/13 | | 2013/14 | | 2014/15 | | 2015/16 | | 2016/17 | |
	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild	Mod / severe	Mild
Sick days avoided	5,000	5,000	70,000	60,000	200,000	170,000	330,000	280,000	370,000	320,000	180,000	150,000
Monetised benefit to employers	£0.5m	£0.4m	£7m	£6m	£19m	£16m	£31m	£26m	£35m	£30m	£17m	£14m

145. There is an overall reduction in sick leave attributable to the additional expansion over the Spending Review period of an estimated **2.1m days**. The overall monetised benefit to employers across this period is estimated at £202m undiscounted, or **£181m present value**[51]. In addition, there may be other economic gains to recoverers that have not been quantified, as discussed above.

D.3.8 Results and conclusions for adult talking therapies

146. The cost and benefit results for completing the roll out of adult talking therapies services are incorporated into the overall cost benefit results in Section D.2. Completing the roll out of adult talking therapies represents the large majority of both costs and benefits of the overall programme. Therefore it

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[50] Technically, additional tax payments by employers would also have to be netted off. However, the net outcome to employers (beyond a reduction in sickness absence) has not been considered in this case; it would have to be at least neutral otherwise employers would not open up the extra employment.
[51] Using a discount rate for employer benefits of 3.5% per annum.

is unsurprising that the conclusion for just this section is the same as for the overall case; it can be concluded that there is a very strong case for completing the roll out of adult talking therapies. Not only are the societal benefits expected to outweigh the costs by a factor of six to one, but the expansion is expected to be net cost saving to the wider public sector and deliver important savings to the local NHS.

D.4   Psychological therapies for children and young people

D.4.1   Introduction

147. Depression, anxiety disorders, self harm, eating disorders together with developmental and conduct disorders represent most referrals to specialist Child and Adolescent Mental Health Services (CAMHS). Evidence shows that similar psychological interventions to those offered for adults of all ages would be effective in meeting these needs for children and young people.

148. *Talking Therapies: a four-year plan of action* sets out plans for developing and delivering appropriate and evidenced services for children and young people.

D.4.2   Costs and benefits

149. Costs: The outcome of the Spending Review for 2011/12 to 2014/15 is likely to include funding for the development and delivery of services for children and young people. This will likely involve costs to develop care pathways and appropriately tailored services, costs to train specialist children and young people therapists, and the cost of commissioning and providing the services themselves. However, a detailed breakdown will only become available at a later stage of the policy development process. Hence, costs for this area have not been included at this stage.

150. Benefits: It is likely that significant savings and wider benefits can be realised from expanding access of psychological therapies to children and young people, due to an ability to intervene early in the life course. However, it has not been possible to quantify the benefits at this stage.

D.5   Talking therapies for older adults

D.5.1   Introduction

151. Older adults are significantly under-represented in the patient profile of existing talking therapies services. Analysis of data from IAPT's first wave sites indicated that adults over the age of 65 represented an average of 4% of those accessing IAPT services between October 2008 and September 2009. The Adult Psychiatric Morbidity Survey assesses prevalence of depression among 65 to 74-year-olds at 10.6% and for all adults at 16%. The expected rate of over 65s in IAPT services, given the age profile of the population and the community prevalence of depression and anxiety disorders, should therefore be 12%.

152. It is intended to promote services tailored for older people and address issues concerning access, as set out in the *four-year plan of action*.

D.5.2   Costs and benefits

153. Costs: There is likely to be some limited cost associated with engaging specialists in older people's care (including dementia), and developing appropriate care pathways and tailored services. However, these have not been quantified at this stage; it is considered that these will be negligible relative to the overall cost of the expansion of talking therapies services. The provision of services themselves to older people has already been considered above in completing the roll out of the adult talking therapies programme.

154. Benefits: The benefits of providing services to older people have already been included as part of completing the roll out of the adult talking therapies programme. This made the assumption that 13.3% of patients would be older adults, helping to redress the imbalance in existing service provision.

D.6 Talking therapy pilots for people with long term conditions and medically unexplained symptoms

D.6.1 Introduction

155. Mental health problems are much more common in those with physical illness. Compared with the general population, people with diabetes, hypertension and coronary artery disease have double the rate of mental health problems, and those with chronic obstructive pulmonary disease, cerebro-vascular disease and other chronic conditions have triple the rate. People with two or more long-term conditions are seven times more likely to have depression.

156. Further, untreated depression leads to worse health outcomes and increased healthcare spending among those with long term conditions:

- Co-morbid depression is associated with a 50% to 75% increase in health spending among diabetes patients[52]

- Those with cardiac problems are three times more likely to die of these causes if they also suffer from depression than if they do not[53]

- Research has shown that people with heart disease are more likely to suffer from depression, and people with depression are at greater risk of developing heart disease[54]

157. Medically unexplained symptoms (MUS) are physical symptoms that have no currently known physical or pathological cause. People with MUS present commonly to the NHS. Analysis of 2008/09 NHS figures shows that they account for as many as one in five new consultations in primary care, 7% of all prescriptions, 25% of outpatient care, 8% of inpatient bed days and 5% of A&E attendances. It is estimated that MUS costs the NHS £3 billion per year (08/09).[55]

158. The *four-year plan of action* sets out plans to develop services for those with long term conditions and medically unexplained symptoms.

D.6.2 Costs and benefits

159. Costs: It is not clear at this stage how much funding will be made available for the development of care pathways and services for those with physical long term conditions and medically unexplained symptoms. Therefore, no costs for this area have been included at this stage.

160. Benefits: The benefits of developing services for those with physical long term conditions and those with MUS may be substantial, but are difficult to estimate at this stage. Use has been made of analysis of a talking therapy-based intervention for MUS carried out by the LSE, which provides an estimate of the expected cost of identification and subsequent CBT, and the resultant savings to the NHS. This is set out in more detail in the Mental Health Strategy Impact Assessment. As no costings have been included at this stage, it has not been possible to estimate the scale of possible future service provision over the next four year period; as a result, benefits have not been quantified either.

D.7 Talking therapies for people with severe mental illness

D.7.1 Introduction

161. More than 1.5 million people in England have severe mental illnesses like schizophrenia, bipolar disorder, and severe depression, and many are not getting the cost-effective evidence-based psychological treatments they need. NICE updated its schizophrenia guidelines in 2009 and recommended that CBT should be offered in an acute episode of schizophrenia.

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[52] Simon G, Katon W, Lin E, et al. Diabetes complications and depression as predictors of health service costs. *Gen Hosp Psychiatry,* 2005;27:344-51.
[53] Frasure-Smith, N.**,** Lespérance, F., Juneau, M., & Talajic, M. (1999). Gender, depression, and one-year prognosis after myocardial infarction. *Psychosomatic Medicine,* 61, 26-37.
[54] Nemeroff C B; Musselman D L. Are platelets the link between depression and ischemic heart disease? *American heart journal,* 2000;140(4 Suppl):57-62.
[55] Bermingham S, Cohen A, Hague J, Parsonage, M (2010) The cost of somatisation among the working-age population in England for the year 2008/09. *Mental Health in Family Medicine* (in press).

162. However, research by Rethink[56], the campaigning organisation that represents people with severe mental illness, indicates that even though 61% of overall mental health service users have been offered psychological therapy, only 51% of people with schizophrenia or bipolar disorder have been offered this support. This demonstrates the current emphasis on services for people with common mental health problems. The *four-year plan of action* sets out plans to develop services for those with severe mental illness, thereby promoting fairer access.

