

Youth Mental Health: New Economic Evidence

Martin Knapp, Vittoria Ardino, Nicola Brimblecombe,
Sara Evans-Lacko, Valentina Iemmi, Derek King,
Tom Snell, Silvia Murguia, Henrietta Mbeah-Bankas,
Steve Crane, Abi Harris, David Fowler,
Joanne Hodgekins, Jon Wilson

January 2016

The Personal Social Services Research Unit (PSSRU) at the London School of Economics and Political Science is a leading social care research group. Since its establishment in 1974 at the University of Kent, PSSRU has had considerable impact on national social care and mental health policy and practice in the UK and in a number of other countries.

PSSRU contact information

Personal Social Services Research Unit
London School of Economics and Political Science
Houghton Street
London
WC2A 2AE

Email: pssru@lse.ac.uk

Tel: +44 (0)20 7955 6238

Website: www.pssru.ac.uk/index-kent-lse.php

Available for download at

www.pssru.ac.uk/publication-details.php?id=5160

This report presents independent research carried out following a request by the NHS Confederation's Mental Health Network on behalf of SHA Mental Health Leads Group (when in existence) to review the evidence around the potential impact of youth mental health services on economic outcomes, and to conduct an economic evaluation of various models of youth mental health service provision. The views expressed in this publication are those of the authors.

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ABOUT THE AUTHORS

[Martin Knapp](#)¹

www.pssru.ac.uk/people-profile.php?id=36

[Vittoria Ardino](#)¹

www.pssru.ac.uk/people-profile.php?id=3811

[Nicola Brimblecombe](#)¹

www.pssru.ac.uk/people-profile.php?id=3685

[Sara Evans-Lacko](#)^{1,2}

www.pssru.ac.uk/people-profile.php?id=3925

[Valentina Lemmi](#)¹

www.pssru.ac.uk/people-profile.php?id=3668

[Derek King](#)¹

www.pssru.ac.uk/people-profile.php?id=35

[Tom Snell](#)¹

www.pssru.ac.uk/people-profile.php?id=47

[Silvia Murguia](#)³

[Henrietta Mbeah-Bankas](#)³

[Steve Crane](#)³

[Abi Harris](#)³

[David Fowler](#)⁴

www.uea.ac.uk/medicine/people/profile/d-fowler#overviewTab

[Joanne Hodgekins](#)⁴

www.uea.ac.uk/medicine/people/profile/j-hodgekins

-
1. Personal Social Services Research Unit, London School of Economics and Political Science
 2. Health Service and Population Research Department, Institute of Psychiatry, King's College London
 3. Tower Hamlets Early Detection Service (THEDS), London
 4. Norfolk and Suffolk Specialist Youth Mental Health Service and University of East Anglia

Executive Summary

This report examines the economic challenges of youth mental health problems in England. The main focus is on adolescents and young adults. We summarise findings from a review of the international evidence on the economic impact of youth mental health services, an analysis of the economic implications of youth mental health problems – including the failure to recognise or treat them – and an evaluation of two models of youth mental health service provision in England. We make a number of recommendations.

This is the first study of the economic impact of youth mental health services in the UK.

Mental health issues account for a significant proportion of the burden of ill-health experienced by young people in the UK:

- Approximately 1 in 10 children and young people have a diagnosed mental health problem.
- However, mental health issues are more likely to be missed in young people than in any other age-group.

The period of adolescence and early adulthood is one in which individuals are highly susceptible to the development of mental health issues:

- 75% of mental illness in adult life (excluding dementia) starts during adolescence
- Existing mental health issues often become more complex during adolescence

Adolescence is the period when reluctance to use mental health services is at its peak and when there are complex transitions to manage from child and adolescent to adult services. The result is that many young people in need do not receive any clinical intervention.

Unidentified and untreated mental health issues at this stage in life can have devastating and costly consequences:

- worse physical health in both the short-term and long-term
- poorer health behaviours: in particular misuse of alcohol, smoking, and substance use
- poor social, educational and employment outcomes.

Recent UK government reports and policy documents recognise deficiencies in the way that services respond to the mental health needs of young people, particularly those who are most vulnerable.

The *Children and Young People's Mental Health and Wellbeing Task Force* was set up in September 2014 by the Government in response to growing awareness and concerns about what was perceived as a growing crisis in the delivery of care to young people.

One possible solution to improving access, engagement and acceptability is age-appropriate, youth-specific mental health services.

There are few data on youth mental health services, particularly economic data, with the exception of psychosis services, a few of which are youth-specific. Our report focuses mainly on non-psychosis mental illness and services for the 12 to 25 age group.

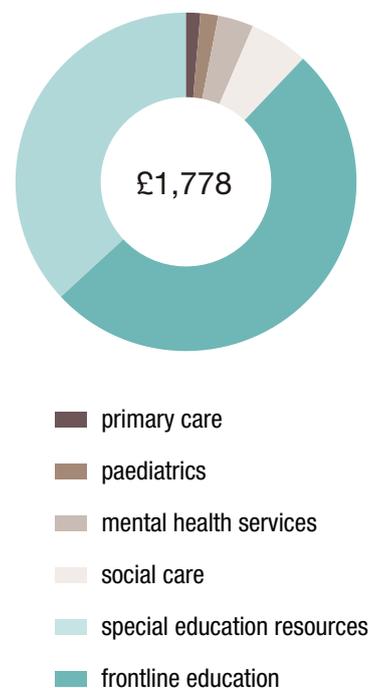
KEY FINDINGS

Economic evidence

- A review of UK and international evidence on youth mental health issues and their treatment found very little previous research on economic aspects of mental health issues or on services for young people in the UK or elsewhere.

Costs of mental health services for teenagers

- We analysed data from a nationally representative epidemiological survey, the British Child and Adolescent Mental Health Survey (BCAMHS). We found that for young people aged 12–15 at baseline assessment (aged 15–18 by the end of the follow-up period), mental health-related average costs over the three-year follow-up period totalled £1,778 a year; 90% of this cost was incurred by the education sector. The total cost comprised: £24 for primary care, £30 for paediatrics, £60 for mental health services, £100 for social care, and £908 for frontline education and £656 for special education resources.
- Total costs were highest for 12–15 year olds with hyperkinetic disorders (i.e. inattention, hyperactivity, impulsivity) with a mean annual cost of £2,780. Average annual costs were £1,789 for 12–15 year olds with conduct disorders and £1,353 for those with emotional disorders.
- There were marked inter-individual variations in service utilisation and in costs. Variations in service use and costs were associated with child and family characteristics and circumstances, such as age, reading ability, severity of emotional and behavioural difficulties, single-parent family, and maternal mental wellbeing.



Economic consequences of not treating mental health issues

- We also looked at data from the 2000 Adult Psychiatric Morbidity Survey (APMS), another big nationally representative survey. We found that young people aged 16 to 25 with mental health issues at baseline were significantly more likely not to be in employment, education or training (NEET) than those without such issues (27% vs 16%). This has economic consequences for those young people and for society.
- Young people with mental health issues at baseline were also significantly more likely to be on welfare benefits than those without mental health issues (27% vs 14%).
- Among the group with mental health issues, those in contact with services were much more likely to be receiving benefits. Given that there was no difference in NEET status between those who did or did not receive treatment, this result appears to show that mental health services are helping young people to secure their benefit entitlements.
- We also found that young people with a mental health issue at baseline (compared to not) were 8 times more likely to have contact with criminal justice services 18 months later. This type of service use also has economic costs.

Treatment gap

- A key theme emerging from our research was the substantial unmet need for services for young people with mental health problems.
- Our analysis of 1999 BCAMHS data found that more than half (55%) of 12–15-year olds with mental health issues had no contact with services in connection with their mental health needs.
- Analysis of the APMS found that the treatment gap is much wider for adolescents and young adults than it is for any other age group: 55% of young people aged 16 to 25 with a mental health issue were not receiving mental health services. The gap is especially wide for those aged 21–25: nearly two-thirds (64%) of young people aged 21 to 25 with a mental health issue were not getting support from mental health services.
- Even for those young people aged 16 to 25 with a severe mental illness, nearly half (46%) were not receiving mental health services. For people with severe illness, this is lower than the rate of contact with specialist services for any other age group.
- Just under half (45%) of a small sample of young people with symptoms of mental illness commencing two-year treatment at a youth mental health service in London in 2010–2012 had not been receiving mental health services during the previous three months.
- The treatment gap has been known for at least two decades and our study identifies treatment gaps dating from 1999. It should be of considerable concern that such gaps have been allowed to continue.

Limited availability of services

- Our ‘mapping’ of specialist youth mental health provision across the UK in 2014 found there was very limited availability. Indeed, some specialist services had closed or changed their focus. In contrast, there were also some well-planned and well-received local services in some parts of the country.

- The treatment gap and the limited availability of services are consistent with recent and ongoing cuts to the funding of youth mental health services in England at a time when need is rising:
- Two-thirds of councils and Clinical Commissioning Groups have cut or frozen budgets for child and adolescent mental health, according to a 2015 Young Minds Freedom of Information request.
- Expenditure by former Primary Care Trusts on child and adolescent mental health services fell from £758 million in 2008/9 to £717 million in 2012/13 (at constant prices).
- Concerns about cuts to funding at a time of increasing need were highlighted by the recent Children and Young People's Mental Health and Wellbeing Task Force report.

Specialist youth mental health services can potentially contribute to improving young people's mental health

- We used routinely collected data from two local specialist youth mental health services – Tower Hamlets Early Detection Service in London and the Norfolk and Suffolk Specialist Youth Mental Health Service – to examine the economic case for this type of service.
- It was not possible to do a full evaluation, but our tentative findings are that significant improvements had been achieved in mental health, employment, education and training outcomes. Contacts with services such as emergency and inpatient hospital care and the criminal justice system had reduced.
- Youth-specific service models of these kinds can potentially contribute importantly to repairing troubled lives, with potential knock-on economic benefits in both the short and longer term.

We conclude that:

To neglect mental illness in young people is not only morally unacceptable, but also an enormous economic mistake.

RECOMMENDATIONS

- A Invest early to prevent or reduce the risk of mental health issues emerging during childhood and adolescence**, for example through earlier and better recognition of maternal mental illness; anti-bullying efforts in schools; and better links to services that work with young people not in employment, education or training.
- B Earlier recognition, timely diagnosis and better response** for those young people who do experience mental health issues.
- C Respond to mental health issues with evidence-based interventions**. Services should be widely available and responsive to needs, flexible enough to adapt to individual circumstances and appropriate for young people.
- D Remove barriers to access and to treatment-seeking by young people**. There is an urgent need for more and better evidence on what works in the youth mental health area. Combatting stigma must be part of the response to this challenge.

- E** Reverse the downward trend in funding of child and adolescent mental health services in England.
- F** **Address difficulties in transition between CAMHS and adult services.** We welcome the fact that NICE is in the process of preparing guidance on transitions in many areas of health, including mental health.
- G** **Strive for better service coordination and integration.** The consequences of failing to recognise or respond to mental health issues in childhood and adolescence can last a lifetime and can spill into many different public and private budgets. The relevant agencies – especially education, youth justice, health, social care, welfare benefits – need to work together to agree priorities and take the necessary actions.
- H** **Collect better and coordinated cross-sector data on levels and patterns of spending and provision, and on individual and societal outcomes.** This action is needed across all relevant sectors, and would greatly assist implementation, monitoring and evaluation of mental health services for young people.

KEY STATISTICS

- Approximately 1 in 10 children and young people have a diagnosed mental health problem.
- 75% of mental illness in adult life (excluding dementia) starts during adolescence
- For young people aged 12–15 at baseline assessment, mental health-related costs over the following three years averaged £1,778 per individual per year; 90% of this cost fell to the education sector.
- Costs were highest for 12–15 year olds with hyperkinetic disorders (inattention, hyperactivity, impulsivity), averaging £2,780 a year.
- 27% of young people aged 16 to 25 with mental health issues were not in employment, education or training (NEET) compared to 16% of young people that age without mental health issues.
- 27% of young people with mental health issues were on benefits compared to 14% of those without mental health issues.
- Young people with mental health issues were 8 times more likely to have contact with criminal justice services than young people without such issues.
- 55% of 12–15 year olds with mental health issues at baseline had no contact with services in connection with their mental health needs.
- 55% of young people aged 16 to 25 with a mental health issue were not receiving mental health services. For those young people aged 21 to 25 with a mental health issue, 64% were *not* receiving mental health services.
- Even for those young people with a severe mental illness, 46% were not receiving mental health services.
- Despite the already wide gaps in treatment, 65% of councils and Clinical Commissioning Groups cut or froze their budgets for child and adolescent mental health services last year (Young Minds survey).

Youth Mental Health: New Economic Evidence

1. INTRODUCTION

1.1 Prevalence and need

Mental health issues account for a significant proportion of the burden of ill-health experienced by young people in the UK (Chief Medical Officer 2013). Prevalence is estimated at between 10% and 20% in the 16–24 age group (Ford *et al* 2008; McManus *et al* 2009; Headstrong 2013), and long-term morbidity and mortality are among the highest of any group (Bailey 2003). Prevalence of mental illness increases during adolescence and issues become more complex (Costello *et al* 2003). Societal changes such as the increase in youth unemployment and increasing instability of employment, poverty and insecure housing, all of which are among the known risk factors for mental health issues in adolescence and early adulthood (Mental Health Foundation 2006; Prince's Trust 2014) may mean that young people are at increasing risk.

The majority of mental illnesses start during adolescence and persist into adulthood (Kim-Cohen *et al* 2003; Kessler, Berglund *et al* 2005). They are associated with poor short- and long-term mental and physical health and negative social, educational and economic outcomes for the young people themselves and for their family and carers, and with financial costs to health and other services such as the criminal justice system (Kim-Cohen *et al* 2003; Kessler *et al* 2005; Bodden *et al* 2008; Cosgrave *et al* 2008; Suhrcke *et al* 2008; Centre for Mental Health 2010; Goodman *et al* 2011; Snell *et al* 2013; Beecham 2014; Department of Health 2014). Mental illness can lead to poor health behaviours – in particular alcohol, smoking, and substance use – likely to result in poorer physical health in adulthood (Bush *et al* 2007; Children and Young People's Health Outcomes Forum 2012).

The situation for people with severe mental health issues is particularly problematic in terms of costs, negative outcomes and need for and use of services (McCrone *et al* 2013; Park *et al* 2015). Individuals will often have had a long duration of untreated illness before accessing services (Norman & Malla 2001), and severe disorders are typically preceded by less severe disorders that are seldom brought to clinical attention (Kessler 2007). When mental health issues go unrecognised and untreated, symptoms may worsen, requiring much more expensive treatment when they are eventually spotted.

1.2 Treatment gap

Because of the peak onset of mental health issues in this age group and the long-term consequences if untreated, there is a need for early intervention and prevention. A stronger focus on young people's mental health can generate greater personal, social and economic benefits than intervention at other times in the lifespan (McGorry *et al* 2008). Despite this, current services do not serve this population well.

Under-diagnosis or misdiagnosis (Green *et al* 2005), a reluctance to access services (Gulliver *et al* 2010), negative attitudes among young people about seeking professional help (Rickwood *et al* 2005), negative attitudes held by their parents too (Gronholm *et al* 2015), discomfort with receiving a formal diagnosis (Brown *et al* 2000) and the feeling that current services are inappropriate for their needs (Rickwood *et al* 2005; Gulliver *et al* 2010; Lavis & Hewson 2010) have resulted in a mismatch between needs and service provision.

The result is that many young people do not receive any clinical intervention. It is hard to find very recent evidence, but in 2004, only 25% of children with mental illness were in treatment (Green *et al* 2005) and this had not improved by 2010 (Centre for Economic Performance Mental Health Policy Group 2012). Of the minority who do access treatment, many drop out or do not engage (Essau 2005; Farrell & Barrett 2007; Ford *et al* 2008) and there is an increase in disengagement from childhood to adolescence (Evans-Lacko *et al* 2011). Certain sub-groups are further under-represented. For example, people from Black, Asian and minority ethnic (BAME) backgrounds are less likely to access mental health services (Chahal & Ullah 2004; Street *et al* 2005) as are those from lower socio-economic groups.

Transition from child and adolescent mental health services to adult services may present a particular problem (Singh *et al* 2010). Adolescence is a time of neurobiological and behavioural transitions – a period of rapid emotional, physical, intellectual and social change – and vulnerable young people may struggle to make their way through complicated developmental transitions. At a time when young people are undergoing many other key transitions in their lives, they often fall through the gap, disengage or find adult services inappropriate to their needs (Singh 2009; Singh *et al* 2010). As McGorry (2007) says: ‘the pattern of peak onset and the burden of mental disorders in young people means that the maximum weakness and discontinuity in the system occurs just when it should be at its strongest’.

A related problem is the lack of integrated service provision for this age group. Young people with or at risk of mental illness may never see the services they need. Being sub-threshold, but still at risk, raises additional problems with accessing appropriate services (WHO 2005, Headspace 2008, Singh *et al* 2008).

One possible solution to improving access, engagement and acceptability is age-appropriate, youth-specific mental health services (McGorry, Hazell *et al* 2008) and Government policy has recognised the needs in this area (HMG 2003; Department of Health and Department for Education and Skills 2007; Department of Health 2009; Department of Health & NHS England 2015). Viner (2007) found that age-appropriate inpatient services for 12 to 17 year olds improved attendance and retention and improved quality of care and feeling about their care. However, according to Bailey (2003) ‘in dramatic contrast to the numbers of adolescents using services and their perceived special needs... there is a relative dearth of specific or discrete services for young people within all our health services’ (p18).

Although youth-specific models have been developed to an extent in services such as palliative care, epilepsy and diabetes, this has generally not been the case in psychiatric care (Bailey 2003), except in the area of psychosis. Tailored Early Intervention for Psychosis (EIP) services offering targeted interventions to individuals between 16–35 years – the age range at which first episode psychosis is most likely to occur – have been demonstrated to have good clinical outcomes, to be cost-effective, and are considered helpful by service users (Lester *et al* 2011; Marshall & Rathbone, 2011). There is also good evidence that EIP services are cost-effective (Mihalopoulos *et al* 2012, Park *et al* 2015). However, these services are only available for young people experiencing psychosis.

There are, however, few data on *broader* youth mental health services, particularly economic data, which may be in part because of the rarity of this type of service model. In their systematic review of randomised controlled trials on the effectiveness, acceptability and cost of mental health services that provide an alternative to inpatient care for children and young people (aged 5 to 18), Shepperd *et al* (2009) found some differences in outcomes but commented on the lack of available economic evidence and concluded ‘The quality of the evidence base currently provides very little guidance for the development of services’ (p.4).

Unfortunately, what appear to be above-average cuts to the funding of mental health services (Young Minds 2014, 2015; King's Fund 2015) will not help the already difficult situation. In a written answer in late 2014 to a Parliamentary Question from Andy Burnham (Shadow Secretary of State for Health at the time), the Care and Support Minister (Norman Lamb) reported how much had been spent on child and adolescent mental health services in England over a period of five years. In real terms, aggregate PCT expenditure had fallen from £758 million in 2008/9 to £717 million in 2012/13 (2013/14 prices).

The most recent survey by Young Minds under Freedom of Information requests (published July 2015) shows that 67% of the 165 Clinical Commissioning Groups that responded had frozen or cut their budgets for CAMHS between 2013/14 and 2014/15, while 65% of the 97 local authorities that responded had similarly frozen or cut their budgets. Indeed, one in five local authorities had frozen or cut their budgets every year since 2010. There have also been cuts to social care and education budgets, which may disproportionately affect those who are already socially disadvantaged (Wahlbeck & McDaid 2012).

1.3 Policy context

The two most recent annual reports by the Chief Medical Officer: *Public Mental Health Priorities: Investing in the Evidence* (Davies 2014) and *Our Children Deserve Better: Prevention Pays* (CMO 2013) recognised the deficiencies in the way that current services respond to the mental health needs of young people, particularly the most

vulnerable young people. So too did the Government's 2014 mental health policy announcement for England, *Closing the Gap* (Department of Health 2014):

It has long been recognised that far too many young people who rely on mental health services are 'lost' to the system when they reach adulthood. Those affected are often the most vulnerable and disadvantaged; getting lost in transition only adds to this – and makes them more likely to end up out of work and not in education or training. It can also mean their physical health deteriorates. For a significant number therefore, transition is poorly planned, poorly executed and poorly experienced. For so many reasons, this “cliff-edge” situation must end (p.26)

The summary of the House of Commons Health Committee report on *Children's and Adolescents' Mental Health and CAMHS* started as follows (House of Commons Health Committee 2014):

There are serious and deeply ingrained problems with the commissioning and provision of children's and adolescents' mental health services. These run through the whole system from prevention and early intervention through to inpatient services for the most vulnerable young people (p.3).

