LSE PSSRU

Centre for Mental Health

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# Mental health promotion and mental illness prevention:

# The economic case

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This report presents the key findings of a project on the economic case for mental health promotion and prevention, based on a detailed analysis of costs and benefits for fifteen different interventions. The project was commissioned with £50,000 funding from the Department of Health. It was undertaken by a group of economists from the London School of Economics and Political Science (Personal Social Services Research Unit), King's College London Institute of Psychiatry (Centre for the Economics of Mental Health) and Centre for Mental Health, under the overall direction of Martin Knapp. We are enormously grateful to many people for evidence, advice, help and encouragement, particularly Dr Jonathan Campion and Dr Panos Zerdevas at the Department of Health, to Teresa Poole for her considerable help with editing this document, and to an anonymous reviewer for helpful suggestions. Fuller accounts of the models summarised in this report will be published shortly.

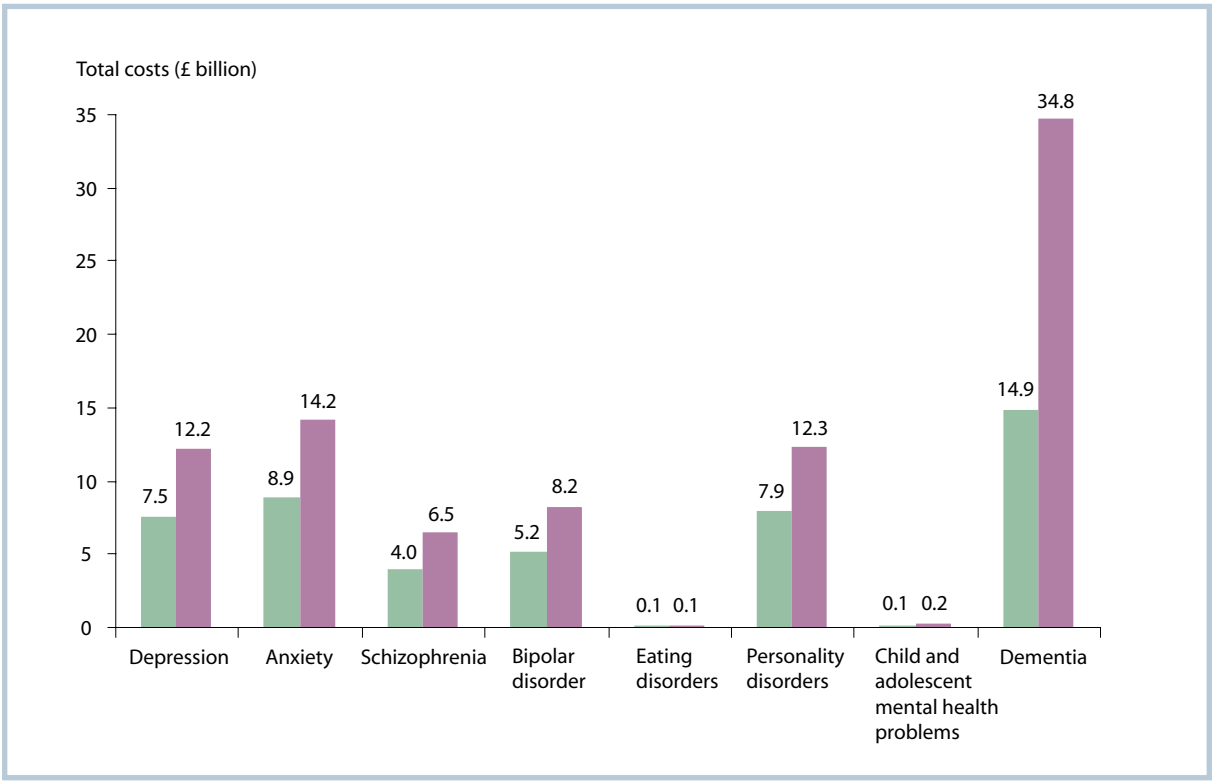
# 1. INTRODUCTION

## 1.1 Prevention, promotion and economics

Health systems aim to improve health and health-related well-being, but are always constrained by the resources available to them. They also need to be aware of the resources available in adjacent systems which can have such an impact on health, such as housing, employment and education. Careful choices therefore have to be made about how to utilise what is available. One immediate corollary is to ask whether investment in the prevention of mental health needs and the promotion of mental wellbeing might represent a good use of available resources. This is the question addressed in this report.

One reason to address such a question is clear from Figure 1. The figure is adapted from a report published three years ago that looked at how the costs of mental health problems might change over a 20-year period. For each of eight mental disorders (depression, anxiety, schizophrenia, bipolar disorder, eating disorders, personality disorders, child and adolescent mental health problems, and dementia), Figure 1 shows the costs of mental health problems in 2007 and the expected costs in 2026 if treatment and support arrangements remain unchanged, and if impacts on, for example, employment patterns also remain unchanged. The projections also assume that the proportion of mental health needs that are recognized and treated remains the same. The projections clearly show a substantial increase in the impact of mental health problems on the economy under current treatment and care arrangements. It is debatable whether such an increase would be widely seen as affordable.

**Figure 1: Current and projected future costs by mental health disorder, England 2007, 2026**




*Source*: McCrone, Dhanasiri, Patel, Knapp, Lawton-Smith. *Paying The Price*. London: King's Fund, 2008.

### 1.2 Objectives and approach

We were asked by the Department of Health to identify and analyse the costs and economic pay-offs of a range of interventions in the area of mental health promotion, prevention and early intervention, and to present this information in a way that would most helpfully support NHS and other commissioners in assessing the case for investment.

Key features of the approach taken in pursuit of these objectives were as follows. First, interventions were chosen for economic analysis only where there was strong evidence in the published research literature for their effectiveness in improving mental health or well-being. In identifying these evidence-based interventions, we used systematic reviews where available or carried out their own rapid reviews of the literature.

Second, for each of the interventions identified in this way, detailed estimates were made of costs and pay-offs using economic modelling and related techniques. As far as possible, a consistent approach was used in the coverage and measurement of economic impacts, in order to put the various interventions on a common footing and to allow comparisons between them. (Note that the cost calculations that fed into Figure 1 above are not identical to those used in the present report.)

Third, the economic analysis for each intervention was designed so as to produce a detailed breakdown of costs and pay-offs, year by year and by individual sector and budget type. Interventions can therefore be examined from two distinct perspectives: first, pay-offs to society as a whole, and second, budgetary impacts in the NHS and other public sector agencies. Both perspectives are important, the first in helping to understand the overall value for money of an intervention, and the second in providing information on its affordability at a time of severe constraints on public spending.

Finally, in order to ensure robust results, the approach and assumptions made were conservative across all areas investigated. Measures of net economic impacts should therefore be regarded as *minimum* estimates in all cases. In addition, no monetary value has been put on the health and quality of life gains for the direct beneficiaries of each intervention. Thus, the net economic impacts demonstrated by the models are *in addition* to the mental health and well-being improvements associated with the various programmes.

### 1.3 Challenges and limitations

The main problems facing this project were associated with data shortages. These imposed some limitations both on the range of interventions covered and on the comprehensiveness of the economic modelling.

Taking these in turn, some interventions initially identified as possible candidates for detailed economic analysis had to be dropped because of a lack of robust evidence on their effectiveness. This particularly applied to interventions which focus on the promotion of positive mental health and well-being rather than the prevention of mental ill health, and to those which operate at the community level rather than the individual level. It is important to emphasise that the fact that there was inadequate evidence to model some of these interventions does not necessarily mean that they are not cost-effective.

Among the interventions which were analysed in detail, limitations on the comprehensiveness of the modelling were particularly associated with shortages of data in the research literature on medium- and long-term impacts, and with the occasional difficulty in attaching reliable economic values to all evidence-based impacts. It is an important characteristic of mental ill health that it can affect many different areas of people's lives, sometimes over long periods of time. An inability to capture the full breadth and duration of these consequences in the modelling again implies that the estimated economic benefits of improved mental health are very much on the conservative side.

## 2. THE INTERVENTIONS MODELLED

Fifteen areas were modelled:

- Health visiting and reducing post-natal depression
- Parenting interventions for children with persistent conduct disorders
- School-based social and emotional learning programmes to prevent conduct problems in childhood
- School-based interventions to reduce bullying
- Early detection for psychosis
- Early intervention for psychosis
- Screening and brief intervention in primary care for alcohol misuse
- Workplace screening for depression and anxiety disorders
- Promoting well-being in the workplace
- Debt and mental health
- Population-level suicide awareness training and intervention
- Bridge safety measures for suicide prevention
- Collaborative care for depression in individuals with Type II diabetes
- Tackling medically unexplained symptoms
- Befriending of older adults

In this section we provide a summary for each, briefly setting out the context, the intervention(s) that were modelled and the key findings. In presenting results, there was a need for consistency across the different models. To this end, in all the tables given below, costs or expenditures associated with an intervention are shown with a plus sign, while savings or reductions in costs are shown with a minus sign. All costs and economic pay-offs are measured at 2009 prices, and economic impacts arising in future years are converted to present values using the public sector discount rate of 3.5% a year. Sensitivity analyses were conducted to examine the effects of different assumptions about parameter values, although generally we do not report the details here.

In this report we present only summary descriptions and findings. At the end of each subsection we have given the contact details for the lead researcher for each model, to whom inquiries should be directed for more information. Some of the more detailed analyses from which these summaries are drawn have been or will be submitted to peer-review journals. Some of the interventions are being examined in continuing work, for example in order to try to estimate impacts over a broader range of areas or for longer periods.