D.7.2   Costs and benefits

163. Talking therapies for people with severe mental illness is at too early a stage of policy development to be able to estimate likely costs and benefits. They are not expected to be significant relative to the overall talking therapies programme.

D.8   Sensitivity analysis

164. Sensitivity analysis helps to identify which input assumptions are the key drivers of the results, and verifies the robustness of the overall conclusions. Under univariate sensitivity analysis, each of the inputs of interest is varied in turn, holding all other assumptions at their base values. A comparison with the base level results can then be made to identify the direction and magnitude of the effect, and further, whether the effect is large enough to alter the overall conclusions.

165. The results of univariate sensitivity analysis are given in Table 22 below, based on the economic modelling work for completing the roll out of the adult talking therapies programme; the assumptions examined were selected on the basis of their perceived importance, uncertainty, or where alternative source information was identified.

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[56] Fair Treatment Now: Better outcomes, lower costs in severe mental illness (Rethink, 2010)

Table 22: Univariate sensitivity analysis results

Input	Value	Original value	Net healthcare saving of overall programme	Net public sector saving of overall programme	Net benefit of overall programme
Base case			-£130m	£302m	£4.6bn
Displacement of pre-IAPT talking therapy with IAPT talking therapy	0%	14%	-£191m	£318m	£5.2bn
	30%		-£61m	£284m	£3.7bn
Treatment dropout rate	0%	20%	-£60m	£489m	£6.0bn
	40%		-£200m	£115m	£3.1bn
PT-only sustained recovery rate	30%	48%	-£229m	£90m	£2.6bn
	60%		-£69m	£435m	£5.7bn
Natural sustained recovery rate	30%	18%	-£222m	£69m	£2.6bn
Training cost per person treated	£83	£41	-£146m	£286m	£4.5bn
Same treatment cost for new and pre-IAPT talking therapy	£1298 for high intensity, £255 for low intensity	£754 for high intensity, £136 for low intensity	-£455m	-£23m	£3.7bn
Full reduction in healthcare usage	2.55 GP consultations, 1.21 inpatient bed nights, 0.60 outpatient procedures	1.59 GP consultations, 0.73 inpatient bed nights, 0.36 outpatient procedures	£56m	£488m	£5.0bn
NHS unit costs	£356 for inpatient bed nights, £132 for outpatient procedures	£533 for inpatient bed nights, £200 for outpatient procedures	-£213m	£219m	£4.3bn
Income for calculating exchequer savings	£11,132	£21,518	-£130m	£106m	£4.0bn
Annual QALY gain per recoverer	0.071	0.152	-£130m	£302m	£3.1bn
	0.20		-£130m	£302m	£7.6bn

166. The results demonstrate that for all sensitivities considered on completing the roll out of adult talking therapies, the overall talking therapies programme is still expected to be strongly cost-beneficial and still even net cost saving to the pubic sector. The following conclusions can be made about individual assumptions for completing the roll out of adult talking therapies:

• Displacement of pre-IAPT talking therapy with IAPT talking therapy: There is considerable uncertainty over this assumption. If displacement is assumed to be zero, then the overall net benefits increase, reflecting the additional number of people being treated. However, the net healthcare cost increases; this demonstrates the possibility of displacement to deliver savings. If displacement is as high as 30%, then the programme is predicted to have a lower net cost to the NHS (albeit with lower overall recovery and hence benefits).

• Treatment dropout rate: Again, there is considerable uncertainty; however, even if the dropout rate for talking therapy is increased to 40%, the overall programme is still expected to be net cost saving to the overall public sector, and strongly net beneficial overall.

• PT-only sustained recovery rate: As would be expected, the recovery rate from IAPT talking therapy services has a large impact on the overall results; if it is 60% (as would be predicted by the IAPT pilot sites in Newham and Doncaster), then the overall programme may deliver NHS savings to completely offset the upfront costs. However, even if the sustained recovery rate was as low as 30%, it is still predicted to be net cost saving to the wider public sector.

• Natural sustained recovery rate: If the natural sustained recovery rate (i.e. what is achievable in the absence of treatment) was 30%, the same as the reported short term natural recovery rate, then the overall programme is still estimated to be net cost saving to the wider public sector, albeit less so.

- Training costs: Training costs are shown not to have a large impact on the results; even doubling the training cost has negligible effect relative to costs of delivering services themselves.
- Treatment costs: If the costs of a course of IAPT talking therapy are the same as for pre-IAPT talking therapy, then there are no longer cost savings from displacement. There is then a much larger net cost to the NHS, and a small net cost to the public sector. However, this scenario is considered very unlikely due to the inherent differences in service provision.
- Reduction in healthcare usage: A decision was taken in Annex C to expect only 60% of the difference in healthcare usage between those with and without common mental health problems to be eliminated on recovery. If the full difference was assumed, then the overall programme may deliver a net saving of an estimated £56m over the next four years.
- NHS unit costs: As discussed in Section D.3.4.1 above, there is an argument to suggest that lower quartile national unit costs should be used for quantifying healthcare savings, rather than median unit costs. This is shown to not alter the results significantly.
- Income for calculating exchequer savings: If a lower estimate of earnings for those regaining or retaining employment is used, based on the average earnings of those leaving Employment Support Allowance, there is no change to the conclusion that the overall programme will be net saving to the wider public sector.
- QALY gains: Unsurprisingly, the QALY score used for calculating health benefits has a large impact on the overall cost-benefit results. If an annual QALY gain of 0.20 is used, in line with Layard et al (2007), then the overall net benefit is estimated to be as high as £7.6bn. However, even with an annual QALY gain of 0.071[57], the overall programme is still expected to be highly cost-beneficial, with costs outweighing benefits by five to one.

D.9   Expected impacts upon equality and human Rights

167. As set out in the accompanying Talking Therapies AIE, the *four-year plan of action* is expected to have a positive impact in promoting equalities and mitigating inequality of access for certain key groups, including children and young people and older adults (age), those with severe illness and physical long term conditions (disability).

168. There are not expected to be any negative impacts upon rural communities; if anything, completing the roll out of adult talking therapies will help to improve equality of access by those in rural areas. Further, there are no identified individuals or groups whose natural rights or legitimate expectations might seem to be compromised as a result of the proposed plan of action.

E.   Summary and weighing of options

169. Overall, it can be concluded that there is a strong economic case for the proposed programme, the proposed talking therapies programme, over the next Spending Review period. Not only are the societal benefits expected to outweigh the costs by a factor of approximately six to one, but the programme is expected to be net cost saving to the wider public sector and deliver important savings to the local NHS. It is acknowledged that there is considerable uncertainty over some of the parameter assumptions; however, efforts have been made to be conservative whenever large uncertainties exist. Further, sensitivity analysis demonstrates that, even when key parameter assumptions are changed within reasonable limits, the programme is still estimated to be highly cost-beneficial and net saving to the wider public sector.

170. Further, the proposed talking therapies programme is expected to deliver important advantages in terms of fairness and broadening access to previously disadvantaged groups. Thus, considering both the economic and equalities aspects, it can be concluded that the proposed programme should be supported.

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[57] 0.071 is the QALY loss associated with mild/moderate depression/anxiety for only those with moderate physical health otherwise.