The Committee went on to make a number of recommendations, in the process expressing concern that:

While demand for mental health services for children and adolescents appears to be rising, many CCGs report having frozen or cut their budgets. CCGs have the power to determine their own local priorities, but we are concerned that insufficient priority is being given to children and young people's mental health (p.4).

Their final comment in the summary of their report was absolutely clear:

There must be a clear national policy directive for CAMHS, underpinned by adequate funding (p.8).

The *Children and Young People's Mental Health and Wellbeing Task Force* was set up in September 2014 by the Coalition Government in response to increasing awareness and concerns about what was perceived as a growing crisis in the delivery of care to young people. It brought together a wide range of stakeholders from across government departments and NHS England, in addition to mix of experts from a wide variety of fields. These included young people and advocacy organisation such as Young Minds, voluntary sector organisations, professional leads for bodies such as the Royal College of Psychiatrists, clinical experts, physical health experts, social care, education, commissioners, and various others (e.g. information experts, social media experts). The Task Force met five times with work occurring outside of the main meetings during which specific work themes emerged as 'task and finish groups':

coordinated system, data and standards, prevention and access, and vulnerable groups and inequalities. In addition, reports on professional and young people's views were commissioned to inform the work. The remit of the Taskforce was to consider services for all young people, ostensibly up to a maximum age of 25, together with the systems which supported them.

The resultant report, *Future in Mind: Promoting, Protecting and Improving our Children and Young People's Mental Health and Wellbeing* (Department of Health & NHS England 2015), was supplemented with reports from each work stream and the consultation and engagement reports. Collectively these wide-ranging reports describe the scale of the problem but also attempt to set out a coherent and rational argument for substantial change in the way clinical services are commissioned and delivered. The arguments include social, clinical and financial descriptions of the case for change, from across all the sectors with which children, young people and their families have contact. By gaining consensus across agencies, the documents represent a 'call to arms', strongly arguing the case for a radical change.

The main challenges identified by the Taskforce include: significant gaps in data and information and delays in the development of payment and other incentive systems; the treatment gap (i.e. raising this as a public health issue between need and cases treated); difficulties in access; the complexity of current commissioning arrangements; and access to crisis, out of hours and liaison psychiatry.

By way of solutions, the Taskforce recommended changes across the system in a number of areas. These include: placing an emphasis on building resilience, promoting good mental health, prevention and early intervention; simplifying structures and improving access; delivering care in a clear joined-up approach; harnessing the power of information (both in terms of collecting data and in using new technologies to deliver interventions); sustaining a culture of evidence-based service improvements (including the training and skill-mix of the workforce, e.g. recommending CYP IAPT be rolled out nationally); and crucially making the right investments (analysing how resources are currently spent within local systems and making investment decisions in a coherent manner).

While the Taskforce recognised the economic benefits of better commissioned and delivered services, their documents included explicit recommendations about the need for more investment, appropriately targeted. Following the publication of *Future in Mind*, further investments were announced within the area of children and young people's mental health, together with the establishment of pilot sites to steer future policy and guide future investment. However, the Taskforce did not recommend specific models of achieving the overall objectives (other than CYP IAPT), beyond suggesting some specific methods, such as 'one-stop-shops' (single points of access for young people which aim to address multiple problems – housing, sexual health, mental health etc.) or methods such as having named points of contact for specialist services and schools, basing transitions to adult services on need rather than age,

having a named lead in each local area responsible for the overall delivery of services aimed at improving children and young people's mental health, or developing a specific set of information metrics to guide future investment and commissioning.

In the Government's 2015 Budget, the Chancellor of the Exchequer, George Osborne, noted a commitment to provide 'funding for a major expansion of mental health services for children and those suffering from maternal mental illness' (HM Treasury 2015). Later Ministerial speeches and announcements have provided some further details (e.g. Burt 2015, 2015a) and have referred to a commitment of £1.25 billion over a five year period. The Prime Minister's recent speech on mental health reaffirmed these policy intentions (Prime Minister's Office 2016), including specialist maternal mental health services, waiting time targets for eating disorder and psychosis services for young people, and expansion of IAPT for children and young people.

2. STUDY AIMS

We were asked by the NHS Confederation's Mental Health Network on behalf of SHA Mental Health Leads Group (when in existence) to review the evidence around the potential impact of youth mental health services on economic outcomes, and to conduct an economic evaluation of various models of youth mental health service provision. Our work comprised six elements, which we describe in turn in sections 3 to 8:

- We completed a *review* of international research evidence on youth mental health issues and their treatment (looking beyond early intervention services for psychoses), particularly looking for economic evidence (section 3).¹
- We sought to '*map*' specialist youth mental health provision across the UK (section 4).
- We looked at previously collected *epidemiological data* from two major surveys that collected nationally representative data on young people with mental health issues (sections 5 and 6).
- We worked with two local specialist youth mental health services (in East London and in Norfolk) and used their routinely collected data to examine the *economic case* for this kind of service (sections 7 and 8).

¹ Other recent work has looked at interventions for young people with learning disabilities and behaviour that challenges (Iemmi et al 2016). We would also draw attention to a forthcoming review of the international economics evidence by our LSE colleague David McDaid. In other LSE-based work, funded by The Shirley Foundation, we are looking at the economic case for interventions in support of young people and adults with autism spectrum disorder.

In section 9 we pull together some over-arching conclusions from our empirical work, and in section 10 we offer some recommendations.

We completed our report in October 2014, but we have updated it to July 2015.

3. LITERATURE REVIEW

A comprehensive literature review of the scientific and grey literatures was carried out.

We searched ten electronic databases (PubMed, EMBASE, PsycINFO, EconLit, ADOLEC, CENTRAL, Cochrane Database of Systematic Reviews, DARE, HTA, NHS-EED) in July 2013, and we updated the search in February 2014, and again in April 2015. The search strategy combined keywords for adolescent and young adult, mental health, and economics. Searches were not limited by publication date. References were screened by title and abstract, then the full text of each included article was retrieved and screened. Articles were included against the following inclusion criteria: mental health and economics, studies involving adolescent populations (13–18 years) or young adults (19–35 years). Both quantitative and qualitative study designs were included. Publications on developing countries were excluded given the aims of the study (focused on the UK). We excluded studies focusing on specific groups or conditions only (e.g. young offenders). In addition, we snowballed reference lists of previous reviews, we searched relevant websites (e.g. DH, NICE, NICE-Pathways, SCIE, Royal College of Psychiatrists, Mental Health Foundation, EU-DG SANCO, WHO-Europe, WHO) and we contacted experts in the field to gather more information about existing services or ongoing studies.

We identified 50 references, of which 15 were cost or economic studies and 35 intervention studies (see Appendix 1). Table 1 summarises the characteristics of the included studies. Out of the 35 intervention studies, 28 evaluated non-pharmacological interventions, one a pharmacological intervention, and six the organisation of care. Non-pharmacological interventions included cognitive behavioural therapy (11), family therapy (4), group therapy (1), psycho-education (2), dance (1), intensity exercise programme (1); school-based mental health screening (3), prevention programme (1), neuroimaging screening (1), and public education (1). The pharmacological intervention used methylphenidate. Studies on organisation of care included early intervention programmes (4), rapid response treatment (1), and inpatient/outpatient services organisation (1). Further details are provided in Appendix 1. Out of the six evaluating the costs and/or savings of mental health services for the 16 to 25 age group in the UK (or elsewhere), four of them focused on early intervention programmes for psychosis, one on rapid response treatment for suicide, and one on inpatient/outpatient services for anorexia.

Table 1. Characteristics of included studies

	Cost studies (n=15)	Intervention studies (n=35)
Country		
Australia	0	2
Canada	0	2
Hong Kong	0	1
Italy	0	1
Norway	0	1
Sweden	0	2
The Netherlands	2	3
United Kingdom	2	11
United States	11	12
Disorder		
Schizophrenia and psychosis	1	8
Bipolar disorders	1	0
Anxiety	1	2
Depression	2	10
Anxiety/Depression	1	2
Eating disorders	1	7
Personality disorders	1	0
Hyperkinetic disorders	4	2
Self-harm and suicide	0	2
Mental disorders	3	2

Of the few available published evaluations of youth mental health services in the UK, an evaluation of the Youtospace service for 16 to 25 year olds in Birmingham showed higher levels of engagement, lower numbers of 'Did Not Attends' (DNA), and high levels of acceptability (Singh 2012). Results for youth advice services for 14 to 25 year olds (Balmer & Pleasence 2012) showed an improvement in mental health and related stressors, in particular housing, with associated cost savings over and above the cost of providing the service.² There are now many studies examining the effectiveness of some interventions (e.g. as summarised by the Fonagy *et al* 2014), but very little is known about their cost-effectiveness.

This is clearly a new area as far as specialist provision and focused research are concerned, and one that needs a much more extensive and consistent body of research. The very few published papers in the area mentioned a scarcity of evaluations in mental health prevention or services for young people.

4. SERVICE MAPPING

A mapping exercise of youth mental health services in the UK aimed to provide a picture of existing mental health services for young people and to identify services that we might contact for potential economic evaluations. For each service identified we collected information regarding the type of service, provider, targeted age group, contact person, and any data or evaluations of the services currently available. In the initial stage we identified approximately 50 services. We have not detailed the service mapping findings here for reasons explained below.

These services varied in objectives and structure, and in the treatment and interventions they offered. Some focused on a particular gender, ethnic or cultural group or condition. Provision was by the NHS, local authorities, the voluntary sector, or partnerships between them. The mapping exercise highlighted many examples of good youth-focused service models, with some innovative approaches to care and support of young people aged 16 to 25, a broad-based and flexible approach to both mental health issues and the factors that may lead to, or exacerbate it such as issues with school, college or university, family and friends, housing, finance, substance misuse and employment, with a focus on promotion, prevention and treatment.

The service mapping illustrated that provision of youth-focused mental services in the UK is an emergent, in-flux, service area. While new services are emerging, some existing ones are also closing, shrinking or changing their focus, in particular their user group. Provision for this age group is still very low, patchy and sometimes transient.

² In Australia, the evaluation of the headspace programme for this age group (Muir 2009) found that headspace has been effective in promoting and facilitating improvements in some young people's mental and physical health, alcohol and drug use, and their social and economic participation.

Funding cuts to mental health and social care services, youth services and local authority budgets are likely to have had, and continue to have, massive impacts on the ability of new, innovative services to continue, expand or to set up in the first place, and informal discussions with practitioners and commissioners confirmed these difficulties. Several of the services in the initial mapping exercise that we conducted had changed or ceased to exist when we later reviewed the map. We therefore have not appended the service mapping details to this report because it would no longer be an accurate reflection of provision.

The service mapping exercise did however guide our approaches to services to explore the possibility of conducting an economic evaluation. We approached a number of services and although there was enthusiasm from many that we approached, they did not already collect the relevant outcome or service use data that we needed to be able to carry out our (modest) economic evaluations. (Our small study did not allow for the possibility of collecting primary data.) However, it proved possible for us to work in fruitful collaboration with two local specialist youth-specific mental health services – Tower Hamlets Early Detection Service (THEDS), and Norfolk and Suffolk Specialist Youth Mental Health Service. Staff in these services kindly made available data (in anonymised form, of course) that they had already collected for young people who had used their services. In sections 7 and 8 we describe findings from our analyses of data made available to us by those two local services.

5. ANALYSES FROM THE BRITISH CHILD AND ADOLESCENT MENTAL HEALTH SURVEY

5.1 Epidemiological data: introduction

Before describing our work in the two locality-based studies, we first report our explorations of the data collected in two nationally representative epidemiological surveys. In this section we focus on the British Child and Adolescent Mental Health Survey (BCAMHS), and in section 6 we report analyses of data collected in the Adult Psychiatric Morbidity Survey (APMS).

Our aim with the BCAMHS data was to look at the cost of support for young people with mental health issues, and to explore whether those costs were associated with the characteristics and circumstances of young people and their families.

5.2 Methods

The BCAMHS was the first nationally representative epidemiological survey of child and adolescent mental health (internationally, not just in the UK). It initially collected data for

10,438 children and adolescents aged 5–15 years in Great Britain in 1999 (Meltzer *et al* 2000). From the full sample we extracted the data on those young people aged 12–15 years at the baseline assessment.

Data on service use as a result of emotional or behavioural problems had been collected for a subsample of individuals for a period of three years after the baseline survey. Services can be grouped into six broad categories:

- Primary care costs – contact with GPs and health visitors.
- Paediatrics and child health service costs – contact with paediatricians, paediatric inpatient stays, community nurses, school nurses, dieticians, physiotherapists, occupational therapists, speech therapists and visits to accident and emergency departments.
- Mental health service costs – contact with child psychiatrists, child psychiatric inpatient stays and child psychiatric day hospital visits, counselling services provided in school and elsewhere, psychologists, family therapists, and community psychiatric nursing staff.
- Frontline education resources – parental meetings with teachers, extra help provided in the school by teaching staff and learning support assistants, contact with special educational needs officers and involvement with special educational needs tribunals.
- Special education resource costs – attendance at special schools and contact with educational social workers and educational psychologists.
- Social care services – social services assessments, contact with a social worker and use of respite care.

The collection methods involved a mix of postal questionnaires and telephone interviews. Data on 2,461 children and young people were obtained on three occasions (baseline, two years later, and a further one year later). Our analyses included all children and young people in the survey reported to receive some response from health, social care or school-based services as a direct result of concerns about ‘emotions, behaviour and concentration’, irrespective of whether those problems were sufficient for ICD-10 diagnosis. Interviewers graded the quality of responses and filtered out inappropriately reported service contacts. (For example, additional educational support related to dyslexia was not seen as mental health-related service use; in contrast, seeing a school doctor for assessment of special educational needs linked to autism was appropriate for inclusion.)

We attached costs to the reported service use patterns at 2007/08 price levels (the base for previous work we had undertaken in this area, but easily updated to today’s cost levels using a general inflator). Further details on the methods for data collection, the sampling procedures and the costing are given in two recent papers, and these

also provided the platform for the new work reported here for *youth* mental health (Snell *et al* 2013, Knapp *et al* 2015).

We then carried out two sets of analyses. In the first we calculated total and component costs for each individual, based on the data on their contacts with nearly 30 types of services or professionals at each time period. Multiple imputation was used to replace missing individual cost values. (Details in Snell *et al* 2013, although the estimates presented here are for a subset of the children and young people whose costs are reported in that paper.) We calculated the mean costs by category and overall, and described how those costs varied by type of mental health issue.

In the second set of analyses we were interested in the patterns of association between characteristics of young people and their families (as assessed at baseline) and mental health-related costs in the subsequent three years. Our analyses were based on two-part models (Duan *et al* 1983). The first part looked at the processes that drive the likelihood of any service use for each of five service groups in turn: primary care, specialist mental health services, frontline (i.e. standard) education, special education (i.e. for children with special needs) and social care contacts. These first-part analyses used logit models to examine factors associated with service contacts, with the dependent variable taking the value 1 if the individual had any service receipt (by category) in the follow-up period, and the value 0 if not. The second part looked at the factors that determine volume of resource use (cost) for those young people using at least some services. We estimated generalised linear models (GLM) with a log-link function (McCullagh & Nelder 1989), using Manning & Mullahy's (2001) algorithm to inform model selection. Details of these methods are given in Knapp *et al* (2015), although again the estimates presented here are for a *subset* of the children and young people whose costs are reported in that paper.

5.3 Results

Contacts with services

Across the full sample, most 12–15-year olds (84%) were not in contact with services as a direct result of concerns about 'emotions, behaviour and concentration'. For those 12–15 year olds with mental health issues at baseline, more than half (55%) had *no* contact with services in connection with their mental health needs (Table 2).

Costs by service category

For the group of young people aged 12–15 at baseline assessment (and so who were aged 15–18 by the end of the follow-up period), we found that *annual* mental health-related average costs over the three-year follow-up period were £24 for primary care, £30 for paediatrics, £60 for mental health services, £100 for social care, but £908 for frontline education and £656 for special education resources (Table 3).

Table 2. BCAMHS: young people NOT in contact with services as a direct result of concerns about ‘emotions, behaviour and concentration’

Service type	Percentage NOT in contact	
	Full sample	Baseline disorder
Primary care	90%	74%
Mental health	94%	81%
Frontline education	96%	88%
Special Education	97%	87%
Social Care	97%	91%
Any services	84%	55%

Table 3. BCAMHS: mean costs per person over three-year follow-up for individuals with psychiatric disorder (n=182)

	Mean cost/ young person	95% CI		Mean annual cost
		lower	upper	
Primary care	70.96	28.25	113.67	23.65
Paediatrics/children’s health services	89.88	29.94	149.81	29.96
Mental health services	180.98	100.14	261.83	60.33
Frontline education resources	2724.71	699.33	4750.09	908.24
Special education resources	1967.05	571.12	3362.99	655.68
Social care services	300.41	73.18	527.64	100.14
Total cost	5333.99	2790.32	7877.66	1778.00

Costs by disorder

This same broad cost distribution applied whether these adolescents had hyperkinetic, conduct or emotional disorders. Summing these mental health-related service costs (i.e. health, social care and education together), the mean annual cost was £2,780 for 12–15 year olds with hyperkinetic disorders, £1,789 with conduct disorders and £1,353 with emotional disorders (Table 4).

Cost variations

We examined these economic data further, because we observed such marked inter-individual variations in the utilisation of services and in costs, and wanted to see if there were any consistent patterns of association with child and family characteristics and circumstances. The child and family characteristics that we were able to include in each part of the analyses are listed in Table 5.

We do not provide the full results here for each service group, but in Table 6 we summarise the findings from the two-part models for all services considered together. We found a number of things that appeared to be significantly associated with utilisation of services and/or costs, including: the level of ‘impact’ (as measured by the Strengths and Difficulties Scale); reading attainment; the adolescent’s age, gender and ethnicity; maternal age at the time of the sample member’s birth; maternal anxiety and depression; social class; family size and family functioning. It should be noted that the sample size is modest for some analyses (for example, it is only 41 for those with non-zero costs), and this may have affected our ability to detect significant associations and may also leave the estimates susceptible to the influences of idiosyncratic individuals. Discussion of cost variation by service group and after accounting for outliers is available in Knapp *et al* (2015), although results consider a broader age spectrum than is included here.

5.4 Discussion of BCAMHS findings

When looking at the mental health-related service costs associated with adolescent mental health issues, the largest cost contribution by far was made by the education sector – much greater than the costs incurred in the health or social care sectors.

The analyses of service use and cost variations showed that there were certainly some significant associations with the characteristics and circumstances of young people and their families, although sample size sometimes made it hard to be confident about the precise results. We should also note that the age group studied (12–15 years at baseline; 15–18 years by the end of follow-up) is at the very youngest end of the range usually associated with ‘youth mental health’ services.

