

EFFECTIVE INTERVENTIONS IN SCHIZOPHRENIA

THE ECONOMIC CASE

A report prepared for the Schizophrenia Commission



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FOREWORD

This report has been produced to support the work of the Schizophrenia Commission during its year-long inquiry into the care, treatment and outcomes for people with schizophrenia and psychosis. This illness is highly distressing, with a 15-20 year mortality gap compared to the general population. The human costs are immense, but so too are the financial costs. For example, the cost of schizophrenia to English society is £11.8 billion per year.

Bringing the information together for this report has been challenging. Although building on research that some of us (Michael, Paul, myself) have undertaken over a period of many years, it has been hugely influenced by the other two authors: by Marija's MSc work on peer support and particularly by Alison's 'summer job' at LSE, when she searched energetically, analysed expertly and summarised results clearly across a wide span of topics.

It will be clear from the report that there are areas where we still know little about the costs of delivering services and even less about the longer-term economic impacts. Nevertheless, there is robust evidence around some interventions, making a strong economic case for change. We hope that the work of the Schizophrenia Commission can drive forward some of the changes required to improve quality of care and quality of lives.

We are grateful to members of the Schizophrenia Commission for their support, especially to Liz Meek and Robin Murray for comments, and we are particularly grateful to Vanessa Pinfold for her enthusiasm throughout the process of pulling this together. We would also like to thank Paul Rowlands and Mike Akroyd from Derbyshire Healthcare NHS Foundation Trust, and Sophia Winterbourne (LSE) for access to very useful information.

The work for this report was funded by the Personal Social Services Research Unit at the LSE. The authors have no conflicts of interest to declare except that I am a Vice President of the British Association of Counselling and Psychotherapy.

A handwritten signature in black ink, appearing to read 'Martin Knapp', with a long horizontal stroke underneath.

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EXECUTIVE SUMMARY

This report describes the main costs associated with schizophrenia and assesses the economic case for a broad range of effective interventions that, if made more widely available, could lead to better outcomes and potentially reduce costs.

CURRENT COSTS OF SCHIZOPHRENIA

Schizophrenia has very significant economic consequences. Costs fall on many different parts of society, especially on individuals with schizophrenia and their families. Overall, the total societal cost in England is estimated at £11.8 billion per year and the cost to the public sector at £7.2 billion. This equates to an average annual cost to society of £60,000 and to the public sector of £36,000 per person with schizophrenia.

These costs arise in many different ways. Some direct costs of schizophrenia appear both as costs to society and to the public sector: examples are in-patient hospital costs and support from community mental health teams. Other costs, such as those associated with unpaid care by family or friends, are very real costs for society but do not have a direct impact on public spending. Lost potential output due to higher unemployment rates and premature mortality for people with schizophrenia represent huge costs for society and also translate into indirect costs for the public sector via the loss of tax revenue. We identify eight key cost drivers associated with schizophrenia: inpatient time; disrupted / loss of employment; disrupted education; homelessness; physical health problems; substance misuse; contact with the criminal justice system; and the impact on the family.

In our work we found many areas where the availability and quality of economic evidence were disappointing, both in terms of accurately estimating the true costs associated with schizophrenia and in being able to draw firm conclusions. We identified a particular lack of evidence relating to costs incurred through disrupted educational opportunities, homelessness and contact with the criminal justice system.

Due to the nature of schizophrenia, many related costs are non-retrievable. Our work focused on areas of the current care and treatment system in England that could potentially be made more cost-effective.

EVALUATING VARIOUS INTERVENTIONS

There are a wide range of interventions that are relevant for the care and treatment of people with schizophrenia. In this work we have looked at: early interventions; Individual Placement and Support schemes; family therapy; diversion from the criminal justice system; physical health; substance misuse; targeting homelessness and supported housing; crisis teams; the role of peer-support workers; advanced treatment directives; and cognitive behaviour therapy.

When assessing the various interventions, we were hampered by the lack of robust economic evidence relating to some of them, in particular physical health interventions, advanced treatment directives and criminal justice interventions.

There is nevertheless strong evidence that several interventions not currently in widespread use could reduce the overall cost of schizophrenia while improving health and quality of life outcomes for people with the illness and for their families. One intervention for which there is strong cost-effectiveness evidence, but which is not available to many people, is Individual Placement and Support, which aims to help people with schizophrenia find competitive employment. We also found good evidence that family therapy, currently offered to very few people with schizophrenia, was cost-effective. In other areas – such as physical health, substance misuse, peer-support, advanced treatment directives and interventions to tackle homelessness – we found some evidence of cost-effectiveness but not enough to draw firm conclusions.

The evidence we identified came down strongly in support of early intervention services that, although currently in widespread use, might be under threat in an era of austerity. There is also evidence that other interventions which are already in place, such as crisis teams, could be utilised more effectively.

In many cases, economic advantages might take many years to be fully realised. For example, interventions to improve the physical health of people with schizophrenia can be effective and cost-effective, but with impacts that show themselves over quite a long period. The full economic consequences of early intervention services will also not be seen immediately; and the (so far unmeasured)

consequences of disrupted education would certainly have long-term economic consequences. When costs and benefits occur over long time periods it can be difficult to obtain accurate estimates of the economic impacts of interventions, since the data are rarely available. It may also be particularly difficult in the current era of austerity to argue successfully for interventions where savings only become apparent over relatively long timescales.

Costs and savings relating to interventions do not always arise in the same area of public spending. One consequent challenge is likely to be a need for negotiation to agree joint courses of action across government departments, local council budget areas or more widely. A good example would be interventions to tackle homelessness which can originate in a number of different sectors, and have pay-offs similarly across a wide range of budgets.

It is also the case that many interventions can cost more than they save. Here decision-makers will need to ask whether the improved outcomes that are generated justify the costs that will be incurred.

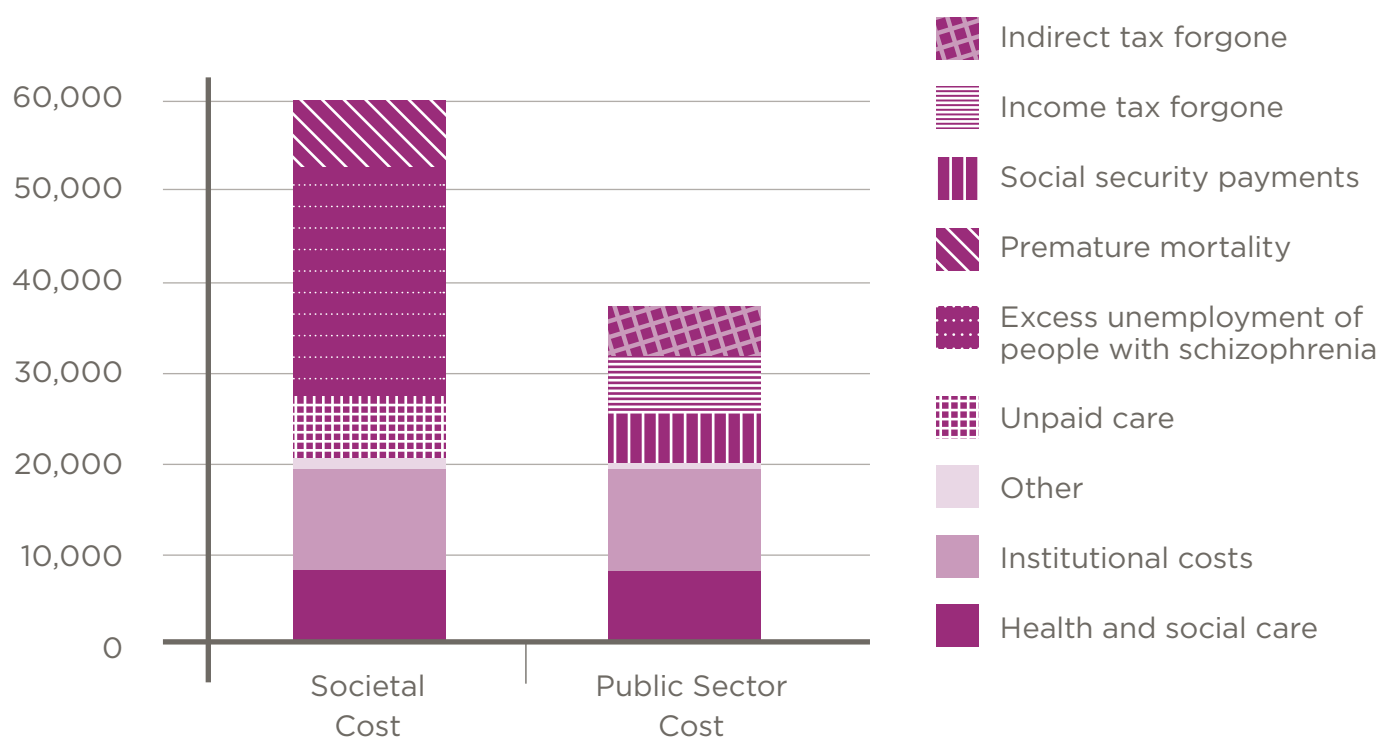
CONCLUSIONS

It was not our intention with this report to recommend a particular ‘package’ of ideal interventions, rather to offer a summary of evidence on costs and cost-effectiveness as a platform for discussion. Our review has established that there are areas of the current system for the care and treatment of people with schizophrenia in England that could be made more cost-effective. There is robust evidence around some interventions which suggests a strong economic case for change.

CURRENT COSTS OF SCHIZOPHRENIA

Schizophrenia has very significant economic consequences; the costs impact on many different parts of society, especially on individuals with schizophrenia and their families. Overall, schizophrenia is estimated to cost English society £11.8 billion per year and the public sector £7.2 billion.¹ This amounts to an average annual cost to society of £60,000 and to the public sector of £36,000 per person with schizophrenia.

Figure 1: Annual costs of schizophrenia to society and the public sector (£,2010/11 prices, per person with schizophrenia)



1. Estimates made from uprating cost estimates by Mangalore and Knapp (2007) to 2010/11 prices (using price indices specific to each cost area), uprating estimated number of people with schizophrenia in England to the recent estimate by NICE of 197,000 (www.nice.org.uk/usingguidance/commissioningguides/schizophrenia) and using an 18% average indirect tax and an 18% average income tax on all earnings. Figures reported here do not include the more intangible costs of the pain and suffering incurred by individuals with schizophrenia and their loved ones.

Figure 1 shows how these cost estimates break down. Some direct costs of schizophrenia, such as in-patient hospital costs and support from community mental health teams, are common components of both the cost to the public sector and the cost to society. Other costs, such as unpaid care, do not cost the public sector directly but are still very real costs for society. Lost potential output due to elevated unemployment rates and premature mortality for people with schizophrenia translate into huge costs for society and also translate into costs for the public sector via the loss of tax revenue.

Evidently, schizophrenia is hugely expensive both to the public purse and society at large. Due to the nature of the condition many of these costs are non-retrievable – no treatment or therapy will be able to get every service user into full-time employment for example, and expensive treatments and medications may always be required. In this report, however, we contend that there are areas of the current system for the care and treatment of people with schizophrenia in England that could be made more cost-effective. The purpose of the report is to summarise the main economic impacts of schizophrenia, and then to consider a range of interventions (using that term broadly) that, if made more widely available, could lead to better outcomes and lower costs. It is not our intention to recommend a particular ‘package’ of ideal interventions, rather to offer a summary of evidence on costs and cost-effectiveness as a platform for discussion.

There are a number of important elements in the overall costs of schizophrenia summarised in Figure 1, and it is helpful to focus on some of the key *cost drivers*. In fact, we can identify eight key cost drivers associated with schizophrenia: areas, events or experiences that account for or help to explain significant proportions of the cost associated with schizophrenia. By considering each of these drivers we can subsequently focus on interventions that may have the potential to reduce the economic impact of these drivers while maintaining or improving the health and well-being of individuals with schizophrenia and their families.

Most of the evidence that we summarise in this report relates to people with schizophrenia, although sometimes the studies that we discuss looked at a wider group of people, such as people with the diagnosis of schizophrenia and other psychotic illnesses, or people with serious or severe mental illnesses. We have endeavoured to be clear about the groups of people covered as we discuss the evidence. We recognise that the term schizophrenia and psychosis in clinical services are used interchangeably but most research uses the term ‘schizophrenia’.