Annexes

Annex A Post Implementation Review (PIR) Plan

Basis of the review: After three years, specific service models and benefits realisation will have been developed for children and young people, those with long term conditions or medically unexplained symptoms and those with severe mental illness, and next steps will need to be considered.
Review objective: To assess progress by the NHS in expanding access to Talking Therapies for the whole community and to develop appropriate plans for the future
Review approach and rationale: To include a review of the monitoring data and a scan of stakeholder views to demonstrate the effectiveness, efficiency and popularity of the policy's achievements
Baseline: By the end of March 2011, talking therapy services will be available to approximately 60% of the population. 3,700 new therapy workers have been trained or are in training. In the latest figures available, for June to Sept 2010, 72,000 patients have moved to recovery and nearly 14,000 people treated have attained or retained a job.
Success criteria: Nationwide coverage of adult IAPT services. An additional 2,400 new therapy workers trained or in training. Continuous professional development made available to therapies in other modalities approved by NICE for treating depression and anxiety disorders. Appropriate proportions of patients moved to recovery and able to attain or retain a job or other purposeful activity. Specific service models and benefits realisations developed as outlined above.
Monitoring information arrangements: Key performance indicators of prevalence of conditions, referrals to services, treatments offered. Two further indicators recording numbers moving to recovery and those attaining or retaining work are sought. Together, these indicators offer effective reporting of the programme's progress and outcomes at national level and enable local services to improve their clinical effectiveness.
Reasons for not planning a PIR: N/A

Annex B Analysis of healthcare usage and mental health

A B.1 Introduction

171. There is strong evidence to suggest that people with common mental health problems use more healthcare services, not only in terms of treatment for their mental health condition, but also in terms of an increased propensity to seek treatment for physical health conditions. This annex sets out a technical analysis to estimate the empirical relationship between healthcare usage and mental health. In particular, it seeks to determine the difference in the healthcare usage of people with and without common mental health problems. This is then used to derive an estimate of the likely reduction in healthcare usage through moving a sufferer to recovery as a result of successful talking therapies treatment.

172. <u>Differences in healthcare usage</u>: Using survey data, it is possible to observe differences in the annual healthcare usage of people with and without common mental health problems. However, these differences should not be taken on face value as the possible reduction in healthcare usage if the mental health disorder was successful treated. There are likely to be a number of countervailing factors associated with both mental health and healthcare usage which are driving some of the difference. For example, people with common mental health problems are more likely to have one or more physical health conditions, also independently associated with higher usage, quite apart from any transmission through mental health. Therefore, even if mental health had no impact on healthcare usage at all, people with mental health problems may be observed to have higher usage. To get a true impression of the differential healthcare usage associated with mental health problems, it is thus necessary to control for as many of these observable factors as possible, and thereby be able to compare like with like.

173. The analysis set out below firstly examines simple differences in the healthcare usage of those with and without common mental health problems using survey data, then seeks to control for as many observable factors as possible that may be biasing the result. Finally, the analysis makes an assessment of how much of the resultant differences can be attributed to successful talking therapies treatment.

174. It should be noted that the analysis seeks to predicted reductions in <u>average</u> usages. There will inevitably be a distribution of individual reductions around these averages, with some patients exhibiting very large reductions being balanced by other patients not exhibiting any reductions at all.

175. <u>Limitations of the analysis</u>: It should be noted that the analysis set out below uses responses from a nationwide survey, the British Household Panel Survey 2008 and 2009[58], rather than information on specific patients or groups of patients who have been treated with talking therapies services. Therefore, the results should be treated with appropriate caution. For example, an implicit assumption of the analysis is that the survey data used is representative of those who actually undergo talking therapies. It is possible that there will be systematic differences between the two groups.

176. A study of IAPT sites is currently pre-publication, undertaken by St George's Medical School. This will be available later in 2011, and should provide IAPT-specific information and therefore be of closer relevance to talking therapies. However, in the absence of better information, it is felt that the estimates derived in this annex are applicable in a talking therapies context.

177. Secondly, it should be noted that the survey questions used to derive the results do not make any distinction between different types of healthcare usage, beyond whether it is a GP visit, inpatient bed night, or outpatient procedure. This poses two limitations: it is not possible to estimate the split of healthcare usage between mental health services and general health services; secondly, the lack of detailed information on the type of usage means that only average cost estimates can be used to determine healthcare savings. If some types of usage are reduced more than others in a systematic way, then it is possible that the use of average costs to estimate savings will therefore not be accurate.

178. Thirdly, the BHPS does not make a distinction between mild and moderate/severe mental health problems, in the way that a reasonable distinction can be made using Adult Psychiatric Morbidity Survey information (discussed in Annex C). As discussed in the main body of the IA, the healthcare usage reductions estimated in this annex should only be considered an average across all patients; it is likely that reductions may be higher for moderate/severe patients, and lower for mild patients. Consequently, the results should not be interpreted as applying to one of mild or moderate/severe on their own.

A B.2   Source data

179. Source data was taken from the British Household Panel Survey (BHPS).The BHPS is an annual survey, which gathers information about essentially the same group of people. Among other things, it collects the following health information for individuals:

- Age
- Gender
- Whether or not they suffer from 14 long term conditions, including breathing problems, heart problems, and diabetes
- Whether or not they have 'anxiety, depression or bad nerves, psychiatric problems' (used as a proxy for common mental health problems, both mild and moderate/severe)
- Number of visits to a GP in a year

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[58] British Household Panel Survey, Waves 17 and 18, 2008 and 2009. University of Essex. Institute for Social and Economic Research

- Number of outpatient visits in a year
- Number of nights spent in hospital

180. The GP and outpatient visit questions ask the individual to quantify the frequency of their healthcare usage. Individuals are asked to respond with one of the following bands:

- No visits
- One or two visits
- Three to five visits
- Six to ten visits
- More than ten visits

181. For nights spent in hospital, respondents were asked for the exact number of bed nights, rather than providing information in bands. The base data from the BHPS for inpatient bed nights also included maternity bed nights; these should not be examined as they cannot be considered to rise or fall as a result of successful talking therapy treatment. However, the BHPS also includes a question on whether all, some, or none of these bed nights were maternity bed nights; hence, it was possible to construct a new variable for inpatient bed nights excluding maternity bed nights.

182. Source data were taken from the two most recent surveys, waves 17 and 18 carried out in 2008 and 2009 respectively. This helped to corroborate the results and ensure that differences in healthcare usage were not driven by an individual year effect.

A B.3   Methodology and assumptions

183. Separate analyses were used to work out the differential healthcare usage of each of GP consultations, inpatient bed nights, and outpatient procedures. In each case, these were selected as the dependent variable. The explanatory variable of interest was taken to be a binary variable for 'anxiety, depression or bad nerves, psychiatric problems', as reported in the BHPS. This was used as a proxy for common mental health problems, both mild and moderate/severe. It is acknowledged that this is not a perfect indicator for common mental health problems; for example it may include more severe psychiatric disorders which would fall under severe mental illness rather than be suitable for general talking therapies treatment, and it may include sub-clinical cases depending on respondents' interpretation of the question. However, in the absence of a better indicator, it is felt that this approach is reasonable.

184. Data was also routinely available on the number of accidents that someone had in a year requiring them to see a doctor or seek hospital treatment, which could be used as a proxy for A&E consultations. However, this variable was not found to be significant in subsequent regression analysis, implying that there is no significant difference in A&E attendance between people with and without common mental health problems. Therefore, this variable was not included. As a result, total difference in healthcare usage is assumed to be the sum of the difference in GP consultations, inpatient bed nights, and outpatient visits.

185. For GP consultations and outpatient procedures, the data are banded according to number of consultations or procedures. As a result, assumptions have to be made about the average number of consultations or procedures for respondents in a particular band. Where the bands are bounded at both ends (e.g. six to ten), the mean of the band is taken; for the unbounded top band, a point only a small amount above the lower limit is taken to ensure that the results are not distorted too much by very high service users. On this basis, the mean values for each of the bands (for both GP consultations and outpatient procedures) were assumed to be 0 for no visits, 1.5 for one to two visits, 4 for three to five visits, 8 for six to ten visits, and 15 for more than ten visits.