## 2.1 Health visiting and reducing post-natal depression

*Annette Bauer, Martin Knapp, David McDaid*

### Context

Moderate to severe post-natal depression affects around one in eight women in the early months following childbirth.[i] [ii] The condition has an adverse impact on the mother-infant relationship, a woman's quality of life, and the behavioural, emotional and intellectual development of children; it also increases the likelihood that fathers become depressed after birth.[iii] The National Institute for Health and Clinical Excellence (NICE) recommends the screening of post-natal depression as part of routine care, and the use of psychosocial interventions and psychological therapy for women depending on the severity of depressive symptoms.[iv] However, research suggests that in practice a significant proportion of women with post-natal depression are missed in primary care.[v] [vi]
The economic costs of post-natal depression are conservatively estimated at £45m for England and Wales.[vii] This includes additional health and social care costs, but does not include indirect costs to society, such as lost productivity due to a mother's reduced ability to return to work or to work at full capacity.

### Intervention

Health visitors are well placed to identify mothers suffering from postnatal depression and to provide preventative screening and early interventions. A range of UK trials with interventions provided by health visitors have been positive: women were more likely to recover fully after 3 months;[viii] targeted ante-natal intervention with high-risk groups was shown to reduce the average time mothers spent in a depressed state;i and a combination of screening and psychologically informed sessions with health visitors was clinically effective 6 and 12 months after childbirth.[ix]

The biggest direct costs of the interventions were associated with training (estimated at £1,400 per health visitor), plus the additional time spent by health visitors with mothers for screening and counselling.

### Impact

This study models a universal health visiting intervention compared with routine care after child birth. The intervention consists of post-natal screening during home visits using a standardised tool. It is assumed all women are screened and those with post-natal depression that does not resolve in the short-term receive psychologically informed sessions from their heath visitors. If this intervention does not lead to improved mental health then the current routine treatment is provided.

An alternative strategy was also explored which targeted the intervention, for example via a pre-stratification process in hospital which identifies high-risk women based on common risk factors. The targeted individuals are then screened by health visitors, while other women receive current routine post-natal care. Findings, however, showed similar results to the universal strategy.

The model provides a conservative estimate of the cost impact of the health visitor intervention. On a one-year time horizon there are no cost savings when considering the impact on mothers (and not including the wider impact on fathers and infants), as lower treatment costs and a reduced productivity loss are outweighed by increased training and higher staff costs for providing the interventions. However, if it is assumed that depressive symptoms persist after one year, it is likely that cost savings could be achieved in the medium term as treatment costs and productivity loss would be further reduced. Longer-term, it would be important to include in any evaluation the economic costs of negative behavioural, emotional and cognitive consequences for the children of mothers who suffered from post-natal depression.

When quality of life benefits to women are incorporated, the health visiting intervention provides a positive net benefit with an incremental cost-effectiveness ratio (ICER) of around £4,500 per quality-adjusted life year (QALY).

### Key points

- Findings of a significant improvement in quality of life for mothers and of cost-effectiveness of the health visiting intervention mirror those of Morrell.ix Our model suggests wider application of this approach.
- On a one-year horizon, health visiting interventions to reduce post-natal depression do not reduce net costs, but do increase productivity for those who return to work.
- The intervention may produce cost savings in the medium- and long-term but this possibility remains to be evaluated.

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## 2.2 Parenting interventions for the prevention of persistent conduct disorders

*Eva-Maria Bonin, Madeleine Stevens, Jennifer Beecham, Sarah Byford, Michael Parsonage*

### Context

Conduct disorders are the most common childhood psychiatric disorders, with a UK prevalence of 4.9% for children aged 5–10 years.[i] The condition leads on to adulthood antisocial personality disorder in about 50% of cases, and is associated with a wide range of adverse long-term outcomes, particularly delinquency and criminality.[ii]

The costs to society are high, with average potential savings from early intervention previously estimated at £150,000 per case.[iii] Costs falling on the public sector are distributed across many agencies and are around ten times higher than for children with no conduct problems.[iv] The cost of conduct disorder-related crime in England may be as high as £22.5bn a year, and £1.1–1.9m over the lifetime of a single prolific offender.[v]

### Intervention

Parenting programmes can be targeted at parents of children with, or at risk of, developing conduct disorder, and are designed to improve parenting styles and parent-child relationships. Reviews have found parent training to have positive effects on children's behaviour, and that benefits remain one year later.[vi,vii] Longer-term studies show sustained effects but lack control groups; cost-effectiveness data are limited, but health and social services costs were found to reduce over time in one trial.[viii] Without intervention, conduct disorder will persist in about 50% of children.[ii]

The median cost of an 8–12 week group-based parenting programme is estimated at £952 per family, while that of individual interventions is £2,078.[vii] Assuming 80% of people receive group-based interventions and 20% individual interventions, in line with NICE guidance, the average cost of the intervention works out at £1,177 per family. An important ingredient of success in the design and implementation of these programmes is maximising the engagement of 'at-risk' families, as there is evidence that some services suffer from low rates of take-up and high rates of drop-out.

### Impact

The model looks at the costs/savings for 5-year-old children with conduct disorder whose parents attend a parenting programme, and estimates the impact to age 30 compared to no intervention. It is assumed that the intervention decreases the chance that early onset conduct disorder will persist into adulthood, thus avoiding high costs to society. Among those whose parents complete the programme, 33% of children improve to 'no problems', and 5% improve to moderate conduct problems; however, behaviour changes are not sustained beyond one year for 50% of children who initially improve.

Table 1 shows that total gross savings over 25 years amount to £9,288 per child and thus exceed the average cost of the intervention by a factor of around 8 to 1. Savings to the public sector come to £3,368 per child, including £1,278 accruing to the NHS. Under the assumptions made, the intervention will provide a positive return to the public sector in year 8, and to the NHS in year 14, after the intervention. No benefits are assumed from a range of other potential wider impacts such as improved employment prospects, reduced adult mental health issues, and improved outcomes for the child's family and peers; these are likely to be substantial, making the intervention an even better investment.

**Table 1: Gross pay-offs from parenting interventions at age 5, per child with conduct disorder (2008/09 prices)**

| | Age 6 (£) | Age 7–16 (£) | Age 17+ (£) | Total (£) |
|---|---|---|---|---|
| NHS | -168 | -912 | -197 | -1,278 |
| Social services | -24 | -29 | -14 | -67 |
| Education | -132 | -304 | 0 | -437 |
| Criminal justice system | 0 | -1,247 | -340 | -1,588 |
| **Public sector total** | **-324** | **-2,493** | **-551** | **-3,368** |
| Voluntary sector | -3 | -6 | -5 | -15 |
| Victim costs (crime) | 0 | -3,361 | -810 | -4,171 |
| Lost output (crime) | 0 | -995 | -232 | -1,227 |
| Other crime costs | 0 | -377 | -129 | -506 |
| **Other sectors/individuals total** | **-3** | **-4,740** | **-1,176** | **-5,919** |
| Total | -328 | -7,233 | -1,727 | -9,288 |

## Key points

- Parenting programmes are cost-saving to the public sector, and to the NHS alone, over the long term, with the main benefits accruing to the NHS and criminal justice system.
- When the wider costs of crime are included, total gross savings over 25 years exceed the average cost of the intervention by a factor of around 8 to 1.

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## 2.3 School-based social and emotional learning programmes to prevent conduct problems in childhood

*Jennifer Beecham, Eva Bonin, Sarah Byford, David McDaid, Gerald Mullally, Michael Parsonage*

### Context

Conduct problems in childhood cover a range of oppositional or anti-social forms of behaviour such as disobedience, lying, fighting and stealing. Such problems are very common: 6% of children aged 5–10 years have severe conduct problems (SCP) and 19% have mild conduct problems (MCP), rising to 9% and 29% respectively in adolescence.[i] Conduct problems are associated with a range of poor outcomes including increased risk of criminal activity, fewer school qualifications, parenthood at a young age, unemployment, divorce or separation, substance abuse, and psychiatric disorders – many of which lead to increased costs across several agencies.

Potential savings (including intangibles) from each case prevented through early intervention have been estimated at £150,000 for SCP and £75,000 for MCP.[ii] Crime accounts for about two-thirds of these long-term costs, with the other main contributors being the costs of mental illness in adulthood and lower lifetime earnings. The annual cost of crime in England attributable to people who had early conduct problems (either severe or mild) may be as high as £60bn.[iii]

### Intervention

School-based Social and Emotional Learning (SEL) programmes help children and young people to recognise and manage emotions, set and achieve positive goals, appreciate the perspectives of others, establish and maintain positive relationships, make responsible decisions and handle interpersonal situations constructively.iv International evidence shows that SEL participants demonstrate significantly improved social and emotional skills, attitudes, behaviour, and academic performance.

The costs of a representative intervention, including teacher training, programme co-ordinator and materials were estimated as £132 per child per year (2009 prices).[v] There are no empirical cost-effectiveness studies evaluating the impact of whole school SEL programmes on conduct problems.[vi] There is a need for evaluation of specific schemes in a UK context.

### Impact

The model looks at the cost savings from school-based SEL programmes through their impact on conduct problems. It is assumed that the intervention occurs at age 10 years and that a child starts in one of three different conduct 'health states': no conduct problems, mild conduct problems or severe conduct problems. International data is used to approximate the probability of transition between these three states between childhood, adolescence and adult hood. For each health state, the model incorporates estimates of the related costs incurred by various public sector agencies, the voluntary sector, and from the wider impact of crime (including the psychological impact on victims). Costs/savings for other outcomes, such as improved academic performance, have not been included; nor have those relating to parents, siblings or other peers.