INPATIENT TIME

Most individuals with schizophrenia have at least one inpatient stay, with a high probability of readmission (Allardyce & Os 2010). Inpatient time accounts for a very significant proportion of the costs associated with schizophrenia, roughly 38% of all health, social care and institutional costs associated with the condition, and roughly 21% of all public sector costs.² The average cost of a night in a mental health inpatient bed in England is £321 (Curtis 2011). Hospital Episode Statistics (HESonline 2011) show that the median length of admission is 38 days, translating into an estimated cost of £12,198 per admission.³ Typically, compulsory (or formal) admissions under the Mental Health Act are longer than this, and thus translate into higher costs than voluntary admissions. Due to the very high costs associated with inpatient services, interventions that reduce the probability of admission or reduce the expected length of stay can translate into very significant cost savings, although this should not be at the expense of poorer health, quality of life or other outcomes.

For many people with schizophrenia, an inpatient admission is a necessary and perhaps important turning point in the course of their illness, but in other instances admission could be avoided if more and better interventions were available outside the inpatient setting. Likewise, in terms of reducing the length of admission, a recent Cochrane review (although the included studies were dated) found no evidence of adverse outcomes from shorter

2. Calculated from Mangalore and Knapp (2007).

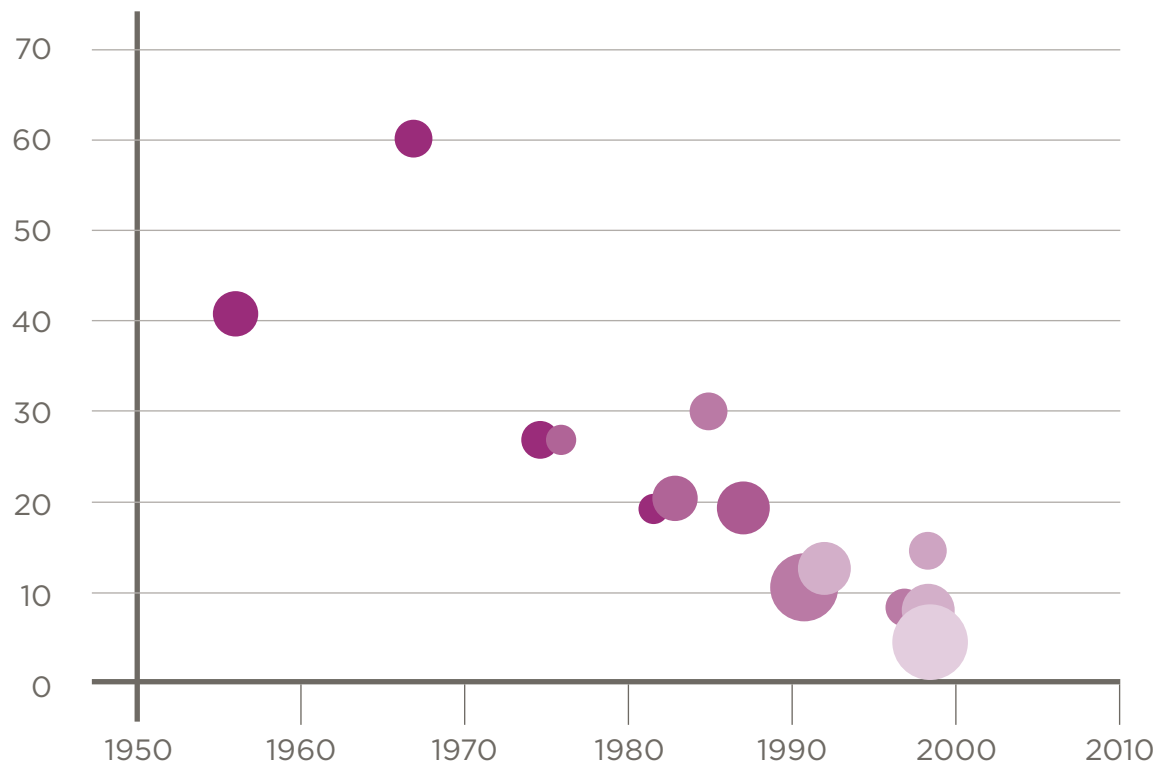
3. Mean length of stay is 130 days. Data are heavily skewed due to a small proportion of individuals who are admitted to long-stay units.

hospital stays and some evidence of benefits (Alwan et al. 2010). Recent work by the Audit Commission (2010) found large variations in inpatient use between different Primary Care Trusts; specifically it found a five-fold variation in admission rates for psychosis, 12-fold variation in psychosis bed days and a 14-fold variation in length of stay.⁴ The report estimated that if all trusts achieved the median rate of bed days then this would reduce total bed use by 15%, resulting in an economic benefit of £221 million⁵ to mental health services.

DISRUPTED / LOSS OF EMPLOYMENT

Whilst the employment rate for all adults aged 16-64 years in England is currently 71%⁶, recent estimates place the employment rate for people with schizophrenia as between 5 and 15%⁷ (Marwaha & Johnson 2004). Evidence summarised in Figure 2 suggests that the employment rate for people with schizophrenia has fallen significantly over the past half century – a time frame over which the employment rate for the population as a whole has risen. There is a noticeable lack of more recent statistics reporting the employment rate for people with schizophrenia in the UK.

Figure 2: Reported employment rates in 15 studies of people with schizophrenia in the UK; circle areas represent sample size. Data taken from Marwaha and Johnson (2004)



4. All rates weighted for need.

5. Updated to reflect current prices using the Pay and Prices Index in Curtis (2011).

6. Source: www.ons.gov.uk/ons/about-ons/who-we-are/services/unpublished-data/social-survey-data/aps/index.html

7. Estimates between 1990 and 2004.

The exceptionally low employment rate for people with schizophrenia represents a huge loss of productive capacity. Assuming an employment rate of 7% for people with schizophrenia (the weighted average of all studies since 1995) and an employment rate of 71% in the general population, then schizophrenia causes – or is associated with – a 64-percentage point decrease in the probability of being competitively employed. Using an estimate of gross annual median earnings of £21,300⁸ this is equivalent to an expected loss of productive capacity of £13,600 per year per individual (2011/12 price levels). The use of *mean* gross annual earnings⁹ (£26,900) gives an estimated loss of productive capacity of £17,200 per individual, which can be scaled up to give an expected loss to the English economy of £3.4 billion each year.

The low employment rate has knock-on effects on the finances of the public sector through losses in tax revenue and payments of social security benefits. Assuming an 18% average direct tax rate (income tax) and an 18% average indirect tax rate (VAT),¹⁰ this translates into £715 million of tax revenue forgone (or £5500 per service user) per annum.

Low rates of employment also translate into higher dependence on social security benefits. Updating the evidence presented by Mangalore and Knapp (2007) to current prices gives an estimated receipt of benefits of £5500 per service user per year (assuming that 77.6% of economically inactive people with schizophrenia are in receipt of benefits). If, in the absence of other information, we assume that the same proportion of the general population who are economically inactive are in receipt of benefits to the same value, we find an average benefit receipt for the general population of around £1900. (This is likely to be an over-estimate since most members of the general population would not be entitled to incapacity benefit.) These estimates suggest an excess of £3600 is paid in benefits per service user per year, or a total of £470 million per year.

Of course the counterfactual used in the above scenario is unrealistic – even the most effective interventions in schizophrenia do not produce employment rates and wage rates on a par with the average for the general population – so the above suggested losses in terms of tax revenue and benefits could never be fully recovered. However, there are very significant savings that could be made if the employment rate for people with schizophrenia could be improved. The economic gains to society resulting from a cautious scenario where 50% of people with schizophrenia were employed at an average of 20 hours a week at the National Minimum Wage would be in the order of £350 million, including a saving of around £120 million to the public finances.

There is no evidence to suggest that increasing employment rates for people with schizophrenia leads to detrimental outcomes. Indeed there is evidence that the converse is true, that successful gain of competitive employment by individuals who want it (and the vast majority do) leads to improved clinical outcomes (Kilian et al. 2012). This improvement in clinical state can generate knock-on savings elsewhere, for example in health service costs.

DISRUPTED EDUCATION

Schizophrenia most often develops in late adolescence or early adulthood – years that are key for developing skills and knowledge that will provide benefit and increase earnings potential throughout life. The debilitating nature of the condition, particularly in the first few years after onset, often forces people with schizophrenia to leave education or training earlier than they would otherwise have done. Surprisingly few studies have addressed the costs of missed educational and training opportunities due to the condition.

A recent report for the department of Business, Innovation and Skills found that the marginal return to an undergraduate degree was 27.4% (when compared to having two or more GCE A levels) (London Economics 2011b).

8. Taken from the annual survey of hours and earnings (ASHE), 2011.

Source: www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-235202

9. Taken from the annual survey of hours and earnings (ASHE), 2011.

Source: www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-235202

10. The use of an indirect tax rate in this estimation accounts for the tax revenue forgone due to reduced consumer spending as a result of the fall in earnings. Rate taken from Adam and colleagues (2012).

This translated into a lifetime net benefit to the individual of £108,000 (current prices, discounted at 3.5% per annum) and to the exchequer of £89,000. Thus, for every young person who has to forgo a university education because of schizophrenia the result would be a lost net benefit of £197,000 to society.

Likewise, for many young people the development of schizophrenia means they miss vocational education and training opportunities. For example, if a young person enrolled for a BTEC level 2 qualification could not complete this qualification because of developing schizophrenia, this is estimated to result in forgoing a 12% wage gain, resulting in a forgone net benefit to society of between £54,000 and £104,000 over a lifetime (London Economics 2011a).

HOMELESSNESS

A recent naturalistic study found that 33% of a sample of people with schizophrenia drawn from London and Leicester had been homeless at some stage and 13% had been roofless. This compared to figures of 9% and 6% for France, and 8% and 3% for Germany (Bebbington et al. 2005). Whilst these figures may not be representative of the UK more widely, since large conurbations such as London and Leicester will have higher rates of homelessness as homeless people from other areas tend to drift to large cities, they do suggest major failings in the current systems that leave large proportions of people with schizophrenia highly vulnerable to violence, theft, substance misuse and further deteriorating mental and physical health.

Homelessness represents a huge waste of potential in our society. Unemployment is both a cause and consequence of homelessness. The homeless are five times less likely to be employed than the population as a whole (Crisis UK 2012) and being homeless creates very significant barriers to subsequently re-entering employment. For many people, being homeless means having no fixed address for mailings and not being able to open a mainstream bank account, making it harder to find work (Stansbury & Phahey 2011).

Homelessness also has significant direct costs to the exchequer. Estimates of the (gross) annual costs of homelessness to the public sector lie between £24,000 and £30,000 per homeless person (Department for Communities and Local Government 2012). It is not easy to attribute costs specifically to homelessness as many costly phenomena, such as substance misuse, criminal behaviour and poor health, are both causes and results of homelessness. However, it is clear that homelessness is not only an appalling experience for an individual, but that it also has wide-ranging economic consequences for them and society.

PHYSICAL HEALTH PROBLEMS

It is now widely recognised that schizophrenia increases the probability of poor physical health (Leucht, et al., 2007). As a result, there is a significant mortality gap between people with schizophrenia and the general population: a recent systematic review estimated that the age-adjusted all-cause mortality rate amongst people with schizophrenia was 2.58 times higher than for the general population (Saha et al. 2007). A proportion of this elevated mortality rate is due to an increased risk of suicide, but individuals with schizophrenia were found to have increased mortality rates in most major 'cause of death' categories.

Schizophrenia increases risk factors for many physical health problems. Analysis of the clinical records of 1.7 million people found that 61% of people with schizophrenia smoked compared to 33% of people without schizophrenia, and that 33% of people with schizophrenia were obese compared to 21% of people without (Hippisley-Cox & Pringle 2005). Many antipsychotic medications (particularly second generation ones) are associated with weight gain (Connolly 2005). Combined, these factors mean that people with schizophrenia face a higher risk of developing many physical health problems.

Until fairly recently the physical health of people with schizophrenia has not been a policy priority despite this very substantial physical health inequality: individuals with schizophrenia are significantly less likely to have had a recent cervical smear, a recent blood pressure recording, a recent cholesterol test or be on aspirin as a prophylaxis for stroke

(Hippisley-Cox & Pringle 2005). There are also economic arguments to be made: physical health problems translate into additional health service expenditure, lost productivity and increased reliance on social care services, resulting in significant economic losses.

SUBSTANCE MISUSE

Quite a high proportion of individuals with schizophrenia are substance misusers. Data from the European Schizophrenia Cohort identified an overall substance dependence in 42% of participants in London and 28.3% in Leicester, placing the two UK cities first and third out of eight European cities looked at in that study (Carrà et al. 2012). That study also estimated a prevalence rate for alcohol misuse of 26.1% compared to 11.9% in the general population, and a prevalence rate for the misuse of all other substances of 17.8% compared to 7% for the general population. Since the data are taken from urban areas, figures may be somewhat higher than for the country as a whole (Carrà et al. 2009), but it is clear that there is a strong association between schizophrenia and substance misuse.