Table 4. BCAMHS: mean costs per young person over three-year follow-up by psychiatric disorder (n=182)

	Mean cost/ young person	95% CI		Mean annual cost
		lower	upper	
Hyperkinetic disorders				
Primary care	21.94	-7.69	51.56	7.31
Paediatrics/children's health services	89.99	-47.46	227.44	30.00
Mental health services	540.73	151.68	929.77	180.24
Frontline education resources	2723.35	-1076.25	6522.94	907.78
Special education resources	3876.19	-2361.77	10114.20	1292.06
Social care services	1089.19	-831.78	3010.16	363.06
Total cost	8341.38	95.77	16587.00	2780.46
Conduct disorders				
Primary care	66.79	14.23	119.35	22.26
Paediatrics/children's health services	76.88	13.17	140.59	25.63
Mental health services	187.55	67.34	307.77	62.52
Frontline education resources	2907.54	-167.17	5982.24	969.18
Special education resources	1768.04	-674.36	4210.43	589.35
Social care services	359.19	76.56	641.81	119.73
Total cost	5365.98	1688.05	9043.91	1788.66
Emotional disorders				
Primary care	94.61	4.77	184.46	31.54
Paediatrics/children's health services	113.25	-14.31	240.81	37.75
Mental health services	98.26	-1.61	198.12	32.75
Frontline education resources	2745.95	-969.78	6461.69	915.32
Special education resources	948.71	-446.91	2344.32	316.24
Social care services	57.83	-45.94	161.59	19.28
Total cost	4058.60	86.79	8030.41	1352.87

Table 5. BCAMHS: Child and family characteristics and circumstances examined as possible cost correlates

Characteristics		
Child	Age	Age at baseline of child/adolescent in years.
	Gender	Gender of child/adolescent (0 = female; 1 = male).
	Ethnicity	Ethnic origin of child/adolescent (0 = black, Asian or other ethnic minority group; 1 = white).
	SDQ impact score	Impact of emotional or behavioural problems on child at baseline on various aspects of day-to-day living (parent-rated), using the 10-point Impact scale of the widely used and validated Strengths and Difficulties Questionnaire (SDQ; Goodman 1999). Higher scores indicate greater impairment.
	Reading test score	Reading attainment at school measured at baseline: Z-transformed, age-adjusted reading test scores based on British Ability Scales (Elliot <i>et al</i> 1978); higher scores indicate higher ability.
Family	Large family	Family size at baseline (0 = fewer than 3 siblings; 1 = three or more siblings).
	Single parent family	Child/adolescent lived in single-parent household at baseline (0 = conventional or reconstituted family; 1 = single parent family).
	Family functioning	General functioning scale of the McMaster Family Assessment Device (Miller <i>et al</i> 1985) to measure family discord. Focusing on degree of functioning across a range of domains relating to interpersonal relationships within the family environment, it is reported by parent during interview. Scale runs from 21 to 41, higher scores indicate greater dysfunction.
Parent	Social class	Occupational class of head of household, identified using Registrar General's classificatory system of occupational status (1 = professional, 2 = managerial/technical, 3 = non-manual/skilled, 4 = manual/skilled, 5 = semi-skilled, 6 = unskilled, 7 = student/never worked).
	Age of mother	Age of the child/adolescent's mother at the time when child/adolescent was born.
	Parental GHQ	Mother's anxiety- and depression-related symptoms at baseline, measured by General Health Questionnaire (Goldberg & Williams 1998). Scale from 0 to 12, higher scores = poorer mental health.

Table 6. BCAMHS: predictors of service use (full sample) and costs (individuals with non-zero service use)

Baseline measures	Any service use (n=853)		Costs (£) (n=41)	
	β	P	β	P
Child characteristics				
Age	-0.11	0.20	0.44	0.06
Gender (male)	-0.15	0.42	0.55	0.20
Ethnicity (white)	0.24	0.58	0.00	–
SDQ impact score	0.44	0.00	0.26	0.09
Reading test	-0.18	0.10	-0.90	0.01
Family characteristics				
Large family	-0.14	0.86	0.00	–
Single parent family	0.41	0.06	-0.79	0.09
Family functioning	0.04	0.42	-0.17	0.02
Parent characteristics				
Social class of parents	0.02	0.81	0.14	0.52
Age of mother at birth of child	0.00	0.97	0.05	0.31
Parental GHQ	0.09	0.00	-0.41	0.00
Constant term	-1.64	0.33	3.07	0.46

6. ANALYSES FROM THE ADULT PSYCHIATRIC MORBIDITY SURVEY

6.1 Adult epidemiological data: introduction

We used data from a second nationally representative epidemiological survey: the 2000 Adult Psychiatric Morbidity Survey (APMS). This survey does not have such detailed information on service use by sample members as BCAMHS, and so we were not able to estimate the costs of support in the same way. On the other hand, the survey design included an 18-month follow-up with information on employment and education, and it covers an age range directly relevant to our study (from aged 16 upwards). We therefore used the APMS to explore patterns of contact with mental health services and some activity 'outcomes' (employment, education and training; benefits receipt; criminal justice system contacts), and to compare young people aged 16–25 with the rest of the adult population (aged up to 74).

6.2 Methods

The APMS that was conducted in 2000 collected data from a nationally representative sample of people aged 16–74 years. The overall sample comprised 8580 adults (Singleton *et al* 2001). Although not used in the main reports from the survey, the design included an 18-month follow-up collection from sample members, for which some analyses were carried out – across the full age range covered by the survey in 2000 – by the survey authors (Singleton & Lewis 2003). Our main interest here was in survey participants aged 16–25 at the first assessment, particularly those who were assessed as having a mental health issue. For this we used the definition of mental health issue employed by the researchers who conducted and originally analysed the APMS data: a score on the Clinical Interview Schedule – Revised (CIS-R) (Lewis *et al* 1992) of 12 or higher. The CIS-R is a survey instrument designed to assess minor psychiatric disorders in community settings based on respondent self-report of the presence, frequency and severity of symptoms associated with psychiatric problems and disorders.

Specialist mental health services can be defined with these data as GP visits, inpatient stays and outpatient visits (in each case where linked to mental health issues), community mental health centres, psychiatrists, psychologists, community psychiatric or learning disability nurses, psychotherapy, cognitive behavioural therapy, counselling or central nervous system drugs.

Outcomes of interest to us were employment, education and training; receipt of benefits and contact with the criminal justice system (CJS); and costs. It was only possible to measure costs at baseline, and we should note that these are contemporaneous with the assessment of characteristics (including mental health

status), which makes it hard to interpret associations and certainly impossible even to hint at causality.

In our analyses we adjusted for baseline covariates such as age, gender and CIS-R score.

6.3 Results

Contact with specialist mental health services

The APMS shows that rates of psychiatric morbidity were very similar across most age bands up to age 65 (32% for those aged 16 to 25 years, 31% among those aged 26 to 45, 35% among those aged 46 to 65) and then lower (18%) among those aged 66 to 74. However, the percentages receiving mental health services show a very different pattern. At baseline, looking at those people assessed as having a mental health issue, the proportions using mental health services were:

- 54% for those aged 26 to 45
- 65% for those aged 46 to 65
- 79% for those aged 66 to 74
- but only 45% for those aged 16 to 25 (see Table 7).

Table 7. APMS: breakdown of longitudinal sample by mental health status and receipt of mental health services at baseline

Age in years	Without mental health problems/ disorders	With mental health problems/disorders*	
		Receiving services	Not receiving services
16 to 25 (n=244)	166 (68.0%)	35 (44.9%)	43 (55.1%)
26 to 45 (n=1,026)	708 (69.0%)	172 (54.1%)	146 (45.9%)
46 to 65 (n=878)	571 (65.0%)	200 (65.2%)	107 (34.9%)
66 to 74 (n=258)	211 (81.8%)	37 (78.7%)	10 (21.3%)

* CIS-R total score of 12 or higher.

Chi-squared test of significance of association between receipt of services and age group, among those with a mental health need, result: Pearson $\chi^2(3)=21.98$; p-value=0.001.

In the last (youngest) age band, the disaggregation reveals an enormous challenge in this area: 58% of those aged 16–20 with a mental health issue were using mental health services, but only 36% of those aged 21–25.

When we break down the figures by severity of mental health issue (Table 8) the contrast between the different adult age groups is even greater. For people with a severe mental health issue, the proportions in contact with mental health services at baseline were:

- 71% for those aged 26 to 45
- 76% for those aged 46 to 65
- 91% for those aged 66 to 74
- but only 34% for those aged 16 to 25.

The treatment gap for severe disorders is clearly much bigger for young people than for older age groups, yet these are disorders that can have considerable and devastating life-long impacts.

Table 8. APMS: breakdown of longitudinal sample by severity of mental health problem and receipt of mental health services at baseline

Age in years	Without mental health problems /disorders (CIS-R score 0–11)	Common mental disorder or mild/moderate mental disorder (CIS-R score 12–17)		Severe mental disorder or having symptoms likely to require treatment (CIS-R score 18+)	
		Receiving services	Not receiving services	Receiving services	Not receiving services
16 to 25 (n=244)	166 (68.0%)	14 (35.9%)	25 (64.1%)	21 (53.9%)	18 (46.2%)
26 to 45 (n=1,026)	708 (69.0%)	59 (37.1%)	100 (62.9%)	113 (71.1%)	46 (28.9%)
46 to 65 (n=878)	571 (65.0%)	89 (55.6%)	71 (44.4%)	111 (75.5%)	36 (24.5%)
66 to 74 (n=258)	211 (81.8%)	16 (66.7%)	8 (33.3%)	21 (91.3%)	2 (8.7%)

It is good to note, however, that young people (aged 16–25) with mental health issues were more likely to use services (inpatient, outpatient, social care) than those without a mental health issue (see Table 9). Costs were also higher at baseline for those with mental health issues.

Table 9. APMS: circumstances at baseline for young people (age 16 to 25) by whether or not they had a mental health problem

	Without mental health care problems (n=166)	With mental health care problems (n=78)
% in employment	87.4	85.4
% NEET	16.3 *	26.9 *
Service use		
% had inpatient stay	1.2*	6.4*
% used outpatient services	12.7*	25.6*
% used social care services	2.4*	9.0*
Annual cost of health & social care: median (IQR)	30 (0–30)**^	30 (30–326)**^
% receiving benefits	13.9*	26.9*
Annual cost of health & social care and welfare benefits: median (IQR)	60 (30–484)**	965 (150–2,646)**

* p<0.05; ** p<0.01

^ higher in subgroup without mental health problems/disorders.

Also, when focusing exclusively on young people with mental health issues, we found that those who were receiving mental health services had higher annual costs (median of £60) than those who were not receiving mental health services (median £30; see Table 10). (As noted earlier, we were not able to look at costs at the 18-month point because available data did not allow these to be calculated.)

Table 10. APMS: circumstances at baseline for young people (age 16 to 25) by whether or not mental health care received at baseline for those judged to have a mental health problem

	No mental health care received (n=43)	Mental health care received (n=35)
% in employment	83.3	89.5
% NEET	16.3*	40.0*
Service use		
% had inpatient stay	2.3	11.4
% used outpatient services	20.9	31.4
% used social care services	4.7	14.3
Total cost of health and social care: median (IQR)	30 (30–30)**	60 (60–367)**
% receiving benefits	18.6	37.1
Total cost of health, social care and welfare benefits: median (IQR)	598 (30–2,419)**	1,630 (431–5,855)**

* $p < 0.05$; ** $p < 0.01$

Employment, education and training

We looked to see what impact having a mental health issue might have on employment, education and training, both at the time of the baseline assessment and at the time of the 18-month follow-up. We looked at these three outcomes singly and in combination (the so-called NEET indicator: not in education, employment or training). We focussed on sample members aged 16–25 at the baseline assessment.

From Table 9 we can see that – at baseline – young people with mental health issues were significantly more likely to be NEET than those without such issues (27% vs 16%). However, within this group of young people with mental health issues it is those who are not receiving mental health services for whom the risk of being NEET is lower (16% vs 40%; see Table 10). The interpretation of this latter result is complicated by the fact that we are looking at cross-sectional data at this point.

We therefore turned to the data at 18-month follow-up, and used logistic regression analyses to examine whether NEET status at follow-up assessment was linked to having a mental health issue at baseline and – for those with a mental health issue – whether NEET status was linked to receiving mental health services. In these analyses we adjusted for some covariates: NEET status at baseline, age, gender and severity of psychiatric morbidity (as measured by CIS-R score).

In both analyses, the most important predictor of NEET status at 18 months was NEET status at baseline (Tables 11 and 12); for example, for the full sample of 244 young people, an individual who was NEET at baseline was 8.9 times more likely to be NEET at follow-up than someone who was not NEET at baseline. These continuities over time are particularly relevant given that we have shown that having a mental health issue increases the chances of being NEET at baseline (Table 9). Over and above these continuities, having a mental health issue at baseline appeared to further increase the likelihood of being NEET at 18 months although the coefficient did not achieve statistical significance.

The only other significant influence on NEET status at follow-up was gender: females were more likely to be NEET than males.

When focusing only on those young people with mental health issues, we found no significant differences in NEET status between those who were or were *not* in contact with mental health services at baseline (Table 12).

Receipt of benefits

An obvious corollary of our findings on employment, education and training is that young people with mental health issues are significantly more likely to be on benefits than those without mental health issues (27% vs 14%; Table 9). Within the group of young people with mental health issues, the percentage looks higher for those not receiving mental health services (37% vs 19%; Table 10) but in fact the difference is not

Table 11. APMS: logistic regression model of NEET status 18-month follow-up for young people (age 16 to 25)

n=244	Odds-ratio (of being NEET at time 2)	95% confidence interval
NEET at time 1 (relative to being in employment, education or training)	8.9**	4.0 to 20.0
With mental health problem at time 1 (relative to not having mental health problem)	2.4	0.6 to 9.4
CIS-R score at time 1	1.0	0.9 to 1.1
Age	1.0	0.9 to 1.1
Gender – male relative to female	0.3*	0.1 to 0.9
Constant	0.2	0.0 to 3.4

Table 12. APMS: logistic regression model of NEET status 18-month follow-up for young people (age 16 to 25) judged to have a mental health problem at baseline

n=78	Odds-ratio (of being NEET at time 2)	95% confidence interval
NEET at time 1 (relative to being in employment, education or training)	7.9**	2.1 to 30.3
Receiving mental health services at time 1 (relative to not receiving services)	1.1	0.3 to 4.1
CIS-R score at time 1	1.0	0.9 to 1.1
Age	1.1	0.9 to 1.4
Gender – male relative to female	0.2	0.0 to 1.2
Constant	0.0	0.0 to 5.1

* p<0.05; ** p<0.01

Table 13. APMS: logistic regression model of receipt of benefits at 18-month follow-up for young people (age 16 to 25)

n=244	Odds-ratio (of being NEET at time 2)	95% confidence interval
Receiving benefits at time 1 (relative to not receiving benefits at time 1)	18.3**	6.7 to 49.8
With mental health problem at time 1 (relative to not having mental health problem)	2.9	0.6 to 14.4
CIS-R score at time 1	1.0	0.9 to 1.1
Age	1.0	0.8 to 1.2
Gender – male relative to female	0.4	0.1 to 1.1
Constant	0.1	0.0 to 4.4

significant. Adding the costs of benefits to the costs of health and social care services used, we can see that the public sector spending implications are considerable (Tables 9 and 10).

Looking at the 18-month follow-up data, we found very strong continuities over time in relation to receipt of benefits (using a similar logistic regression approach to that used for NEET), both for the full sample (Table 13) and the subsample with mental health issues (Table 14). Over and above these continuities, having a mental health issue at baseline appeared to further increase the likelihood of receiving benefits at 18 months although the association was not statistically significant. Interestingly and importantly, among the group with mental health issues, those getting treatment were much more likely to be receiving benefits, which – given that those getting treatment did not have a different NEET status from those not in treatment – appears to show that the mental health services are helping young people to secure their benefit entitlements. Within this group, males were less likely to be receiving benefits than females (Table 14).

Contacts with criminal justice services

At the 18-month follow-up, the most important influence on contacts with criminal justice agencies was reporting similar contacts at baseline (Tables 15 and 16). In addition, within the full sample of young people, those with a mental health issue at

Table 14. APMS: logistic regression model of receipt of benefits at 18-month follow-up for young people (age 16 to 25) judged to have a mental health problem at baseline

n=78	Odds-ratio (of being NEET at time 2)	95% confidence interval
Receiving benefits at time 1 (relative to not receiving benefits at time 1)	65.4**	6.8 to 626.7
Receiving mental health services at time 1 (relative to not receiving services)	6.0*	1.0 to 37.7
CIS-R score at time 1	0.9	0.8 to 1.0
Age	1.0	0.7 to 1.3
Gender – male relative to female	0.0*	0.0 to 0.7
Constant	0.5	0.0 to 569.7

* p<0.05; ** p<0.01

Table 15. APMS: logistic regression model of contact with criminal justice services at 18-month follow-up for young people aged 16 to 25

n=244	Odds-ratio (of being NEET at time 2)	95% confidence interval
Criminal justice contact at time 1 (relative to no criminal justice contact time 1)	9.9**	2.7 to 36.6
With mental health problem at time 1 (relative to not having mental health problem)	8.2*	1.0 to 70.4
CIS-R score at time 1	1.0	0.9 to 1.1
Age	0.9	0.8 to 1.2
Gender – male relative to female	1.8	0.5 to 6.1
Constant	0.0	0.0 to 4.0

Table 16. APMS: logistic regression model of contact with criminal justice services at 18-month follow-up for young people (age 16 to 25) judged to have a mental health problem at baseline

n=78	Odds-ratio (of being NEET at time 2)	95% confidence interval
Criminal justice contact at time 1 (relative to no criminal justice contact time 1)	9.0*	1.5 to 53.6
Receiving mental health services at time 1 (relative to not receiving services)	0.8	0.1 to 4.6
CIS-R score at time 1	1.0	0.9 to 1.1
Age	0.9	0.7 to 1.3
Gender – male relative to female	1.5	0.3 to 7.1
Constant	0.3	0.0 to 262.2

* $p < 0.05$; ** $p < 0.01$

baseline (compared to not) were eight times more likely to have contact with criminal justice services 18 months later (Table 15). There were no other significant influences on criminal justice service contacts.

6.4 Discussion of APMS findings

The APMS in 2000, with its nationally representative sample and its 18-month follow-up, allowed us to see what links there might be between baseline characteristics (especially psychiatric morbidity) and subsequent contacts with mental health and other services, as well to see what happened in terms of employment, education or training achievement, in benefit receipt and in contacts with the criminal justice system.

We found that young people aged 16–25 are particularly disadvantaged relative to other age groups: the treatment gap is much wider for these young people than it is for other age groups. The gap is especially wide for those aged 21–25. The contrast between young people and older adults (i.e. those aged 26 or above) was even more marked in relation to severe mental disorders, which is particularly worrying.

For the group of people in the survey sample aged 16–25, mental health issues were strongly associated with being NEET (not in employment, education or training) and

receipt of benefits. Over the follow-up period, being in contact with mental health services appeared to be associated with a greater likelihood of receiving benefits, other things being equal, which testifies to the wider support role often played by these services. We also found that young people with mental health issues were much more likely than those without issues to have contact with criminal justice services over the next 18 months.

The small sample size – particularly for those with mental health issues – has probably limited our ability to find statistically significant differences. The data are also now quite old, although nothing comparable has been collected in the period since, and – from the anecdotal evidence often reported in this youth mental health area – we believe that these findings continue to have relevance today.

7. TOWER HAMLETS EARLY DETECTION SERVICE

Returning to our work in the two locality-based studies, we first describe the Tower Hamlets Early Detection Service (THEDS).

7.1 Intervention

THEDS was set up in 2009 to provide assessment and support service for 16–25 year olds in Tower Hamlets in London who may be at risk of suffering from a psychotic illness. The main focus is preventing or delaying the onset of psychosis; however, the service's remit also covers young people who are in distress.

There are three strands to the service. All young people who are referred or self-referred are offered a three-month brief intervention incorporating medical review by a psychiatrist, psychological assessments, information about how to keep mentally well, signposting to other services, and access to work and training opportunities. Those assessed as being at ultra-high risk (UHR) of developing psychosis – using the Structured Interview of Prodromal Symptoms (SIPS) and the Scale of Prodromal Symptoms (SOPS) measures – are provided access to the service's two-year intervention. This includes an allocated caseworker, access to psychological therapies, family intervention, biopsychosocial interventions and work and training support. Those who show symptoms of psychosis are referred to a specialist early intervention in psychosis service. The third strand of the service is mental health promotion and education work in the community. Our analysis focuses on the *second strand* of the service which was offered to 28% (41) of the young people assessed. Our sample was 20 young people who met the SIPS/SOPS criteria for being at UHR of psychosis and completed two years treatment, and for whom pre-, during- and post-treatment data were available.

Tower Hamlets Borough has a high proportion of people from Black and Minority Ethnic (BME) backgrounds – 55% compared to 14% nationally (Office for National Statistics 2012) – and in 2010 was the seventh most deprived local authority district in England out of 326 (Greater London Authority 2011). Between 2009/10 and 2011/12 Tower Hamlets had the seventh highest standardised hospital admission rate for mental illness in London (source: Tower Hamlets Clinical Commissioning Group).