186. The controls used in each case were a binary variable for gender, a partially continuous variable for age (in whole years), and binary variables for the presence of breathing problems, diabetes, and cardiac problems (as there is most evidence on the link between these and common mental health problems). Also, a composite discrete variable was used to control for other health problems, taken by adding the binary responses for each of the 11 health problems surveyed not including breathing problems, diabetes, and cardiac problems.

187. Regression analysis: For GP consultations and outpatient procedures, the data are banded according to number of consultations or procedures (as discussed above). Therefore, multinomial logistic regression has been used for these to estimate the relationship between the dependent variable, explanatory variables of interest, and the controls. This bounds the predicted probability of being in any particular band between zero and one on account of its functional form, thereby eliminating the risk of impossible

results. Predicted probabilities for each band can then be calculated by setting the explanatory variables to one or zero, and then holding all other variables at their mean values.[59]

188. For inpatient bed nights, the dependent variable is continuous in nature, allowing the use of OLS.

189. In order to improve the reliability of the results, a decision was taken to run two separate regressions using Wave 17 and 18 data (the two most recent years of data, 2008 and 2009) separately in each case, and then averaging between the two results.

190. The mean values for the variables included within the regressions are shown in Table 23 below for Wave 17, and Table 24 below for Wave 18, with a distinction made between those with and without self-reported mental health problems.

Table 23: Variables used in regression analysis – mean values for Wave 17

Variable name	Mean value (no reported MH problem)	Mean value (reported MH problem)
Dependent variables (per annum)		
GP consultations	3.01	7.37
Outpatient procedures	1.46*[60]	2.82*
Inpatient bed nights	0.73*	2.32*
Explanatory variable		
Mental health	0	1
Controls		
Gender (1 if male)	0.48	0.31
Age	48.53	50.65
Breathing	0.13	0.28
Diabetes	0.05	0.08
Cardiac	0.20	0.35
Other health conditions	0.74	1.61

Table 24: Variables used in regression analysis – mean values for Wave 18

Variable name	Mean value (no reported MH problem)	Mean value (reported MH problem)
Dependent variables		
GP consultations	2.97	6.83
Outpatient procedures	1.38*	2.60*
Inpatient bed nights	0.65*	2.57*
Explanatory variable		
Mental health	0	1
Controls		
Gender (1 if male)	0.48	0.29
Age	48.23	50.60
Breathing	0.13	0.25
Diabetes	0.05	0.08
Cardiac	0.20	0.31
Other health conditions	0.77	1.59

191. It can be noted that in terms of mean values, there is very strong consistency between the two years of data, as would be expected due to the longitudinal nature of the survey. For all of the controls, the comparative mean values for those with and without mental health problems is in the ordering that would be expected. Those with mental health problems are more likely to be female, are slightly older on average, and have significantly higher prevalence of physical health conditions.

A B.4   Results

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[59] In practice, due to the non-linear nature of logistic regression, it is more accurate to calculated predicted probabilities for each individual data point (with the explanatory variable set to either one or zero regardless of its actually value), and then average across data points to derive a population estimate. This technique is employed in the results section.
[60] Mean values for GP consultations and outpatient procedures are estimates, calculated by multiplying the mean probability of being in a particular band by the assumed number of consultations/procedures for that band. Hence, these values are starred.

A B.4.1   Simple differences in healthcare usage

192. Simple differences in annual healthcare usage between people with and without common mental health problems are shown in Table 25 below.

Table 25: Simple annual differences in healthcare usage between people with and without common mental health problems, as reported in BHPS

	Wave 17	Wave 18	Average
GP consultations	3.86	4.36	**4.11**
Outpatient procedures	1.21	1.36	**1.29**
Inpatient bed nights	1.92	1.59	**1.76**

A B.4.2   Multinomial logistic regression results for GP consultations

193. Multinomial logistic regression was carried out for GP consultations for each of Wave 17 and Wave 18. The explanatory variable of interest, presence of a common mental health problem, is highly significant and has the expected sign. Further, the controls are all highly significant, and have the expected signs:

- Being female is associated with a higher annual number of GP consultations
- Increasing age is associated with a higher annual number of GP consultations
- All the physical health state variables are associated with a higher annual number of GP consultations

194. It is then necessary to calculate the predicted annual number of GP consultations for those with mental health problems, and then calculate the predicted annual number for those same people if they did not have a mental health problem. This allows the estimation of a difference, having controlled for the key observable factors. This is done by calculating the predicted probability of being in each GP consultation banding for each individual respondent who reported to have common mental health problems, and then averaging across respondents and multiplying by the assumed mean value for each banding. As verification, it is found that this value is identical to the observed estimated number of GP consultations for people with common mental health problems reported in Table 25 above. Then, the predicted probability of being in each banding is then calculated for each of this group of respondents, this time assuming that they did not have a self-reported mental health problem. The expected number of consultations is then calculated if these same respondents were not to have a self-reported mental health problem. The difference between the observed estimate with mental health problems, and the predicted estimate without mental health problems can then be taken. This is shown in Table 26 below, for each of Wave 17 and Wave 18.

Table 26: Predicted annual difference in GP consultations between those with and without common mental health problems

	Wave 17	Wave 18	Average
MH group – actual GP consultations	7.37	6.83	7.10
MH group – predicted GP consultations if no MH problem	4.80	4.12	4.46
Difference	2.57	2.71	**2.64**

195. The predicted annual difference in GP consultations, having controlled for observable factors, is estimated to be 2.65. As expected, this difference is lower than the simple difference given in Table 25 above (4.11 annual consultations); some of this original difference is due to observable differences between the non-mental health and mental health population, which have now been controlled for. In particular, this is likely to reflect the poorer physical health status on average of those with mental health problems.

A B.4.3   Multinomial logistic regression results for outpatient procedures

196. Multinomial logistic regression was carried out for outpatient procedures for each of Wave 17 and Wave 18. The explanatory variable of interest, presence of a common mental health problem, is highly significant and has the expected sign. Further, the controls are all highly significant, and have the expected signs:

- Being female is associated with a higher annual number of outpatient procedures
- Increasing age is associated with a higher annual number of outpatient procedures
- All the physical health state variables are associated with a higher annual number of GP consultations

197. It is then necessary to calculate the predicted annual number of outpatient procedures for those with mental health problems, and then calculate the predicted annual number for those same people if they did not have a mental health problem, in the same way as for GP consultations. Again, as verification, it is found that the predicted number of outpatient procedures for people with common mental health problems is identical to the observed estimated number reported in Table 25 above. The difference between the observed estimate with mental health problems, and the predicted estimate without mental health problems can then be taken. This is shown in Table 27 below, for each of Wave 17 and Wave 18.

Table 27: Predicted annual difference in outpatient procedures between those with and without common mental health problems

	Wave 17	Wave 18	Average
MH group – actual outpatient procedures	2.82	2.6	2.71
MH group – predicted outpatient procedures if no MH problem	2.27	1.95	2.11
Difference	0.55	0.65	**0.60**

198. The predicted annual difference in outpatient procedures, having controlled for observable factors, is estimated to be 0.60. As expected, this difference is lower than the simple difference given in Table 25 above (1.29 annual outpatient procedures); some of this original difference is due to observable differences between the non-mental health and mental health population, which have now been controlled for (in the same way as for GP consultations above). In particular, this is likely to reflect the poorer physical health status on average of those with mental health problems.