In addition to the personal costs that substance abuse can cause, there are also wider economic consequences. There is evidence that individuals with a dual diagnosis of schizophrenia and substance misuse incur higher service use costs. Turkington and colleagues (2009) found that persistent substance misuse increased the probability of relapse, suggesting additional admissions and service costs. McCrone and colleagues (2000) found that in a sample from South London, 'core' costs (mental health service costs, emergency clinic costs and day care costs) over a six-month period were £1913 higher for the dual diagnosis group than for other patients (95% CI: £309 to £3865), non-accommodation costs were £1910 higher (95% CI: £281 to £3820) and total costs (including supported accommodation) were £1469 higher (95% CI: -£954 to £4292). Whilst there are problems

of self-selection into the substance misuse state – perhaps individuals with more severe psychosis, who would incur more costs anyway, are more likely to be substances misusers and thus the above costs may not represent the true marginal difference in costs due to substance misuse – there is strong evidence that substance misuse is associated with higher service costs in schizophrenia care.

Another cost that may be associated with substance abuse for people with schizophrenia is because of crime. In a large longitudinal study in Sweden (80025 people, of which 8003 had a diagnosis of schizophrenia) Fazel and colleagues (2009) showed that the elevated risk of someone with schizophrenia committing a violent crime can be almost entirely accounted for by high levels of substance abuse in this group.

It was found that individuals with schizophrenia and substance-use co-morbidity had a risk of committing a violent crime that was 4.4 times greater (95% CI: 3.9 to 5.0) than for the general population, whereas individuals who had schizophrenia but did not abuse substances had an elevated risk of just 1.2 greater (95% CI: 1.1 to 1.4). Similar findings were found in a recent systematic review (Fazel et al. 2009). Given the Home Office (2005) estimates that violent crime causes economic and social costs totalling £44.6 billion¹¹ in England and Wales each year, elevated violent crime due to this co-morbidity between schizophrenia and substance misuse is clearly very costly.

Other costs may also be incurred as a result of a dual diagnosis with substance misuse. It is likely that substance misuse reduces employment opportunities, resulting in wasted economic potential and losses to the exchequer in tax revenue forgone.

11. Updated to reflect current prices using the GDP deflator (ONS).

CONTACT WITH THE CRIMINAL JUSTICE SYSTEM

People with schizophrenia are over-represented in the criminal justice system. The most recent (although now quite dated) estimates are that around 8% of the prison population has psychosis, with 2% qualifying for a formal diagnosis of schizophrenia (Singleton et al. 1998). This compares to figures of between 0.2% to 0.5% for the general household population (Singleton et al. 2000; Saha et al. 2005; Mangalore et al. 2007).

Questions are increasingly being asked about the appropriateness of prison sentences for many of these people – from both moral and effectiveness perspectives. It is also clear that prison may be an economically inefficient intervention for many with schizophrenia or other mental health problems. The cost of a prison place for one year is estimated to be £40,000 (Ministry of Justice 2011b) and yet it is remarkably ineffective at preventing reoffending; results from the Surveying Prisoner Crime Reduction survey¹² found that 54.2% of prisoners who had been treated for a mental health / emotional problem in the year before custody had been reconvicted within one year of release (at 51.7% the reconviction rate was also very high for prisoners without such problems).

Many people with schizophrenia who have committed crimes end up in secure care provided or funded by the NHS. These units are different from prisons because of their emphasis on care and treatment as opposed to punishment. There are a number of routes by which an individual can be admitted to secure care: they can be referred from prison, on a restricted or unrestricted hospital order from court as an alternative to prison, or directly from community treatment. Secure mental health beds are divided into high, medium and low secure, as well as specialised medium secure units for women. Nearly 97% of people transferred on restriction orders from prison go into high or medium secure beds, whereas low secure beds are mainly used for people detained directly from the community under the Mental Health Act, or people ‘stepped-down’ from more secure beds (Rutherford & Duggan 2007).

Secure units represent a very expensive element of mental health care: secure and high-dependency services accounted for 19% of direct investment in mental health services in 2010/11, with investment totalling over £1 billion (Mental Health Strategies 2011). In addition to high unit costs, total costs are so high partly because stays are typically very long, with 27% of people detained remaining in forensic services for over 10 years (Rutherford & Duggan 2007).

FAMILY IMPACT

Many relatives and other unpaid carers of people with schizophrenia will give up employment or take time off work in order to provide care and support. Using results from the UK-SCAP study, Mangalore and Knapp (2007) estimated that 4.8% of carers had terminated employment and 15.5% took a mean of 12.5 days off work per year specifically as a result of being a carer. This translates into a mean annual economic loss of £517 (2011/12 prices) per individual with schizophrenia living in the household population.

In addition to the loss of productivity as a result of being a carer, it is also possible to put an economic value on the unpaid care that these individuals (who are usually family members) provide to people with schizophrenia, on the assumption that if they did not provide such care someone else would have to. If such care and support is valued at how much it would cost the NHS to provide similar care (the salary of an assistant nurse or nursing auxiliary) then based on the assumption that the unpaid carer provides a mean of 5.6 hours support per day, this comes to an average of £34,000 per person with schizophrenia being looked after by a family or other carer. Roughly 31% of people with schizophrenia are living in private households (Mangalore & Knapp 2007b), so this could translate into an aggregate cost to society of as much as £1.24 billion per year.

12. Source: www.justice.gov.uk/downloads/statistics/mojstats/spcr-full-tables-paper-5-2-prisoners-backgrounds-reconviction-a.xls

EVALUATING VARIOUS INTERVENTIONS

Having discussed some of the key cost drivers in relation to schizophrenia, we now move on to look at the economic consequences of a variety of interventions. The extensive evidence collected by the Schizophrenia Commission from a wide range of people with expertise about and/or experience of psychosis guides the scope and nature of interventions discussed here. In gathering and collating economic evidence on each of these interventions we have tried to be as balanced and fair as possible.

However, due to time constraints, a systematic review in each case was certainly not possible. Instead, as a starting point for each intervention, we contacted researchers in the area to identify the most significant existing economic evidence, including extant reviews. This information was supplemented with extensive, albeit not systematic, literature searching for each intervention in turn.

Where the economic evidence for interventions was considered to be strong we have attempted to draw conclusions for the economic implications of these interventions on three different levels – for the NHS, for the public purse more generally, and for society as a whole. For those interventions where the economic evidence is not strong enough to draw firm conclusions, key evidence has been summarised and areas for future work highlighted.

Attention must be drawn to the fact that these interventions are neither mutually exclusive nor independent. Schizophrenia is a complex condition and most individuals with the condition can benefit from a combination of interventions, and of course, they and their families would have preferences about which interventions are appropriate in

different circumstances. Interventions are not independent from one another in that the outcomes of one may be positively or negatively impacted by other interventions that an individual is receiving or has previously received. For example, it would perhaps be unrealistic to assume the same reduction in inpatient use as a result of a specific talking therapy, such as cognitive behavioural therapy (CBT), when the individual already receives other types of psychologically-informed interventions as when he/she receives CBT alone. Because of this interdependence, the cost estimates reported here are in certainly not additive. We discuss this further in Section 3.

Another point to bear in mind is the often elusive nature of the so called ‘standard care’ or ‘treatment as usual’ against which interventions are typically compared. Often trials give limited information about the nature of such standard services to which they are comparing the intervention in question, yet since standard practices of care vary tremendously across the country (let alone between countries and over time), this leads to serious questions about extrapolating economic evidence from one context to another. If a particular intervention saved £X per patient in one locality when compared to standard care in that area, it is

not necessarily the case that the same saving of £X will be obtained in another locality if the standard care practiced in this area is different. Having said that, without extensive information about the routine practice of different mental health services there is often little option but to assume a similar standard care and thus that any costs or benefits will be generalisable.

Some of the interventions discussed below, such as Early Intervention and Crisis Teams are already widely in place, at least in name; and for these our analysis attempts to evaluate the economic evidence for *maintaining* them. Other interventions discussed here, such as Individual Placement and Support, Homelessness Interventions and Peer Support are as yet not widely available; here we attempt to evaluate the evidence for making such interventions *more widely available*.

All costs in this report have been updated for inflation to 2010/11 price levels using an appropriate price index. All future cost implications have been discounted back to the present at a rate of 3.5% per annum.

EARLY INTERVENTION

Some early intervention services (EIS) in psychosis aim at early detection of people with prodromal symptoms of psychosis (or those whose psychosis has not already been adequately detected and treated), but most early intervention teams are working with people whose illness has been diagnosed. Treatment in the early intervention stage ideally involves a combination of 'pharmacological, psychological, social, occupational and educational interventions' (National Institute for Health and Clinical Excellence 2009). The rationale for intervening early in psychosis is based on evidence that suggests an association between the duration of untreated psychosis and overall prognosis (Marshall et al. 2005).

Early intervention services were formally introduced into the NHS in 2001/2002 as outlined in *The Mental Health Policy Implementation Guide* (Department of Health 2001). Since then, early intervention teams have been introduced quite widely across England (Shiers & Smith 2010) although there remain inequalities in access (IRIS 2011).

Clinical evidence suggests Early Intervention in Psychosis can have positive effects. A recent systematic review and meta-analysis suggested that specialised First Episode Psychosis programmes can significantly reduce the risk of relapse when compared to usual treatment (Alvarez-Jiménez et al. 2011). A recent Cochrane review was less positive, finding few significant results in favour of EIS (Marshall & Rathbone 2011). However, the usefulness of the Cochrane methodology in evaluating service models such as Early Intervention has been questioned. McGorry (2012) claims that many well-designed studies evaluating the effectiveness of EIS were excluded from the Cochrane review. He disputes the relevance of many of the Cochrane findings since 'the review focused largely on trials comparing the "component interventions" of EIP services. ... Such interventions were typically studied against the backdrop of the range of care provided within streamered EIP services. It is not surprising that some of these individual trials were "ineffective" given that the control groups in these trials were the recipients of an already comprehensive model of care.'

In addition to patient outcomes there has been attention given to potential cost savings that the use of early intervention services may offer – in both the immediate and longer term. The first studies that aimed to tackle this issue were relatively narrow in scope – focusing largely on direct costs to mental health services. More recently, however, work has been done to take a more comprehensive look at the economic consequences of Early Intervention services. Recent studies have considered the implications of EIS for more of the cost drivers discussed in Section 1, including criminal justice costs and lost employment costs (McCrone et al. 2010).

In a recent economic evaluation of EIS, McCrone and colleagues (2010) used a decision modelling approach, deriving probabilities from the literature, to estimate the cost consequences of Early Intervention Services. The results were strongly in favour of EIS. This report updates the costs reported by McCrone et al. (2010) so they reflect current costs and prices, and also adds in an expected increase in tax revenue. Below we outline the key mechanisms through which Early Intervention Services may lead to cost savings.

Mental Health Service Use

Since Early Intervention Services have been shown to have clinical benefits it is perhaps unsurprising that their introduction would reduce service use, in particular high-cost inpatient time. Indeed, using data from the Lambeth Early Onset (LEO) team, routine data from Worcestershire and Northumberland EI Services and the Healthcare Commission the authors (McCrone, et al. 2009a) estimated that Early Intervention Services reduce the probability of a formal admission (compulsory admission under the Mental Health Act) from 44% to 23% in the first 2 months of psychosis and from 13% to 6% in each 2-month period thereafter. This translates into very sizeable cost savings for the mental health services: it is estimated that, at 2010/11 prices, the introduction of an Early Intervention Service saves £5,493 per service user in the first year of psychosis and £15,742 during the first three years (costs discounted at 3.5% per year).

Suicide and Homicide Costs

Early Intervention Services have been shown to be effective in reducing the risk of both suicide and homicide. Associated cost savings from the reduction of suicide risk (through costs to the NHS and the lost productivity of the deceased) are estimated at £481 in the first year of psychosis. The associated cost savings from the reduction in homicide risk are small (just £28 over three years) because of the very low starting probability that a service user will commit homicide, yet Early Intervention Services do significantly reduce this risk. However, we need to be cautious with these figures on suicide and (especially) on homicide given the limited data that were available as a basis for the economic calculation.

Earnings

Early Intervention Services have a positive impact on the retention and gain of competitive employment. McCrone et al. (2010) estimate that 12% of standard care patients will be in employment, compared to 35% of people supported by EIS. If a human capital approach is assumed, valuing employment at the minimum wage rate, the result would be a gain in earnings of £4299 even when assuming that no employment occurs in the first year for either group.