7.2 Methods

Outcome measures

We used outcomes that concurred with the aims of THEDS with regard to the young people at high risk: to improve mental health, prevent it from becoming more severe, and improve social functioning, one measure of which is employment. The outcome measures used are: change in mental health status as measured by Global Assessment of Functioning (GAF) score (Aas 2010) and change in proportions in employment. GAF is a numeric score, given by clinicians at THEDS to quantify the severity of a person's psychological symptoms and functioning. The scale ranges from 1 to 100, with 1 being the most severe, but can also be broken down into 'severity' groups of ten. We also looked at change in use of hospital admissions, accident and emergency (A&E) and the criminal justice system (CJS).

Analysis

We utilised a pre-, during- and post-treatment comparative design with each young person acting as their own control, a method used by Green *et al* (2007). It was not possible to find a parallel comparison group because of differences in time of collection or characteristics of participants in available datasets, and because of practical (and indeed ethical) issues in obtaining data about young people who do not use mental health services. We analysed data already routinely collected by THEDS from 2010 to 2012. Ethical approval was obtained from the Caldicott Guardian of the NHS Trust in which THEDS is located. Data have been anonymised.

For mental health we compared GAF severity category at baseline to end of treatment at year 2. For employment, we compared each young person's employment status (employed/not employed) at baseline to status over the two years of the intervention. The cost of employment was estimated using the human capital approach, which uses potential wages lost or gained (e.g. Park *et al* 2015). For this we used the national minimum wage. It may be that this is an underestimate because not all of those young people gaining employment will be on the minimum wage and in fact the median earnings for this age group are higher. We assumed an average full-time working week is 35 hours and that there are 48 working weeks in one year. We use a definition of part-time as half-time. Additionally we looked at gained tax revenues and saved unemployment-related state benefits. For benefits, we used a mean of Job Seekers

allowance (JSA) and Income Support (IS) because we did not know which of the two the young people were in receipt of. It is possible to get JSA or IS if working part time and on a low income so we did not assume that the part-time workers are on either benefit.

For service use, we compared number of A&E visits and hospital admissions in the three months pre-baseline to use during the two-year treatment period and in the year after discharge. We compared CJS contact in the three months pre-baseline to contact during the two-year treatment; data were not available for the year after discharge. To calculate service costs we applied relevant national unit costs to the difference in hospital admissions (Curtis 2013), use of A&E (Department of Health 2012) and CJS (Home Office 2011). The data available for pre-baseline were for a three month period. For comparison purposes this was multiplied by four to give an annual use. This assumes that service use was constant over that time, which may not be the case and so could be an over- or underestimate, but we do not know which.

For hospital admissions, we multiplied the unit cost by the average stay for adults in Tower Hamlets, which was 36 days in 2013 (Tower Hamlets Clinical Commissioning Group 2013). This length of stay is for all ages and it may be higher for young people: for those aged under 18 in 2007, length of inpatient stay was 116 days in one UK study (Green *et al* 2007). For the CJS unit cost a mean cost has been used for all offences excluding homicide. Costs were discounted for year two and year three using the UK government HM Treasury discount rate of 3.5% (HM Treasury 2014).

The annual cost of providing THEDS was derived from estimates provided by THEDS for a snapshot caseload of 100 young people at UHR of psychosis using the two-year treatment programme. THEDS costs were also discounted for year two.

7.3 Results

Participants

The sample size was 20 young people. The mean age was 21 years, range 18 to 27. Of these, 59% were male and 82% were from a BME background, mainly Bangladeshi or British Bangladeshi. All had mental health symptoms at baseline as measured by having a GAF score of less than or equal to 70, were considered at 'ultra-high risk' (UHR) of developing psychosis according to the SIPS/SOPS criteria, did not transition to psychosis and completed two years of treatment. At baseline, 60% were unemployed, 45% had a history of self-harm, 40% used alcohol and/or cannabis, and 45% had experienced domestic abuse either as a child, an adult or both. For illustrative purposes, we also describe below three 'typical' case studies of young people who followed different pathways through THEDS. The names and details changed to ensure anonymity.

Unmet need

Just under half (45%) of those commencing two-year treatment at THEDS – all of whom were judged to be at high risk of developing psychosis and who were showing symptoms of mental illness – were not receiving mental health services during the previous three months. The case studies further show the difficulties the young people had with accessing or engaging with services and their complicated trajectories to the care they need (see below).

Mental health

As can be seen from Table 17, 75% of those with mental health symptoms at baseline showed an improvement in mental health at the end of two years' treatment, 25% stayed within the same severity category and none showed worse mental health.

Table 17. THEDS sample: change in mental health from baseline to end of treatment

	Mental health at baseline			
	All (n=20)	Severe (GAF score 1–50) (n=13)	Moderate (GAF score 51–60) (n=6)	Mild (GAF score 61–70) (n=1)
Improvement	75% (n=15)	77% (n=10)	83% (n=5)	0% (n=0)
No change	25% (n=5)	23% (n=3)	17% (n=1)	100% (n=1)
Worsened	0% (n=0)	0% (n=0)	0% (n=0)	0% (n=0)

Note: Improvement is moving from a higher severity category to a lower one, worsening is moving to a higher severity category and no change is remaining within that severity category.

Table 18. THEDS sample: change in employment status from baseline to mid- and end-treatment

	Change in employment status baseline to year one (n=14)	Change in employment status year one to year two (n=12)
Unemployed to unemployed	50% (n=7)	33% (n=4)
Unemployed to employed	37% (n=5)	17% (n=2)
Employed to employed	14% (n=2)	42% (n=5)
Employed to unemployed	0% (n=0)	8% (n=1)

Employment

At baseline, 60% (n=12) were unemployed (see Table 18). Five of those were employed by year 1 and a further two moved from unemployment to employment by year 2. Two were enabled to remain in employment from baseline to year 1, and five from year 1 to year 2.

Service use

Service use – hospital admissions, A&E and CJS – was lower after one year’s treatment compared to baseline. After the second year of treatment, service use remained lower and for some services was further reduced (Table 19). For the year after treatment ended, A&E attendances and hospital admissions were zero. We do not have post-treatment information on use of CJS.

Costs

Reduction in service use is associated with total cost differences of £473,120 for the 20 young people; 70% (£332,095) associated with reduction in use of NHS services: A&E and hospital inpatient services (Table 20). Improved employment compared to baseline is associated with total cost differences of £148,305; however this is based on a very small sample size. This compares to a cost of £106,174 over the period for providing THEDS services to these 20 young people.

Table 19. THEDS sample: change in service use from baseline to mid-, end- and post-treatment

Service use (contacts)	Baseline (annual use)	Change in annual use baseline to year 1	Change in annual use year 1 to year 2	Decrease in annual use year 2 to year 3
Hospital admissions	8	-8	+1	-1
A&E	12	-8	0	-4
CJS	12	-9	-3	na

Note: service use is totalled number of contact across all 20 respondents

7.4 Discussion of THEDS findings

These results for THEDS suggest that, consistent with previous research (Green *et al* 2005; Centre for Economic Performance Mental Health Policy Group 2012), there is a great deal of unmet need for services among young people with mental health needs, with 45% of those assessed as being at high risk of developing psychosis, and already with symptoms, not receiving any mental health services in the three months before baseline (although there is a possibility that they were receiving mental health services at some point prior to this). It also shows the success of this service model in identifying and recruiting young people in need.

THEDS aims to improve or prevent increasing severity of mental illness and 75% of those receiving THEDS services showed improvements in mental health by end of treatment, while none worsened. This can be set in the context of the literature on the persistence of mental illness which suggests that between 50% and 75% of mental illness at this age persists or recurs in adulthood (Pine *et al* 1998; Fombonne *et al* 2001; Kim-Cohen *et al* 2003; Costello *et al* 2005; Kessler *et al* 2005; Gladstone & Beardslee 2009). The case studies further illustrate the long history of issues expressed by some young people. These issues might have persisted had they not received specialist treatment, as happened in case study 3. THEDS has achieved its aim of improving mental health and preventing its increasing severity for a high risk group, and this is particularly positive because of the difficulties this age group have in accessing and engaging with services. Furthermore, THEDS has a high number of service users from BME backgrounds who may have additional difficulties with accessing services (Chahal & Ullah 2004; Street *et al* 2005).

THEDS also aims to improve social functioning, one measure of which is employment. Employment rates improved over treatment time, although the sample size is small.

Table 20. THEDS sample: costs of changes in outcomes and cost of providing THEDS

	Difference: baseline to year 1		Difference: year 1 to year 2		Difference: year 2 to year 3		Total cost difference
	Unit	Cost	Unit	Cost	Unit	Cost	
Entered full time employment from unemployment	4	£42,404	1	£10,243	na		£52,647
Entered part time employment from unemployment	1	£5,300	1	£5,121	na		£10,421
Remained in full time employment	1	£10,601	3	£30,728	na		£41,329
Remained in part time employment	1	£5,300	2	£10,242	na		£15,542
Tax revenue on full time employment	5	£1,160	4	£897	na		£2,057
Receipt of state unemployment benefits	5	£14,840	4	£11,471	na		£26,311
Total employment-related cost differences		£79,605		£68,700			£148,305
Inpatient	8	£123,840	-1	-£14,957	1	£15,480	£123,334
Stayed out of inpatient			7	£104,696	7	£108,360	£205,831
A&E	8	£864	0	£0	4	£432	£1,267
Stayed out of A&E			8	£835	8	£864	£1,642
CJS	9	£61,631	3	£19,849	na		£81,479
Stayed out of CJS			9	£59,546	na		£59,546
Total service-related cost differences		£186,335		£169,969		£116,116	£473,120
Total		£265,940		£238,669		£116,816	£621,425
Annual cost of THEDS treatment		£54,000		£52,174		£0	£106,174

The high baseline unemployment rate in the THEDS sample (60%) – compared to 31% of those young people referred to Youthspace (Singh 2012) and 20% for the population in this age group overall (Office for National Statistics 2010) – emphasises the high level of need of the THEDS users, given that unemployment is both a consequence and a risk factor for mental illness (Prince's Trust 2014).

Use of A&E, hospital admissions and CJS all decreased over the time of treatment and were zero by the end of treatment. One year after treatment at THEDS ended, use of all NHS secondary services including A&E and hospital admissions remained at zero. Case study 2 in particular shows the use of non-THEDS services before receiving THEDS and is consistent with the literature on this type of service use by young people with mental illness (Suhrcke *et al* 2008; Snell *et al* 2013). It can therefore be postulated that without treatment, service use would have remained high, and this is illustrated by case study 3 where the young person did not complete treatment. Research by Byford *et al* (2010) has shown that an improvement in GAF score reduces mental health service costs and this seems to be the case here, as none of the 20 individuals had returned to either THEDS or other mental health services within a year of leaving THEDS. It could be that participants lacked access to mental health services but as they are able to re-refer to THEDS if they need to do so, this seems an unlikely explanation.

Overall cost differences for the 20 young people who completed treatment were substantial over the two years of treatment, and also where we have data for the year after, suggesting that THEDS more than meets its costs. We cannot estimate any longer-term costs because it is not known how long the improved mental health and other changes would be sustained. The finding that one year after treatment had ended, and in the absence of any more treatment, the young people had not returned to secondary services is encouraging, and the literature on the long-term outcomes and costs of untreated mental illness is indicative of longer-term savings (Bodden *et al* 2008; Suhrcke *et al* 2008; Centre for Mental Health 2010; Goodman *et al* 2011; Knapp *et al* 2002; Knapp *et al* 2011; Cartwright-Hatton 2013; Snell *et al* 2013; Beecham 2014), but conclusions about these have not been drawn here. Long-term evaluation is needed to look further at long term outcomes and cost savings for this age group.

Overall, it is clear that THEDS supports young people who have traditionally accessed services proportionately less, who typically often fall through the gaps in 'standard' mental health services and who are in high need: at high risk of developing psychosis, not previously accessing mental health services, living in a highly deprived area, having high levels of unemployment and with histories of abuse, self-harm and substance use. The results from the THEDS youth-specific mental health service show that this is a model that appears to be successful, demonstrating improvements in mental health and social functioning and reducing service use for young people aged 16 to 25 who received two years' treatment, with associated cost differences in the short term and implications for longer-term cost savings.

Case study 1: Rohima. Completed two years' treatment

Rohima is a 20-year-old woman from a Bangladeshi background; she is a single mother with an 18-month old daughter. She is the second generation of Bangladeshi immigrants: her father, who had bipolar affective disorder, left the family home when she was growing up. She has a younger brother with an autistic spectrum disorder. Rohima did not have any special educational needs and obtained her A Levels with the view of pursuing a nursing course at university. She became pregnant while making applications for university and as a result did not pursue that career. She was also a survivor of sexual abuse in her early teens. She experienced domestic violence by her baby's father who was subsequently imprisoned for various offences.

Following a move into temporary accommodation when her child was 8 months old Rohima felt isolated and started experiencing low mood and suicidal thoughts. She was referred to THEDS following attendance to A&E on a couple of occasions expressing suicidal thoughts, low mood and auditory hallucinations telling her to be dead. Previous to her presentation to THEDS she had been seen by her GP several times, by A&E at least three times and had been referred for counselling to a third sector party organisation which she did not find useful.

Rohima was assessed at being at ultra-high risk of developing psychosis. She had five assessment sessions including a family assessment, a medical review and a vocational assessment. Over the two years she had a short-term course of low dose antidepressants. She had psychoeducation focussing on normalisation and understanding of the impact of her past experiences on her self-esteem and self-efficacy, training and vocational support, case working support, psychosocial support and medical review.

At the point of discharge, Rohima had not been on antidepressant medication for three months, had completed an access to nursing course and gained admission to start university. Her daughter had also gained admission to a local primary school. The attenuated psychotic symptoms had resolved and there was an increase in GAF score. There was no other agency involved in her care and she was discharged to the GP. She had gained self-esteem, and learned coping mechanisms and an understanding of her difficulties. She felt confident that she would ask for help if she experiences any of the symptoms she had previously.

One year after her discharge from services, she had not returned to secondary care nor had she needed to restart any psychotropic medication.

Case study 2: Mark. Currently receiving two years' treatment

Mark is a 19-year old white British male. At secondary school age he started truanting and getting involved with gangs. He was also reported at age 11 to be using various substances. He missed a lot of his education and left school without any qualifications. He has numerous convictions for robbery and damage to property and arrests for getting into fights.

Mark was referred to THEDS by a CAMHS forensic worker due to concerns about his mental health. He was assessed as not being at ultra-high risk of developing psychosis and discharged to a Community Mental Health Team (CMHT) for specialist substance misuse input.

He was subsequently referred to THEDS again with concerns about functional decline and cognitive problems. Mark was assessed again as not suitable for THEDS input because he did not meet the criteria despite ongoing mental state concerns.

He subsequently presented to A&E with an acute psychotic episode following an intoxication of multiple substances. He was admitted under section 2 of the Mental Health Act and following discharge was referred to the CMHT for follow-up care. After a period of intervention with the specialist substance misuse worker,

Mark was referred to the Early Intervention Service who assessed him and felt that he had suffered a Brief Limited Psychotic Episode (BLIP) as a result of drug intoxication. He was at this point referred to THEDS.

Mark has engaged with THEDS and there has been a noticeable reduction in his criminal behaviour. He has also agreed to have Behavioural Family Intervention which has been initiated and the family are hopeful that it could help improve their relationship.

Case Study 3: Jalal. Offered two years' treatment but did not complete it

Jalal is a 23-year-old man from a Somali background. His parents were refugees from the Somali war and his mother did not speak much English. His father had a severe mental illness, was disruptive to family life and died in Somalia when Jalal was a child. Jalal successfully completed his GCSEs and his A Levels with very good grades and enrolled on a pharmacy course at university.

He then got involved with the wrong crew and started having trouble with the police. He left university a year into the course and started to work as a pharmacy assistant. He reports that it was because he did not like the course, but his mother relates it to the start of a decline in his overall functioning and his difficulties with the police.

Jalal was originally referred to the local CMHT after his mother went to the GP with concerns about his behaviour, in particular that he had become increasingly withdrawn, hardly left his room and was self-neglecting. Jalal appeared to be afraid of leaving the house and was getting episodes of heightened anxiety. The GP suspected that the presentation may be explained by an emerging psychotic illness and requested an assessment.

Jalal reluctantly engaged with the assessment and was deemed at high risk of developing a psychosis because of a significant decline in his functioning and a family history of severe mental illness. He was adamant that the decline in his functioning was due to laziness rather than emerging mental illness and hence did not engage with the service.

He was subsequently referred again to THEDS by a community support worker. THEDS attempted to engage with him again but he was clear that he did not want to access the service. Jalal was then seen by his GP again and referred to psychological therapies, later he disengaged and was referred by the GP to the CMHT. He was started on medication but disengaged soon after. He has not attended several appointments with the CMHT and consequently he has been discharged.

Jalal is still at risk of developing psychosis.

8. NORFOLK AND SUFFOLK SPECIALIST YOUTH MENTAL HEALTH SERVICE

8.1 Intervention

Mental health services for young people in Norfolk and Suffolk recently underwent a significant redesign, with the development of the Norfolk and Suffolk Youth Mental Health Service for young people aged 14–25 years experiencing severe non-psychotic mental health difficulties. The service recognised that young people experiencing non-psychotic mental health difficulties need more effective transition arrangements to smooth the access to services.

A pilot service was, therefore, initially set up to address problems with the traditional separation of services for those aged under and over 18 years. This service emulates the Early Intervention in Psychosis models of service by setting out to addressing a range of psychiatric, psychological and social issues in recognition of the fact that this subgroup of young people usually present with difficulties across multiple psychiatric domains. Specifically, the service offers specialist and dedicated assessment, case management and a range of psychiatric and psychological interventions to young people (aged 14–25 years) with severe non-psychotic mental health issues.

The aims of the pilot service are: to support key partners in delivering appropriate interventions for young people with explicit or emerging mental health difficulties; to provide outreach, liaison and specialist advice and interventions through a brief intervention/assessment component; and to case-manage (using an adapted Early Intervention in Psychosis model) more complex cases or those individuals with significant and persistent mental health difficulties. The service includes intensive/crisis support for those individuals who may traditionally have received inpatient care. The pilot service aims to engage young people at high risk of long-term mental health difficulties and offer novel, developmentally tailed interventions using a team-based model.

The service works in partnership with other services or organisations to support the wider system around the young person, and focuses on social recovery as a core outcome rather than purely on symptom reduction. The majority of clients are currently referred into the service via an Access and Assessment Team who will initially triage and assess before referring into specialist services. Clients are then allocated to the various parts of the youth service on the basis of this assessment information. The service will also accept self-referrals or direct referrals from external agencies, especially in cases of re-referrals. Care packages are individualised, based on individual need, and vary from time-limited focused interventions (usually less than six months) and group interventions to longer-term enhanced interventions and case management.

Following the success of the pilot service it has since been rolled out as a full 0–25 service line incorporating dedicated youth teams for all 14–25 year olds.

A case study is shown in the boxes below, illustrating the contrast between standard care and the Norfolk and Suffolk Specialist Youth Mental Health Service.

Case Study 1: Standard care

Amy is a 17-year old woman with significant issues around self-harm including regularly cutting herself and taking overdoses. She has been known to local CAMHS services since she was 11 years old when she started to self-harm. She has received individual support and therapy from CAMHS, and her family has had regular family therapy sessions. She is also known to Children's Services as she was an adopted child.

Since she started to become unwell her adoptive parents have struggled to cope with her behaviour and to manage the risk. Her school has also had significant concerns and has tried to put in extra support. She has not been diagnosed with a mental illness but the overall formulation from CAMHS suggests that she may have been exposed to significant alcohol levels in utero, followed by emotional abuse and neglect prior to her adoption. Since then she has had significant attachment difficulties and is now showing symptoms consistent with an emerging Emotionally Unstable Personality Disorder.

Amy is now approaching her 18th birthday and her teams in CAMHS and Children's Services feel she will need ongoing mental health services and wish to refer her to the adult mental health team. The adult recovery team does not feel they can offer her a service as she does not have a significant and enduring mental illness and so does not meet their criteria. Although she continues to have mental health problems, Amy is not taken on by any mental health service after her 18th birthday.

Case Study 2: Norfolk and Suffolk Specialist Youth Mental Health Service

Amy is gradually transferred over to the Norfolk and Suffolk Youth Team when she is approaching 14 years old, and they agree to support her with regard to the self-harm and to try and help her manage the risk. Their aim is to reduce and prevent any hospital admissions or A&E attendances by helping Amy learn to better manage her feelings and behaviour.