A B.4.4 OLS regression results for inpatient bed nights

199. OLS regression was carried out for inpatient bed nights for each of Wave 17 and Wave 18. The explanatory variable of interest, presence of a common mental health problem, is highly significant and has the expected sign. Further, the controls are all highly significant, and have the expected signs:

- Being female is associated with a higher annual number of inpatient bed nights
- Increasing age is associated with a higher annual number of inpatient bed nights
- All the physical health state variables are associated with a higher annual number of inpatient bed nights

200. The difference in inpatient bed nights attributable to mental health, controlling for the other factors, can then simply be identified as the regression coefficient. This is shown in Table 28 below, for each of Wave 17 and Wave 18.

Table 28: Predicted annual difference in inpatient bed nights between those with and without common mental health problems

	Wave 17	Wave 18	Average
Difference	1.15	1.27	**1.21**

201. The predicted annual difference in outpatient procedures, having controlled for observable factors, is estimated to be 1.21. As expected, this difference is lower than the simple difference given in Table 25 above (1.76 annual inpatient bed nights); some of this original difference is due to observable differences between the non-mental health and mental health population, which have now been controlled for (in the same way as for GP consultations above). In particular, this is likely to reflect the poorer physical health status on average of those with mental health problems.

A B.4.5 Attributing causality to the results

202. All of the regression equations estimated demonstrate that mental health status has a significant effect on healthcare usage, even after controlling for age, gender, and physical health status. However, it is possible or indeed likely that there will be other confounding factors associated with both mental health and healthcare usage that have not been controlled for. If so, these will show up as omitted variable bias in the regression outputs, and are likely to lead to overestimated effect sizes. For example, it is possible that socioeconomic status may have an effect, and may explain some of the differences, and it is likely that there will be other important physical health indicators that have not been controlled for as they are beyond the scope of the survey data.

203. Further, it is possible that there will be a limited amount of dual causality in the determination of mental health state and healthcare usage; not only do mental health problems cause higher healthcare usage,

which is the theoretical assumption, but also, higher healthcare usage may lead to mental health problems. If such dual causality exists, then this will exhibit as simultaneity bias in the regression equations, another form of endogeneity, and would likely lead to overestimated effect sizes. Having said this, there is little clinical or empirical evidence for the latter chain of causality.

204. Finally, as mentioned in the Source Data section, the indicator for common mental health problems is relatively broad, and may include more severe psychiatric problems, which may be associated with very high usage. While this possible distortion has been controlled for already to some extent by selecting relatively low assumed mean values for the upper bandings for GP consultations and outpatient procedures, it still may lead to overestimated effect sizes.

205. In light of these three points, caution must be taken before the estimated reductions in healthcare usage identified from the regression analysis can be attributed as the likely reduction after recovery due to successful talking therapies treatment. A decision has been taken to be conservative; as an approximate approach, only a set proportion of the identified differential healthcare usage is attributed to successful talking therapies treatment. In the base case, it is assumed that this proportion is 60%.[61] On this basis, the reduction in healthcare usage following successful treatment is estimated to be **1.59 annual GP consultations, 0.36 annual outpatient procedures, and 0.73 inpatient bed nights**. It should be noted that these reductions are much smaller than the simple differences originally identified from survey data.

206. It is recognised that this approximate approach for attributing reductions in healthcare usage to successful talking therapies treatment lacks statistical robustness. As a result, different proportions of the identified usage differentials are tested in sensitivity analysis in Section D.9.

A B.5   Conclusions

207. Based on analysis of survey data from the British Household Panel Survey 2008 and 2009, it is estimated that, following recovery after successful talking therapy treatment, individuals will have 1.59 fewer GP consultations, 0.36 fewer annual outpatient procedures, and 0.73 fewer inpatient bed nights on average per annum. However, as mentioned in the introduction, the results are not based on IAPT-specific data, and as such, should be treated with appropriate caution.

Annex C   Analysis of employment and mental health

A C.1   Introduction

208. This annex sets out a technical analysis to determine the relationship between employment and mental health. In particular, it seeks to determine the difference in the employment rate for people with and without common mental health problems. This is then used to derive an estimate of the likely gain in employment through moving a sufferer to recovery as a result of successful talking therapies treatment.

209. Existing literature: A high-level review of previous literature provides a strong theoretical basis and empirical evidence for the link between unemployment and economic activity and mental health. Causality is considered to run in both directions; mental health problems reduce ability to work, and also, unemployment has been shown to be a key cause and exacerbation of mental health problems, particularly depression and anxiety. However, there is little previous literature on the quantifiable reduction in the employment rate for people with common mental health problems, and none identified in a UK setting.

210. Differences in the employment rate: Using survey data, it is possible to observe differences in the employment rate for people with and without common mental health problems. For example, Layard et al (2007)[62] reports percentage point differences in the employment rate for people with no identified mental health problem, and for people with a variety of different mental health disorders.[63]

211. However, as Layard et al (2007) notes, these percentage point differences should not be taken as the possible increase in employment if the mental health disorder was successful treated. There are likely to

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[61] In another context, looking at the relationship between employment and mental health status, Layard et al (2007) uses this technique, acknowledging the presence of other confounding factors.
[62] Layard, R., Clark, D., Knapp, M., Mayraz, G.(2007). 'Cost-Benefit Analysis of Psychological Therapy'. Centre for Economic Performance. CEP Discussion Paper No 829, October 2007.
[63] For example, the employment rate for people with depression is found to be 50%, compared with 74% for people with no mental disorder, a difference of 24 percentage points.

be a number of countervailing factors associated with both mental health and employment which are driving some of the difference. For example, people with common mental health problems are more likely to be female, from a minority ethnic group, have a lower educational and socioeconomic status, and have one or more physical health conditions. All of these factors are also independently associated with lower employment rates, quite apart from any transmission through mental health. Therefore, even if mental health had no impact on employment at all, people with mental health problems may be observed to have lower employment rates. To get a true impression of the differential employment rate associated with mental health problems, it is thus necessary to control for as many of these observable factors as possible, and thereby be able to compare like with like.

212. There is a second difficulty in determining the possible increase in employment through successful treatment, arising from dual causality (discussed above). While it is possible to derive a robust estimate of the reduction in the employment rate associated with common mental health problems, it is more difficult to isolate how much of this difference is causal in the direction from mental health to employment, and not the other way. Only the difference which is causal can be credited as a possible increase in the employment rate upon successful treatment; this is discussed further in Section C.4 below.

213. The analysis set out below firstly examines simple percentage differences in the employment rate, then seeks to control for as many observable factors as possible which may be biasing the results, and finally, makes an assessment of how much of the resultant differences can be attributed to successful talking therapies treatment.

214. <u>Limitations of the analysis</u>: It should be noted that the analysis set out below uses responses from a nationwide survey, the Adult Psychiatric Morbidity Survey (APMS) 2007[64], rather than information on specific patients or groups of patients who have been treated with talking therapies services. Therefore, the results should be treated with appropriate caution. For example, an implicit assumption of the analysis is that the survey data used is representative of those who actually undergo talking therapies. It is possible that there will be systematic differences between the two groups.

215. A study of IAPT sites that have piloted employment support and coordination services is ongoing, undertaken by Warwick University. This will be available later in 2011, and should IAPT-specific information and therefore be of closer relevance to talking therapies. However, in the absence of better information, it is felt that the estimates derived in this annex are applicable in a talking therapies context.

A C.2   Source data

216. Source data was taken from the APMS 2007, which contains data from 7,403 respondents over 1,754 variables. These include information about the age, gender, ethnicity, socioeconomic status, educational qualifications, and underlying physical health of respondents, as well as detailed information on their mental and psychiatric health, and importantly for the purposes of the analysis, information on their employment status. As such, it represents a very rich dataset.