This increase in employment rate, when viewed from a societal perspective, increases production in the economy as a whole and, when viewed from a public sector perspective, increases tax revenue. In this report it is assumed that the only net benefit in terms of tax revenue comes from the mean indirect tax rate of 18% (Adam et al. 2012); since the size of the earnings we are considering is relatively modest, we assume no income tax is paid, which makes the estimates of cost savings to the public sector conservative.

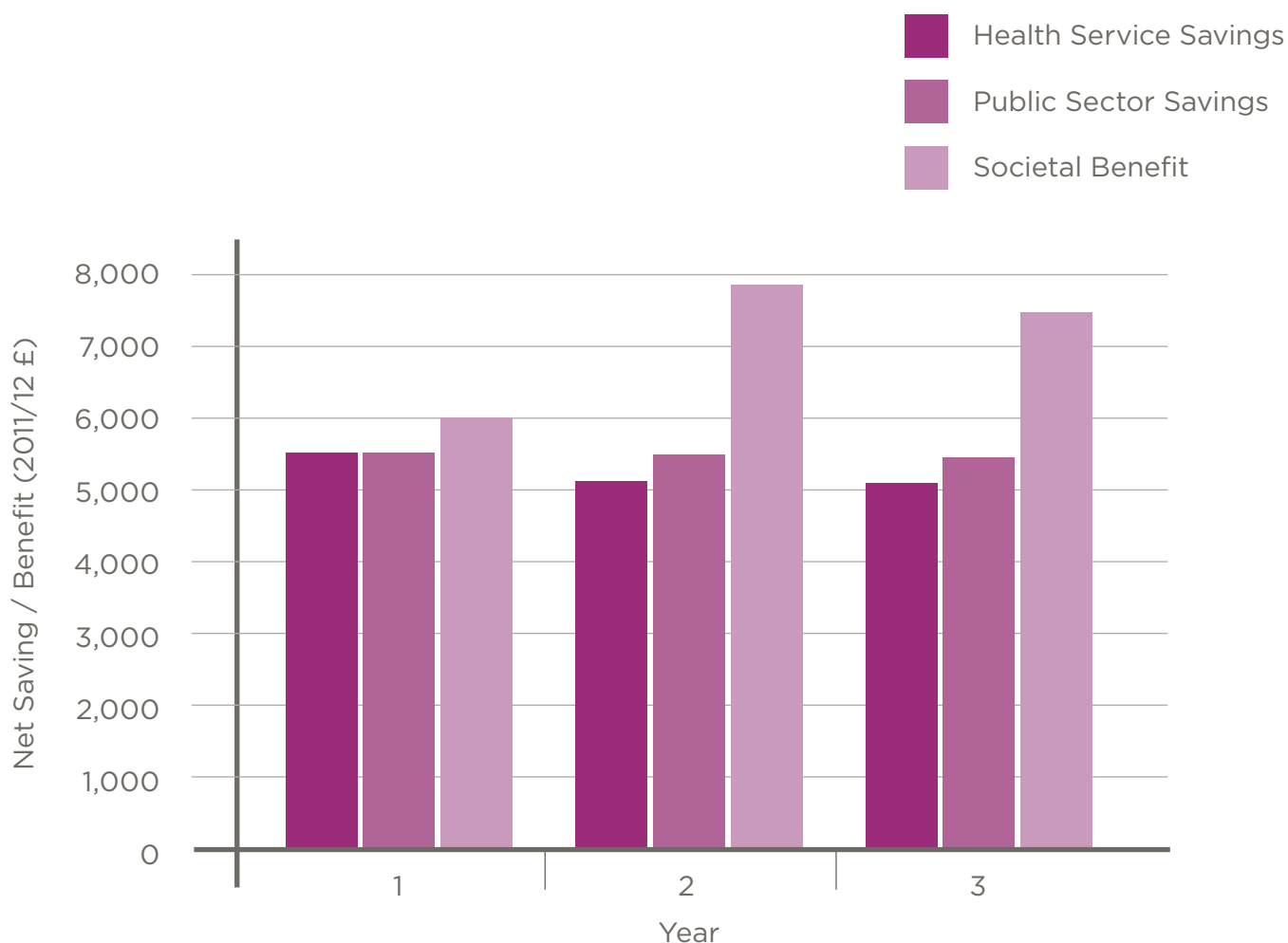
Net Cost Savings

When we sum these individual costs together to find the net savings accrued by the introduction of EIS we find the following results:

- The introduction of Early Intervention Services is estimated to save the National Health Service £5536 per service user in the first year of psychosis. This rises to a total of £15862 in the first three years.
- In terms of the public purse viewed as a whole, the introduction of EIS is estimated to have a net benefit of £5545 in the first year of psychosis, rising to £16663 over the first three years. These figures include costs accrued to the NHS, criminal justice system and extra tax revenue gained.
- Taking a societal view of the net benefits of EIS by including all increased production that occurs as a result (not only that which is subsequently collected by government in taxes) gives a figure of £6015 saved in the first year of psychosis and £21512 saved over the three-year period.

There are other costs that have not been integrated into this model that would, it seems likely, increase the potential savings of EI services. One is the cost incurred by families and carers through reducing their own employment and providing unpaid care and support. It is expected that through the clinical benefits associated with EI, this cost incurred by families would be reduced.

Figure 3: Cost savings accrued through the introduction of Early Intervention Services (2010/2011 £)



Caveats

The above estimates of cost savings from implementation of EIS are obtained using one specific set of model parameters: a specific set of probabilities of admission under standard care and EIS, and a specific set of costs of admission and community care. Estimated cost savings from the implementation of EIS will vary from locality to locality depending on prior admission rates, the fidelity of EIS to evidence-based models, the nature and quality of 'standard care' services and the quality and cost of inpatient care. The above model is largely estimated using parameters taken from London-based studies, so results may not be immediately transferable to other areas of the country, where service models and populations could be different. However, EIS in very different parts of the country have been successful in reducing admissions. For example, following the implementation of the North

East Derbyshire Early Intervention service, the percentage of people with schizophrenia with a first episode of psychosis (who came into contact with regular services and the specialist EIS respectively) that were admitted to hospital within the first year fell from 62% to less than 31% (Rowlands 2012; Phillipson et al. 2012).¹³

When considering the economic consequences of Early Intervention it is also important to bear in mind that schizophrenia is a lifelong condition and the benefits of the specialised model that EIS provides may not be sustained after the service user is no longer eligible for the service. In two major studies, significant benefits of EIS were no longer seen at a five-year follow-up (Gafoor et al. 2010; Bertelsen et al. 2008). This, though, may be because of the services that recipients of EI were discharged to rather than to deficiencies in EI itself.

13. It must be noted that the eligible populations for the two services are different, mainly in that NE Derbyshire EIS only deals with people under the age of 35. Thus, whilst this figure is indicative of the success of EIS in bringing about fewer inpatient admissions it must not be interpreted as a precise estimate of the impact of the service.

INDIVIDUAL PLACEMENT AND SUPPORT SCHEMES

Most people with schizophrenia and other severe mental health issues want to work (Grove 1999; Mueser et al. 2001; Marwaha 2005). However, only between 5 and 15% are actually in employment, representing a huge waste of potential as well as denying people opportunities for social inclusion, meaningful daytime activity and a sense of personal identity and achievement. Individual Placement and Support (IPS) is a type of supported employment aimed at helping those with severe mental health problems to gain paid competitive employment. IPS services are very different to the kinds of vocational rehabilitation services conventionally available (and the services that still exist in many parts of England) in that IPS services aim to place people with schizophrenia in competitive employment as soon as possible and then provide additional support and training. In contrast, standard vocational schemes largely take the approach that a considerable amount of training is needed before people with schizophrenia are ready to begin competitive employment.

Such training prior to obtaining competitive employment is highly expensive and has often been somewhat ineffective in helping people with schizophrenia gain competitive employment (Sainsbury Centre for Mental Health 2009a; Crowther et al. 2010). There is now a substantial body of evidence from across the world that IPS is significantly more effective at helping people with schizophrenia to gain competitive employment than standard vocational services (Crowther et al. 2010)

The detailed characteristics of effective IPS schemes are reported elsewhere (Becker et al. 2008). Below are listed the key concepts of high-fidelity IPS schemes (copied from the Sainsbury Centre for Mental Health's report (2009):

- Competitive employment is the primary goal
- Everyone who wants it is eligible for employment support
- Job search is consistent with individual preferences
- Job search is rapid: beginning within one month
- Employment specialists and clinical teams work and are located together
- Support is time-unlimited and is individualised to both the employed and the employee
- Welfare benefits counselling supports the person through the transition from benefits to work

Perhaps the most obvious public sector cost saving that we might expect to accompany the implementation of IPS services is the additional tax revenue received and the social security benefit payments saved. However, more important is likely to be the reduction in service costs resulting from the improvement in mental health that competitive employment (or the active search for it) can bring. IPS services have consistently been shown to have very positive outcomes in terms of clinical measures. Meta-analysis has shown that IPS schemes significantly improve symptoms of thought disturbance ($p=0.069$), anergia ($p=0.094$) and depression ($p=0.022$) and improve total symptoms ($p=0.009$)¹⁴ (Campbell et al. 2011).

In addition to the better documented shorter term effects of IPS services on mental wellbeing there is also emerging evidence that there are very significant long-term benefits associated with the gain of stable competitive employment which correspond to significant economic savings (Sainsbury Centre for Mental Health 2009).

Much of the evidence on the economic consequences of IPS schemes is somewhat limited, with many studies focusing primarily on savings in terms of increased earnings and not considering broader cost consequences.

14. All symptoms measured using the Brief Psychiatric Rating Scale (BPRS)

Mental Health Service Use

The most recently published economic evaluation of IPS was based on a randomised controlled trial carried out in six European cities; this is EQOLISE study (Burns et al. 2007; Knapp et al. 2012). This study randomised 312 participants (around 80% had schizophrenia, others had bipolar or other severe mental health problems) to either IPS services or standard vocational services and followed them for 18 months. In accordance with other studies of IPS, largely originating from the USA, IPS proved much more effective than standard vocational services, both in terms of gaining competitive employment and in terms of clinical outcomes (Burns et al. 2007; Burns et al. 2009; Kilian et al. 2012)

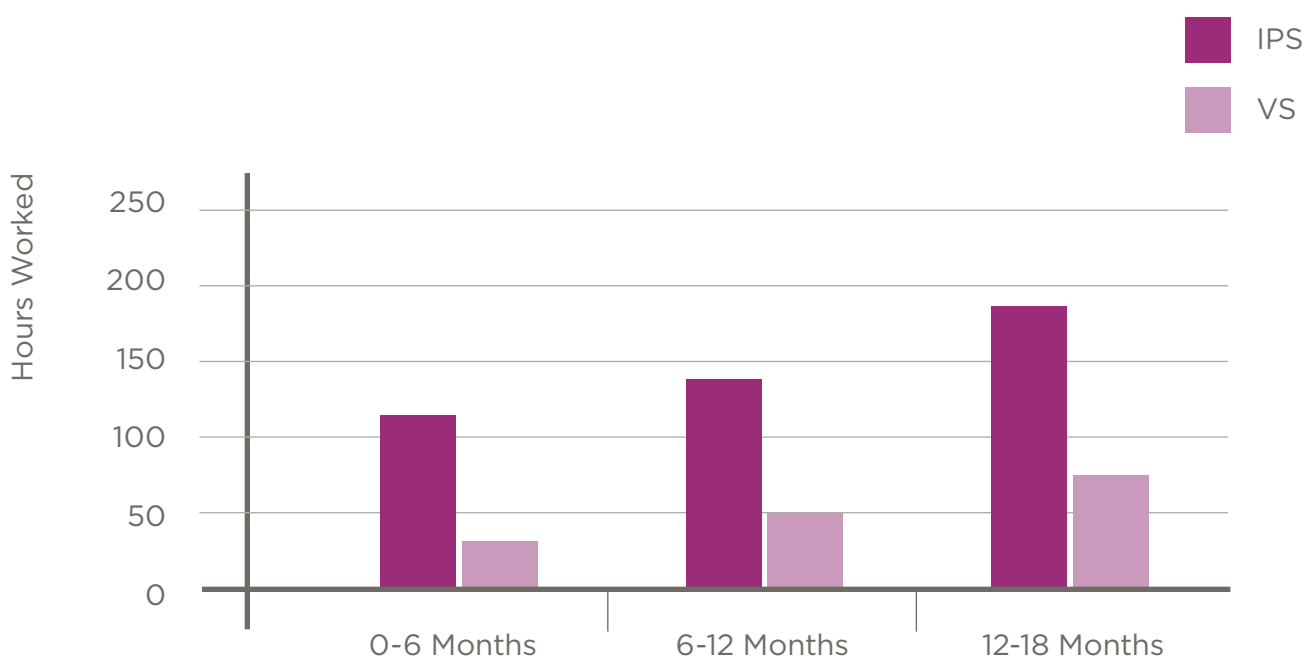
The economic analysis of the EQOLISE study showed encouraging results for IPS in terms of service use and associated costs (Knapp et al. 2012). It was found that IPS generated significant savings in inpatient costs, a saving of £4,400 over the 18-month follow-up period, although most of this saving occurred in the first six months. Effects on other areas of mental health service costs were smaller: IPS was found to increase outpatient service and

community service costs by a total of around £1,000 over the 18 months, whilst effects on other areas were mixed. Total mental health service costs (excluding intervention costs) were £4,000 lower for the IPS group compared to the vocational services group over the 18-month period.