Amy is allocated a Case Manager who works to build a relationship with her. Amy has access to individual therapy and family therapy but increasingly the psychological interventions focus around group therapy. The group therapy includes input around managing her emotions informed by Dialectical Behaviour Therapy principles in a small group of her peers. The Youth Team, via her Case Manager and an Assistant Practitioner, also work with the school and Children's Services to support Amy, together with a coherent plan across agencies. When working with Amy, her family and other agencies, issues are managed using AMBIT principles, as developed by the Anna Freud Centre.

As she approaches 18, Amy continues with the same Case Manager: there is no need for her to make any transition into a different service and no problems around diagnosis or thresholds. The intervention increasingly focuses on supporting Amy to access community resources run predominantly by the third sector. Ultimately Amy is discharged from the youth service on the understanding that Amy, her family or her community supports can seek advice or refer her back at any point.

8.2 Methods

The data for the study were obtained from the one-year pilot evaluation carried out by the clinical team in Norfolk during the implementation of the youth mental health service. They evaluated the impact of the service implementation on various youth outcomes, employing a pre-post design and sampling young people accessing the service.

Outcomes measures

The original pilot study monitored youth outcomes at baseline and follow-up, where a series of psychological assessments were conducted at different points in time. We used data on demographic characteristics, global level of functioning, service use, and pathway to care; and looked at differences between baseline and follow-up.

Mental health status was assessed by the Global Assessment of Functioning (GAF; Aas 2010), a numeric scale (0 through 100) widely used by mental health clinicians and physicians to rate subjectively the social, occupational, and psychological functioning of adults.

Social functioning was measured by the Time Use Survey (Office of National Statistics 2003), a tool aiming to identify, classify and quantify the main types of activity that people engage in during a particular time period. Time-use data were used to show engagement with employment and education (see Hodgekins *et al* 2015 for further information on this measure).

Service use and pathways to care data were retrieved from case notes, NHS Informatics departments and via interviews with service users using the method outlined by Gater *et al.* (1991). The data included information about the point of entry into the service; involvement of criminal justice agencies (police, courts, prisons) and general practitioners along the pathway; source of referral to services; and specialised services prior to accessing the service. Data on service use also provided information about hospitalisations when young people were involved in the youth mental health service.

Service impact evaluation

Our strategy involved a series of descriptive and inferential statistics to evaluate the impact of the youth-specific service on the functioning of those young people in contact with it and their pathways to care prior to accessing the service. A 'before-and-after' analysis was used to show any changes from baseline to follow-up.

Cost analysis

To cost the pathways to care, we replicated the methodology developed by Heslin *et al* (2011). The methodology operationalised a contact on the pathway to care as any

contact with the NHS or criminal justice system as a result of mental illness or leading to being accepted onto a specialist mental health service caseload. Unit costs were attached to the data on services use. Established national unit cost figures were applied to: GP, counsellor and social care contacts; psychiatric home visits; accident and emergency (A&E) and emergency clinic visits (Curtis 2008). The cost for a police contact was based on an estimate of a referral involving two police officers (three hours each) and unit costs from a Revolving Doors report (Finn *et al* 2000). The cost for a referral from prison was assumed to correspond to a referral to a consultant psychiatrist (one hour) and national unit cost figures were applied (Curtis 2008). All costs were then inflated to 2013 prices.

8.3 Results

Participants

A total of 214 participants (75 male, 139 female; mean age 18.9 years) were assessed at baseline and at one-year follow-up, although missing data meant that numbers were usually lower for our analyses.

Pathways to care

Before accessing the youth-specific service, 131 young people (25%) consulted a GP and 79 (15%) accessed CAMHS services (see Table 21). These data show that participants accessed a variety of services prior to accessing the youth service, with an average of 6.4 services from onset of presenting the problem to the youth service. If the young people that were referred to the youth service but then redirected to more appropriate services were excluded, the average number of services used prior to the service was 5.8.

Duration of time spent at the youth-specific service

The amount of time young people spent at the service was calculated in terms of hours received and months of involvement in the programme. On average, young people were in contact over a period of 8.7 months and had 17 hours of contact.

We also calculated the number of days spent in the hospital – when in the programme – and included it as service time. In terms of hospital admissions, 87.9% of participants were never admitted to a hospital during the programme, whilst 8.2% were admitted to hospital once and 3.8% twice.

Youth-specific service costs

Norfolk Youth Pilot Service received an annual budget of £353,000.

Table 21. Norfolk: frequency of service use prior to attending the youth-specific service

Type of service	n	%
Third sector service	27	5.1
CAMHS	79	15.0
CAMHS/Youth*	18	3.4
Education	44	8.4
GP	131	25.0
Inpatient/crisis	35	6.7
Community paediatrics	4	0.8
Physical health	4	0.8
Police/Youth Offending Team	19	3.6
Primary care	66	12.6
Private sector	4	0.8
Social care	36	6.9
Specialist	18	3.4
Youth service	2	0.4

*CAHMS service with some youth-specific intervention; education: interventions at school

Mental health

Overall, participants showed improvement in mental health functioning from baseline to follow-up as measured by the GAF (mean scores of 46.7 at baseline and 59.5 at follow-up; $p < 0.001$). Frequencies of GAF scores across baseline and follow-up are summarised in Table 22. Only 147 participants were included in the above analysis because of missing data. Young people with the most severe functional impairments were the most likely to improve from baseline to follow-up. Likewise, young people with moderate symptoms improved over time.

We also investigated change across the three GAF categories over time: of the 147 participants who completed the GAF at baseline and follow-up, half sample remained severe, whilst the rest improved to either moderate (18.7%) or mild/none (42.9%). Among those who had moderate functional impairment at baseline, 13.6% showed more severe impairment at follow-up whilst 61.4% improved to mild or no symptoms, and 25% remained the same. The majority of those with mild or no symptoms at baseline remained at that level; however, most participants (83.3%) improved from more severe to mild or no symptoms.

Regression analyses showed that GAF score at baseline and number of hours spent in the service predicted an improvement in global functioning (GAF) at follow-up ($p < 0.001$).

We also divided participants according to whether they were above or below the sample mean GAF score of 53. The number of participants (out of 147) who scored higher than 53 at baseline was 39 (27%) against 98 (67%) at the follow-up, suggesting a significant improvement in functioning after a year in the service.

We have not attempted to turn these changes in global functioning into economic indicators, although it is clear from the previous section that young people supported by THEDS – for whom significant changes were recorded on GAF – used fewer services and had better employment outcomes. For an older sample, Byford *et al* (2010) found that an improvement in GAF score was associated with reduced service use.

Table 22. Norfolk: distribution of GAF scores at baseline and follow-up

Level of functioning (GAF)	Baseline (n =147)	Follow up (n =147)
Severe	61.9%	27.9%
Moderate	29.9%	20.4%
Mild/None	8.2%	51.7%

Social functioning: education, employment and leisure

To investigate the effects of service on social functioning, we calculated change in time spent by participants in employment, education and leisure activities between baseline and follow-up (as measured by the Time Use Survey). To test differences between baseline and follow-up, a series of paired-sample Wilcoxon Signed Rank test were conducted. At follow-up, young people spent more hours in employment than at baseline ($p < 0.05$), as well as more hours in leisure time ($p < 0.05$), although the sample size was now quite small ($n=78$).

We therefore concluded that there were positive changes in the way young people spent their time since their involvement in the service. Again, although we are not able to estimate these changes in monetary terms, it is very likely that there are economic benefits associated with these employment gains.

8.4 Discussion of Norfolk findings

The Norfolk and Suffolk Specialist Youth Mental Health Service represents an innovative youth-specific service for young people with complex mental health needs and aims to transform service delivery with a focus on evidence-based practice. This is in line with recent policy strategies that recognise that many young people are not accessing mental health services and that there are high levels of unmet need (Care Quality Commission 2014; Department of Health & NHS England 2015).

The service addresses the problem of transition from child and adolescent mental health services (CAMHS) to adult mental health services (AMHS) for young people with non-psychotic issues. Indeed, adult services often have higher thresholds for receiving care, focusing on diagnosed severe and enduring mental health issues (Singh *et al* 2010). In practice this means that young people who would have been assessed as needing support by a CAMHS team may not meet the criteria to receive a service from an AMHS team.

Since its inception, the service implementation has been integrated with a strong research component that constituted a solid basis to investigate the service impact on functioning of young people.

Our modest study aimed to understand the impact of the service on young people's mental health and social functioning, but we were not able to attach an economic value to these gains. This youth-specific service for young people with complex mental health needs had a positive impact on both mental status as measured by the GAF and the quality of time people spent in different activities (more time in employment, education and leisure compared with baseline, rather than the common withdrawal from activities caused by severe mental health issues). Age-appropriate services for adolescents increase the quality of care and thus are likely to produce better outcomes (Viner 2012).

Although, the implementation of such services and related research are both at their infancy, the Norfolk service represents an important example of reorganisation of secondary mental health services for young people aged 14–25 years, reflecting the developmental stage of adolescence and young adulthood. Similar to the development of Early Intervention in Psychosis services, this approach addresses the challenges during the traditional transition period from children and adolescents to adult services, providing continuity in services at a time when most chronic mental health issues emerge.

Our findings from the limited evaluation indicate that the Norfolk and Suffolk Specialist Youth Mental Health Service may play a role in improving the mental health status of young people with mental health needs and their social functioning, with likely implications for savings over both the short and longer term.

9. DISCUSSION

The high susceptibility to developing mental health issues in adolescence and early adulthood is often coupled with a reluctance to access services (Gulliver *et al* 2010); these young people may lack emotional competence, may prefer self-reliance, and they or their parents may hold negative attitudes about seeking professional help (Rickwood *et al* 2005; Gronholm *et al* 2015). As we found with our analyses of the APMS, only about a half of the young people with mental health issues were actually receiving mental health services, and the proportion was almost as low as a third for those aged 21–25. Among young people, the treatment gap was greater for common compared to severe mental health issues. However, under-treatment of severe disorders is a bigger problem among young people compared to older adults. The complicated, multifaceted and damaging life-course consequences of poor mental health should make this wide treatment gap a major public concern.

Using data from the BCAMHS for younger adolescents (ages 12–15 at initial data collection; 15–18 when followed up), we again found a substantial treatment gap: more than half of those with a mental health issue had no contact with services in connection with their emotional, behavioural or concentration problems. When they did, it was much more likely to be the education sector than the health sector that provided front-line support. Across the education, health and social care sectors, mean annual costs per individual were substantial: £2,780 for those with hyperkinetic disorders, £1,789 for those with conduct disorders and for those with £1,353 with emotional disorders. Those costs varied from one person to another of course, with the level of ‘impact’ caused by the mental health issue being an important factor, and with a number of other child, parent and family characteristics also exerting influences.

From the APMS data, covering those aged 16–25, we found that mental health issues were strongly associated with not being in employment, education or training, and with the receipt of benefits, no doubt, often because mental health services helped young people to understand and claim their entitlements. Over the 18-month follow-up period, mental health issues were also associated with a high likelihood of contact with criminal justice services. In addition to the service cost implications of mental health issues experienced by young people, there are therefore short-term (at least) costs associated with unemployment, receipt of benefits and the criminal justice system. These direct and indirect costs are very likely to persist for more years than our data allow us to measure (see, for example, Scott *et al* 2001; Goodman *et al* 2011; Knapp *et al* 2011; D’Amico *et al* 2014).

Our review of the research literature revealed very few studies that investigated the costs or savings associated with mental health services for young people aged 16 to 25 in the UK (or indeed elsewhere), and very few that examined the cost-effectiveness of interventions.

We were also disappointed by the findings of our mapping of youth mental health services in the UK. Although we initially identified about 50 services, some had ceased to operate and some had shrunk or changed their focus (including changing their user group). The overall impression was of the limited availability of specialist youth mental health services. There were, however, some well-planned and well-received local services across the country. We used the mapping to try to identify services that might be able to provide data that we could use to examine the economic case for youth mental health services.

We were able to work collaboratively with two local services, one in East London and one in Norfolk. The THEDS service in East London supports young people who traditionally have often not accessed services. These are exactly the kinds of young people who do not get picked up by, or decline to get involved with, ‘standard’ mental health services: the young people revealed by the APMS data to constitute the ‘treatment gap’. Most of these young people faced many disadvantages in addition to their mental illness. Our evaluation of the THEDS service was constrained by the routinely collected data that were available and by the small sample size, but suggested that the service was achieving important improvements in mental health and social functioning, while reducing service use for those young people who received two years of treatment. We used case studies to bring further evidence to the fore. The associated short-term cost savings are likely to have implications for longer-term savings too.

The Norfolk and Suffolk Specialist Youth Mental Health Service is an innovative youth-specific service for young people with complex (non-psychotic) mental health needs, and among other things addresses the challenge of transition between CAMHS and adult services. We found significant improvements in mental health and engagement

with employment, education and leisure which are likely to generate economic gains in both the short and longer term.

We hesitate to generalise from either of these small, local studies. We did not have a comparison group in either locality (which would anyway be very hard to study, given the lack of data, and the very practical challenge of engaging with young people with mental health issues who are not in contact with services). Consequently, it is possible that changes over time for those in contact with the THEDS and Norfolk services might simply reflect the usual trajectories for youth mental health conditions. However, our analyses of APMS data show strikingly the very strong continuities over time in terms of psychiatric morbidity, employment and education status, and contacts with criminal justice services. For this reason, and given what we learned more generally from our work with the two local services, we are confident that both are contributing very positively to the lives of the young people they are treating and supporting.

This is the first study of the economic impact of youth mental health services in the UK. Our study was hampered by an almost complete absence of: relevant previous research to provide a platform from which to build a research design, specialist youth mental health services across the UK with which we could work collaboratively, and good data on outcomes or cost-related indicators. We could not therefore estimate the overall cost of youth mental health problems. Despite these difficulties, we have gathered new evidence to feed into national and local discussions about this most challenging of mental health areas. Our findings show the wide-ranging and sizeable economic consequences of not identifying or appropriately addressing the mental health needs of adolescents and young adults. We have also shown that two specialist local services appear to have had important impacts on the mental health and broader life quality of the people they support.

From our empirical evidence we believe that the youth-specific model appears to be successful and that there is a clear role for age-appropriate services to address both the current and longer-term consequences of mental health issues experienced by young people. The treatment gap is bigger for this age group than for any other, yet this is precisely the age when many fundamental decisions are taken – in relation to education, employment, personal relationships and so on – each of them with ramifications over the life-course. To neglect mental illness in adolescence and young adulthood to the extent that we currently do in the UK is not just morally unacceptable but economically enormously wasteful.

10. RECOMMENDATIONS

Since we started our work there have been some helpful public discussions in the area of youth mental health. One of these culminated in the House of Commons Health Committee (2014) report late last year on children's and adolescents' mental health, which drew on a wide range of evidence to highlight failings in the current system, and set out many challenges for improvement. Another very useful development was the report from the Children and Young People's Mental Health and Wellbeing Taskforce (Department of Health and NHS England 2015). Both reports offer astute, insightful observations on the state of mental health services for this age group, and make important recommendations for improvement over the coming years. We will not even attempt to cover the same span of recommendations here. Rather, we offer recommendations stemming primarily from what was the focus of our report: the *economic* issues in relation to youth mental health issues.

- A. **Investing early to prevent or reduce the risk** of mental health issues emerging during childhood and adolescence is an obvious and sensible approach. There are actions that can be taken that are likely to pay considerable dividends in terms of better lives for the individuals concerned and better use of societal resources. These actions include, for example, much earlier and better recognition of perinatal mental health problems and the consequences that can follow for mother and child: the economic consequences of failing to do so can be immense (Bauer *et al* 2015, 2016), yet there are interventions of proven cost-effectiveness (Petrou *et al* 2015). Other emphases could include better organisation of preventive work in schools; better links to services that work with young people not in employment, education or training, or with other disadvantaged and high-risk groups.
- B. For those mental health issues that are not prevented, the **need for earlier recognition, timely diagnosis and better response** should be obvious, because the consequences of failing to do so can be enormous distress and difficulties for the young people concerned, as well as for their families and others. We have additionally pointed to the economic consequences. Yet, as others have reported previously, the treatment gap for young people in the 16–25 age group is greater than for any other age group, whether child or adult. This has been known for at least two decades, and indeed some of the data that we use in this report were collected in 2000. It is of considerable concern that this situation has been allowed to continue, or indeed perhaps to have worsened, given what we know about national trends in spending.
- C. Responding appropriately to mental health issues with **evidence-based interventions** is a fundamental recommendation. There are treatment approaches which are known to work well in many cases, such as parenting interventions where there is a family with a child with conduct disorder, and these have the potential not only to be effective but also highly cost-effective (Bonin *et al* 2011;

Beecham 2014). Severe non-psychotic psychopathology can often have a long-term prognosis and implications comparable to psychosis, yet its prevalence is not widely appreciated.

High rates of trauma (often multiple) are common in this group, linked particularly to physical, sexual or emotional abuse, family discord, and bullying. Again, there are long-term economic impacts. Services should be in place and sufficiently resourced to respond to these needs, as well as flexible enough to adapt as individual and population needs change overtime.

The arrangements in both Norfolk and THEDS begin to give an indication of what might be achieved. The Orygen Youth Health model in Melbourne is a comprehensive youth service with different pathways for psychosis, personality disorder and developmental difficulties, to which could be added an IAPT-like service for common mental disorders, but with a youth-oriented front focusing on better engagement. (And if there were better routine data – see below – it would also be easier to make comparisons between different service models to aid our understanding of what works.)

- D. One challenge is to remove the **barriers to access** and to treatment-seeking by young people. We summarised evidence from two local services that appear to have achieved some degree of success in these respects, but there is an urgent need for more and better evidence on what works in the youth mental health area. Targeted social marketing and education of front-line professionals who work with young people (in education, youth offender teams, youth hostels, third sector organisations etc.) to improve early recognition of potential difficulties might help to address this challenge.

Combatting stigma must be part of the response to this state of affairs. Time to Change has been successful in bringing about some changes in societal attitudes to mental health, but perhaps less successfully with young people than with adults. But again, there is evidence that successful anti-stigma campaigns can generate economic pay-offs that easily exceed the initial investments (McCrone *et al* 2010; Evans-Lacko *et al* 2013).

- E. Part of the problem has been the pattern of **commissioning** of services over recent years, with a real-terms decrease in funding of child and adolescent mental health services in England (Young Minds 2015). As the House of Commons Health Committee diplomatically expressed it in their summary: ‘While demand for mental health services for children and adolescents appears to be rising, many CCGs report having frozen or cut their budgets. CCGs have the power to determine their own local priorities, but we are concerned that insufficient priority is being given to children and young people’s mental health’ (House of Commons Health Committee 2014, p.4). Simon Stevens, in his Foreword to the Taskforce report wrote: ‘Need is rising and investment and services haven’t kept up. The treatment gap and the

funding gap are of course linked' (Department of Health & NHS England 2015, p.7). It has doubtless been frustrating for government ministers with a strong commitment to youth mental health services to find themselves with so little influence over what – in terms of local commissioning and delivery – is actually funded or provided.

- F. Another clear source of difficulty is the **transition** between CAMHS and adult services, with many authors referring to this period as a 'cliff edge'. There is little extant evidence to be contributed to discussion of this issue from an economics perspective. We welcome the fact that NICE is in the process of preparing guidance on transitions in many areas of health, including mental health (National Institute for Health and Care Excellence 2014).
- G. The consequences of failing to recognise or respond appropriately to mental health issues in childhood and adolescence will often last a lifetime. We have pointed to some of the short-term economic consequences that flow from these failings, and other studies have demonstrated longer-term impacts on, for example, poor educational outcomes, antisocial behaviour and crime, above-average use of health services, difficulties finding employment outcomes and reliance on benefits.

What is clear from this UK research and from work in other countries (albeit therefore in different systems with different patterns of economic consequence and incentive) is that the lifetime consequences of untreated mental health issues in childhood and adolescence will usually spill into many different public budgets and other areas of the economy. This helps to explain why Simon Stevens, in his Taskforce report Foreword, cautions against focusing 'too narrowly on targeted clinical care, ignoring the wider influences and causes of rising demand, over-medicalising children along the way' (Department of Health & NHS England 2015, p.7). There is an urgent need to bring together different agencies – especially education, youth justice, health, social care, welfare benefits – to discuss and agree priorities and the actions that should follow. One model would be to have an identified mediator tasked with bringing these different services and sectors together to work in the best interests of the young person.