Without SEL, approximately 46% of children have few conduct problems throughout their life course; 24% have conduct problems in childhood that do not persist; 20% develop conduct problems in adolescence; and approximately 11% have life-course persistent conduct problems.[vii] Based on the evidence, the model conservatively assumes that school-based SEL programmes achieve a 9% reduction in transition between conduct 'health states'.

**Table 2: Cumulative pay-offs per child through social and emotional learning programmes (2009 prices)**

| | Year 1 (£) | Year 5 (£) | Year 10 (£) |
|---|---|---|---|
| NHS | -39 | -751 | -1,148 |
| Social Services | -4 | -13 | -23 |
| Education | -26 | -135 | -186 |
| Criminal Justice | -14 | -1,139 | -1,849 |
| **Public sector total** | **-83** | **-2,038** | **-3,206** |
| Voluntary Sector | 0 | -4 | -8 |
| Victim costs (crime) | -30 | -3,164 | -4,912 |
| Other crime costs | -12 | -1,295 | -2,038 |
| **Other sector/individuals total** | **-42** | **-4,463** | **-6,958** |
| Total pay-offs | -125 | -6,501 | -10,164 |
| Cost of intervention | 132 | 132 | 132 |
| **Net costs/pay-offs** | **7** | **-6,369** | **-10,032** |

The results show that the SEL intervention is cost-saving overall after the first year, while education recoups its costs in five years. A key driver of net savings is the crime-related impacts of conduct problems that can be avoided (Table 2). Reducing the assumption about the impact of SEL to 3% (down from 9%) produces cost savings to the NHS after four years; assuming an impact of just 1% across the 'health states', the model is cost saving to the public sector after five years.

### Key points

- There is a strong case that school-based SEL programmes are cost-saving for the public sector.
- The key drivers of net savings are the crime and NHS-related impacts of the intervention.
- Education services are likely to recoup the cost of the intervention in five years.
- There are substantial wider benefits stemming from this intervention.

*Further details: Jennifer Beecham (j.beecham@lse.ac.uk)*

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## 2.4 School-based interventions to reduce bullying

*Jennifer Beecham, Sarah Byford, Canny Kwok, Michael Parsonage*

### Context

Bullying in schools is a common problem with potentially long-lasting consequences for victims. According to a recent Ofsted survey, 39% of children report being bullied in the previous 12 months,[i] although estimates of prevalence vary widely between studies, mainly because of differences in definition.

Being bullied at school has adverse effects on both psychological well-being and educational attainment. There is evidence from longitudinal data that this has a negative long-term impact on employability and earnings; on average, lifetime earnings of a victim of bullying are reduced by around £50,000.[ii]

### Intervention

Anti-bullying programmes in schools show mixed results, depending on the design of the intervention and its implementation. That said, there is a consensus in the literature that whole-school programmes with a range of components operating at different levels within the school are more effective in reducing the prevalence of bullying than curriculum-based programmes. One high-quality evaluation of a school-based anti-bullying intervention found a 21–22% reduction in the proportion of children victimised.[iii] Benefits include improvements in the emotional, physical and social health of victims, school attendance and educational attainment, all of which are associated with better long-term employment and earnings outcomes. However, the available evidence about anti-bullying interventions uses relatively short follow-up periods, and little is known about the longer-term impact on prevalence.

Information is limited on the cost of anti-bullying programmes, but one study estimates this at £15.50 per pupil, per year.[ii]

### Impact

This study makes use of a model developed for the National Institute for Health and Clinical Excellence (NICE)[ii] which explores the link between being bullied at school and subsequent earnings. The NICE model incorporates recent analysis[iv] of data from the longitudinal National Child Development Survey (NCDS), covering a large sample of children born in 1958, and takes into account variables such as family background, health problems and educational aptitude. Based on NCDS data, the prevalence of bullying in the NICE model is put at 24%. The school-based programme includes peer mediators and a classroom intervention, and it is assumed that the anti-bullying intervention achieves a sustained reduction in bullying of 15%.

The results estimate that, averaged across all children whether bullied or not, the benefit of intervention is £1,080 per school pupil. Given that the cost of the intervention is just £15.50 per pupil per year, it offers good value for money even if repeated annually. The economic case is even stronger if allowance is made for other benefits of reduced bullying, such as improved psychological well-being, which are not included in the NICE model. The quantified benefits are long-term in nature and accrue mainly to individuals in the form of higher incomes. However, there will also be benefits to the Exchequer, from increased tax revenues and savings in social security expenditure.

### Key points

- On the limited evidence available, inexpensive anti-bullying interventions appear to offer good value for money on a long-term perspective, based on improved future earnings.
- Further evidence is needed about which interventions are most effective, and whether their impact is sustained over the longer-term.

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## 2.5 Early detection for psychosis

*Paul McCrone, A-La Park, Martin Knapp*

### Context

The first symptoms of psychosis typically present in the late teenage and early adult years. It is estimated that each year in England 15,763 people exhibit early (prodromal) symptoms before the onset of full psychosis.[i] However, early detection services are not routinely provided and provision is currently very limited.

Progression of the disease is associated with higher costs to public services (including health, social care, and criminal justice), lost employment, and greatly diminished quality of life for the patient and their family. A 2008 analysisi estimated the average annual direct costs per average patient with schizophrenia at £10,605, and total costs (including lost employment) at £19,078. The corresponding costs for bipolar disorder and related conditions were £1,424 and £4,568. Total costs for these conditions combined were estimated at £3.9bn for services and £9.2bn for services and lost employment.

### Intervention

Early detection services aim to identify the early symptoms of psychosis, reduce the risk of transition to full psychosis and shorten the duration of untreated psychosis for those who do develop it. Such services include the provision of sessions of cognitive behavioural therapy, psychotropic medication, and contact with psychiatrists; this contrasts with treatment as usual which typically consists of GP and counsellor contacts. There is some evidence that such services can reduce the rate of transition to full psychosis.[ii]

One year of early detection intervention has been estimated to cost £2,948 (2008/9 prices) per patient, compared with £743 for standard care.[ii] The costs of community mental health care and inpatient admissions (formal and informal) were included.

### Impact

The model looks at whether investments in specialist early detection services can be cost-saving in terms of health care services, criminal justice services, suicide, homicide and lost employment for a one-year cohort of patients. It is based on one specific implementation of early detection services that is provided by Outreach and Support in South London (OASIS). The target group is young people aged 15 to 35 years old in the general population with prodromal symptoms of psychosis.

The model assumes that transition from prodromal symptoms to full psychosis occurs for 20% of patients compared to 35% under standard care.[ii] Table 3 shows the impact on annual costs/savings of full coverage by early detection services, compared to standard care. Savings from year 3 onwards are assumed to be due to 2,364 avoided cases of psychosis estimated from the model; it is also assumed that patients with avoided psychosis would otherwise have been treated either by an early intervention team (67%) or a standard care team (33%). The impact on costs from reductions in the suicide and homicide rates is assumed to appear from year 4 onwards.

The savings associated with ED are, in the model, entirely driven by reduced numbers of people making a transition to psychosis. The assumed 'success rate' in the model is 15 percentage points (20% compared to 35%). If the difference was only 5 percentage points, the annual saving in years 2–5 would fall to around £16m, but would increase to around £79m if the success rate were 25 percentage points. Using these two extreme scenarios, the annual savings over years 6–10 are approximately £14m and £68m, respectively. The assumed difference of 15 percentage points[ii] is in fact similar to the impact reported elsewhere.[iii iv v]

**Table 3: Impact of early detection services on annual costs/pay-offs, based on 15,763 people with prodromal symptoms of psychosis (2008/9 prices)**

| | Year 1 | Years 2–5 | Year 6–10 |
|---|---|---|---|
| **Per person** | **(£)** | **(£)** | **(£)** |
| Services | 2,228 | -1,149 | -1,053 |
| Productivity losses | | -1,835 | -1,476 |
| Intangibles (negative impact on quality of life) | | -39 | -£75 |
| Total | 2,228 | -3,022 | -2,604 |
| **By sector** | **(£m)** | **(£m)** | **(£m)** |
| NHS | 35.1 | -15.2 | -13.2 |
| Other public sector | 0 | -2.9 | -3.6 |
| Productivity losses | 0 | -28.9 | -23.3 |
| Intangible | 0 | -0.6 | -1.2 |
| Total | 35.1 | -47.6 | -41.0 |

## Key points

- Early detection services for patients with prodromal symptoms of schizophrenia are cost-saving overall, and also cost-saving from the perspective of the NHS from year 2.
- Further evidence is needed on the impact of different models of early detection services.

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## 2.6 Early intervention for psychosis

*Paul McCrone, A-La Park, Martin Knapp*

### Context

The number of young people each year aged 15–35 who experience a first episode of psychosis is estimated at 6,900 in England. Psychosis related to schizophrenia is associated with higher costs to public services (including health, social care, and criminal justice), lost employment, and greatly diminished quality of life for the individual with the illness and their family. Estimates of the costs of schizophrenia and bipolar disorder are given in the report on early detection for psychosis (see previous model).

### Intervention

Early intervention teams aim to reduce relapse and readmission rates for patients who have suffered a first episode of psychosis, and to improve their chances of returning to employment, education or training, and more generally their future quality of life. Such intervention involves a multidisciplinary team that could include a range of professionals (psychiatrists, psychologists, occupational therapists, community support workers, social workers, vocational workers). The emphasis is on an assertive approach to maintaining contact with the patient and on encouraging a return to normal vocational pursuits. In the UK evidence has shown that early intervention can reduce relapse and readmission to hospital and to improve quality of life.[i ii]

The annual direct cost per patient of this type of service in terms of input from an early intervention team plus other community psychiatric services and inpatient care has been estimated at £10,927 at 2008/09 prices, considerably less than that of standard care at £16,704.[iii] The reduction in overall service costs is primarily due to the lower demand for inpatient care when specialist early intervention is provided; the first year of the actual early intervention team's input (including contacts with psychiatrists, social workers and community mental health nurses) is estimated to cost £2,282 per patient, which is higher than the £1,284 for standard care.