Earnings

Earnings for IPS and standard care were estimated from the EQOLISE study using a human capital approach. Data from the EQOLISE study reveal that hours worked increased over the 18-month period for both the IPS and the comparison groups, but IPS participants worked more in each and every period with the difference between the groups increasing (see Figure 4). Reassuringly, the estimated hours worked from the EQOLISE study were very similar to those estimated in a recent meta-analysis of four high-quality RCTs conducted in the USA (Campbell et al. 2011) which together included 681 participants. It was, however, decided to use data only from the EQOLISE study since UK labour markets are more similar to Europe than the USA.

Figure 4: Hours worked by IPS and standard Vocational Services participants (adapted from Burns et al 2007)



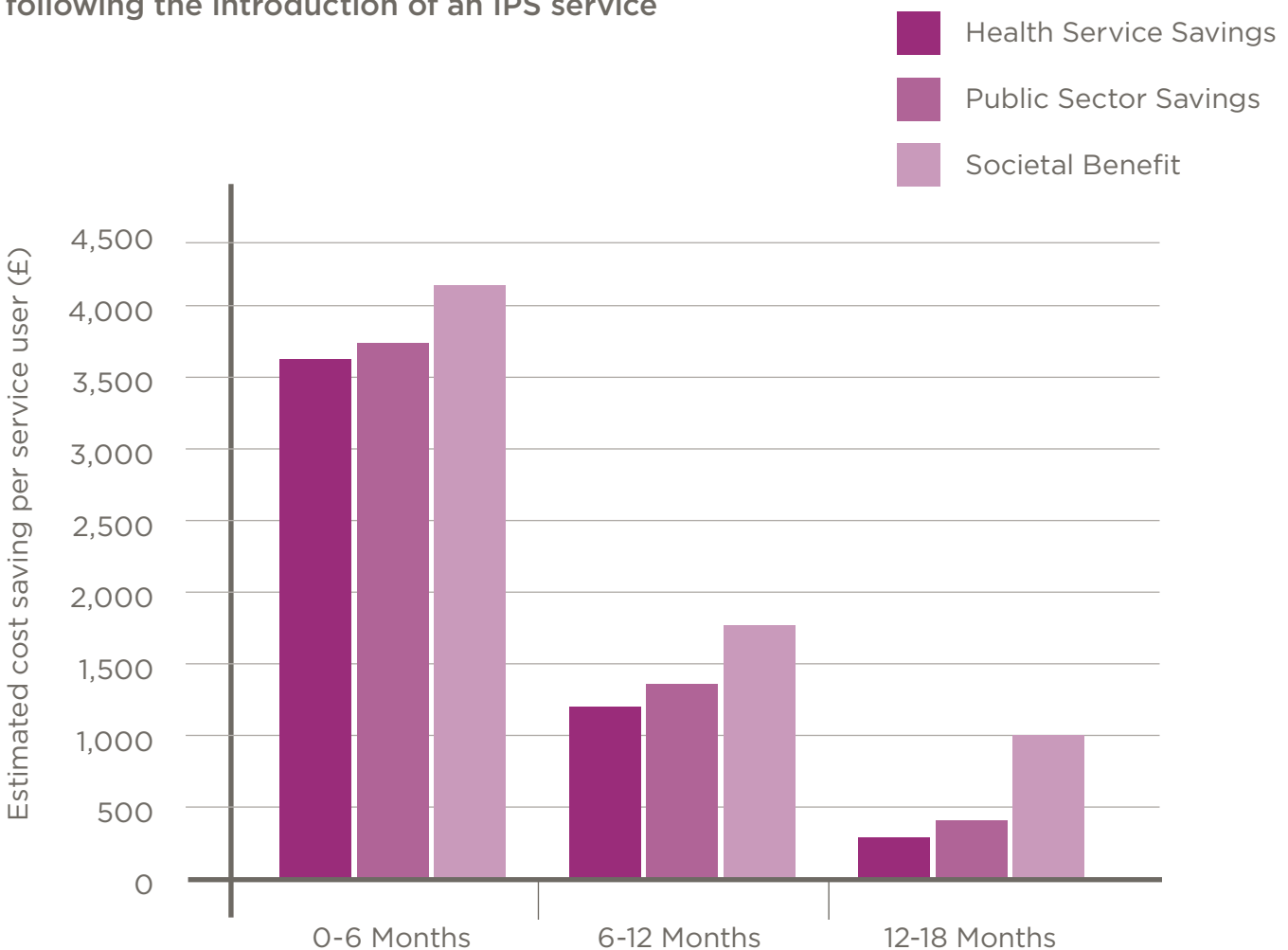
This increase in earnings translates directly into societal benefit of £1700 over 18 months (conservatively, employment was valued at the national minimum wage of £6.08 per hour). For present purpose, to create an estimate of the benefit accruing to the Exchequer as a result of this increase in earnings, an average indirect tax of 18% can be used, resulting in an increased revenue of £300 over 18 months for the Exchequer.

Since the estimated average earnings resulting from IPS are relatively small - only eight of the 312 EQOLISE participants were estimated to have annual earnings above the lower threshold for income tax (£8105)¹⁵ - no increased revenue due to income taxes or national insurance contributions were estimated.

Other Economic Impacts

Analysis of the cost implications of IPS presented in this report covers only costs and benefits related to mental health service use and earnings. We have not attempted to estimate the cost consequences of any effect that IPS might have on physical health, criminal justice contacts or housing because, although it is possible that these effects might result, there is insufficient robust evidence on them. A recent meta-analysis of IPS services in the USA suggested that IPS could *possibly* reduce homelessness and substance abuse and hence generate further savings, although the results of the met-analysis were positive but not statistically significant. Additionally, in the present report we have assumed no reduction in benefit receipt resulting from IPS, whereas in reality it is likely that benefit receipt would fall with the increase in the competitive employment rate.

Figure 5: Estimated cost savings per service user following the introduction of an IPS service



15. This is an underestimate since a minimum wage rate was assumed for all participants whereas in reality some would be earning significantly more. Thus the actual benefit accrued to the exchequer is likely to be more than the figure estimated here.

Net Savings

Intervention costs were taken from the London site of the EQOLISE study. In reality, intervention ‘costs’ when IPS was compared to standard vocational services were actually negative since IPS was significantly cheaper to provide than these standard services. Whilst this may not represent a realistic cost saving for mental health services that currently offer little or no vocational services, such a situation may result in larger savings in other areas as a result of an even greater differential in the employment rate.

Putting together these various cost components we arrive at estimated net savings per service user of implementing an IPS service:

- The introduction of Individual Placement and Support Services is estimated to save the National Health Service £5193 per user of the service over an 18 month period.
- It is estimated that the introduction of IPS services would save the public sector as a whole £5501 per user over 18 months through reduced health service costs and increased tax revenue.
- Taking a societal view the net benefits of IPS are estimated to be £6906 per user over 18 months which includes the increase in total production, not just the component collected in tax revenue by the government.

These net savings are represented in Figure 5.

Figure 5 represents estimated cost savings per service user engaging with an Individual Placement and Support service. The EQOLISE study, on which the calculations in this report are based, studied only people with schizophrenia who wished to find competitive employment (Burns et al. 2007) and therefore, since IPS would not be suitable for *all* people with schizophrenia, it is difficult to calculate aggregate savings that might flow from the national roll-out of IPS services.

Caveats

Many people have expressed doubts about the applicability of IPS, a service model developed in the USA, to a UK context (Heslin et al. 2011). They argue that the differing structure of social security and the labour markets means that IPS would be less effective in the UK due to a lesser necessity to find work in order to survive in the USA. This argument is slightly misleading, since it does not take into account that there are also major economic disincentives to regaining employment in the USA – people will often lose their entitlement to programmes like Medicaid when they become employed.

There are legitimate arguments to be made about the differing incentives to work across nations, but the overarching premise and motivation of an IPS approach is that the majority of individuals with schizophrenia want to find competitive employment. This is often not only (or perhaps at all) for economic reasons, and gaining such competitive employment is clinically beneficial. However, some results do suggest that the work incentives in the UK are such as to discourage the pursuit of competitive employment for individuals with schizophrenia. In the EQOLISE study, Burns and colleagues (2007) found that London was at the highest risk out of the six European centres of having a benefit trap despite there being measures in place to reduce the disincentives for work (Sainsbury Centre for Mental Health 2004). Current reforms to social security entitlements in England might, of course, reduce any financial disincentive to work.

FAMILY THERAPY

Family therapy refers to a range of psychosocial interventions for people who have a significant emotional connection to someone with schizophrenia, here referred to for simplicity as ‘the family’. The therapy typically involves providing information about schizophrenia, searching for methods of supporting an individual with schizophrenia and resolving practical problems. Interventions are aimed at reducing the level of expressed emotion within the family, since expressed emotion has long been recognised as a robust predictor of relapse (Butzlaff & Hooley 2012).

Although family therapy has been an accepted intervention in schizophrenia treatment for a long time, relatively few studies have formally attempted to assess its economic impact (Mihalopoulos et al. 2004; Knapp 2000; Leff et al. 2001; Goldstein 1996; McFarlane et al. 1995; Tarrier et al. 1991; Liberman et al. 1987). In this report, we base our economic analysis of family therapy primarily on a recent decision model by the authors of this report (to be published separately). This model uses the estimated risk ratios associated with the probability of relapse with family therapy derived from a recent Cochrane systematic review (Pharoah et al. 2010) to update probabilities of relapse under standard care to estimate the total service use costs under family therapy and standard care.

The model estimates a cost saving (net of intervention cost) of £1,004 over a three-year period, meaning that family intervention would be seen to be superior to standard care in that it is associated with both better clinical outcomes and lower costs. In sensitivity analysis this result held using a variety of different admission costs.

CRIMINAL JUSTICE SYSTEM DIVERSION

Many people in the criminal justice system have complex mental health needs which are poorly recognised and inadequately managed. Large numbers end up in prison: a high-cost intervention which is inappropriate as a setting for mental health care and ineffective in reducing subsequent offending. The overall size of the prison population has more than doubled in the last 20 years and one prisoner in ten has a severe mental illness such as schizophrenia.

Diversion seeks to ensure that people with mental health problems who come into contact with the criminal justice system are identified and directed towards appropriate mental health care, particularly as an alternative to imprisonment. Diversion can be within or outside the justice system and need not replace sanctions for any offence a person has committed.

For some offenders with severe mental illness, the most appropriate alternative to prison is placement in an NHS secure unit. These units are, however, intended only for those who have committed serious offences and the great majority of prisoners with severe mental illness are on short sentences and have not committed serious enough crimes to warrant transfer to a secure hospital.

About three-quarters of all people sent to prison each year receive sentences of less than 12 months and particularly for those in this group with severe mental illness there is a strong cost-effectiveness case for the use of suspended sentences or community orders instead of imprisonment, together with an appropriate package of community-based mental health support.

In terms of costs a community sentence is far cheaper to provide than a prison sentence. Figures from the National Audit Office (Accenture 2007) suggest that on average a community sentence costs between £720 and £4,100¹⁶ depending on its type. Even the Mental Health Treatment Requirement, which is the most expensive of the twelve community orders, costs only roughly 10% of the cost of the average prison sentence (Ministry of Justice 2011b).