This need for **coordination or integration** has been incanted so many times that there is a danger that it is no longer heard. The Taskforce report gives this great emphasis, as does every commentator in the area. The economic challenges are manifold, especially when public bodies are tightly performance-managed, since there may be few financial incentives to take action when the biggest pay-offs will be to other people's budgets. Anecdotal evidence that police commissioners are investing in parent training programmes for young children with conduct disorder or that schools are investing in counsellors demonstrate an ability for local action to tackle the bureaucratic sclerosis that appears to have set into strategic coordination.

- H. Most of these actions would be easier to implement, and certainly much easier to monitor and evaluate, if there were **better routine data** on levels and patterns of spending and provision, and on individual and societal outcomes. We searched hard for data to bring to bear on the economics questions addressed in our study, but with little success, although we were able to use some data that had been drawn from more than one local system by the teams in Norfolk and East London. Generally, however, there are very few data on young people with or at risk of mental health issues in England. It is surely not right that a report published in 2015 has to rely on data collected in 2000 – before many of the adolescents who today experience distressing mental health issues were actually born.

Although the coordination of risk-reduction strategies, responses to need and delivery of support are most important, **coordinated data collections** and their careful interrogation would certainly help. It is not obvious to us that there is much opportunity currently to read across from data in one system to data in another. Information systems in local health, education, social care, housing, employment and other relevant sectors seem to operate in parallel universes. The Taskforce report gives welcome emphasis to the need for a better information base for action and monitoring, and perhaps it is time to consider a minimum data set for youth mental health services to support commissioning, local and national policy-making and research. Given the opportunity costs of both any new data collection – in terms of over-burdening frontline professionals – and of any pooling across organisations – in terms of how to get information systems to talk to each other – any such proposal should be proportionate and not immediately doomed by over-ambition.

- I. The Taskforce report also urges the various systems to ‘make the right investments’ (p.15). The particular challenge in the youth mental health area is that there is so little economic evidence to inform those investments. We do not completely agree with the Taskforce report when it notes that ‘Evidence shows that, for all of these conditions [child and adolescent mental health issues], there are interventions that are not only very effective in improving outcomes, but also good value for money, in some cases outstandingly so, as measured by tangible economic benefits such as savings in subsequent costs to public services’ (p.26).

Our reading of the international evidence is that there has certainly been an accumulation of evidence, but it is considerably less than commissioners need if they are to ‘make the right investments’. This view is reinforced by the recent review by Beecham (2014). There is now a good body of work on early detection and intervention for psychosis, but not much on other mental health issues in this age group, which are of course much more prevalent. Consequently, the body of reliable cost-effectiveness evidence in this area is much smaller than commissioners would undoubtedly wish to find to guide their spending decisions. Among others, the Early Intervention Foundation is working to generate further evidence and to bring it to the attention of relevant decision-makers.

We would very much prefer not to be finishing this report with yet another lament about the absence of research evidence. However, in the area of youth mental health, this absence – relative to the need for it – is as pronounced as we have seen just about anywhere.

ACKNOWLEDGEMENTS

We would like to acknowledge with thanks the young people in both of the local services on whose lives part of our evaluation was based. We are grateful to the NHS Confederation Mental Health Network for funding this study, although we emphasise that views expressed in this report are those of the authors and are not necessarily those of the funding body.

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Appendix 1: Literature review

1. COST STUDIES

- Anderson DM et al (2015) Youth depression and future criminal behaviour. *Economic Inquiry* 53(1): 294–317.

While the contemporaneous association between mental health problems and criminal behavior has been explored in the literature, the long-term consequences of such problems, depression in particular, have received much less attention. Using data from the National Longitudinal Study of Adolescent Health, we examine the effect of depression during adolescence on the probability of engaging in a number of criminal behaviours later in life. In our analysis, we control for a rich set of individual, family, and neighbourhood level factors to account for conditions that may be correlated with both childhood depression and adult criminality. One novelty in our approach is the estimation of school and sibling fixed effects models to account for unobserved heterogeneity at the neighbourhood and family levels. Furthermore, we exploit the longitudinal nature of our data set to account for baseline differences in criminal behavior.

We find little evidence that adolescent depression predicts the likelihood of engaging in violent crime or the selling of illicit drugs. However, our empirical estimates show that adolescents who suffer from depression face an increased probability of engaging in property crime. Our estimates imply that the lower-bound economic cost of property crime associated with adolescent depression is about \$219 million annually.

- Beecham K et al (2009) Cost variation in child and adolescent psychiatric inpatient treatment. *Eur Child Adolesc Psychiatry* 18(9): 535–542.

Publicly available costs data for child and adolescent psychiatric inpatient services do not allow links to be made with patients' needs and outcomes. Without this information commissioners may reduce the role of inpatient services on the basis of budgetary impacts alone. This study estimates the support costs before, during and after an inpatient admission and explores the associations between costs, needs and outcomes. A detailed prospective cohort study of eight child and adolescent units was undertaken in which participants were assessed at referral, admission, decision to discharge and one year later.

Mean admission costs were £24,120, although the range was wide. Associations were found between costs and patients' global impairment, age and exclusion status. Support costs after admission were similar to pre-admission costs, but there was some evidence to suggest that services were better targeted. Moves in England to develop national tariffs for inpatient psychiatric episodes should be based on the likely cost of the episode of treatment rather than costs per day, and good commissioning requires more information on the predictors of such costs.

- Bodden DH *et al.* (2008) Societal burden of clinically anxious youth referred for treatment: a cost-of-illness study. *Journal of abnormal child psychology* 487–497.

A prevalence-based cost-of-illness study using a societal perspective was conducted to investigate the cost-of-illness in clinically anxious youth aged 8–18 in The Netherlands. Discriminant validity of the cost diary used was obtained by comparing costs of families with an anxious child (n=118) to costs of families from the general population (n=41). To examine the convergent validity, bottom-up acquired costs derived from cost diaries were compared to top-down acquired costs obtained from national registrations. Bottom-up acquired costs measured by means of cost diaries amounted to €2,748 per family of a clinically referred anxious child per annum.

Societal costs of families with clinically anxious children were almost 21 times as high compared to families from the general population. With respect to convergent validity, total health care costs using the bottom-up approach from clinically anxious children were quite comparable to those of top-down data of anxious children, although costs within the subcategories differed considerably. Clinical anxiety disorders in childhood cost the Dutch society more than €20 million a year. Based on results of discriminant and convergent validity, the cost diary seems a valid method in establishing cost-of-illness in childhood anxiety disorders.

- Burd L *et al.* (2003) Children and adolescents with attention deficit-hyperactivity disorder: 1. Prevalence and cost of care. *J Child Neurol* 18(8): 555–561.

The objective of this study was to use population-based data to estimate the prevalence and cost of treatment for attention-deficit hyperactivity disorder (ADHD). The North Dakota Department of Health Claims Database was used to estimate the administrative prevalence, annual cost of care per case, and total annual cost of care for subjects with ADHD compared with controls. The case population was 7,745, and the mean prevalence rate was 3.9%, with a peak prevalence at 10 years of age.

For children with ADHD, the annual cost of care was \$649 compared with that of controls at \$495. Cost of care attributable to ADHD was $\$649 - \$495 = \$154$ (31%). Utilization by children with ADHD with publicly-funded payers was increased 25% to 175% over that of children with privately funded coverage. In North Dakota, the annual cost of care for children with ADHD was \$5.1 million, 5.6% of all health care costs for children. The annual attributable cost of care was \$1.79 million. Thus, 1.9% of total health expenditures for children was attributable to ADHD. In the United States, the cost of care attributable to children with ADHD would be \$2.15 billion annually.

- Chabra A *et al* (1999) Hospitalization for mental illness in adolescents: risk groups and impact on the health care system. *Journal of Adolescent Health* 24(5): 349–356.

Determined the extent and cost of hospitalizations for mental illness among 27,595 10–19 year olds and identified differences in acute care hospital use by gender and between racial/ethnic groups. Analysis of discharge data provided relative risks calculated by race/ethnicity and gender and stratified by race/ethnicity and payment source.

Results show that mental illness accounted for 14.8% of hospitalizations in this age group; the mean length of stay was 10.9 days. Total charges exceeded \$300 million. Adolescent boys had a slightly lower risk of hospitalization for mental illness than did adolescent girls, but a higher risk for certain diagnoses. Overall, non-White adolescents had a lower risk of hospitalization for mental illness than did White adolescents.

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- Costello E *et al* (2007) Service costs of caring for adolescents with mental illness in a rural community, 1993–2000. *The American Journal of Psychiatry* 164(1): 36–42.

Objective: Costs of treating child psychiatric disorders fall on educational, primary care, juvenile justice, and social service agencies as well as on psychiatric services. The authors estimated multi-agency mental health costs by integrating service unit costs with utilization rates in an 11-county area. Using psychiatric diagnoses made independently of service use records, the authors calculated costs across agencies as well as the extent of unmet need for psychiatric care. Method: Annual parent and child reports were used to measure mental health care needs and units of service across 21 types of settings for the population-based Great Smoky Mountain Study sample of 1,420 adolescents from ages 13 to 16. Unit costs for services were generated from information from service providers and records. The authors calculated costs overall, costs by type of service, and costs by diagnosis.

Results: Average annual costs per adolescent treated were \$3,146. Juvenile justice and inpatient/residential facilities accounted for well over half of the total costs. Costs for youths with two or more diagnoses were twice as much as costs of those with a single disorder. Among adolescents with service needs, 66.9% received no services. Public health insurance was associated with higher rates of specialty mental health care than either private insurance or no insurance.

Conclusions: Annual costs across all services were three to four times greater than recent health insurance estimates alone. Many costs for adolescents with mental health problems were borne by agencies not designed primarily to provide psychiatric or psychological services. Only one in three adolescents needing psychiatric care

received any mental health services.

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- Cuffel BJ *et al* (1996) Treatment costs and use of community mental health services for schizophrenia by age cohorts. *American Journal of Psychiatry* 153(7): 870–876.

Objective: Research on schizophrenia has tended to ignore patterns and costs of mental health service use in late life. The present study examined the types of mental health services used and their costs for several age-defined cohorts in a large community mental health system.

Method: The data covered all users of the mental health system included in the San Diego county billing information system in fiscal years 1986 and 1990. Community mental health service use and codes were modelled as a function of patient demographic characteristics, diagnosis, and age. The patients were grouped into the following age categories: 18–29, 30–44, 45–54, 55–64, 65–74, and ≥75 years of age.

Results: The total costs for schizophrenia were higher than those for other psychiatric disorders, and they were also age dependent. In both fiscal years, the costs of schizophrenia were higher for the youngest and oldest cohorts than for the patients in the 30–65 year range.

Conclusions: The economic burden of late-life schizophrenia to the public mental health system is at least as high as that of schizophrenia in younger adults.

- Domino ME *et al* (2009) Service use and costs of care for depressed adolescents: Who uses and who pays? *Journal of Clinical Child and Adolescent Psychology* 38(6): 826-836.

Major depressive disorder is common in adolescence and is associated with significant morbidity and family burden. Little is known about service use by depressed adolescents. The purpose of this article is to report the patterns of services use and costs for participants in the Treatment for Adolescents with Depression Study sample during the three months before randomization. Costs were assigned across three categories of payors: families, private insurance, and the public sector. We examined whether costs from payors varied by baseline covariates, such as age, gender, insurance status, and family income. The majority (71%) of depressed youth sought services during the three-month period. Slightly more than one-fifth had contact with a behavioral health specialist. The average participant had just under \$300 (SD = \$437.67, range = \$0– \$3,747.71) in treatment-related costs, with most of these costs borne by families and private insurers.

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- Feenstra DJ *et al* (2012) The burden of disease among adolescents with personality pathology: quality of life and costs. *Journal of Personality Disorders* 26(4): 593–604.

In adults, personality disorders are associated with a low quality of life and high societal costs. To explore whether these findings also apply to adolescents, 131 adolescent patients were recruited from a mental health care institute in The Netherlands. Axis I and Axis II disorders were diagnosed using semi-structured interviews. The EuroQol EQ-5D was used to measure quality of life and costs were measured by the Trimbos and Institute for Medical Technology Assessment Questionnaire on Costs Associated with Psychiatric Illness.

The mean EQ-5D index value was 0.55. The mean direct medical cost in the year prior to treatment was €14,032 per patient. The co-occurrence of Axis I and Axis II disorders was a significant predictor of a low quality of life. Direct medical costs were higher for the depressive personality disorder. This study shows that the burden of disease among adolescents with personality pathology is high. This high burden provides evidence to suggest that further research and development of (cost-) effective treatment strategies for this population may be worthwhile.

(PsycINFO Database Record © 2012 APA, all rights reserved) (journal abstract).

- Jones DE, Foster EM (2009) Service use patterns for adolescents with ADHD and comorbid conduct disorder. *J Behav Health Serv Res* 36(4): 436–449.

Service use patterns and costs of youth diagnosed with attention-deficit/hyperactivity disorder (ADHD) and comorbid conduct disorder (CD) were assessed across adolescence (ages 12 through 17). Featured service sectors include mental health, school services, and the juvenile justice system. Data are provided by three cohorts from the Fast Track evaluation and are based on parent report. Diagnostic groups are identified through a structured assessment.

Results show that public costs for youth with ADHD exceed \$40,000 per child on average over a six-year period, more than doubling service expenditures for a non-ADHD group. Public costs for children with comorbid ADHD and CD double the costs of those with ADHD alone. Varying patterns by service sector, diagnosis, and across time indicate different needs for youth with different conditions and at different ages and can provide important information for prevention and treatment researchers.

- Peele PB *et al* (2004) Use of Medical and Behavioral Health Services by Adolescents With Bipolar Disorder. *Psychiatric Services* 55(12): 1392–1396.

Objective: This study compared use of medical and behavioral health care by adolescents with bipolar disorder and other adolescents and identified areas in need of more clinical attention.

Methods: Medical and behavioral health insurance claims from 1996 for 100,880 adolescents were examined and categorized. Differences between and among various categories of disease were explored by using multivariate analyses.

Results: Among the 10,970 adolescents who used at least one behavioral health service, adolescents with bipolar disorder (n=326) had significantly higher behavioral health costs than those with mood or non-mood disorders, a result driven by these adolescents' significantly higher hospital admission rates for behavioral health care. Adolescents with bipolar disorder also had significantly higher medical admission rates compared with adolescents who had other behavioral health diagnoses. More than half of the 14 medical admissions for adolescents with bipolar disorder were due to drug overdose.

Conclusions: Reallocation of medical and behavioral health resources to improve ambulatory treatment of bipolar disorder among adolescents has the potential to decrease the use and costs of health care while improving the welfare of these adolescents and their families.

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■ Richardson LP *et al* (2008) The effect of comorbid anxiety and depressive disorders on health care utilization and costs among adolescents with asthma. *General Hospital Psychiatry* 30(5): 398–406.

Objective: To assess whether youth with asthma and comorbid anxiety and depressive disorders have higher health care utilization and costs than youth with asthma alone.

Methods: A telephone survey was conducted among 767 adolescents (aged 11 to 17 years) with asthma. Diagnostic and Statistical Manual-4th Version (DSM-IV) anxiety and depressive disorders were assessed via the Diagnostic Interview Schedule for Children. Health care utilization and costs in the 12 months pre- and 6 months post-interview were obtained from computerized health plan records. Multivariate analyses were used to determine the impact of comorbid depression and anxiety on medical utilization and costs.

Results: Unadjusted analyses showed that compared to youth with asthma alone, youth with comorbid anxiety/depressive disorders had more primary care visits, emergency department visits, outpatient mental health specialty visits, other outpatient visits and pharmacy fills. After controlling for asthma severity and covariates, total health care costs were approximately 51% higher for youth with depression with or without an anxiety disorder but not for youth with an anxiety disorder alone. Most of the increase in health care costs was attributable to non-asthma and non-mental health-related increases in primary care and laboratory/radiology expenditures.

Conclusions: Youth with asthma and comorbid depressive disorders have significantly higher health care utilization and costs. Most of these costs are due to increases in

non-mental health and non-asthma expenses. Further study is warranted to evaluate whether improved mental health treatment and resulting increases in mental health costs would be balanced by savings in medical costs.

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- [Robergeau K et al \(2006\) Hospitalization of children and adolescents for eating disorders in the State of New York. *Journal of Adolescent Health* 39\(6\): 806–810.](#)

Purpose: To examine hospitalization patterns, length of stay, cost and insurance status for children and adolescents with eating disorders.

Methods: A cross-sectional study was conducted of patients with eating disorders aged 9 to 17 years, discharged from hospitals in the State of New York in 1995. All patients discharged in the state were registered by the State Planning and Research Collaborative System (SPARCS). A subset was identified based on coding by the International Classification of Diseases (ICD) for Anorexia Nervosa, Bulimia and Eating Disturbance Not Otherwise Specified. The Statistical Analysis System (SAS) was used for data analysis. The variables selected were gender, ethnicity, insurance status and length of stay.

Results: In one year there were 352 hospitalizations, 312 females (88.6%) and 40 males (11.4%); 279 Caucasians (79.3%), 35 African Americans (9.9%), and 38 Other (10.8%); commercial insurance 246 (69.9%), Medicaid 68 (19.3%), other 38 (10.8%). The diagnostic categories were Anorexia Nervosa 242, Bulimia 59, and Eating Disturbance Not Otherwise Specified 63 (reflecting dual diagnosis in 13). Mean length of stay was 18.43 days, the median was 7 days. The cost per stay ranged between \$341.78 and \$148,471; with a median of \$3,817 and a mean of \$10,019. Length of stay was not influenced by gender, age, or ethnicity; only payor status, availability of insurance, was dominant.

Conclusions: This is the first statewide report on hospitalization of children and adolescents for eating disorders. The mean cost in 1995 exceeded \$10,000. A correlation was found between length of stay and insurance status. Hospitalizations for eating disorder have a significant public health impact, calling for the formulation of fair and rational strategies to optimize care.

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- Swensen A *et al* (2004) Incidence and costs of accidents among attention-deficit/hyperactivity disorder patients. *Journal of Adolescent Health* 35(4): 346. e1–19.

Purpose: The purpose is to analyse the incidence and costs of accidents among Attention-Deficit/Hyperactivity Disorder (ADHD) patients.

Methods The analysis relied on administrative medical, pharmaceutical, and disability claims for a national manufacturer's employees, spouses, dependents, and retirees ($n > 100,000$). Accidental injuries were identified using ICD-9 codes for injuries or poisoning treatment. ADHD sample consists of individuals with at least one claim for ADHD during 1996–1998 ($n_{\text{ADHD}} = 1,308$), which was compared with a matched control sample. In addition to descriptive statistics, multivariate analysis involving logistic regression was used to model the probability of having an accident claim in 1998. This probability was estimated for the whole population, for adults alone, for children (under age 12 years), and for adolescents (age 12–18 years). We also estimated a generalized estimation equation (GEE) model to account for the possibility of multiple accident claims for a single patient.

Results: ADHD patients had a greater probability of having at least one accident claim than their controls for children (28% vs. 18%), adolescents (32% vs. 23%), and adults (38% vs. 18%). Although ADHD patients' costs were greater than their controls for adults (\$483 vs. \$146), there was no difference for children or adolescents. However, among patients with accident claims, the average number of accident claims was similar for both groups (3.6 vs. 3.5) and costs were not statistically different. The multivariate analysis confirms this utilization pattern: the odds of having an accident for ADHD patients were 1.7 times greater than for controls.

Conclusions: ADHD was a significant predictor of having an accident claim. However, for people with an accident claim, ADHD patients and controls had a similar number of accident claims and costs.

(Society for Adolescent Medicine, 2004).

- Telford C *et al* (2013) Estimating the costs of ongoing care for adolescents with attention-deficit hyperactivity disorder. *Social Psychiatry and Psychiatric Epidemiology* 48(2): 337–344.

Attention-deficit hyperactivity disorder (ADHD) is associated with increased use of health, social and education services. There is a lack of data to quantify the economic burden of ADHD in the UK. The aim of this study was to estimate additional education, health and social care costs amongst adolescents in the UK diagnosed with ADHD. Participants were 143 12- to 18-year-olds from the Cardiff longitudinal ADHD study. Service use relating to mental health over the previous year was measured using the children's service interview. Individual resource use was combined with unit cost data,

from national sources, to calculate costs per patient and subsequently the mean cost per patient. Mean costs, 95% confidence intervals and median use were calculated using nonparametric bootstrapping methods.