217. The variables used in subsequent analysis are set out in Table 29 below. These include the variables used to construct the binary dependent variable, the explanatory variables of interest (presence of common mental health problems), and the controls. A decision was taken to use CIS-R (Revised Clinical Interview Schedule) scores as a proxy for mild and moderate/severe mental health problems (the distinction used in the remainder of the IA). These scores approximate to sub-clinical and clinical mental health disorder, and cover all common mental health problems rather than taking each diagnosable condition individually. Further, the identified prevalence rates, 8.5% for a score of 12-17 and 9.5% for a score of 18 or more, correspond reasonably well to the prevalence rates set out in *Paying the Price*.

Table 29: Source data taken from the Adult Psychiatric Morbidity Survey 2007

Variable name	Values	APMS 2007 Description
DVILO4a	1 if in employment, 2 if unpaid family worker, 3 if unemployed, 4 if economically inactive, negative if missing data/not applicable	Current employment status in four categories
CISRFOUR	1 if 0-5, 2 if 6-11, 3 if 12-17, 4 if 18 or more, negative if missing data/not applicable	CIS-R score in four groups

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[64] McManus, S and Meltzer, H and Brugha, TS and Bebbington, PE and Jenkins, R (2009) Adult Psychiatric Morbidity in England, 2007: Results of a Household Survey. The NHS Information Centre for Health and Social Care

	1 if degree, 2 if teaching, HND or nursing, 3 if A level, 4 if GCSE or equivalent, 5 if foreign or other, 6 if no qualifications, negative if missing data/not applicable	Highest educational qualification
EDQUAL5		
ETHNIC4	1 if white, 2 if black, 3 if South Asian (Indian, Pakistani or Bangladeshi), 4 if mixed or other ethnic origin, negative if missing data/not applicable	Ethnic origin of respondent in four groups
Health1	1 if present, 0 if none, negative if missing data/not applicable	Cancer (ever had since age 16)
Health2	1 if mentioned, 0 if not mentioned, negative if missing data/not applicable	Diabetes (ever had since age 16)
Health7	1 if mentioned, 0 if not mentioned, negative if missing data/not applicable	Cataracts/eyesight problems (ever had since age 16)
Health8	1 if mentioned, 0 if not mentioned, negative if missing data/not applicable	Ear/hearing problems (ever had since age 16)
Health10	1 if mentioned, 0 if not mentioned, negative if missing data/not applicable	Heart attack/angina (ever had since age 16)
Health11	1 if mentioned, 0 if not mentioned, negative if missing data/not applicable	High blood pressure (ever had since age 16)
Health12	1 if mentioned, 0 if not mentioned, negative if missing data/not applicable	Bronchitis/emphysema (ever had since age 16)
PsycProb	1 if probable psychosis, 0 if no probable psychosis, negative if missing data/not applicable	Probably psychosis using phase one and two, approach consistent with 2000 survey
DVADHD4	1 if ASRS summary score is 0-3, 2 if ASRS summary score is 4 or more, negative if missing data/not applicable	ADHD ASRS summary score in two bands
ResMarDF	1 if married, 2 if cohabiting, 3 if single, 4 if widowed, 5 if divorced, 6 if separated, negative if missing data/not applicable	De facto marital status of selected respondent
ResAge	Age of selected respondent in whole years, negative if missing data/not applicable	Age of selected respondent (95+ merged)
ResSex	1 if male, 2 if female, negative if missing data/not applicable	Sex of selected respondent

218. Data points were removed where a value was negative for any of the variables listed above, to ensure that missing or not applicable data were not incorrectly marked as a question being answered as no (taking a value of zero) in subsequent regression analysis. Further, any data points were removed where the respondent was aged 65 or more; this ensures that the analysis is of the working age population only. Following these steps, 5,316 data points remained.

A C.3   Methodology

219. <u>Construction of binary variables</u>: In all cases, binary variables were constructed from the source data set out above. Working, including both full and part time employment, was constructed as the dependent variable, taking the value one if a respondent is in employment and zero otherwise. This has a mean value of 70.8% for all respondents, 78.2% for males and 65.2% for females. CISR1217 and CISR18more have been constructed as the explanatory variables of interest (set out in Table 30 below), proxying for mild and moderate/severe common mental health problems.

220. Controls fall into the following key groups: gender, educational qualifications (used as a proxy for socioeconomic status that is not directly related to employment in its definition), ethnicity, physical health status, severe mental health status, marital status, and age. These are considered to have the greatest association with both employment and mental health. In the case of educational qualifications, ethnicity, and age, the different variables contained within the grouping are mutually exclusive; for example, someone cannot have a score of one for both Degree and ALevel (set out in Table 30 below). As a result, in each case one of the binary variables has been left out; respectively, no educational qualifications, white ethnicity, and age 61 to 64. Therefore, the results for the remaining binary variables can be interpreted relative to the one left out (e.g. the regression coefficient for Degree allows the calculation of the difference in employment between someone with a degree and no qualifications, controlling for all other factors).

221. For each binary control, mean values are reported for both males and females (in Table 30 below); these can be interpreted as the probability of a positive response in each case.

222. Logistic regression analysis: Logistic regression has been used to estimate the relationship between the dependent variable, explanatory variables of interest, and the controls. In comparison with OLS regression, logistic regression bounds the predicted value of the dependent variable between zero and one on account of its functional form, thereby eliminating the risk of impossible results. Predicted probabilities (expected values of the dependent variable) can then be calculated by setting the explanatory variables to one or zero, and then holding all other variables at their mean values.[65]

223. Several permutations of the explanatory variables and controls were tested, including the use of interaction terms for gender, different age bandings, and additional controls which were not found to add any explanatory power. When using interaction terms between gender and mental health, the gender controls were consistently found to have very strong explanatory power. As a result, a decision was taken split the data set into males and females separately, to allow the effect of mental health on employment to differ between males and females; statistical testing for stratification in the dataset supported this decision.

224. The variables included in the final regression specification, for both males and females, are shown in Table 30 below.

Table 30: Variables used in regression analysis

Variable name	Values	Source	Mean value (males)	Mean value (females)
Dependent variable				
Working	1 if respondent is working, 0 otherwise	Constructed from DVILO4a	0.782	0.652
Explanatory variables				
CISR1217	1 if respondent has a CIS-R score of 12 to 17, 0 otherwise	Constructed from CISRFOUR	0.065	0.100
CISR18more	1 if respondent has a CIS-R score of 18 or higher, 0 otherwise	Constructed from CISRFOUR	0.074	0.112
Controls				
Degree	1 if respondent has a degree or higher as their highest educational qualification, 0 otherwise	Constructed from EDQUAL5	0.228	0.224
Teaching	1 if respondent has a teaching, HND or nursing qualification as their highest educational qualification, 0 otherwise	Constructed from EDQUAL5	0.084	0.076
ALevel	1 if respondent has A levels as their highest educational qualification, 0 otherwise	Constructed from EDQUAL5	0.184	0.143
GCSE	1 if respondent has GCSEs or equivalent as their highest educational qualification, 0 otherwise	Constructed from EDQUAL5	0.288	0.320

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[65] In practice, due to the non-linear nature of logistic regression, it is more accurate to calculated predicted probabilities for each individual data point (with the explanatory variable set to either one or zero regardless of its actually value), and then average across data points to derive a population estimate. This technique is employed in the results section.