In terms of effectiveness too it appears that community sentences dominate prison in the outcomes they achieve – both clinically and in reducing reoffending. People with schizophrenia can get much better mental health care in the community than in prison: prison is a very poor therapeutic environment which, if anything, is likely to exacerbate a mental health problem. Since the people for whom community orders are designed are on short prison sentences (typically less than one year) they are unlikely to be enrolled on, or benefit from, behavioural programmes aimed at reducing re-offending. With a prison sentence they are also not required to see a probation officer after release which means they get little or no support once back in the community, in contrast to what would happen if they were on a community sentence. Partly because of these factors re-offending rates are significantly higher on a like-for-like basis comparing people on a short prison sentence and those on a community sentence. Indeed,

16. Updated to reflect current prices using the GDP deflator, ONS.

Figure 6: Mean Differences in change in body weight between the treatment and control groups. End of treatment results include follow up, up to 6 months (95% CI in parentheses). Source: Faulkner et al. (2010)

	Cognitive / Behavioural Intervention	Pharmacological Intervention
Preventing Weight Gain	Medium term: -3.38kg (-4.81kg to -1.96kg) End of treatment: -4.87kg (-7.11kg to -2.64 kg)	End of treatment: -1.16kg (-1.90kg to -0.41 kg)
Treating Weight Gain	Medium term: -1.69kg (-2.77kg to -0.61kg)	End of treatment: -3.85kg (-4.25kg to -3.44kg)

using a matched pairs technique, the Ministry of Justice estimated that Community Orders (of all types) result in an 8 percentage point decrease in re-offending rates when compared with custodial sentences of less than one year (Ministry of Justice 2011a).

It is to be noted that there is no strong argument for prison sentences over community orders on public safety grounds given that the type of offences involved are relatively minor.

The Mental Health Treatment Requirement (MHTR) is one of the twelve requirements that magistrates and judges can place on individuals who receive a Community Order or a Suspended Sentence Order. The requirement means that the individual is then required to receive mental health treatment for a defined period of time. Despite its introduction in 2005, recent data from the Ministry of Justice show a very low uptake of the requirement. Whilst 43% of people serving community sentences have some sort of mental health problem (Solomon & Silvestri 2008), only 0.3% are given a Mental Health Treatment Requirement. Barriers to more widespread use of MHTRs include difficulties in obtaining psychiatric assessments,

ineffective identification of mental health problems in the criminal justice system, a lack of awareness of the requirements within the criminal justice system workforce and a lack of communication and trust between health services and the criminal justice system (Khanom et al. 2009; Seymour et al. 2008).¹⁷

It is, however, important to emphasise that the case for diversion for people with schizophrenia does not stand or fall depending on whether or not they get an MHTR. If an MHTR is deemed to be unsuitable, perhaps because of an inappropriateness of providing treatment on a compulsory basis, the cost-effectiveness case for the diversion of people with schizophrenia out of prison and into the community still stands.

PHYSICAL HEALTH

As discussed in Section 1.5, the physical health of individuals with schizophrenia and the associated economic consequences have long been overlooked. Interventions for schizophrenia are rarely analysed from a physical health perspective; the in-depth cost-

17. The reports make detailed recommendations as to how MHTRs could be better implemented.

consequence analysis of the antipsychotic medication aripiprazole which took into account risks of diabetes and cardio-vascular disease undertaken by Barnett and colleagues (2009) is a rare exception. It is important that physical health implications of all treatments be routinely considered in analyses that inform policy decisions. Below we discuss evidence on interventions that are specifically designed to target the physical health of individuals with schizophrenia.

Interventions to reduce weight

Responding to higher than usual levels of overweight and obesity amongst individuals with schizophrenia, a range of interventions have been devised which aim to reduce weight (either prevent weight gain or treat weight gain). Such interventions can fall into the broad categories of cognitive-behavioural interventions that work through changing lifestyle choices and pharmacological interventions.

A recent Cochrane review (Faulkner et al. 2010) of such interventions found that both types of interventions (within which there are many different specific interventions) were effective both at preventing and treating weight gain in the short to medium term. Figure 6 offers a summary.

Even when there is significant weight reduction in the short run it is very difficult to draw conclusions about the economic impact of such interventions. There is little evidence with which to determine whether or not any reduction in weight is sustained into the longer run. Since many of these interventions are designed to be administered in the early stages of schizophrenia, the participants' risk of suffering a major physical health event (such as a heart attack or stroke) is small in the short term, and so even if a reduction of weight occurs this may be of little importance in increasing overall life expectancy if weight reduction is not sustained. Thus, to fully understand the economic consequences of interventions that aim to reduce weight in people with schizophrenia, more research is needed looking at the extent to which weight loss is sustained.¹⁸

Exercise Therapy

Exercise therapy is an intervention that is sometimes used with the aim of increasing mental and physical wellbeing. Clinical outcomes reported in a recent Cochrane review (Gorczyński & Faulkner 2011) were generally positive, recording significant improvements in measures of mental health and physical fitness. However, the limited number of studies addressing Exercise Therapy as a treatment in schizophrenia and the lack of evidence as to how changes in physical fitness translate into economic consequences means that no more analysis is possible here.

Smoking Cessation

As discussed in Section 1.5, schizophrenia is associated with almost a doubling of the risk of tobacco use, which in turn has many adverse effects on physical health. In response, a variety of interventions have been conceptualised in order to help people with schizophrenia stop smoking, many of which are based on interventions that have previously been shown to be effective for the population as a whole. In a recent Cochrane review, Tsoi and colleagues (2010) found evidence to suggest that the antidepressant bupropion could be effective at helping people to quit. However, too little evidence was found in our review to draw any meaningful conclusions about the effects of other treatments such as nicotine replacement therapy and psychosocial interventions.

In terms of cost-effectiveness evidence, little analysis has specifically addressed the question of whether interventions designed to help people with schizophrenia to stop smoking. One recent analysis used a Markov model to consider the economic implications of ten-week intervention of bupropion and co-interventions (group therapy either alone or in combination with nicotine replacement therapy) and compared this to co-interventions only. The model estimated that the incremental cost-effectiveness ratio of the combined intervention was £385 per QALY, well below NICE's recommended threshold for cost effectiveness. The model predicted that there was a 95% chance that the combined intervention was more cost-effective than the co-interventions only (Winterbourne 2012).

18. Current research in PSSRU at the LSE is looking at the economic case for weight loss/avoidance interventions for people in the early stage of their psychosis.

SUBSTANCE MISUSE

As discussed in Section 1.8, substance misuse amongst people with schizophrenia has significant adverse economic consequences, in part through inflating NHS costs and criminal justice system costs. The complex needs of this population are increasingly being recognised; NICE has recently published a guideline on assessing and managing 'psychosis with co-existing substance misuse'. Clinical practice recommendations by NICE address many broad areas to equip mental health and substance misuse services to work effectively with people who fall under the remit of both services. Here, we summarise the available economic evidence on psychological and psychosocial interventions that have been specifically designed for a population with co-existing schizophrenia and substance misuse.

A variety of psychological and psychosocial interventions are recommended for people with one of schizophrenia or substance misuse, but some evidence suggests that individuals with a *dual* diagnosis can be excluded from these interventions (in particular, many do not receive any treatment for substance misuse) (Department of Health 2006). Therefore psychological and psychosocial interventions have been designed specifically for this population with a dual diagnosis; these interventions generally involve some combination of CBT and motivational interviewing.

The clinical outcomes recorded by meta-analyses in a recent Cochrane review (Cleary et al. 2010) and by NICE (2011) are mixed, with some evidence of significant improvements in substance misuse and mental health, although many measures showed no significant difference. Sample sizes were generally small, as were the number of relevant studies available.

One randomised trial has attempted to study the economic consequences of an intervention that combined CBT, family intervention and motivational interviewing (Haddock 2003). A wide range of costs was taken into account, including health service costs, travel costs, productivity losses and out-of-pocket expenditures. Net of intervention costs (the

intervention cost £2813¹⁹ over an 18 month period) it was found that mean total costs were £1627 lower ($p=0.25$) for the intervention group than for the control group (95% CI: £9012 less to £5759 more). Net of intervention costs, mean costs incurred by the health service were £1554 lower for the intervention group. The authors estimated that there was a 69.3% chance that the intervention was cost-saving (a willingness to pay of zero). If the favourable clinical results produced by the intervention were given value, the probability of the intervention being cost-effective would increase. Whilst this study shows some promising results for such interventions, the small sample size and lack of other similar trials mean caution must be applied.

HOMELESSNESS-TARGETED INTERVENTIONS / SUPPORTED HOUSING

As discussed in Section 1.4, people with schizophrenia in the UK are highly vulnerable to becoming homeless, with major implications for their mental and physical well-being, and for direct service costs, as well as representing a huge waste of economic potential. In recognition of this problem a variety of different interventions have been conceptualised which aim to reduce the incidence of homelessness amongst people with severe mental illness.

Critical Time Interventions

A Critical Time Intervention (CTI) is 'an individual-level intervention designed to reduce the risk of homelessness and other adverse outcomes in adults with mental illness following discharge from institutions to community living' (Herman et al., 2007). Such interventions typically last around 9 months and consist of three phases – the transition phase, the try-out phase and the transfer of care phase. A CTI worker oversees the whole intervention and performs key roles including home visits, co-ordinating care-givers (meeting with, giving advice to and mediating conflicts) and developing plans for long-term goals (Herman et al., 2007).

19. Updated to reflect current prices using PSSRU's Pay and Prices Index.

A randomised controlled trial to examine the effectiveness and cost-effectiveness of CTI was carried out with a sample of 96 men discharged from a shelter in New York City between 1991 and 1993. This study showed the CTI group experienced significantly fewer nights of homelessness as compared to the control group ($p=0.003$) and significantly fewer periods of extended homelessness (over 54 nights) ($p=0.45$) (Susser et al. 1997). A re-analysis of the data also suggested a significant reduction in chronic homelessness (Lennon et al., 2005). A cost-effectiveness analysis of the same trial revealed that mean costs (including intervention costs, mental health care, other health care, acute services, substance abuse services, housing services, criminal justice and public transfers) were broadly similar across the two groups: costs incurred by the CTI group were 1.4% higher than those incurred by the controls.

The cost of the intervention was almost offset by a reduction in service use (in particular in acute services, supported housing, shelter services). The authors concluded that a willingness to pay of more than £147²⁰ per non-homeless night made CTI a cost-effective intervention. This suggests CTI could possibly be a cost-effective intervention in the UK too, although more work would need to be done to see how such interventions could be adapted to a UK context.

A recent RCT has compared outcomes following discharge from a psychiatric hospital in New York City of a group receiving a 9-month CTI service in addition to usual care and a control group receiving only usual care. This study estimated that the CTI service led to a five-fold decrease in the risk of homelessness (Odds ratio: 0.22, 95%CI: 0.06,0.88) (Herman et al. 2011). Whilst this study makes no mention of service use or the costs of providing CTI, such a dramatic reduction in homelessness suggests this is an important intervention to consider.

Although no data are yet available, a study led by the University of Manchester is currently evaluating CTI for people with mental health problems released from prison,

Assertive Community Treatment

Assertive Community Treatment (ACT) refers to an outpatient service model grounded on a mobile team delivering psychiatric care and case management to people with schizophrenia who make intensive use of inpatient services. The approach was not designed specifically to address the issue of homelessness amongst people with severe mental illness, although it has been suggested that ACT may be an effective intervention to tackle the issue.

Wolff and colleagues (1997) conducted a cost-effectiveness analysis of an RCT examining the effect of providing three forms of case management to individuals with severe mental illness who were either homeless or at risk of homelessness from St. Louis. Whilst ACT services did not significantly reduce the incidence of homelessness the authors did find that there was no significant difference in total costs incurred (a reduction in service use largely offset higher intervention costs of ACT) and an improvement in symptoms and satisfaction, indicating ACT may be a cost-effective intervention for delivering mental health services to the homeless. Another RCT studying the outcomes of providing ACT to homeless people with severe mental illness, this time in Baltimore, found positive, but largely insignificant, effects on housing outcomes (Lehman et al. 1997). This study suggested net savings from the implementation of an ACT service: mean cost per case (net of intervention costs) was found to be 24% lower for the ACT group than the control. Whilst these two studies do provide supporting evidence for the premise that ACT is a cost-effective intervention for homeless people with severe mental illness, Rosenheck (2000) has questioned the generalizability of findings since both studies had patients who incurred much higher costs (at baseline) than the US national average and thus it may be easier to prove cost-effectiveness or cost-neutrality.

A recent large-scale (non-randomised) study of ACT in the USA suggested that ACT did not significantly (in the matched sample) reduce homelessness yet caused a net increase in costs, thus questioning whether this is the most effective way with which to deal with the problem of homelessness amongst people with schizophrenia (Slade et al. 2012).