The mean cost per adolescent for NHS, social care and education resources used in a 12-month period related to ADHD was £5,493 (£4,415.68, £6,678.61) in 2010 prices and the median was £2,327. Education and NHS resources accounted for approximately 76 and 24%, respectively. Estimated annual total UK costs are 670 million. The additional costs to the NHS and education system of treating adolescents remain substantial for several years after the initial ADHD diagnosis. There exists a need to develop and evaluate early interventions which have the potential to reduce the longer-term burden, particularly on education resource use.

2. INTERVENTION STUDIES

■ Adams M *et al* (1996) Diagnostic utility of endocrine and neuroimaging screening tests in first-onset adolescent psychosis. *Journal of the American Academy of Child and Adolescent Psychiatry* 35(1): 67–73.

Objective: To determine the diagnostic utility of endocrine and neuroimaging screening tests in first-onset adolescent psychosis.

Method: 111 consecutively admitted adolescents (aged 13 through 19 years) who presented with a first-onset psychosis and who had an unremarkable medical history and normal physical examination were given a battery of endocrine and neuroimaging screening tests. Diagnostic utility of a screening test was defined as an abnormal result (a positive test) that either led to a previously unknown or unsuspected medical diagnosis or played an important role in the clinical care of the patient.

Results: 15.4% of the endocrine screening tests and 11.0% of the neuroimaging screening tests were identified as positive. However, no endocrine and no neuroimaging tests met criteria for diagnostic utility. The direct cost of this screening battery was \$636.95 per patient.

Conclusion: Routine endocrine and neuroimaging screening tests in first-onset adolescent psychosis provide no diagnostic utility and are not cost-effective. Selective use of appropriate endocrine and neuroimaging diagnostic tests in populations with symptoms suggestive of organic disorders should replace routine screening procedures.

- Agras WS *et al* (2014) Comparison of 2 family therapies for adolescent anorexia nervosa: a randomized parallel trial. *JAMA Psychiatry* 71(11): 1279–1286.

Importance: Anorexia nervosa (AN) is a serious disorder with high rates of morbidity and mortality. Family-based treatment (FBT) is an evidence-based therapy for adolescent AN, but less than half of those who receive this approach recover. Hence, it is important to identify other approaches to prevent the development of the chronic form of AN for which there is no known evidence-based treatment.

Objective: To compare FBT with systemic family therapy (SyFT) for the treatment of adolescent-onset AN.

Design, setting and participants: Research in Anorexia Nervosa (RIAN) is a two-group (FBT and SyFT) randomized trial conducted between September 2005 and April 2012. Interviewers were blinded to the treatment condition. A total of 564 adolescents receiving care at six outpatient clinics experienced in the treatment of AN were screened. Of these, 262 adolescents did not meet the inclusion criteria and 138 declined to participate; hence, 164 adolescents (aged 12–18 years) of both sexes meeting the criteria for Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, AN (except for amenorrhea) were enrolled. Three participants were withdrawn from FBT and seven were withdrawn from SyFT after serious adverse events occurred.

Interventions: Two manualized family therapies with 16 one-hour sessions during nine months. Family-based therapy focuses on the facilitation of weight gain, whereas SyFT addresses general family processes.

Main outcomes and measures: The primary outcomes were percentage of ideal body weight (IBW) and remission ($\geq 95\%$ of IBW). The a priori hypothesis was that FBT would result in faster weight gain early in treatment and at the end of treatment (EOT).

Results: There were no statistically significant differences between treatment groups for the primary outcome, for eating disorder symptoms or comorbid psychiatric disorders at the EOT or follow-up. Remission rates included FBT, 33.1% at the EOT and 40.7% at follow-up and SyFT, 25.3% and 39.0%, respectively. Family-based therapy led to significantly faster weight gain early in treatment, significantly fewer days in the hospital, and lower treatment costs per patient in remission at the EOT (FBT \$8,963; SyFT \$18,005). An exploratory moderator analysis found that SyFT led to greater weight gain than did FBT for participants with more severe obsessive-compulsive symptoms.

Conclusions and relevance: The findings of this study suggest that FBT is the preferred treatment for adolescent AN because it is not significantly different from SyFT and leads to similar outcomes at a lower cost than SyFT. Adolescents with more severe obsessive-compulsive symptoms may receive more benefits with SyFT.

(Trial Registration: clinicaltrials.gov Identifier NCT00610753).

- Anderson R *et al* (2014) Cost-effectiveness of classroom-based cognitive behaviour therapy in reducing symptoms of depression in adolescents: a trial-based analysis. *Journal of Child Psychology and Psychiatry* 55(12): 1390–1397.

Background: A substantial minority of adolescents suffer from depression and it is associated with increased risk of suicide, social and educational impairment, and mental health problems in adulthood. A recently conducted randomized controlled trial in England evaluated the effectiveness of a manualized universally delivered age-appropriate CBT programme in school classrooms. The cost-effectiveness of the programme for preventing low mood and depression for all participants from a health and social care sector perspective needs to be determined.

Methods: A trial-based cost-effectiveness analysis based on a cluster-randomized controlled trial (trial registration-ISRCTN 19083628) comparing classroom-based CBT with usual school provision of Personal Social and Health Education. Per-student cost of intervention was estimated from programme records. The study was undertaken in eight mixed-sex UK secondary schools, and included 3,357 school children aged 12 to 16 years (in the two trial arms evaluated in the cost-effectiveness analysis). The main outcome measures were individual self-reported data on care costs, Quality-Adjusted Life-Years (QALYs, based on the EQ-5D health-related quality-of-life instrument) and symptoms of depression (Short Mood and Feelings Questionnaire) at baseline, 6 and 12 months.

Results: Although there was lower quality-adjusted life-years over 12 months (-.05 QALYs per person, 95% confidence interval -.09 to -.005, $p = .03$) with CBT, this is a 'clinically' negligible difference, which was not found in the complete case analyses. There was little evidence of any between-arm differences in SMFQ scores (0.19, 95% CI -0.57 to 0.95, $p = .62$), or costs (142, 95% CI -132 to 415, $p = .31$) per person for CBT versus usual school provision.

Conclusions: Our analysis suggests that the universal provision of classroom-based CBT is unlikely to be either more effective or less costly than usual school provision.

(PsycINFO Database Record © 2015 APA, all rights reserved) (journal abstract).

- Birchwood M *et al* (2014) The UK national evaluation of the development and impact of Early Intervention Services (the National EDEN studies): study rationale, design and baseline characteristics. *Early Intervention in Psychiatry* 8(1): 59–67.

Aims: National EDEN aims to evaluate the implementation and impact on key outcomes of somewhat differently configured Early Intervention Services (EIS) across sites in England and to develop a model of variance in patient outcomes that includes

key variables of duration of untreated psychosis (DUP), fidelity to the EIS model and service engagement. The cohort is being followed up for two further years as patients are discharged, to observe the stability of change and the impact of the discharge settings.

Methods: A longitudinal cohort study of patients with a first episode of a psychosis, managed by EIS in six services across England. Patients are followed up 12 months after inception, then up to two years following discharge. Measures of DUP, psychosis, social functioning and relapse were taken. User and carer experience of EIS were monitored over time; as was the fidelity of each EIS to national guidelines. Service use is costed for a health economic evaluation.

Results: 1,027 people consented to the study of which 75% were successfully followed up at 12 months, with almost 100% data on treatment, relapse and recovery and service use.

Conclusions: National EDEN is the largest cohort study of young people with psychosis receiving care under EIS. It will be able definitively to indicate whether this major investment in the United Kingdom in EI is achieving meaningful change for its users in practice and provide indications concerning who does well under this approach and who does not, and the long-term stability of any improvements.

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■ **Bodden DH *et al* (2008) Costs and cost-effectiveness of family CBT versus individual CBT in clinically anxious children. *Clinical child psychology and psychiatry* 543–564.**

The objective of this study was to investigate the cost-effectiveness of family cognitive-behavioral therapy (CBT) compared with individual CBT in children with anxiety disorders. Clinically anxious children (aged 8–18 years) referred for treatment were randomly assigned to family or individual CBT and were assessed pre-treatment, post treatment, and at three months and one year after treatment. Cost-effectiveness ratios were calculated expressing the incremental costs per anxiety-free child and the incremental costs per Quality Adjusted Life Year (QALY) for the referred child.

Neither societal costs nor effectiveness were significantly different between individual and family CBT. However, the point estimates of the cost-effectiveness ratios resulted in dominance for individual CBT, indicating that individual CBT is more effective and less costly than family CBT. These results were confirmed by bootstrap analyses and cost-effectiveness acceptability curves. Several secondary and sensitivity analyses showed that the results were robust.

It can be concluded that family CBT is not a cost-effective treatment for clinically anxious children, compared with individual CBT.

- Byford S *et al* (2007) Economic evaluation of a randomised controlled trial for anorexia nervosa in adolescents. *The British Journal of Psychiatry* 191(5): 436–440.

Background: Young people with anorexia nervosa are often admitted to hospital for treatment. As well as being disruptive to school, family and social life, in-patient treatment is expensive, yet cost-effectiveness evidence is lacking.

Aims: Cost-effectiveness analysis of three treatment strategies for adolescents with anorexia nervosa.

Method: UK multicentre randomised, controlled trial comparing in-patient psychiatric treatment, specialist out-patient treatment and general out-patient treatment. Outcomes and costs assessed at baseline, one and two years.

Results: There were 167 young people in the trial. There were no statistically significant differences in clinical outcome between the three groups at two years. The specialist out-patient group was less costly over the two-year follow-up (mean total cost 26,738) than the in-patient (34,531) and general out-patient treatment (40,794) groups, but this result was not statistically significant. Exploration of the uncertainty associated with the costs and effects of the three treatments suggests that specialist out-patient treatment has the highest probability of being cost-effective.

Conclusions: On the basis of cost-effectiveness, these results support the provision of specialist out-patient services for adolescents with anorexia nervosa.

(PsycINFO Database Record © 2012 APA, all rights reserved) (journal abstract).

- Byford S *et al* (2007) Cost-effectiveness of selective serotonin reuptake inhibitors and routine specialist care with and without cognitive-behavioural therapy in adolescents with major depression. *The British Journal of Psychiatry* 191(6): 521–527.

Background: Major depression is an important and costly problem among adolescents, yet evidence to support the provision of cost-effective treatments is lacking.

Aims: To assess the short-term cost-effectiveness of combined selective serotonin reuptake inhibitors (SSRIs) and cognitive-behavioural therapy (CBT) together with clinical care compared with SSRIs and clinical care alone in adolescents with major depression.

Method: Pragmatic randomised controlled trial in the UK. Outcomes and costs were assessed at baseline, 12 and 28 weeks.

Results: The trial comprised 208 adolescents, aged 11–17 years, with major or probable major depression who had not responded to a brief initial psychosocial

intervention. There were no significant differences in outcome between the groups with and without CBT. Costs were higher in the group with CBT, although not significantly so ($P = 0.057$). Cost-effectiveness analysis and exploration of the associated uncertainty suggest there is less than a 30% probability that CBT plus SSRIs is more cost-effective than SSRIs alone.

Conclusions: A combination of CBT plus SSRIs is not more cost-effective in the short-term than SSRIs alone for treating adolescents with major depression in receipt of routine specialist clinical care.

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- [Carter T *et al* \(2012\) The effectiveness of a preferred intensity exercise programme on the mental health outcomes of young people with depression: a sequential mixed methods evaluation. *BMC Public Health* 12: 187.](#)

Background: People with mental illness are more likely to suffer physical health problems than comparable populations who do not have mental illness. There is evidence to suggest that exercise, as well as having obvious physical benefits, also has positive effects on mental health. There is a distinct paucity of research testing its effects on young people seeking help for mental health issues. Additionally, it is generally found that compliance with prescribed exercise programmes is low. As such, encouraging young people to exercise at levels recommended by national guidelines may be unrealistic considering their struggle with mental health difficulties. It is proposed that an exercise intervention tailored to young people's preferred intensity may improve mental health outcomes, overall quality of life, and reduce exercise attrition rates.

Methods/design: A sequential mixed methods design will be utilised to assess the effectiveness of an individually tailored exercise programme on the mental health outcomes of young people with depression. The mixed methods design incorporates a Randomised Controlled Trial (RCT), focus groups and interviews and an economic evaluation.

Participants: 158 young people (14–17 years) recruited from primary care and voluntary services randomly allocated to either the intervention group or control group.

Intervention group: participants will undertake a 12-week exercise programme of 12 per 60 minutes of preferred intensity aerobic exercise receiving motivational coaching and support throughout. Participants will also be invited to attend focus groups and one-to-one interviews following completion of the exercise programme to elicit potential barriers/facilitators to participation. Control group: participants will receive treatment as usual.

Primary outcome measure: Depression using the Children's Depression Inventory 2 (CDI-2).

Secondary outcome measures: Quality of Life (EQ-5D), physical fitness (Borg RPE scale, heart rate), incidents of self-harm, treatment received and compliance with treatment, and the cost effectiveness of the intervention. Outcome measures will be taken at baseline, post intervention and six-month follow up.

Discussion: The results of this study will inform policy makers of the effectiveness of preferred intensity exercise on the mental health outcomes of young people with depression, the acceptability of such an intervention to this population and its cost effectiveness.

(Trial Registration: ClinicalTrials.g (AU))

- Chatterji P *et al* (2004) Cost assessment of a school-based mental health screening and treatment program in New York City. *Ment Health Serv Res* 6(3): 155–166.

Although school-based mental health screening and treatment programmes have been proposed as a viable means of reaching youth with unmet mental health needs, no previous reports have attempted to comprehensively document the costs of such programmes. The purposes of this report are (1) to estimate the cost of a school-based mental health screening and treatment programme in a real-world school setting, and (2) to outline the methods and procedures that should be employed by future investigators to explore the costs of such programmes.

The programme, located in a middle school in a low-income, largely Hispanic neighbourhood in New York City, aimed to screen all students in Grades 6–8 for anxiety, depression and substance use disorders. Most students in need of treatment were referred to the school-based treatment programme, where social workers offered individual and group counseling. Economic evaluation methods and a before/after study design were used to assess the costs of the screening and treatment programmes for three years of operation. Costs were estimated from the societal perspective, which includes all measurable programme costs regardless of who bears the costs, and the school perspective, which includes only costs that would be borne directly by a school operating these programmes. Data primarily came from administrative records and staff interviews.

The total cost ranged from \$106,125 to \$172,018 for the screening programme and from \$420,077 to \$468,320 for the treatment programme. The cost of the screening programme ranged from \$149 to \$234 per student and the cost of the treatment programme ranged from \$90 to \$115 per session. These costs were estimated from the perspective of society. Applying economic cost analysis methods in a real-world school setting is challenging, but the process can generate useful estimates. Cost analyses and cost-effectiveness studies are needed in this area.

- Cocchi A *et al* (2011) Cost-effectiveness of treating first-episode psychosis: five-year follow-up results from an Italian early intervention programme. *Early Interv Psychiatry* 5(3): 203–211.

Aim: Early intervention programmes are expected to result in the reduction of illness severity in patients with schizophrenia, and contain health care costs by reducing hospital admissions and improving the social functioning of patients. This study aimed to investigate the cost-effectiveness of treatment in an early intervention programme in comparison to standard care.

Methods: Retrospective analysis of data prospectively recorded in an urban area (Milan, Italy). Twenty-three patients from an early intervention programme and 23 patients from standard care with first-episode psychosis were evaluated on their use of services over a five-year period. The Health of the Nation Outcome Scale was used to measure clinical status.

Results: Significant changes with respect to initial assessment were recorded on the Health of the Nation Outcome Scale, with larger effect sizes in the early intervention programme than in the standard care group. Consequently, the cost-effectiveness ratio per reduced score of severity was lower in the early intervention programme than in standard care (€4,802 vs. €9,871), with an incremental cost-effectiveness ratio, or net saving of €1,204 for every incremental reduced score of severity. Over time, greater recourse to hospital and residential facilities to obtain comparable improvement in symptoms resulted in a steady cost increase for the patients in standard care.

Conclusions: Allocation of funds to specialized early intervention programmes is the best alternative, as it can save costs by reducing the use of hospitals and residential facilities, and may produce net savings of costs in the long term.

- Domino ME *et al* (2008) Cost-effectiveness of treatments for adolescent depression: results from TADS. *The American Journal of Psychiatry* 165(5): 588–596.

Objective: While the evidence base for treatments for adolescent depression is building, little is known about the relative efficiency of such treatments. Treatment costs are a relevant concern given the competing demands on family and health care budgets. The authors evaluated the cost-effectiveness of three active treatments among adolescents with major depressive disorder.

Method: Volunteers (n=439) ages 12 to 18 with a primary diagnosis of major depressive disorder participated in a randomized, controlled trial conducted at 13 US academic and community clinics from 2000 to 2004. Subjects included those participants who did not drop out and had evaluable outcome and cost data at 12 weeks (n=369). Subjects were randomly assigned to 12 weeks of either fluoxetine alone (10–40 mg/day), CBT alone, CBT combined with fluoxetine (10–40 mg/day), or

placebo (equivalent to 10–40 mg/day). Both placebo and fluoxetine were administered double-blind; CBT alone and CBT in combination with fluoxetine were administered unblinded. Societal cost per unit of improvement on the Children's Depression Rating Scale-Revised and cost per quality-adjusted life year (QALY) were compared.

Results: Results ranged from an incremental cost over placebo of \$24,000 per QALY for treatment with fluoxetine to \$123,000 per QALY for combination therapy treatment. The cost-effectiveness ratio for CBT treatment was not evaluable due to negative clinical effects. The models were robust on a variety of assumptions.

Conclusions: Both fluoxetine and combination therapy are at least as cost-effective in the short-term as other treatments commonly used in primary care (using a threshold of \$125,000/QALY). Fluoxetine is more cost-effective than combination therapy after 12 weeks of treatment.

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■ [Domino ME *et al* \(2009\) Relative cost-effectiveness of treatments for adolescent depression: 36-week results from the TADS randomized trial. *Journal of the American Academy of Child & Adolescent Psychiatry* 48\(7\): 711–720.](#)

Objective: The cost-effectiveness of three active interventions for major depression in adolescents was compared after 36 weeks of treatment in the Treatment of Adolescents with Depression Study.

Method: Outpatients aged 12 to 18 years with a primary diagnosis of major depression participated in a randomized controlled trial conducted at 13 US academic and community clinics from 2000 to 2004. Three hundred twenty-seven participants randomized to 1 of 3 active treatment arms, fluoxetine alone (n=109), cognitive-behavioral therapy (n=111) alone, or their combination (n=107), were evaluated for a three-month acute treatment and a six-month continuation/maintenance treatment period. Costs of services received for the 36 weeks were estimated and examined in relation to the number of depression-free days and quality-adjusted life-years. Cost-effectiveness acceptability curves were also generated. Sensitivity analyses were conducted to assess treatment differences on the quality-adjusted life-years and cost-effectiveness measures.

Results: Cognitive-behavioral therapy was the most costly treatment component (mean \$1,787 [in monotherapy] and \$1,833 [in combination therapy], median \$1,923 [for both]). Reflecting higher direct and indirect costs associated with psychiatric hospital use, the costs of services received outside Treatment of Adolescents with Depression Study in fluoxetine-treated patients (mean \$5,382, median \$2,341) were significantly higher than those in participants treated with cognitive-behavioral therapy (mean \$3,102, median \$1,373) or combination (mean \$2,705, median \$927). Accordingly,

cost-effectiveness acceptability curves indicate that combination treatment is highly likely (>90%) to be more cost-effective than fluoxetine alone at 36 weeks. Cognitive-behavioral therapy is not likely to be more cost-effective than fluoxetine.

Conclusions: These findings support the use of combination treatment in adolescents with depression over monotherapy.

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- [Faber A *et al* \(2008\) Long-acting methylphenidate-OROS in youths with attention-deficit hyperactivity disorder suboptimally controlled with immediate-release methylphenidate: a study of cost effectiveness in The Netherlands. *CNS Drugs* 22\(2\): 157–170.](#)

Background: Attention-deficit hyperactivity disorder (ADHD) is the most common mental health disorder in youths. Stimulants are the drugs of first choice in the treatment of ADHD. It has been suggested that full costs associated with the treatment of ADHD may be reduced by once-daily administration regimens of stimulants.