### Impact

The model looks at whether investments in specialist early intervention services can be cost-saving in terms of use of health care services, criminal justice services, suicide, homicide and lost employment. The target group is young people aged 15 to 35 years old in the general population experiencing a first episode of psychosis.

Table 4 shows the impact on annual costs/savings of full coverage by early intervention services of a one-year cohort of patients, compared to standard care. Savings are reduced after three years (when discharge to standard care is assumed to occur) because it is conservatively assumed that, from then on, the inpatient admission rates for early intervention services are the same as for standard care.

### Key points

- The expansion of the coverage of early intervention services to all patients experiencing a first episode of psychosis is cost-saving overall, and also cost-saving from the perspective of the NHS alone, from year 1.
- Savings are estimated to decrease over time because there is no current evidence to suggest that reductions in inpatient stays are maintained when patients are discharged from the early intervention team.

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**Table 4: Impact of early intervention services on annual costs/pay-offs, based on a one-year cohort of patients (2008/09 prices)**

| | Year 1 | Years 2 –5 | Year 6–10 |
|---|---|---|---|
| **Per person** | **(£)** | **(£)** | **(£)** |
| Services | -5,777 | -2,408 | -60 |
| Productivity losses | | -2,052 | -1,912 |
| Intangibles (negative impact on quality of life) | | -314 | -628 |
| Total | -5,777 | -4,774 | -2,600 |
| **By sector** | **(£m)** | **(£m)** | **(£m)** |
| NHS | -39.1 | -16.0 | 0 |
| Other public sector | -0.8 | -0.6 | -0.4 |
| Productivity losses | 0 | -14.2 | -13.2 |
| Intangible | 0 | -2.2 | -4.3 |
| Total | -39.9 | -32.9 | -17.9 |

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## 2.7 Screening and brief intervention in primary care for alcohol misuse

*Rabeea'h Aslam, Martin Knapp, Michael Parsonage, Jamie Vela*

### Context

It is estimated that 6.6 million adults in England currently consume alcohol at hazardous levels and 2.3 million at harmful levels.[i] Hazardous drinking is defined as weekly alcohol consumption of 21–50 and 14–35 units for men and women, respectively, and harmful drinking as above 50 and 35 units.

The total costs of alcohol misuse in England, based on inflation-adjusted Department of Health data,[ii] can be estimated in 2009/10 prices at around £23.1bn, comprising: £3.0bn in NHS costs, £7.2bn in output losses and £12.9bn from the costs of crime. In practice, these figures understate the costs falling on the NHS as more than £1bn allocated to crime covers medical treatment for injuries suffered by the victims of alcohol-related violence. Harmful alcohol misuse is disproportionately costly: analysis for this study estimates that the overall average annual costs of a harmful drinker are around 3.4 times that of a hazardous drinker.

### Intervention

Effective strategies to reduce alcohol-related harm require a combination of measures, covering both population-level approaches (such as price increases and advertising controls) and interventions aimed at individuals.[iii] In the latter category, evidence indicates that brief interventions in primary care settings achieve an average 12.3% reduction in alcohol consumption per individual.[iv] However, this is a short-term effect and evidence about its duration is less clear cut.

An inexpensive intervention in primary care combines universal screening by GPs of all patients, followed by a 5-minute advice session for those who screen positive. The total cost of the intervention averaged over all those screened is £17.41 per head in 2009/10 prices.[v]

### Impact

The model analyses the costs and benefits of GPs using the Alcohol Use Disorders Identification Test (AUDIT) to screen a representative sample of 1,000 adults attending their next GP consultation, followed by 5 minutes of advice for those identified as hazardous or harmful drinkers. Based on national prevalence data, the numbers per 1,000 in these two categories are estimated at 224 and 78 respectively, but it is assumed that around 20% of relevant individuals are missed in the screening. In line with other studies,v the effectiveness of the intervention is assumed to decline linearly to zero in seven years. To avoid any exaggeration of benefits, no allowance is made in the analysis for any savings associated with alcohol-related premature mortality.

Given the £17.41 cost of the intervention, the results demonstrate that savings after seven years exceed costs by a factor of nearly 12 to 1 (Table 5). Purely in terms of public expenditure, the intervention offers good value for money over the same period as combined savings in the NHS and criminal justice system exceed the costs of the intervention by a factor of more than 3 to 1. Estimated savings in the NHS alone exceed costs by more than 2 to 1.

**Table 5: Costs/pay-offs per head for screening and brief advice based on a representative sample of 1,000 adults attending their next GP consultation (2009/10 prices)**

| | Year 1 (£) | Years 2–5 (£) | Years 6–7 (£) | Total (£) |
|---|---|---|---|---|
| NHS | -10.55 | -24.61 | -3.91 | -39.07 |
| Crime | -28.49 | -66.02 | -10.49 | -105.00 |
| Productivity losses | -16.20 | -38.24 | -6.05 | -60.48 |
| Total | -55.23 | -128.87 | -20.45 | -204.55 |

### Key points

- There is a robust economic case: low-cost interventions in primary care offer good value for money in reducing alcohol-related harm.
- The main constraint on national implementation is one of scale; options to consider include targeted approaches (e.g. focusing on young males), screening people only when they change GP rather than at next consultation, or using practice nurses rather than GPs to provide the screening and/or follow-up advice.

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## 2.8 Workplace screening for depression and anxiety disorders

*David McDaid, Derek King, Michael Parsonage*

### Context

Substantial potential economic costs arise for employers from productivity losses due to depression and anxiety in the workforce. The main costs occur due to staff absenteeism and presenteeism (lost productivity while at work). From the perspective of the public purse, failure to intervene also risks higher future health and social care costs.

Labour Force Survey data suggest that 11.4 million working days were lost in Britain in 2008/09 due to work-related stress, depression or anxiety. This equates to 27.3 days lost per affected worker. It is estimated that the average annual cost of lost employment in England attributable to an employee with depression is £7,230, and £6,850 for anxiety (2005/06 prices).[i] If these conditions are not treated, additional costs are also likely to arise from related physical health problems. In the longer term, wider costs may also be incurred, such as from acute care, the impact on family members and premature death. There may also be additional recruitment and training costs for employers if their employees permanently withdraw from the workforce.

### Intervention

Workplace-based enhanced depression care consists of completion by employees of a screening questionnaire, followed by care management for those found to be suffering from, or at risk of developing, depression and/or anxiety disorders. Those identified as being at risk of depression or anxiety disorders are offered a course of cognitive behavioural therapy (CBT) delivered in six sessions over 12 weeks. This intervention has been shown in a number of studies to be effective in tackling depression and reducing productivity losses in various workplaces. In a similar approach in Australia, productivity improvements outweighed the costs of the intervention.[ii]

It is estimated that £30.90 (at 2009 prices) covers the cost of facilitating the completion of the screening questionnaire, follow-up assessment to confirm depression, and care management costs.[iii] For those identified as being at risk, the cost of six sessions of face-to-face CBT is £240. Computerised CBT courses are cheaper, and may be less stigmatising to individual workers, but less is known about their longer-term effectiveness.

### Impact

The model assesses the cost-effectiveness of a workplace-based intervention for depression and anxiety disorders, and whether it reduces sickness, absenteeism and presenteeism, compared with no intervention. The target population is a hypothetical cohort of working age individuals in a white collar enterprise with 500 full time equivalent employees, all of whom are screened. The cost/savings impact is addressed from the perspective of the health system (including personal social services) and business, with the enterprise bearing the total costs of the intervention. It assumes that only two-thirds of employees offered CBT as a result of screening will make use of this treatment. It is estimated that the reduction in presenteeism as a result of successful intervention is equivalent to an extra 2.6 hours of work per week.[iv] In year 1 it is assumed that this benefit is seen only in the 36 weeks after the completion of the CBT course. If depression and anxiety orders are averted, then 27.3 days of absenteeism per annum associated with these disorders will be avoided. Conservatively, the model assumes that health and personal social services costs relating to depression and anxiety only occur in year 2.

The results show that from a business perspective the intervention appears cost-saving, despite the cost of screening all employees (Table 6). Benefits are gained through both a reduction in the level of absenteeism

**Table 6: Total net costs/pay-offs from business and societal perspectives for a company with 500 employees (2009 prices)**

| | Year 1 (£) | Year 2 (£) |
|---|---|---|
| Intervention cost | 20,676 | 0 |
| Health (including social care) | 0 | -10,522 |
| Absenteeism (productivity losses) | -17,508 | -23,006 |
| Presenteeism (productivity losses) | -22,868 | -30,050 |
| Total | -19,700 | -63,578 |

and improved levels of workplace productivity through a reduction in presenteeism. However, the impact may differ across industries; the case may be less strong where staff turnover is high and skill requirements low. From a health and personal social services perspective the model is cost-saving, assuming the costs of the programme are indeed borne by the enterprise.

### Key points

- The intervention is cost-saving from the perspectives of both business and the health system, on the assumption that all costs are borne by business.
- The costs of the intervention are more than outweighed by gains to business due to a reduction in both presenteeism and levels of absenteeism.
- Public sector employers also have the potential to benefit from investing in universal workplace depression and anxiety screening interventions.