20. Figure converted from US\$ using PPP rates in 1992 and then updated for inflation using the GDP deflator.

The above studies were all conducted in the USA and the first two are now quite dated, meaning questions must be asked about the relevance of these findings for the UK today. The most recent RCT studying high-fidelity ACT in the UK found no reduction in service use for ACT service users – indeed total in-patient days were higher (but insignificant) for the ACT group than for the community mental health team group (Killaspy et al. 2009). Whilst the study did not report on homelessness directly, it raises questions about the added benefit that ACT services bring above and beyond Community Mental Health Teams in a UK context, not least because many ‘standard’ community services now embody the principles of assertive outreach (Burns et al 2001).

Outreach Programmes

Outreach programmes aim to improve outcomes for homeless people with mental illness by engaging with homeless people who are unwilling to find help on their own and providing help to such groups.

The only outreach programme evaluated with an experimental design is the New York Choices programme. This consisted of four main elements: (1) outreach and engagement, (2) invitation to the Choices Centre, (3) respite housing, and (4) in-community and on-site rehabilitation services (Shern et al. 2000). By using available service use data, Rosenheck (2000) estimated that the service increased costs, both through the additional intervention costs and through increased service use costs as more people were brought into services.

Similarly, by estimating the cost implications from service utilisation data, Rosenheck (2000) estimated that the Access to Community Care and Effective Supportive Services Program (Lam & Rosenheck 1999) was a cost-increasing intervention but was effective in improving access to housing and improving symptoms. Likewise, an observational study of the Department for Veteran’s Affairs veteran’s program showed health care costs (both inpatient and outpatient) increased significantly with outreach contact, with an observed increase in health care costs of 13%. When the costs of the intervention are also added, the

observed increase in costs in the year after first outreach contact was 36% (Rosenheck et al. 1993).

By the definition of outreach, these programmes very often bring people into contact with services who may not otherwise have been so, and thus may well increase service use costs as well as improving outcomes. This does not mean these programmes are not cost-effective, but their cost effectiveness lies in the balance of the extra costs they incur, the improvement in outcomes and the value society places on those improvements.

Supported Housing

Supported housing for people with schizophrenia is seen as a crucial component of care for those who may not be able to live independently in the community (Lelliott et al. 1996; Priebe et al. 2009). High-quality supported housing interventions may reduce the number of people with schizophrenia who become homeless (Macpherson 2004). Surprisingly very few high-quality studies have attempted to address the implications of supported housing for people with schizophrenia (or severe mental illness in general). Indeed, a recent Cochrane review on the subject found that no studies met their inclusion criteria (Chilvers et al. 2010).

Studies have addressed the issue but given their methodological weaknesses results must be interpreted with caution. One study in Boston, Massachusetts randomised participants to either Evolving Consumer Households (where people with schizophrenia lived in groups and, in the early stages, had much support from programme workers) or Independent Living apartments. Housing and clinical outcomes were not significantly different between the two groups, but costs for the Evolving Consumer Households group were much greater due to the additional housing costs (Dickey et al. 1997; Rosenheck 2000). An observational study of the Department for Veteran’s Affairs Homeless Chronically Mentally Ill Veterans Program in which homeless people with mental illness were given time-limited treatment in a halfway house suggested that residential treatment led to superior outcomes

but increased costs: mean costs for the residential treatment group were 53% higher than for the case management group (Lipton et al. 1988; Rosenheck 2000).

The evidence on the cost-effectiveness of supported housing interventions in the context of tackling homelessness is mixed. There is a need for robust studies in this area.

CRISIS TEAMS

Crisis Resolution Home Treatment (CRHT) teams were established in the NHS following their recommendation in the National Service Framework in 1999 (Department of Health 1999). The aim of these teams is to provide intensive treatment and support in the community to those undergoing a severe mental health crisis that would otherwise result in admission to an inpatient unit. Effective CRHT teams reduce inpatient usage, both through reducing the probability that an admission would occur (acting as a so called “gatekeeper”) and by allowing for earlier discharge.

Studies suggest savings can be made from CRHT teams when they are implemented with high fidelity. A prospective non-randomised study compared service costs of patients before and after the implementation of a CRHT team in South Islington (McCrone et al. 2009b). It was found that mean costs for the cohort following the implementation of the Crisis Resolution team were £1738²¹ lower than before the service, although this difference was not statistically significant. A subsequent economic evaluation alongside a randomised controlled trial examining the effects of a Crisis Resolution Team in North Islington found that mean total service use costs were £2520²² (90% CI: £969 to £4054) lower for those randomised into the CRT group (McCrone et al. 2009c).

However, studies looking at the effects of the implementation of CRHT teams as they have been implemented and are working in practice have been slightly more mixed. An initial analysis showed a positive effect on inpatient admissions with admissions falling by an average of 10% (95% CI: 1.7% to 18.1%) more in the 34 areas which had had CRHT teams in place for the past two years and by 23% (95% CI: 7.1% to 38.4%) more in the 12 areas

which operated 24 hours a day, compared with the 130 areas without CRHT teams (Glover et al. 2006). However, reanalysis of the same admission data reached a different conclusion. The reanalysis used a difference-in-difference model and controlled for confounding variables such as deprivation, substance misuse, age, gender, population density, region, length of stay and fidelity of services. The CRHT indicator variable was not significant. This analysis led the authors to the conclusion that the implementation of a CRHT *per se* did not decrease admission rates (Jacobs & Barrenho 2011). However, this perhaps reflects the fact that while inpatient use for those receiving CHRT input falls, bed use for an area may be maintained due to the existence of excess demand.

Earlier work by the National Audit Office (2007) suggested that while CRHT teams were having a positive impact on inpatient bed use, teams were often not utilised to their full potential. The survey of 500 admissions they carried out suggested that only half (as opposed to all) of admissions had been assessed by a CRHT team and that 20% of admissions could have been suitable for CRHT instead. Economic analysis for the NAO, using a decision modelling framework, estimated a saving of £690²³ per crisis episode with full utilisation of a CRHT team versus when no such service was available. This economic analysis concluded that at least £13.7 million could be saved each year if teams in which a below-average proportion of cases involved CRHT involvement could increase involvement to the average rate of 53%. They estimated potential savings of £59 million a year if the involvement rate was 90% for all teams.

Likewise a report by the Healthcare Commission (2008) suggested that CRHT teams were not as fully utilised as intended. During a six-month study period, CRHTs were involved in only 61% of almost 40,000 admissions to acute wards, with very substantial variations across the country (rates ranged from 9% to 100%). Likewise, only 25% of almost 40,000 discharges from acute wards occurred early with CRHT support (rates ranged from 0% to 70%). This evidence suggests that the reduced inpatient bed use following the introduction of CRHT teams is not as great as it could be, which in turn suggests that further cost savings could be made if fuller use was made of CRHT teams.

PEER-SUPPORT WORKERS

Soloman (2004) defines peer support as ‘social emotional support, frequently coupled with instrumental support, that is mutually offered or provided by persons having a mental health condition to others sharing a similar mental health condition to bring about a desired social or personal change.’ Such support may be delivered voluntarily or be financially remunerated. It can take different forms: self-help groups, internet support groups, peer-delivered services, peer-run or operated services and peer employees (Solomon 2004). Generally an important distinction is that these services are unlike mutual support because peer-support workers receive training and supervision (Repper and Carter 2011). Whilst some of these services like self-help groups have long formed a part, albeit often an informal part, of recovery from mental illness in the National Health Service, others are relatively new and have yet to become mainstream components of care.

Peer-support workers are, at the simplest level, people who have experienced living with a diagnosis of severe mental illness and have been able to recover. Recovery emerged as a psychiatric concept in the English-speaking world in the 1970s and has largely overtaken the previous traditional medical model in the US (Davidson 2005). It defines the health outcome as overall wellbeing beyond symptom management. Of central importance in the ‘recovery’ approach is the very different expectation that patients can lead normal lives, secure employment, further education and training, and independent housing. Peer-support workers are those that are ‘further along their road to recovery’ (Deegan 1996; Repper & Carter 2011; Davidson et al. 2006). Peer-support workers are thought to benefit patients by sharing their experience, provide an empathetic and reciprocal relationship, and are better able to provide hope and encouragement, which in combination provide patients with empowerment, confidence, and increased self-esteem that facilitates the recovery process (Klein et al. 1998; Forchuk et al. 2005; Davidson et al. 2006; Lawn 2007; Rivera et al. 2007; Repper & Carter 2011).

The evidence base on peer-support workers largely comes from the US and as recently as 2003 it became a federally reimbursed service (The President’s New Freedom Commission on Mental Health 2003). In a forthcoming report from the Centre for Mental Health, it was found that peer-support workers are a cost-effective component of service delivery.

The evidence base on peer-support workers staffed in adjunct positions is growing and fairly extensive, although is also heterogeneous with respect to the functions and service models in which they are employed. In the forthcoming report from the Centre for Mental Health, the authors identified seven studies of good design, a majority of which were either randomized or observational studies, with one study relying on expert opinion for the estimation of hospital days saved. Generally it was found that one peer-support worker could save a significant number of hospital days per individual per year and the evidence base seems very positive in this regard. The estimates used by the Centre for Mental Health are conservative, reflecting minimum savings, although the studies themselves have reported greater reductions. The Centre for Mental Health, using UK costs, found that there is an almost certain likelihood that peer-support workers, if employed and paid as community support workers, would generate net cost savings. Across the eight studies, the total sample size for the control and intervention groups was close to 1,000 each (Centre for Mental Health, forthcoming). In these included studies, health benefits were either the same as, if not better than for individuals without peer support.

An alternative model for peer support is when workers are employed in existing case manager roles. Here, three studies found no worsened outcomes and peer-support workers could function in the same way as case managers with no experience of severe mental illness (Solomon & Draine 1995; Clarke et al. 2000; Schmidt et al. 2008). The studies found no statistically significant difference between individuals in relation to health or service use outcomes at the end of the study. While it was expected that patients would experience improved outcomes, at least in service use,

21. Updated to reflect current prices using PSSRU’s Pay and Prices Index

22. Updated to reflect current prices using PSSRU’s Pay and Prices Index.

23. All costs updated to reflect current prices using PSSRU’s Pay and Prices Index.

Schmidt (2008) hypothesizes this may be due to peer-support workers adopting the professional culture to fit in and thus downplay their medical history and rely less on their personal experience. These studies were randomized control trials with sample sizes of less than 50 in each group; Clarke et al (2000) replicated the same study design as Solomon and Draine (1995), comparing an intervention team fully staffed with peer-support workers as case managers and the control team staffed with case managers with no personal experience of a severe mental illness diagnosis. The study by Schmidt (2008) may be limited in its ability to detect differences because the intervention was staffed by only one peer-support worker as a case manager in a team of six with the analysis on group differences, limiting the ability to detect any differences if there were any.

It is, however, difficult to draw firm conclusions from just three studies focusing on the cost-effectiveness in terms of hospitalization, and further research in this area is clearly needed.

It is also worth noting that the benefits of employing peer-support workers include not just benefits relating to the people they support, but also benefits to the workers themselves in terms of being in gainful employment and all the associated rewards that this brings.

In conclusion, further research would help to generate stronger conclusions about the economic implications of peer-support workers. We are aware of a number of ongoing projects involving peer support (Williams 2011; Mental Health Foundation 2012) and it is hoped that these will contribute helpfully to the evidence base. However, the most recent work by the Centre for Mental Health reaches a similar conclusion to previous literature reviews (Davidson et al. 1999; Simpson & House 2002; Doughty & Tse 2011; Repper & Carter 2011; Wright-Berryman et al. 2011; Davidson et al. 2012) that the results are promising and that there are health benefits. The Centre's recent work, however, places more confidence than previous reviews in the assertion that there are significant reductions in hospital days, given the enhanced evidence base now available.

ADVANCED TREATMENT DIRECTIVES

Advanced Treatment Directives are documents drawn up to express a patient or service user's preferences concerning treatment options and other arrangements in the event of the individual losing the capacity to make that decision in the future. The preferences expressed in such documents can be overridden using the Mental Health Act, but the NICE guidelines (2009) state that 'healthcare professionals should endeavour to honour advance decisions and statements wherever possible'. Such directives have strong ethical appeal as they give people with schizophrenia a right to self-determination (including the right to refuse treatment) at times when they may lack capacity. In addition, there are hopes that such directives could decrease the use of coercion and involuntary admission during periods of relapse, possibly resulting in reduced service use.