Other	1 if respondent has a foreign or other qualification as their highest educational qualification, 0 otherwise	Constructed from EDQUAL5	0.028	0.028
Black	1 if respondent is of black ethnic origin, 0 otherwise	Constructed from ETHNIC4	0.028	0.031
SouthAsian	1 if respondent is of South Asian ethnic origin, 0 otherwise	Constructed from ETHNIC4	0.042	0.028
MixedorOther	1 if respondent is of mixed or other non-white ethnic origin, 0 otherwise	Constructed from ETHNIC4	0.029	0.028
Cancer	1 if respondent has mentioned cancer at any point since 16, 0 otherwise	Constructed from Health1	0.019	0.040
Diabetes	1 if respondent has mentioned diabetes at any point since 16, 0 otherwise	Constructed from Health2	0.046	0.030
HighBP	1 if respondent has mentioned high blood pressure at any point since 16, 0 otherwise	Constructed from Health11	0.178	0.173
SightProblems	1 if respondent has mentioned cataracts or sight problems at any point since 16, 0 otherwise	Constructed from Health7	0.131	0.142
HearingProblems	1 if respondent has mentioned ear or hearing problems at any point since 16, 0 otherwise	Constructed from Health8	0.075	0.049
Angina	1 if respondent has mentioned a heart attack or angina at any point since 16, 0 otherwise	Constructed from Health10	0.032	0.015
Bronchitis	1 if respondent has mentioned bronchitis or emphysema at any point since 16, 0 otherwise	Constructed from Health12	0.038	0.055
PsycProb	1 if respondent has probable psychosis, 0 if no probable psychosis	Taken directly from APMS source data	0.004	0.008
DVADHD4reg	1 if respondent has an ASRS score of 4 or more, 0 otherwise	Constructed from DVADHD4	0.097	0.091
Married	1 if respondent is married, 0 otherwise	Constructed from ResMarDF	0.494	0.492
Cohabiting	1 if respondent is cohabiting, 0 otherwise	Constructed from ResMarDF	0.111	0.108
Less21	1 if respondent is age less than 21, 0 otherwise	Constructed from ResAge	0.065	0.050
21to30	1 if respondent is age 21 to 30 inclusive, otherwise	Constructed from ResAge	0.145	0.161
31to40	1 if respondent is age 31 to 40 inclusive, otherwise	Constructed from ResAge	0.243	0.246
41to50	1 if respondent is age 41 to 50 inclusive, otherwise	Constructed from ResAge	0.232	0.236
51to60	1 if respondent is age 51 to 60 inclusive, otherwise	Constructed from ResAge	0.220	0.214

A C.4   Results

A C.4.1   Simple percentage point differences in the employment rate

225. Simple percentage point differences in the employment rate between people with and without common mental health problems are shown in Table 31 below. Interestingly, the differences are approximately double for males than for females. A weighted average has been taken to generate overall results, using the assumption that approximately 60% of those who use adult talking therapies services are female, and approximately 40% are male. On this basis, the weighted average difference is 10.3 percentage

points for mild mental health problems, and 27.6 percentage points for moderate/severe mental health problems.

Table 31: Logistic regression for females only

	Women	Men	Weighted average
Overall	65.2%	78.2%	70.4%
No MH problem	68.1%	82.1%	73.7%
Mild MH problem	61.3%	66.7%	63.4%
Moderate/severe MH problem	48.2%	42.9%	46.1%
Difference – mild vs. no MH problems	**6.8%**	**15.4%**	**10.3%**
Difference – moderate/severe vs. no MH problems	**19.9%**	**39.1%**	**27.6%**

A C.4.2 Logistic regression results for females only

226. The results of logistic regression for females only are shown in Table 32 below. This is based on a dataset of 3,007 respondents.

Table 32: Logistic regression for females only

Dependent variable: Working			
Explanatory variables	**Coefficient**	**Standard error**	**Significance**
Degree	1.592	0.139	0.000
Teaching	1.567	0.190	0.000
ALevel	1.311	0.149	0.000
GCSE	0.775	0.115	0.000
Other	0.571	0.252	0.024
Black	-0.259	0.240	0.282
SouthAsian	-0.833	0.244	0.001
MixedorOther	-0.339	0.244	0.166
Cancer	-0.199	0.215	0.355
Diabetes	-0.253	0.251	0.315
HighBP	-0.013	0.116	0.909
Sightproblems	-0.127	0.123	0.300
Hearingproblems	-0.074	0.197	0.706
Angina	-1.022	0.381	0.007
Bronchitis	-0.192	0.185	0.300
PsycProb	-1.876	0.587	0.001
DVADHD4reg	-0.453	0.151	0.003
Married	0.093	0.096	0.334
Cohabiting	0.461	0.153	0.003
Less21	0.830	0.238	0.000
21to30	1.081	0.184	0.000
31to40	1.378	0.171	0.000
41to50	1.932	0.173	0.000
51to60	1.404	0.165	0.000
CISR1217	-0.208	0.139	0.135
CISR18More	-0.588	0.141	0.000
Constant	-1.369	0.174	0.000
		Data points included	**3,007**
		Nagelkerke R Square	**0.227**

227. The summary statistics indicate that the regression is well specified; the Nagelkerke R Square indicates good explanatory power, and the majority of the coefficients are highly significant.[66] It is useful to set out

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[66] Foreign/other educational qualifications is not found to be significant, but are included for completeness. Black and mixed/other ethnicity, cancer, diabetes, high blood pressure, sight and hearing problems, and bronchitis are not significant, but their inclusion increases the Nagelkerke R Square and as such improves the predictive power of the regression equation.

the logit equation for calculating the predicting employment rate in order to be able to make inference about the individual coefficients[67]:

$$P(employment) \approx \frac{1}{\left[1 + e^{-LOGIT}\right]}$$

Where

$$LOGIT = \sum_{i=1}^{n} \overline{\beta}_i \overline{X}_i$$

Setting $\overline{X}_j$ *to one or zero accordingly*

228. Therefore, a positive coefficient is associated with a positive association with the employment rate. The magnitude of the coefficient is also of relevance; the larger the coefficient, the larger the impact on the employment rate. In each case, the estimated coefficient value is of the expected sign:

- Better educational status is associated with higher employment (with the ordering as expected between different educational statuses)
- Black, South Asian, and mixed/other ethnicity are all associated with lower employment than white ethnicity, reflecting average socioeconomic status of these groups.
- All of the physical and psychiatric health variables are associated with lower employment
- All adult age bands below 60 are associated with higher employment than those aged 61 to 64
- The mental health status coefficients both have the same expected sign; however, the results are not significant for CISR1217. This reflects the relatively small difference in the employment rate observed for females for those with mild mental health problems.

229. It is then necessary to calculate predicted employment rates for those with mental health problems, and then calculate the predicted employment rate for those same people if they did not have a mental health problem (this is done for both mild and moderate/severe separately). This allows the estimation of a percentage point increase in the employment rate, having controlled for the key observable factors. This can be done using the approximate formula given above; however, as mentioned in footnote 64, it is more accurate to calculate logit values and hence predicted probabilities for each individual data point (both the actual with mental health problems, and then the predicted value without), and then average the predicted probabilities.[68] This is due to non-linearity in the functional form of the logistic regression equation.

230. Logit values and employment rates are given for people with mild and moderate/severe mental health problems below, and then estimated logit values and predicted employment rates are given for if those people did not have a mental health problem. As a verification, it can be noted that the employment rates using actual values for the mental health variables are 61.3% for mild and 48.2% for moderate/severe, identical to the actual employment rates from the original survey data. It can be noted that the predicted employment rate if someone had no mental health problems is lower for the moderate/severe group than for the mild group; this reflects the fact that the moderate/severe group may have characteristics which are conducive to a low employment rate, independent of any effect of their mental health.