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## 2.9 Promoting well-being in the workplace

*David McDaid, Derek King, A-La Park, Michael Parsonage*

### Context

The workplace provides a convenient location for addressing the physical and mental health of a large proportion of the adult population. Problems inside and beyond work can be identified and tackled, and there is also scope for general health promotion. Aside from the potential benefits to public health, this type of well-being intervention can improve an organisation's productivity, image and workplace safety. It may also reduce the vulnerability of employees to work-related mental health problems.

Deteriorating well-being in the workplace is potentially costly for businesses as it may increase absenteeism and presenteeism (lost productivity while at work), and in the longer term potentially leads to premature withdrawal from the labour market. Estimates of the costs of depression and anxiety in the labour force are given in the report on workplace screening for depression and anxiety disorders (see previous model). From a health system perspective, improved well-being potentially will help avoid the use of services for some mental and physical health problems.

### Intervention

There are a wide range of approaches to mental health promotion in the workplace. These include flexible working arrangements; career progression opportunities; ergonomics and environment; stress audits; and improved recognition of risk factors for poor mental health by line managers. Other measures targeted at general well-being can include access to gyms, exercise and sports opportunities and changes to the canteen food. One study found that Scottish health care workers who were helped to adopt more active commuting habits showed significantly improved mental health.[i]

A multi-component health promotion intervention of the sort modelled in the current study consists of personalised health and well-being information and advice; a health risk appraisal questionnaire; access to a tailored health improvement web portal; wellness literature; and seminars and workshops focused on identified wellness issues. A quasi-experimental evaluation of this type of programme has reported significantly reduced stress levels, reduced absenteeism and reduced presenteeism, compared with a control group.[ii] Promotion of long-term mental well-being may be associated with reduced longer term risk of poor mental health, although the evidence for this remains weak.[iii] [iv]

The cost of a multi-component intervention is estimated at £80 per employee per year.[ii]

### Impact

The model assesses the impact of a workplace-based health promotion and well-being programme in a white collar enterprise with 500 employees, all of whom are covered by the intervention. The costs/savings are addressed from the perspective of the business, which is assumed to bear costs of the intervention. Estimates of the effectiveness, uptake of the intervention (43% of all employees) and impact on absenteeism and presenteeism (lost productivity while at work) are taken from a study undertaken in the UK offices of a large multi-national company.[ii]

From a business perspective the model appears cost saving compared to taking no action (Table 7). In year 1, the initial costs of £40,000 for the programme are outweighed by gains arising from reduced presenteeism and absenteeism of £387,722. This represents a substantial annual return on investment of more than 9 to 1. In addition there are likely to be benefits to the health system from reduced physical and mental health problems as a result of the intervention, but these are not quantified here.

**Table 7: Total net costs/pay-offs from a business perspective for a company with 500 employees (2009 prices)**

| | Year 1 (£) |
|---|---|
| Intervention cost | 40,000 |
| Absenteeism (productivity losses) | -110,527 |
| Presenteeism (productivity losses) | -277,195 |
| Total | -347,722 |

## Key points

- A strong case can be made to businesses that workplace well-being interventions can be significantly cost-saving in the short term, but some smaller companies may need public support to implement such schemes.
- The public sector, including the NHS, can also benefit as an employer from improved investment in workplace well-being programmes.

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## 2.10 Debt and mental health

*Martin Knapp, David McDaid, Sara Evans-Lacko, Chris Fitch, Derek King*

### Context

Even before the current global financial crisis, it was estimated that 8% of the population had serious financial problems and another 9% showed signs of financial stress.[i] These problems have wide-ranging implications. In particular, research has demonstrated a link between debt and mental health; individuals who initially have no mental health problems but find themselves having unmanageable debts within a 12-month period have a 33% higher risk of developing depression and anxiety-related problems compared to the general population who do not experience financial problems.[ii]

The vast majority of these mental health problems take the form of depression and anxiety-related disorders. These conditions are associated with significant costs arising from health service use, legal fees, debt recovery and lost productivity. On average, the lost employment costs of each case of poor mental health are £11,432 per annum, while the annual costs of health and social service use are £1,508.[iii]

Only about half of all people with debt problems seek advice,[iv] and without intervention almost two-thirds of people with unmanageable debt problems will still face such problems 12 months later.

### Intervention

The current evidence suggests that there is potential for debt advice interventions to alleviate financial debt, and hence reduce mental health problems resulting from debt. For the general population, contact with face-to-face advice services is associated with a 56% likelihood of debt becoming manageable,[v] while telephone services achieve 47%.[vi] In comparison, around one-third of problem debt may be resolved without any intervention.

The costs of this type of intervention vary significantly, depending on whether it is through face-to-face, telephone or internet-based services. The Department for Business, Innovation and Skills suggests expenditure of £250 per client for face-to-face debt advice; telephone and internet-based services are cheaper. Funding for debt advice comes from a range of sources including government, NHS, charities and creditors.

### Impact

The model explores the cost-effectiveness of different types of debt advice services targeted at working age adults without mental health problems. It follows a hypothetical cohort of people at risk of unmanageable debt over a 24-month period, and looks at the impact of subsequent debt-related mental health problems (depression and anxiety) on costs to the health, social care and legal systems, and from lost productivity due to reduced employment. Legal and debt advice costs are assumed to fall in year 1, while other costs fall mostly in year 2.

A range of scenarios was explored in models. Even under conservative assumptions, investment in debt advice services can both lower expected costs and reduce the risk of developing mental health problems. The intervention appears to be cost-effective from most societal and public expenditure perspectives. However, face-to-face services will only be the most cost-effective option if a high proportion of the costs of providing the service is recovered from creditors. This is feasible: one major not-for-profit debt advice service covers more than 90% of its costs in this way. In other scenarios, where cost recovery is lower, either telephone or web-delivered services will be most cost-effective. Table 8 shows the impact on costs/savings of face-to-face intervention for a hypothetical population of 100,000, compared with no intervention, assuming that one-third of the cost of the debt advice is borne by the NHS, with the rest paid for by creditors.

**Table 8: Impact on costs/pay-offs of face-to-face debt intervention (with NHS paying one-third of the costs of the debt advice services) (2009 prices)**

| | Year 1 (£) | Year 2 (£) | Year 3 (£) | Year 4 (£) | Year 5 (£) |
|---|---|---|---|---|---|
| Health and social care | 151,512 | -13,209 | -13,017 | -12,829 | -12,643 |
| Legal | -87,908 | - | - | - | - |
| Productivity losses | -7,827 | -100,128 | -98,677 | -97,426 | -95,837 |
| Net costs/pay-offs | 55,777 | -113,336 | -111,694 | -110,075 | -108,480 |

In practice, this type of intervention could be targeted at specific groups who may be particularly vulnerable to financial debt and mental health problems, for example low-income communities.

### Key points

- In nearly all modelled scenarios, at least one type of debt management intervention has better outcomes and lower costs over a two-year period compared to no action.
- For greatest cost-effectiveness, careful consideration needs to be given to models of financing and to the mix between face-to-face, telephone and web-based provision.

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## 2.11 Population-level suicide awareness training and intervention

*David McDaid, A-La Park, Eva-Maria Bonin*

### Context

The economic impacts of suicide are profound, although comparatively few studies have sought to quantify these costs. Updating work undertaken previously by one of the authors,[i] it is estimated that the average cost per completed suicide for those of working age only in England is £1.67m (at 2009 prices). This includes intangible costs (loss of life to the individual and the pain and suffering of relatives), as well as lost output (both waged and unwaged), police time and funerals.

There are also costs to the public purse from recurrent non-fatal suicide events; these are more difficult to estimate, and will vary by means of suicide attempt. One recent English study indicates that only 14% of costs are associated with A&E attendance and medical or surgical care; more than 70% of costs are incurred through follow up psychiatric inpatient and outpatient care.[ii] This is in part because a proportion of individuals who survive suicide attempts are likely to make further attempts, in some cases fatal. There are nevertheless economic benefits from delaying completed suicide as the number of lost years of productive activity will be reduced; overall it is estimated that costs are averted of £66,797 per year per person of working age where suicide is delayed.

### Intervention

Around 81% of working age adults in England come into contact with a GP at least once a year,[iii] and there is evidence that suicide prevention education for GPs can have an impact as a population-level intervention to prevent suicide. This has the potential to be cost-effective if it leads to adequate subsequent treatment.[iv] With greater identification of those at risk, individuals can receive cognitive behavioural therapy (CBT), followed by ongoing pharmaceutical and psychological support to help manage underlying depressive disorders. Evidence from the US suggests that CBT can help reduce the risk of future suicidal events by up to 50%.[v]

The cost of this type of intervention has several components. A course of ten sessions of CBT in the first year is around £400 per person. Further ongoing pharmaceutical and psychological therapy is estimated to cost £1,182 a year (2009 prices). The cost of suicide prevention training for GPs, based on the Applied Suicide Intervention Skills Training (ASIST) course, is £200 which would mean a total cost of around £8m if delivered to all GPs in England.

### Impact

The model looks at the economic case over 10 years for investing in GP suicide prevention education aimed at reducing suicide among the cohort of working age adults. It is assumed that, without any action, 20% of individuals experiencing suicidal thoughts are at risk of completing suicide within a one year period. The risk of serious non-fatal events in the year following a non-fatal suicide attempt falls from 41.6% to 24.1% as a result of the intervention.v The model does not assume any decrease in the risk of suicide in the 10 years after the first self-harm event other than that initially achieved, and that individuals identified as being at risk will continue to receive a combination of therapies to help maintain reduced risk. Based on an earlier study, GPs who go on the suicide prevention training course will have a 20% greater chance of identifying those at risk of suicidal behaviour in the year following training.[vi] The model indicates that 603, 706 or 669 suicides would be avoided over the 1-, 5- and 10-year time horizons, respectively.