A recent Cochrane systematic review of Advanced Treatment Directives found just two published studies that met its inclusion criteria (most studies on the subject were non-randomised and therefore excluded). The first included study was an RCT examining the effects of making a low-intensity Advanced Treatment Directive intervention where people with schizophrenia were encouraged to fill in a booklet containing seven preference statements (e.g. 'If I do seem to be becoming ill again I would like...' and 'If I have to be admitted to hospital again I would like...'). The study investigated the effects of the intervention on compulsory re-admission rates for 156 individuals about to be discharged from two psychiatric inpatient units in London (Papageorgiou et al. 2002). The study found no significant differences in voluntary or involuntary readmission in the one-year follow-up period.

The second study was a single-blind RCT measuring the effects of a joint crisis plan that was 'formulated by the patient, care coordinator, psychiatrist and the project worker and contained contact information, details of mental and physical illnesses, treatments, indicators for relapse, and advance statements of preferences for care in the event of future relapse' (Henderson et al. 2004). This study was also carried out in the UK. It found that

Figure 7: Re-hospitalisation rates with CBT from Jones and colleagues (2012)

Rehospitalisation	Pooled sample size	Estimated Risk Ratio	95% Confidence interval
Short term	136	0.36	0.11 to 1.13
Medium term	132	0.59	0.27 to 1.30
Long term	294	0.86	0.61 to 1.20

compulsory admissions were significantly ($p=0.028$) lower for the intervention group than for the control group, with a risk ratio of 0.48 (95% CI: 0.25 to 0.95). In other words, the study estimated that the intervention reduced compulsory admissions by more than one half. An economic evaluation of the study estimated that the service costs incurred by the intervention group were £1210²⁴ lower, although this difference was not statistically significant (95% CI: -£3109 to £5529). The authors concluded that there was a greater than 78% chance that the Joint Crisis Plans are more cost-effective than standard service information (Flood et al. 2007).

Jankovic (2010) suggested the observed differences in outcomes between these two studies could be due to the fact that Papageorgiou and colleagues' study looked only at people about to be discharged who had been undergoing treatment under sections 2, 3 or 4 of the Mental Health Act, whereas Henderson and colleagues looked at a broader group of people – anyone with an operational diagnosis of psychotic illness or non-psychotic bipolar disorder who had experienced hospital admission within the previous two years. Additionally, the interventions were very different, one being a low-intensity booklet not supported by the service user's mental health team, whilst the other intervention fully involved many stakeholders.

There seems to be some positive evidence that, as well as increasing self-determination of service users, Advance Directives may result in lower service use and service costs. More evidence is, however, needed before a firm conclusion could be drawn on this issue. Two study protocols have been identified describing RCTs currently in progress examining the effects of Advanced Directives on service use and costs (Thornicroft et al. 2010; Ruchlewska et al. 2009). These studies are taking place in the UK and the Netherlands respectively. The results and analysis of these studies will hopefully allow more conclusive inferences to be made on the economic implications of Advance Directives.

COGNITIVE BEHAVIOUR THERAPY

Cognitive Behaviour Therapy (CBT) is a short-term talking therapy typically comprising of between five and twenty weekly sessions with homework between sessions. As its name would suggest, CBT focuses on thinking patterns and behaviour, often breaking down problems into small components so that straightforward interventions can be identified to address these problems. CBT sessions often comprise of discussions with the therapist about negative beliefs and behavioural experiments in which beliefs are tested through

24. Updated to reflect current prices using the Pay and Prices Index reported in the PSSRU unit costs volume.

behavioural changes. The elements of CBT that are different from other psychological therapies are the highly structured nature of the therapy, the focus predominantly on the here-and-now and its practical nature. CBT has been shown to be beneficial in the treatment of a wide range of mental health conditions including depression and anxiety disorders. More recently it has been recognised that CBT may also be beneficial for individuals with schizophrenia by helping them cope with unhelpful thoughts and behaviours. CBT is formally recommended by NICE yet in practice the therapy is not available in England for the majority of people with schizophrenia.

By helping people with schizophrenia to address negative thoughts and behaviours, CBT may be helpful in reducing relapse thus reducing service usage. In addition, CBT may equip individuals with coping mechanisms to return to employment, thus providing additional economic benefits.

Service Use

A recent Cochrane systematic review (Jones et al. 2012) compared CBT with other psychosocial treatments (both 'active' and 'non-active' therapies). A meta-analysis of relevant studies that met the inclusion criteria estimated that CBT reduced (but not significantly) readmission rates in the short, medium and long run. As shown in Figure 7, the estimated effect size was fairly large, but results were not statistically significant due to a large variance and relatively small pooled sample size. More evidence is needed before a firmer conclusion could be drawn as to how CBT impacts on admission rates vis-à-vis other psychological therapies.

However, since many people with schizophrenia do not have access to any kind of psychological therapy, the question of *which* psychological therapy may be seen as less relevant. For mental health services who do not, as yet, offer any form of psychological therapy, a more relevant question for economic evaluation is what are the costs and benefits of offering CBT or another psychological therapy as compared to offering no such service. Another psychological therapy that has been evaluated

for people with schizophrenia is cognitive remediation therapy, for which there is some encouraging evidence on both effectiveness and cost-effectiveness (Wykes et al. 2007, Patel et al. 2010). An earlier study evaluated what was called 'compliance (or adherence) therapy' for people who were leaving an inpatient setting to return to the community (Healey et al. 1998). It found cost-effectiveness advantages for the intervention, which included motivational interviewing, but a subsequent multi-site European study did not replicate the findings of effectiveness or cost-effectiveness (Patel et al. 2012).

Simple economic modelling by NICE involved a meta-analysis of five RCTs (the most recent being 2003) to obtain a relative risk ratio of hospitalisation of 0.74 for CBT plus standard care compared to standard care alone (95% CI: 0.61 to 0.94). This analysis estimated that a full course of CBT, involving 16 individually delivered sessions with a clinical psychologist, each of one hour in duration, cost £1184.²⁵ However, the reduction in hospitalisation rates implied by the meta-analysis led NICE to estimate a reduction in hospitalisation cost of £2277, resulting in a net saving due to CBT of £989. In their sensitivity analysis, varying rehospitalisation rates to the bounds of the 95% confidence interval, the estimated net cost of providing CBT ranged between -£1124 (a net saving) and £829. However, more recent controlled trials suggest that the effectiveness of CBT on reducing relapse and hospitalisation rates may be lower than that assumed used in NICE's modelling. The RCTs identified by a recent review (Lynch et al. 2010) found no significant difference in relapse rates between CBT and control groups (Bechdolf et al. 2004; Tarrier et al. 2004; Valmaggia et al. 2005; Barrowclough et al. 2006; Garety et al. 2008), although some of these trials were testing group CBT which may affect fidelity and outcomes.

Other studies have attempted to analyse the cost implications of CBT directly by recording service use and calculating associated costs. Economic outcomes were recorded in an RCT of CBT for acute schizophrenia in North Wales (Startup et al. 2005). Positive clinical outcomes

25. This and other costs quoted in this paragraph were updated to reflect current prices using the Pay and Prices Index in the PSSRU volume.

were reported, with the CBT group scoring significantly higher than the control group on positive symptoms, negative symptoms and social function at a one-year follow-up, and significantly higher on negative symptoms and social functioning at the two-year follow-up. (They also appeared to score higher on positive symptoms at the two-year follow-up, but the difference was not statistically significant.) The economic evaluation of the trial showed that the mean cost of providing CBT was £914,²⁶ but this cost was offset by a reduction in service use. Mean total costs over the two-year period were slightly lower for the CBT group but the difference was not significant ($p=0.94$). This trial provides positive evidence for the claim that CBT is a cost-effective treatment for schizophrenia, providing superior clinical outcomes for the same cost.

A more recent RCT investigating costs associated with CBT in the Netherlands (Van Der Gaag et al. 2011) found that CBT was associated with better clinical outcomes than treatment as usual (183 days of normal social functioning vs. 106, $p<0.05$) but higher costs: the CBT group had mean total costs of £2860²⁷ higher than the comparison group over an 18-month period, although this difference was not significant. The authors calculated a cost of £39²⁸ per additional day of normal functioning gained, which suggested that CBT for schizophrenia could be a cost-effective intervention in schizophrenia if society is willing to pay this price.

Employment

If CBT does improve outcomes and prevent relapse in schizophrenia, this may lead to increases in employment, in turn leading to additional benefits, both to the Exchequer and to society. However, few studies could be identified that included employment as a measured outcome. Gumley and colleagues (2003) found employment increased 2.1 times more from baseline in the CBT group than in the treatment as normal group but this was not significant at conventional levels.

Another study (Lysaker et al. 2005) investigated the use of 'enhanced cognitive-behavioural therapy for vocational rehabilitation in schizophrenia.' Fifty participants were offered 6-month work placements, and were randomised to receive either standard vocational services or a programme based on CBT techniques to target beliefs that might affect vocational functioning. Results were encouraging: compared to standard vocational services group, the CBT group worked for more weeks ($p=0.02$) and more hours ($p=0.06$). Caution must be exercised in applying these conclusions to how standard CBT might affect employment outcomes since this CBT programme was designed specifically to help its participants in a work environment, and therefore the effect may be larger than for more typical CBT courses. However, this study does suggest that there may be additional economic benefits to CBT (in addition to any reduction in service use) through an increase in paid employment (and thus an increase in tax revenue and a reduction in benefits dependence).

26. Updated to reflect current prices.

27. Converted into pounds sterling using PPP exchange rate as reported by OECD iLibrary.

28. Converted into pounds sterling using PPP exchange rate as reported by OECD iLibrary.

CONCLUSIONS

In this report we have described both the main costs associated with schizophrenia and the economic implications of a variety of interventions. The interventions considered include some that are currently widely used in practice, as well as some that have yet to be fully explored or applied in the UK, and are not, generally speaking, incorporated into mainstream care, support and treatment arrangements. In concluding we offer a few brief comments.

First, we have found many areas where both the availability and quality of economic evidence are disappointing. This has limited our ability to say very much about the likely economic consequences of some promising-looking interventions, and in some other cases it has meant that we can only set out such consequences over relatively short time periods. Schizophrenia is an illness with potentially lifelong implications for individuals and families, and it would be helpful if the associated economic impacts of both the illness and interventions that might be accessed could be more reliably projected.

What is clear from the evidence that we were able to collate in this report is that schizophrenia has very significant economic consequences for society. Whilst some of the costs estimated in previous studies are unavoidable, given the nature of schizophrenia – because, for most people, the illness will need treatment of some kind for some period of time – there is nevertheless strong evidence that several interventions that are not currently in widespread use could reduce the overall cost of schizophrenia while improve health and quality of life outcomes for people with the illness and for their families.

But there are challenges in getting the right responses to this evidence. One challenge is obviously the general economic climate, particularly in view of the austerity measures being implemented across public and non-public sectors alike. It is hardly a great time to be proposing additional public expenditure unless savings can be expected. Moreover, those savings will need to be secured in relatively short timescales, whereas some of the evidence in support of interventions discussed in this report suggests that the economic advantages might take a number of many years to be fully realised.

A linked challenge is that many interventions require expenditure by one part of the public sector (and often this will be the NHS), while many of the payoffs in terms of savings, improved productivity and so on could well be seen in other parts of the public sector or elsewhere. One consequence and challenge is likely to be a need for negotiation to agree joint courses of action across government departments, local council budget areas or more widely. Without such coordination, it could hard to address what are clearly pressing issues for individuals, families and communities.

Some interventions will not produce savings that are sufficient to cover the full cost of the initial investment or the continued support of individuals with schizophrenia. In other words, those interventions could cost more than they save. This is absolutely no reason for not exploring those options further, because the vast majority of interventions in, for example, the health field or the criminal justice system also do not generate savings that exceed expenditures. The crucial question is whether the returns to those expenditures are justified, and that means making comparisons of costs and outcomes between interventions, not just for people with schizophrenia but for people with other health needs, and indeed in comparison to other areas of public expenditure.

There is, finally, also the question of inequalities, which we have barely touched on in this report. Because of the devastating impact of an illness like schizophrenia, people with the condition often find themselves in personal economic difficulties. Many people with schizophrenia are socially isolated or in other ways socially as well as economically excluded. Interventions that have the potential to improve their quality of life should be considered not just on grounds of efficiency (i.e. whether the health or quality of life gains justify the costs), but also on the grounds of equity. In other words, do those interventions help to break down otherwise entrenched positions of social exclusion, creating better life chances?



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The Schizophrenia Commission is an independent group set up and funded by Rethink Mental Illness (Registered charity number 271028).

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This report should be referenced as:

Andrews A, Knapp M, McCrone P, Parsonage M, Trachtenberg M (2012) *Effective interventions in schizophrenia the economic case: A report prepared for the Schizophrenia Commission*. London: Rethink Mental Illness.