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[67] As mentioned in footnote 65 above, the true predicted probability of employment should be calculated by calculating predicted probabilities for individual data points and then averaging; hence the first equation is only approximate. However, this does not affect inference on individual coefficients.

[68] For each data point, the logit value is found by multiplying the actual variable value (apart from the variables of interest) by the corresponding coefficient from the regression equation, and then summing across variables. CISR1217 and CISR18More are then set to zero for no mental health problems, CISR1217 is set to one and CISR18More is set to zero for mild mental health problems, and CISR1217 is set to zero and CISR18More is set to one for moderate/severe mental health problems.

Table 33: Predicted probabilities of employment for females only

	Mild group – actual	Moderate/severe group – actual	Mild group – if no MH problems	Moderate/severe group – if no MH problems
Logit value	0.512	-0.120	0.720	0.468
Predicted probability of employment	61.3%	48.2%	65.3%	60.3%
Percentage point difference in employment rate – mild vs. no MH problems				**4.0%**
Percentage point difference in employment rate – moderate/severe vs. no MH problems				**11.6%**

231. Using Table 33 above, the difference in the employment rate for females can be estimated as 4.1 percentage points for those with mild mental health problems, and 12.1 percentage points for those with moderate/severe mental health problems. As expected, these differences are lower than the simple percentage comparison given in Table 31 above; some of this original difference is due to observable differences between the non-mental health and mental health population, which have now been controlled for.

A C.4.3   Logistic regression results for males only

232. The same logistic regression equation is calculated for males only, given in Table 34 below. This is based on a dataset of 2,309 respondents.

Table 34: Logistic regression for males only

Dependent variable: Working			
Explanatory variables	**Coefficient**	**Standard error**	**Significance**
Degree	1.167	0.186	0.000
Teaching	1.135	0.256	0.000
ALevel	1.030	0.185	0.000
GCSE	0.796	0.158	0.000
Other	0.269	0.321	0.402
Black	-0.263	0.342	0.442
SouthAsian	-0.024	0.320	0.941
MixedorOther	-0.340	0.333	0.307
Cancer	-0.912	0.355	0.010
Diabetes	-0.398	0.249	0.110
HighBP	-0.424	0.150	0.005
Sightproblems	-0.049	0.175	0.779
Hearingproblems	-0.173	0.205	0.398
Angina	-0.752	0.276	0.007
Bronchitis	-0.483	0.269	0.072
PsycProb	-1.653	0.799	0.039
DVADHD4reg	-0.319	0.196	0.103
Married	0.847	0.137	0.000
Cohabiting	0.498	0.215	0.021
Less21	-0.073	0.265	0.782
21to30	1.521	0.253	0.000
31to40	1.779	0.230	0.000
41to50	1.450	0.210	0.000
51to60	0.855	0.188	0.000
CISR1217	-0.782	0.213	0.000
CISR18More	-1.551	0.209	0.000
Constant	-0.430	0.207	0.038
		Data points included	**2,309**
		Nagelkerke R Square	**0.304**

233. The Nagelkerke R Square of 0.304 indicates that there is good explanatory power, indeed better than in the females only regression. Again, all of the regression coefficients have their expected sign; better educational qualifications are associated with higher employment, those from minority ethnic status is

associated with lower employment (albeit with an insignificant difference for South Asian), worse physical and psychiatric health is associated with lower employment, and being married or cohabiting is associated with higher employment. Each age band below 60 is associated with higher employment than those aged 61 to 64, with the exception of less than 21 when many people will still be in full time education.

234. The mental health coefficients again have the same expected sign, albeit with much larger magnitude than for females only. Both coefficients are strongly significant.

235. Logit values and predicted employment rates are shown in Table 35 below. Again, the predicted employment rates using actual values for the mental health variables are identical to the actual employment rate from the original survey data, at 66.7% for mild and 42.9% for moderate/severe. Again, it can be noted that the predicted employment rate if someone had no mental health problems is lower for the moderate/severe group than for the mild group; this reflects the fact that the moderate/severe group may have characteristics which are conducive to a low employment rate, independent of any effect of their mental health.

Table 35: Predicted probabilities of employment for males only

	Mild group – actual	Moderate/severe group – actual	Mild group – if no MH problems	Moderate/severe group – if no MH problems
Logit value	0.829	-0.360	1.611	1.192
Predicted probability of employment	66.7%	42.9%	78.5%	72.9%
Percentage point difference in employment rate – mild vs. no MH problems				11.9%
Percentage point difference in employment rate – moderate/severe vs. no MH problems				29.3%

236. The difference in the employment rate for males can be estimated as 11.9 percentage points for those with mild mental health problems, and 29.3 percentage points for those with moderate/severe MH problems, over double the differences that were estimated for females. As with females, these differences are lower than the simple percentage comparison given in Table 31 above; some of this original difference is due to observable differences between the non-mental health and mental health population, which have now been controlled for.

A C.4.4   Overall results

237. Overall differences in the employment rate between those with and with common mental health problems can then be calculated, again using the assumption that approximately 60% of talking therapies services users are female and 40% are male.

Table 36: Overall employment differentials from regression analysis

Percentage point difference in employment rate	Females	Males	Weighted average
Mild vs. no MH problems	4.1%	11.9%	7.2%
Moderate/severe vs. no MH problems	12.1%	29.3%	19.0%

238. On this basis, the overall differential employment rate can be estimated as 7.0 percentage points for mild common mental health problems, and 19.0 percentage points for moderate/severe common mental health problems.

A C.4.5   Attributing causality to the results

239. As mentioned in the introduction in Section A C.1, it is established that there is dual causality between mental health and employment. This typically shows in regression equations as simultaneity bias; a form of endogeneity. This essentially exhibits as selection bias in how the non-mental health and mental health group are constructed; people with mental health problems are more likely to be unemployed even before any causal effect of mental health on employment is taken into account. If the dual causality is self-reinforcing in both directions (as it is in this case), then it is likely that the regression estimates will overestimate the causal link from the explanatory variable (mental health) to the dependent variable (employment). As a result, it is unrealistic to assume that all of the employment rate difference found above would be observed following recovery after successful treatment.

240. Where simultaneity bias is likely to exist, a standard approach is to use a simultaneous equations system as the functional form, with employment the dependent variable of one regression, and mental health the dependent variable of the other. This requires the identification of a suitable instrument, or ideally two suitable instruments if there are two different mental health variables and hence a system of three simultaneous equations. However, it has not been possible to identify a suitable instrument to correct for simultaneity bias; instead, an approximate approach has been used, which assumes that only a set proportion of the identified employment differential is causal in the direction from mental health to employment. In the base case it is assumed that this proportion is 60%, i.e. 60% of the 7.2 percentage point and 19.0 percentage point differentials can be attributed to someone who recovers as a result of successful treatment. On this basis, the increase in employment following successful treatment is estimated to be **4.3 percentage points** for those with mild mental health problems, and **11.4 percentage points** for those with moderate/severe mental health problems.

241. It is recognised that this approximate approach for attributing employment gains to successful talking therapies treatment lacks statistical robustness. As a result, different proportions of the identified employment differentials are tested in sensitivity analysis in Section D.9.

A C.5　　　Conclusions

242. Based on analysis of survey data from the Adult Psychiatric Morbidity Survey 2007, it is estimated that, compared with not having a mental health problem, those with mild mental health problems have a 4.3 percentage point lower employment rate, and those with moderate/severe mental health problems have a 11.4 percentage point lower employment rate. These results represent a current best estimate of the increase in employment achievable by successful talking therapy. However, as mentioned in the introduction, the results are not based on IAPT-specific data, and as such, should be treated with appropriate caution.