The analysis of costs/savings includes expenditure on health care, police/coroner activities, funerals, productivity and intangible costs. The additional treatment and support costs for individuals who do not complete suicide are to some extent offset by a reduction in the costs to the health care system of completed

**Table 9: Net costs/pay-offs for suicide prevention following suicide awareness training, compared with no intervention in England (2009 prices)**

| | After 1 year (£m) | After 5 years (£m) | After 10 years (£m) |
|---|---|---|---|
| Health | | | |
| – Suicide awareness training | 8.1 | 8.1 | 8.1 |
| – Suicide prevention measures | 1.8 | 7.2 | 12.5 |
| – Emergency Treatment | -0.4 | -0.9 | -1.0 |
| Police/coroner costs | -0.3 | -0.5 | -0.6 |
| **Total public services** | **9.2** | **14.0** | **19.0** |
| Funerals | -0.5 | -0.9 | -1.2 |
| Productivity losses | -186.2 | -340.2 | -416.8 |
| Intangible costs | -390.3 | -713.0 | -873.6 |
| Total | -567.8 | -1,040.1 | -1,272.6 |

suicides and serious self harm events, but the intervention has significant net costs to the health care system of up to £19m over 10 years. However, if the reductions in productivity losses are also included then the intervention is cost-saving by a very large margin (Table 9), and remains so even if the estimated impact on productivity is reduced to just 5% of the baseline case. Overall, net savings of £1.27bn arise over 10 years if intangible costs are also included. All results are sensitive to assumptions about the future risk of suicide.

From a cost-effectiveness perspective, for the health system the cost per life saved would be £15,726, £20,438 and £29,235 over 1, 5 and 10 years respectively. Using conservative assumptions about the gain in life and quality of life, this yields a highly effective cost to the NHS per QALY saved of £1,573, £2,044, and £2,924, respectively.

### Key points

- Investment in GP suicide prevention training is cost-saving overall from year 1 even if only very modest reductions in productivity losses are factored in.
- The intervention appears highly cost-effective from a health system perspective alone.

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## 2.12 Bridge safety measures for suicide prevention

*Eva-Maria Bonin, David McDaid*

### Context

In England alone, there were 12,479 suicides and an estimated 121,634 non-fatal suicide attempts in the three years from 2006 to 2008. The costs of suicide to society are high, in both human and financial terms; on average, for the whole population, these are estimated at £1.45m (at 2009 prices), including intangible costs (loss of life to the individual and the pain and suffering of relatives) as well as lost output (both waged and unwaged) and police time.[i]

Jumping from a height accounts for around 3% of completed suicides. Given high fatality rates of over 50%, the lifetime costs of completed and attempted suicides by jumping account for more than £176m per year.

### Intervention

Bridges provide obvious jumping sites, and the construction of safety barriers has been shown successfully to reduce suicides on particular bridges.[ii iii iv] It appears that these averted suicides are not simply displaced to other, unsecured jumping sites, but whether suicide occurs by another method is difficult to analyse.

The Clifton Suspension Bridge in Bristol is one such suicide 'hot spot'. Following the installation of a safety barrier in 1998, at a cost of £300,000 (in 2009 prices), the number of suicides reduced from an average of 8.2 per annum in the five years before the barrier, to 4 per annum in the five years after it was installed.[v]

### Impact

Using the Clifton Suspension Bridge as a case study, the model estimates the savings (both tangible and intangible) to society of installing a safety barrier. It assumes that the barrier prevents around half of suicide attempts, but also considers the impact if these individuals instead attempt suicide using other methods. This displacement can still lead to a lower number of suicides, as the mortality of those who jump from this bridge is 95%, compared with around 9% for other suicide methods combined. The model includes the probability of subsequent attempted and fatal suicides.

The cost savings are calculated first for a 1-year cohort of those attempting suicide from the bridge in a single year, and follows this group over a 10-year period. It then looks at aggregated savings from ten consecutive cohorts, assuming that the pattern of suicides would have recurred every year. The savings do not include the costs of bereavement support, or the impact on children losing a parent. It is assumed that barrier construction costs are incurred in the first year.

The results show that investment to prevent individuals from attempting suicide using high-fatality methods are likely to be cost saving, even if all the averted attempts are diverted to other suicide methods (Table 10).

### Key points

- Investment in a barrier to prevent suicide jumping from a particular bridge can generate substantial financial benefits, even if suicides are displaced to other, less lethal, methods.
- Such savings would potentially also apply to other suicide "hot spots", including alternative jumping sites, and other high fatality suicide methods.

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**Table 10: Pay-offs following installation of the Clifton Suspension Bridge safety barrier (2009 prices)**

| | After 1 year (£m) | After 5 years (£m) | After 10 years (£m) |
|---|---|---|---|
| 1-year cohort | | | |
| – No displacement | -3.0 | -2.7 | -2.6 |
| – Displacement to other methods | -2.5 | -2.2 | -2.1 |
| 10 consecutive cohorts | | | |
| – No displacement | -3.0 | -22.4 | -44.0 |
| – Displacement to other methods | -2.5 | -20.0 | -40.0 |

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## 2.13 Collaborative care for depression in individuals with Type II diabetes

*Derek King, Iris Molosankwe, David McDaid*

### Context

Depression is commonly associated with chronic physical health problems. NICE has estimated that 20% of individuals with a chronic physical problem are likely to have depression,[i] while US data indicate that 13% of all new cases of Type II diabetes will also have clinical depression.[ii]

These patterns are important as evidence shows that co-morbid depression exacerbates the complications and adverse consequences of diabetes,[iii] in part because patients may more poorly manage their diabetes. Not only does this increase the risk of disability and premature mortality, it also has substantial economic consequences. Health care costs are higher, and productivity is lower due to reduced work performance, increased absenteeism and withdrawal from the labour force. In the UK, compared to people with diabetes alone, individuals with co-morbid depression and diabetes are four times more likely to have difficulties in self-managing their health and seven times more likely to have days off work.[iv] In the US, health care costs for those with severe depression and diabetes are almost double those with diabetes alone.[v]

### Intervention

'Collaborative care' can be delivered in a primary care setting to individuals with co-morbid diabetes and depression. Like 'usual care', collaborative care includes GP advice and care, the use of antidepressants and cognitive behavioural therapy (CBT) for some patients. The difference is that for collaborative care a GP practice nurse acts as a case manager for patients receiving care; GPs also incur additional time costs liaising with practice nurses.

Using a NICE analysis, it is estimated that the total cost of six months of collaborative care is £682, compared with £346 for usual care. A two-year evaluation in the US found that, on average, collaborative care achieved an additional 115 depression-free days per individual; total medical costs were higher in year 1, but there were cost savings in year 2.[vi]

### Impact

The model assessed the economic case for investing in six months of collaborative care in England for patients with newly diagnosed cases of Type II diabetes who screen positive for depression, compared with care as usual. The costs associated with screening are not included in the baseline model; we were given expert advice that in GP care all individuals with diabetes would already be screened for depression. The analysis assumed that 20% of patients under collaborative care would receive CBT, compared with 15% of the usual care group. Existing data on the cost-effectiveness of CBT were used to estimate the impact on health care and productivity losses.

Table 11 shows the estimated costs/savings for 119,150 new cases of Type II diabetes in England in 2009, assuming 20% screen positive for co-morbid depression. Completing and successfully responding to collaborative care leads to an additional 117,850 depression-free days in year 1 and 111,860 depression-free days in year 2. According to the model, the intervention results in substantial additional net costs in year 1 due to the costs of the treatment. In year 2, however, there are net savings for the health and social care system due to lower costs associated with depression in the intervention group, plus further benefits from reduced productivity losses. Using a lower 13% rate of co-morbid diabetes and depression, total net costs in year 1 would be more than £4.5m, while net savings in year 2 would be more than £450,000.

The study also estimated the incremental cost per Quality-Adjusted Life Year (QALY) gained, which over two years was £3,614. This is highly cost-effective in an English context.

**Table 11: Costs/pay-offs of collaborative care for new cases of Type II diabetes screened positive for depression in England (2009 prices)**

| | Year 1 (£) | Year 2 (£) |
|---|---|---|
| Health and social care | 7,298,860 | -385,240 |
| Productivity losses | -331,170 | -314,330 |
| Net cost/pay-off | 6,967,690 | -699,570 |

These estimates of the potential benefits are, however, very conservative. The model does not factor in productivity losses due to premature mortality, nor further quality of life gains associated with avoidance of the complications of diabetes, such as amputations, heart disease and renal failure. Nor does the analysis include long-term cost savings from reduced complications. These are potentially substantial: research in 2003 showed that for diabetes-relates cases the average initial health care costs of an amputation were £8,500 and for a non-fatal myocardial infarction £4,000.[vii] If, on average, costs of just £150 per year could be avoided for the intervention group then investment in collaborative care would overall be cost-saving from a health and social care perspective after just two years.

### Key points

- The intervention is cost-effective in an English context after two years, but has high net additional costs in the short term due to implementation costs.
- A wider-ranging analysis is merited to demonstrate the potential longer-term savings in health and social care costs due to reduced complications of diabetes.

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## 2.14 Tackling medically unexplained symptoms

*David McDaid, Michael Parsonage, A-La Park*

### Context

Somatoform conditions present physical symptoms for which there is no identifiable physical cause. These medically unexplained symptoms are thought to be triggered or exacerbated by mental and emotional factors, such as psychosocial stress, depression or anxiety. Somatoform conditions are commonly encountered in primary care and elsewhere in the NHS; it is estimated that in England 1.2% of working age adults consulting their GPs have full somatoform disorders, and a further 23.4% have sub-threshold levels.[i] Overall, for working age adults, it is estimated that somatoform conditions account for 22% of all primary care consultations, 7% of all prescriptions, 25% outpatient care, 8% of inpatient bed days and 5% of A&E attendances.

The financial costs to public services and society are considerable. NHS expenditure arising from working age patients with somatoform conditions has been estimated at £2.892bn for 2008/2009, equivalent to 11% of total expenditure on health care services for this population. In addition, sickness absence from work associated with somatoform conditions accounted for a further £5.235bn.[i]

### Intervention

Cognitive behavioural therapy (CBT) has been found to be an effective intervention for tackling somatoform conditions and their underlying psychological causes.[ii] Studies report a positive impact on symptoms and lower health care resource utilisation due to reduced primary care consultations and the avoidance of unnecessary diagnostic tests and invasive procedures.[iii] [iv] The limited data indicates that 40% of individuals receiving CBT continue to report much improved, or very much improved, somatisation (physical symptoms caused by mental or emotional factors) 15 months after treatment, compared with just 5% of those who receive treatment as usual. iii

A course of CBT may last for 10 sessions at £40 per session. Costs associated with the need to raise the awareness of GPs to the potential role of CBT treatment for somatoform conditions, either through e-learning or (much more expensively) face-to-face training are also included. These include costs associated with encouraging GPs to attend regional workshops prior to e-learning, and the costs of lcums while GPs are attending face-to-face courses.

### Impact

The model looks at the impact on costs in England, over three years, of the CBT intervention for working age individuals in England who present to GPs with somatoform conditions. Based on existing studies, it is assumed that 50% of those offered CBT (after six months observation) take up the treatment, and that patients who improve will avoid the additional utilisation of health care resources commonly associated with somatoform conditions. While no data are available on clinical effectiveness beyond 21 months, the model assumes that the benefits are maintained until the end of year 3. The economic analysis looks at the costs to the health care system and the impact on productivity as a result of somatoform-related sickness absence from work.

The results show the impact on net costs and the cost per QALY gained. When all patients with somatoform conditions (sub-threshold and full disorders) receive CBT, and e-learning is used to increase GP awareness, the model shows an overall saving of £639m over three years, nearly all because of reduced sickness absence (Table 12). The impact on the NHS is broadly cost-neutral. If the more costly option of face-to-face GP training is used, net NHS costs increase by £143m, but the cost per QALY gained is only £3,402 which would be considered highly cost-effective. Also taking into account reduced sickness absence, the model shows that

**Table 12: Annual costs/pay-offs impact of investment in CBT for sub-threshold and full somatoform disorders (with e-learning for GPs) (2009 prices)**

| | Year 1 (£m) | Year 2 (£m) | Year 3 (£m) | Total (£m) |
|---|---|---|---|---|
| CBT awareness training for GPs | 0.6 | 0 | 0 | 0.6 |
| CBT cost | 847.6 | 0 | 0 | 847.6 |
| GP consultations | -45.8 | -45.1 | -44.5 | -135.3 |
| Prescriptions | -13.3 | -13.1 | -12.9 | -39.2 |
| Outpatient consultations | -5.8 | -19.7 | -19.5 | -45.0 |
| Inpatient stays | -82.2 | -181.7 | -179.0 | -442.9 |
| A&E attendances | -64.3 | -63.3 | -62.4 | -190.0 |
| **Net NHS costs** | **636.9** | **-322.9** | **-318.2** | **-4.2** |
| Productivity losses | -214.7 | -211.6 | -208.5 | -634.8 |
| Net NHS and productivity costs | 422.2 | -534.5 | -526.7 | -639.1 |

CBT for all somatoform conditions with face-to-face GP learning would start to be cost-saving in year 3. A variety of sensitivity analyses were conducted. For instance, if we assume that all individuals treated for medically unexplained symptoms received 15 sessions of therapy at £50 per session then total costs of the CBT treatment would rise to £1.59bn, with net costs to the NHS of £737m at a cost per QALY gained of £17,527.

The analysis also demonstrates the higher returns available when the intervention is targeted solely on patients with full somatoform disorders. In this scenario, the model shows that the net impact of the intervention is cost-saving to the NHS after two years if face-to-face GP training is used, and after just one year (saving around £60m in year 1) if e-learning is used. In both cases, net cost savings are improved when the analysis includes reduced sickness absence of around £40m a year.

### Key points

- While the economic case for CBT is most compelling if resources are targeted at those with full somatoform disorders, the case for also tackling sub-threshold conditions is strong. All models are likely to be cost saving in the long term.
- The model relies on evidence of effectiveness from US studies, which may not be easily generalisable to an English context. However, sensitivity and threshold analyses indicate that – even assuming very limited improvements in health outcomes – investing in actions to tackle somatoform disorders remains cost-effective from a societal perspective under most scenarios.
- More information is required on the relative effectiveness of e-learning compared to face to face learning as a way of raising GP awareness as costs are substantially lower.

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## 2.15 Befriending of older adults 2.15

*Annette Bauer, Martin Knapp, Margaret Perkins*

### Context

Befriending initiatives, often delivered by volunteers, provide an 'upstream' intervention that is potentially of value both to the person being befriended and the 'befriender'. For those receiving the intervention, particularly older people, it promotes social inclusion and reduces loneliness;[i] for the befriender, there is the personal satisfaction of contributing to the local community by offering support and skills. Specific potential benefits include the improved mental well-being of the person receiving the intervention, a reduced risk of depression, and associated savings in health care costs.

### Intervention

In a typical befriending intervention, a befriender visits a person in their home, usually on a one-to-one basis, where that individual has requested and agreed to such a contact. The intervention is not usually structured and nor does it have formally-defined goals. Instead an informal, natural relationship develops between the participants, who will usually have been matched for interests and preferences. This relationship facilitates improved mental health, reduced loneliness and greater social inclusion. A recent research review confirmed that, compared with usual care and support (which may mean no intervention at all), befriending has a modest but significant effect on depressive symptoms, at least in the short term.[ii] Another evaluation showed decreased depression and anxiety in 5% of people receiving socio-emotional interventions, including befriending.[iii]

The contact is generally for an hour per week or fortnight. The cost to public services of 12 hours of befriending contact is estimated at £85, based on the lower end of the cost range for befriending interventions.[iv]

### Impact

The model looked at the cost-effectiveness of befriending interventions in terms of the reduction in depressive symptoms and the consequent decline in the use of health services by the recipient of the intervention. The intervention is assumed to be targeted at lonely and isolated individuals aged over 50. The analysis included costs/savings associated with the use of mental health services, primary care, hospital services and medication; home helps, but no other social care services, were included. The model did not factor in any benefits to the befriender.

Using existing estimates of savings associated with reduced treatment of depression,[v] the model found total gross cost savings to the NHS were around £40 (at 2008/9 prices) in year 1 for every £85 invested in the intervention. Thus, befriending schemes do not appear to be cost-saving from a public expenditure perspective.

If the analysis includes the quality of life benefits associated with reduced depressive symptoms, then befriending schemes have the potential to create further improvements worth £270 per person and are likely to be cost-effective with an incremental cost effectiveness ratio (ICER) of around £2,900.

### Key points

- Befriending interventions are unlikely to achieve cost savings to the public purse, but they do improve an individual's quality of life at a low cost.
- The targeting of at-risk groups (e.g. older people discharged from hospital or mothers at risk of post-natal depression) would potentially offer better returns on an investment in befriending, and this could be explored through further research.

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## 3. SUMMARY IMPACTS

The estimated economic pay-offs per £ of expenditure from each of these fifteen models can be pulled together in summary tables, distinguishing pay-offs for the NHS, other public sector bodies, and non-public sector impacts, and also separating impacts in the short term (in the first year), medium term (in years 2 to 5) and long term (year 6 and beyond). It should be reiterated that for some interventions it was not possible to estimate the potential pay-offs across the full span of sectors or for many years, even though it might be expected that there would be such impacts.

In Tables 13–16, the symbol '–' indicates that the economic pay-off could not be estimated, whereas '0' indicates a genuine zero. Comparisons between interventions should therefore be made only with caution.

**Table 13: Total returns on investment (all years): economic pay-offs per £1 expenditure [a]**

| | NHS | Other public sector | Non-public sector | Total |
|---|---|---|---|---|
| **Early identification and intervention as soon as mental disorder arises** | | | | |
| Early intervention for conduct disorder | 1.08 | 1.78 | 5.03 | 7.89 |
| Health visitor interventions to reduce postnatal depression | 0.40 | – | 0.40 | 0.80 |
| Early intervention for depression in diabetes | 0.19 | 0 | 0.14 | 0.33 |
| Early intervention for medically unexplained symptoms [b] | 1.01 | 0 | 0.74 | 1.75 |
| Early diagnosis and treatment of depression at work | 0.51 | – | 4.52 | 5.03 |
| Early detection of psychosis | 2.62 | 0.79 | 6.85 | 10.27 |
| Early intervention in psychosis | 9.68 | 0.27 | 8.02 | 17.97 |
| Screening for alcohol misuse | 2.24 | 0.93 | 8.57 | 11.75 |
| Suicide training courses provided to all GPs | 0.08 | 0.05 | 43.86 | 43.99 |
| Suicide prevention through bridge safety barriers | 1.75 | 1.31 | 51.39 | 54.45 |
| **Promotion of mental health and prevention of mental disorder** | | | | |
| Prevention of conduct disorder through social and emotional learning programmes | 9.42 | 17.02 | 57.29 | 83.73 |
| School-based interventions to reduce bullying | 0 | 0 | 14.35 | 14.35 |
| Workplace health promotion programmes | – | – | 9.69 | 9.69 |
| **Addressing social determinants and consequences of mental disorder** | | | | |
| Debt advice services | 0.34 | 0.58 | 2.63 | 3.55 |
| Befriending for older adults | 0.44 | – | – | 0.44 |

*Notes:*

a Returns on investment calculated as gross economic pay-offs divided by expenditure on the intervention. Depending on the availability of data, these returns may be calculated over different time periods for different interventions; see Section 2 and Tables 14–16 for details. Returns and expenditures discounted back to present values, expressed in 2009/10 prices.

b For e-learning of GPs, plus CBT for all people with somatoform conditions (including sub-threshold cases as well as those with full somatoform disorders).

**Table 14: Short-term returns on investment (year 1): economic pay-offs per £1 expenditure [a]**

| | NHS | Other public sector | Non-public sector | Total |
|---|---|---|---|---|
| **Early identification and intervention as soon as mental disorder arises** | | | | |
| Early intervention for conduct disorder | 0.14 | 0.13 | 0 | 0.28 |
| Health visitor interventions to reduce postnatal depression | – | – | – | – |
| Early intervention for depression in diabetes | 0.06 | 0 | 0.05 | 0.11 |
| Early intervention for medically unexplained symptoms [b] | 0.25 | 0 | 0.25 | 0.50 |
| Early diagnosis and treatment of depression at work | 0 | – | 1.96 | 1.96 |
| Early detection of psychosis | -1.00 | 0 | 0 | -1.00 |
| Early intervention in psychosis | 5.70 | 0.12 | 0 | 5.82 |
| Screening for alcohol misuse | 0.61 | 0.25 | 2.31 | 3.17 |
| Suicide training courses provided to all GPs | 0.04 | 0.03 | 18.97 | 19.04 |
| Suicide prevention through bridge safety barriers | 0.02 | 0.06 | 2.32 | 2.40 |
| **Promotion of mental health and prevention of mental disorder** | | | | |
| Prevention of conduct disorder through social and emotional learning programmes | 0.29 | 0.33 | 0.32 | 0.95 |
| School-based interventions to reduce bullying | 0 | 0 | 0 | 0 |
| Workplace health promotion programmes | – | – | 9.69 | 9.69 |
| **Addressing social determinants and consequences of mental disorder** | | | | |
| Debt advice services | 0 | 0.58 | 0.05 | 0.63 |
| Befriending for older adults | 0.44 | – | – | 0.44 |

*Notes:*

a Returns on investment calculated as gross economic pay-offs divided by expenditure on the intervention. Depending on the availability of data, these returns may be calculated over different time periods for different interventions; see Section 2 and Tables 14–16 for details. Returns and expenditures discounted back to present values, expressed in 2009/10 prices.

b For e-learning of GPs, plus CBT for all people with somatoform conditions (including sub-threshold cases as well as those with full somatoform disorders).

**Table 15: Medium-term returns on investment (years 2–5): economic pay-offs per £1 expenditure [ab]**

| | NHS | Other public sector | Non-public sector | Total |
|---|---|---|---|---|
| **Early identification and intervention as soon as mental disorder arises** | | | | |
| Early intervention for conduct disorder | 0.13 | 0.13 | 0.05 | 0.30 |
| Health visitor interventions to reduce postnatal depression | – | – | – | – |
| Early intervention for depression in diabetes[c] | 0.13 | 0 | 0.09 | 0.22 |
| Early intervention for medically unexplained symptoms [d] | 0.75 | 0 | 0.49 | 1.25 |
| Early diagnosis and treatment of depression at work | 0.51 | - | 2.56 | 3.07 |
| Early detection of psychosis | 1.74 | 0.32 | 3.37 | 5.43 |
| Early intervention in psychosis | 3.98 | 0.10 | 3.60 | 7.69 |
| Screening for alcohol misuse | 1.41 | 0.59 | 5.40 | 7.40 |
| Suicide training courses provided to all GPs | 0.03 | 0.01 | 21.15 | 21.19 |
| Suicide prevention through bridge safety barriers | 0.64 | 0.42 | 16.66 | 17.73 |
| **Promotion of mental health and prevention of mental disorder** | | | | |
| Prevention of conduct disorder through social and emotional learning programmes | 5.39 | 9.42 | 33.49 | 48.30 |
| School-based interventions to reduce bullying | 0 | 0 | 0 | 0 |
| Workplace health promotion programmes | – | – | – | – |
| **Addressing social determinants and consequences of mental disorder** | | | | |
| Debt advice services | 0.34 | 0 | 2.58 | 2.92 |
| Befriending for older adults | – | – | – | – |

*Notes:*

a Returns on investment calculated as gross economic pay-offs divided by expenditure on the intervention. Depending on the availability of data, these returns may be calculated over different time periods for different interventions; see Section 2 and Tables 14–16 for details. Returns and expenditures discounted back to present values, expressed in 2009/10 prices.

b Estimated returns for some interventions are not available for all years; see Section 2 for these details.

c Estimates for this model only cover year 2; estimates for further years are not available.

d For e-learning of GPs, plus CBT for all people with somatoform conditions (including sub-threshold cases as well as those with full somatoform disorders).

**Table 16: Long-term returns on investment (year 6 onwards): economic pay-offs per £1 expenditure [ab]**

| | NHS | Other public sector | Non-public sector | Total |
|---|---|---|---|---|
| **Early identification and intervention as soon as mental disorder arises** | | | | |
| Early intervention for conduct disorder | 0.81 | 1.52 | 4.98 | 7.31 |
| Health visitor interventions to reduce postnatal depression | - | - | - | - |
| Early intervention for depression in diabetes | - | - | - | - |
| Early intervention for medically unexplained symptoms [c] | 0 | 0 | 0 | 0 |
| Early diagnosis and treatment of depression at work | - | - | - | - |
| Early detection of psychosis | 1.88 | 0.47 | 3.48 | 5.84 |
| Early intervention in psychosis | 0 | 0.05 | 4.42 | 4.47 |
| Screening for alcohol misuse | 0.22 | 0.09 | 0.86 | 1.18 |
| Suicide training courses provided to all GPs | 0.01 | 0.01 | 3.74 | 3.76 |
| Suicide prevention through bridge safety barriers | 1.09 | 0.83 | 32.31 | 34.23 |
| **Promotion of mental health and prevention of mental disorder** | | | | |
| Prevention of conduct disorder through social and emotional learning programmes | 3.75 | 7.25 | 23.48 | 34.48 |
| School-based interventions to reduce bullying | 0 | 0 | 14.35 | 14.35 |
| Workplace health promotion programmes | – | – | – | – |
| **Addressing social determinants and consequences of mental disorder** | | | | |
| Debt advice services | – | – | – | – |
| Befriending for older adults | – | – | – | – |

*Notes:*

a Returns on investment calculated as gross economic pay-offs divided by expenditure on the intervention. Depending on the availability of data, these returns may be calculated over different time periods for different interventions; see Section 2 and Tables 14–16 for details. Returns and expenditures discounted back to present values, expressed in 2009/10 prices.

b Estimated returns for some interventions are not available for all years; see Section 2 for these details.

c For e-learning of GPs, plus CBT for all people with somatoform conditions (including sub-threshold cases as well as those with full somatoform disorders).

## 4. CONCLUSIONS

We stress again that the interventions examined and modelled here are not necessarily the only ones for which there may be an economic case: they are the interventions for which we were able to find sufficient evidence to build economic models. We would also emphasise that we have reported our findings for every intervention we modelled: nothing has been dropped because the economic case was weak or for other reasons.

The results of these models suggest some general conclusions:

- **Value for money** Even though the economic modelling is based on conservative assumptions, many interventions are seen to be outstandingly good value for money.

- **Self-financing** A number of interventions are self-financing over time, even from the narrow perspective of the NHS alone. However, the scope for 'quick wins', in the sense of very short payback periods for the NHS, is relatively limited.

- **Range of impacts** Many interventions have a broad range of pay-offs, both within the public sector and more widely (such as through better educational performance, improved employment/earnings and reduced crime).

- **Timescales** In some cases the pay-offs are spread over many years. Most obviously this is the case for programmes dealing with childhood mental health problems, which in the absence of intervention have a strong tendency to persist throughout childhood and adolescence into adult life. However, the overall scale of economic pay-offs from these interventions is generally such that their costs are fully recovered within a relatively short period of time.

- **Low cost** Many interventions are very low cost. A small shift in the balance of expenditure from treatment to prevention/promotion should generate efficiency gains.

- **Range of interventions** The interventions included in the analysis cover a wide range, from the prevention of childhood conduct disorder to early intervention for psychosis, practical measures to reduce the number of suicides and well-being programmes provided in the workplace. Many of these interventions are an NHS responsibility, but the analysis also highlights opportunities for the NHS to work closely in partnerships with other organisations and in jointly funded programmes.

- **Programme design and implementation** In many cases the modelling of economic impacts reveals the importance of key elements of programme design and implementation such as targeting, take-up and drop-out, although we have not reported details here. One consequence is that for some interventions the most cost-effective action when refining a programme may be to increase take-up among high-risk groups or to improve completion rates, rather than to broaden coverage of the intervention.

- **Evidence-based** Finally, it should be emphasised once again that each of the modelled interventions is evidence-based, in the sense of having been shown to be effective in improving mental health. The economic analyses summarised in this report show that, *over and above these gains in health and quality of life*, the interventions also generate very significant economic benefits including savings in public expenditure.