Objectives: To estimate the cost effectiveness of treatment with long-acting methylphenidate osmotic release oral system (OROS) [Concerta] for youths with ADHD for whom treatment with immediate-release (IR) methylphenidate is suboptimal.

Study design: We developed a Markov model to obtain an incremental cost-effectiveness ratio (ICER). The analysis covered 10 years, with a Markov cycle of one day. Costs (in 2005 Euros) included medication, consultations and treatment interventions, and additional costs for attending special education. Quality-adjusted life-years (QALYs) were used as the effectiveness measure. Outcome probabilities were taken from the medical literature and an expert panel of five child psychiatrists and paediatricians. Univariate sensitivity analyses were performed to assess the robustness of the base-case estimate. Multivariate sensitivity analysis was used to estimate a worst- and best-case ICER.

Results: The ICER of methylphenidate-OROS treatment in youths with ADHD for whom treatment with IR methylphenidate is suboptimal was €2,004 per QALY. Total costs after 10 years were €15,739 for the IR methylphenidate pathway and €16,015 for the methylphenidate-OROS pathway. In the univariate sensitivity analysis, the ICER was sensitive to changes in resource use and the probability of stopping stimulant treatment in favour of IR methylphenidate. An ICER of 0 was reached with a 6.2% price reduction of methylphenidate-OROS.

Conclusion: Methylphenidate-OROS is a cost-effective treatment for youths with ADHD for whom treatment with IR methylphenidate is suboptimal. Higher medication costs of methylphenidate-OROS were compensated for by savings on resource use, yielding similar 10-year costs compared with treatment with IR methylphenidate. Our analysis is

sensitive to both clinical parameters and (differences in) resource utilization and costs between the groups modelled, warranting further research within clinical trials and observational databases, and into the full scope of costs.

- [Gowers SG *et al* \(2010\) A randomised controlled multicentre trial of treatments for adolescent anorexia nervosa including assessment of cost-effectiveness and patient acceptability – the TOutCAN trial. Health Technology Assessment \(Winchester, England\) 1–98.](#)

Objective: To evaluate the clinical effectiveness and cost-effectiveness of inpatient compared with outpatient treatment and general (routine) treatment in Child and Adolescent Mental Health Services (CAMHS) against specialist treatment for young people with anorexia nervosa. In addition, to determine young people's and their carers' satisfaction with these treatments.

Design: A population-based, pragmatic randomised controlled trial (RCT) was carried out on young people age 12 to 18 presenting to community CAMHS with anorexia nervosa.

Setting: Thirty-five English CAMHS in the north-west of England coordinated through specialist centres in Manchester and Liverpool. Two hundred and fifteen young people (199 female) were identified, of whom 167 (mean age 14 years 11 months) were randomised and 48 were followed up as a preference group.

Interventions: Randomised patients were allocated to either inpatient treatment in one of four units with considerable experience in the treatment of anorexia nervosa, a specialist outpatient programme delivered in one of two centres, or treatment as usual in general community CAMHS. The outpatient programmes spanned six months of treatment. The length of inpatient treatment was determined on a case-by-case basis on clinical need with outpatient follow-up to a minimum of six months.

Main outcome measures: Follow-up assessments were carried out at 1, 2 and 5 years. The primary outcome measure was the Morgan-Russell Average Outcome Scale (MRAOS) and associated categorical outcomes. Secondary outcome measures included physical measures of weight, height, body mass index (BMI) and % weight for height. Research ratings included the Health of the National Outcome Scale for Children and Adolescents (HoNOSCA). Self report measures comprised the user version of HoNOSCA (HoNOSCA-SR), the Eating Disorder Inventory 2 (EDI-2), the Family Assessment Device (FAD) and the recent Mood and Feelings Questionnaire (MFQ). Information on resource use was collected in interview at 1, 2 and 5 years using the Child and Adolescent Service Use Schedule (CA-SUS). Satisfaction was measured quantitatively using a questionnaire designed for the study and qualitative (free) responses on it. The questionnaire data were supplemented by qualitative analysis of user and carer focus groups.

Results: Of the 167 patients randomised, 65% adhered to the allocated treatment. Adherence was lower for inpatient treatment (49%) than for general CAMHS (71%) or specialist outpatient treatment (77%) ($p = 0.013$). Every subject was traced at both 1 and 2 years, with the main outcome measure completed (through contact with the subject, family members or clinicians), by 94% at 1 year, 93% at 2 years, but only 47% at 5 years. A validated outcome category was assigned for 98% at 1 year, 96% at 2 years and 60% at 5 years. There was significant improvement in all groups at each time point, with the number achieving a good outcome being 19% at 1 year, 33% at 2 years and 64% (of those followed up) at 5 years. Analysis demonstrated no difference in treatment effectiveness of randomisation to inpatient compared with outpatient treatment, or, specialist over generalist treatment at any time point, when baseline characteristics were taken into account. Generalist CAMHS treatment was slightly more expensive over the first two years of the study, largely because greater numbers were subsequently admitted to hospital after the initial treatment phase. The specialist outpatient programme was the dominant treatment in terms of incremental cost-effectiveness. Specialist treatments had a higher probability of being more cost-effective than generalist treatments and outpatient treatment had a higher probability of being more cost-effective than inpatient care. Parental satisfaction with treatment was generally good, though better with specialist than generalist treatment. Young people's satisfaction was much more mixed, but again better with specialist treatment, including inpatient care.

Conclusion: Poor adherence to randomisation (despite initial consent to it), limits the assessment of the treatment effect of inpatient care. However, this study provides little support for lengthy inpatient psychiatric treatment on clinical or health economic grounds. These findings are broadly consistent with existing guidelines on the treatment of anorexia nervosa, which suggest that outpatient treatments should be offered to the majority, with inpatient treatment offered in rare cases, though our findings lend little support to a stepped-care approach in which inpatient care is offered to outpatient non-responders. Outpatient care, supported by brief (medical) inpatient management for correction of acute complications may be a preferable approach. The health economic analysis and user views both support NICE guidelines, which suggest that anorexia nervosa should be managed in specialist services that have experience and expertise in its management. Comprehensive general CAMHS might, however, be well placed to manage milder cases. Further research should focus on the specific components of outpatient psychological therapies. Although family-based treatments are well established, trials have not established their effectiveness compared with good-quality individual psychological therapies and the combination of individual and family approaches is untested. Further research is needed to establish which patients (if any) might respond to inpatient psychiatric treatment when unresponsive to outpatient care, the positive and negative components of it and the optimum length of stay.

(Trial Registration: NRR number (National Research Register) N0484056615; Current Controlled Trials ISRCTN39345394).

■ Green JM *et al* (2011) Group therapy for adolescents with repeated self harm: randomised controlled trial with economic evaluation. *BMJ* (Clinical research ed.) d682

Objective: To examine the effectiveness and cost-effectiveness of group therapy for self harm in young people.

Design: Two arm, single (assessor) blinded parallel randomised allocation trial of a group therapy intervention in addition to routine care, compared with routine care alone. Randomisation was by minimisation controlling for baseline frequency of self harm, presence of conduct disorder, depressive disorder, and severity of psychosocial stress.

Participants: Adolescents aged 12–17 years with at least two past episodes of self harm within the previous 12 months. Exclusion criteria were: not speaking English, low weight anorexia nervosa, acute psychosis, substantial learning difficulties (defined by need for specialist school), current containment in secure care.

Setting: Eight child and adolescent mental health services in the northwest UK.

Interventions: Manual-based developmental group therapy programme specifically designed for adolescents who harm themselves, with an acute phase over six weekly sessions followed by a booster phase of weekly groups as long as needed. Details of routine care were gathered from participating centres.

Main outcome measures: Primary outcome was frequency of subsequent repeated episodes of self harm. Secondary outcomes were severity of subsequent self harm, mood disorder, suicidal ideation, and global functioning. Total costs of health, social care, education, and criminal justice sector services, plus family related costs and productivity losses, were recorded.

Results: 183 adolescents were allocated to each arm (total n=366). Loss to follow-up was low (<4%). On all outcomes the trial cohort as a whole showed significant improvement from baseline to follow-up. On the primary outcome of frequency of self harm, proportional odds ratio of group therapy versus routine care adjusting for relevant baseline variables was 0.99 (95% confidence interval 0.68 to 1.44, P = 0.95) at 6 months and 0.88 (0.59 to 1.33, P = 0.52) at 1 year. For severity of subsequent self harm the equivalent odds ratios were 0.81 (0.54 to 1.20, P = 0.29) at 6 months and 0.94 (0.63 to 1.40, P = 0.75) at 1 year. Total 1 year costs were higher in the group therapy arm (£21,781) than for routine care (£15,372) but the difference was not significant (95% CI -1,416 to 10,782, P = 0.132).

Conclusions: The addition of this targeted group therapy programme did not improve self harm outcomes for adolescents who repeatedly self harmed, nor was there evidence of cost effectiveness. The outcomes to end point for the cohort as a whole were better than current clinical expectations.

(Trial registration ISRCTN 20496110).

■ [Kuo E et al \(2009\) Cost-effectiveness of a school-based emotional health screening program. *J Sch Health* 79\(6\): 277–285.](#)

Background: School-based screening for health conditions can help extend the reach of health services to underserved populations. Screening for mental health conditions is growing in acceptability, but evidence of cost-effectiveness is lacking. This study assessed costs and effectiveness associated with the Developmental Pathways Screening Program, in which students undergo universal classroom emotional health screening and those who have positive screens are provided with on-site clinical evaluation and referral.

Methods: Costs are enumerated for screening and clinical evaluation in terms of labor and overhead and summarized as cost per enrolled student, per positive screen, and per referral. Cost-effectiveness is summarized as cost per student successfully linked to services. School demographics are used to generate a predictive formula for estimating the proportion of students likely to screen positive in a particular school, which can be used to estimate programme cost.

Results: Screening costs ranged from \$8.88 to \$13.64 per enrolled student, depending on the prevalence of positive screens in a school. Of students referred for services, 72% were linked to supportive services within six weeks. Cost-effectiveness was estimated to be \$416.90 per successful linkage when 5% screened positive and \$106.09 when 20% screened positive. A formula to estimate the proportion of students screening positive proved accurate to within 5%.

Conclusion: Information concerning costs and effectiveness of school-based emotional health screening programmes can guide school districts in making decisions concerning resource allocation.

■ [Latimer EA et al \(2014\) Cost-effectiveness of a rapid response team intervention for suicidal youth presenting at an emergency department. *Canadian Journal of Psychiatry* 59\(6\): 310–318.](#)

Objective: To investigate the cost-effectiveness of a rapid response team (RRT), compared with usual care (UC), for treating suicidal adolescents.

Methods: Suicidal adolescents (n=286) presenting at an emergency department were enrolled in a trial to compare UC with enhanced outpatient care provided by an RRT of health professionals. Functioning (Child Global Assessment Scale) and suicidality (Spectrum of Suicidal Behavior Scale) scores were measured at baseline and six months later. Resource use and cost data were collected from several sources during the same period.

Results: As previously reported, there was no statistically or clinically significant difference in either functioning or suicidality between the groups. Costs of the RRT

were lower by \$1,886, thus -\$1,886 (95% CI -\$4,238 to \$466), from the perspective of the treating hospital, and by \$991, thus -\$991 (95% CI -\$5,580 to \$3,598), from the perspective of society. If decision makers are not willing to pay for any improvement in functioning or suicidality, the RRT has a 95% probability of being cost-effective from the perspective of the treating hospital. From the point of view of society, the probability of the intervention being cost-effective is about 70% for functioning and 63% for suicidality. The difference between the two perspectives is mainly attributable to the cost of hospitalizations outside the treating hospital.

Conclusions: An RRT intervention appears to be cost-effective, compared with UC, from the point of view of the treating hospital, but there is no difference from the point of view of society.

■ [Lock J *et al* \(2008\) Costs of remission and recovery using family therapy for adolescent anorexia nervosa: a descriptive report. *Eat Disord* 16\(4\): 322–330.](#)

This paper reports on the costs of overall treatment for a cohort of adolescent patients with anorexia nervosa treated with a similar regimen consisting of inpatient medical stabilization, outpatient family therapy, and psychiatric medications for co-morbid psychiatric conditions.

Most of the costs associated with outcome were secondary to medical hospitalization. However, the overall costs per remission varied widely depending on the threshold used. However, compared to costs described for adults with anorexia nervosa, adolescent treatment costs appear to be lower when families are used effectively to aid in treatment.

■ [Lynch FL *et al* \(2011\) Incremental cost-effectiveness of combined therapy vs medication only for youth with selective serotonin reuptake inhibitor-resistant depression: treatment of SSRI-resistant depression in adolescents trial findings. *Archives of General Psychiatry* 68\(3\): 253–262.](#)

Context: Many youth with depression do not respond to initial treatment with selective serotonin reuptake inhibitors (SSRIs), and this is associated with higher costs. More effective treatment for these youth may be cost-effective.

Objective: To evaluate the incremental cost-effectiveness over 24 weeks of combined cognitive behavior therapy plus switch to a different antidepressant medication vs medication switch only in adolescents who continued to have depression despite adequate initial treatment with an SSRI.

Design: Randomized controlled trial.

Setting: Six US academic and community clinics. Patients: Three hundred thirty-four patients aged 12 to 18 years with SSRI-resistant depression. Intervention: Participants

were randomly assigned to (1) switch to a different medication only or (2) switch to a different medication plus cognitive behavior therapy.

Main outcome measures: Clinical outcomes were depression-free days (DFDs), depression-improvement days (DIDs), and quality-adjusted life-years based on DFDs (DFD-QALYs). Costs of intervention, non-protocol services, and families were included.

Results: Combined treatment achieved 8.3 additional DFDs ($P = .03$), 0.020 more DFD-QALYs ($P = .03$), and 11.0 more DIDs ($P = .04$). Combined therapy cost \$1,633 more ($P = .01$). Cost per DFD was \$188 (incremental cost-effectiveness ratio [ICER] = \$188; 95% confidence interval [CI], -\$22 to \$1,613), \$142 per DID (ICER = \$142; 95% CI, -\$14 to \$2,529), and \$78,948 per DFD-QALY (ICER = \$78,948; 95% CI, -\$9,261 to \$677,448). Cost-effectiveness acceptability curve analyses suggest a 61% probability that combined treatment is more cost-effective at a willingness to pay \$100,000 per QALY. Combined treatment had a higher net benefit for subgroups of youth without a history of abuse, with lower levels of hopelessness, and with comorbid conditions.

Conclusions: For youth with SSRI-resistant depression, combined treatment decreases the number of days with depression and is more costly. Depending on a decision maker's willingness to pay, combined therapy may be cost-effective, particularly for some subgroups.

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■ [Lynch FL *et al* \(2005\) Cost-effectiveness of an intervention to prevent depression in at-risk teens. *Archives of General Psychiatry* 62\(11\): 1241–1248.](#)

Contact: Depression is common in adolescent offspring of depressed parents and can be prevented, but adoption of prevention programmes is dependent on the balance of their incremental costs and benefits.

Objective: To examine the incremental cost-effectiveness of a group cognitive behavioral intervention to prevent depression in adolescent offspring of depressed parents.

Design: Cost-effectiveness analysis of a recent randomized controlled trial.

Setting: Kaiser Permanente Northwest, a large health maintenance organization.

Participants: Teens 13 to 18 years old at risk for depression.

Interventions: Usual care ($n=49$) or usual care plus a 15-session group cognitive therapy prevention programme ($n=45$).

Main outcome measures: Clinical outcomes were converted to depression-free days and quality-adjusted life-years. Total health maintenance organization costs, costs of services received in other sectors, and family costs were combined with clinical

outcomes in a cost-effectiveness analysis comparing the intervention with usual care for one year after the intervention.

Results: Average cost of the intervention was \$1,632, and total direct and indirect costs increased by \$610 in the intervention group. However, the result was not statistically significant, suggesting a possible cost offset. Estimated incremental cost per depression-free day in the base-case analysis was \$10 (95% confidence interval, -\$13 to \$52) or \$9,275 per quality-adjusted life-year (95% confidence interval, -\$12,148 to \$45,641).

Conclusions: Societal cost-effectiveness of a brief prevention programme to reduce the risk of depression in offspring of depressed parents is comparable to that of accepted depression treatments, and the programme is cost-effective compared with other health interventions commonly covered in insurance contracts.

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■ [McCrone P *et al* \(2013\) The economic impact of early intervention in psychosis services for children and adolescents. *Early Intervention in Psychiatry* 7\(4\): 368–373.](#)

Aims: To develop and populate a plausible model of the impact of early intervention (EI) for children and adolescents with psychosis to estimate potential short-term health-related cost savings compared to generic Child and Adolescent Mental Health Services (CAMHS).

Method: A decision-tree-based model for EI in CAMHS was developed. The model was populated using data relating to the use of inpatient care and EI service activity for people aged under 18 from an area of North East England. Data were abstracted from the National Health Service clinical reporting systems for 2001–2008. Sensitivity analyses were performed to examine costs associated with the model under differing assumptions.

Results: EI delivered cost savings of £4,814 per patient compared to care provided by generic CAMHS. Cost savings were predominantly a consequence of reduced length of hospital admissions for patients served by the EI team. The findings were robust to sensitivity analyses.

Conclusions: These findings suggest that EI services for children and adolescents with psychosis provide potential direct health cost savings comparable to those observed for working-age adults.

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■ [Mihalopoulos C *et al* \(2012\) The population cost-effectiveness of interventions designed to prevent childhood depression. *Pediatrics* 129\(3\): e723–730.](#)

Background and objectives: Depression in childhood and adolescence is common and often persists into adulthood. This study assessed the population-level cost-effectiveness of a preventive intervention that screens children and adolescents for symptoms of depression in schools and the subsequent provision of a psychological intervention to those showing elevated signs of depression. The target population for screening comprised 11- to 17-year-old children and adolescents in the 2003 Australian population.

Methods: Economic modelling techniques were used to assess the incremental cost-effectiveness of the intervention compared with no intervention. The perspective was that of the health sector, and outcomes were measured by using disability-adjusted life-years (DALYs). Multivariate probabilistic and univariate sensitivity testing was applied to quantify variations in the model parameters.

Results: The modelled psychological intervention had an incremental cost-effectiveness ratio of \$5,400 per DALY averted, with just 2% of iterations falling above a \$50,000 per DALY value-for-money threshold. Results were robust to model assumptions.

Conclusions: After school screening, screening and the psychological intervention represent good value-for-money. Such an intervention needs to be seriously considered in any national package of preventive health services. Acceptability issues, particularly to intervention providers, including schools and mental health professionals, need to be considered before wide-scale adoption.

■ [Nyden A *et al* \(2008\) Long-term psychosocial and health economy consequences of ADHD, autism, and reading-writing disorder: a prospective service evaluation project. *J Atten Disord* 12\(2\): 141–148.](#)

Objective: The study aims to evaluate psychosocial, societal, and family cost consequences of a psychoeducational intervention programme.

Methods: Sixty boys with ADHD, Asperger syndrome/high-functioning autism (AS/HFA), and reading and writing disorder (RD/WD) were allocated to participate in a service evaluation project. Every other boy in each diagnostic group was randomly allocated to receive either (a) a special education programme (clinical index group) or (b) follow-up without the special education programme (clinical comparison group). Nine years after initial assessments the stability of the psychosocial and economic resource consequences over time was studied.

Results: ADHD, AS/HFA, and RD/WD all had severe impact on family life quality. The societal costs were high, but no significant differences in resource use or in total costs were found between the clinical index and the comparison groups.

Conclusions: The results underscore the very long-term need for support including individually tailored reevaluations and carefully monitored intervention programmes adapted to family needs and severity of child disorder.

■ Philipsson A *et al* (2013) Cost-utility analysis of a dance intervention for adolescent girls with internalizing problems. *Cost Effectiveness and Resource Allocation* 11: 4.

Background: The increasing prevalence of psychological health problems among adolescent girls is alarming. Knowledge of beneficial effects of physical activity on psychological health is widespread. Dance is a popular form of exercise that could be a protective factor in preventing and treating symptoms of depression. The aim of this study was to assess the cost-effectiveness of a dance intervention in addition to usual school health services for adolescent girls with internalizing problems, compared with usual school health services alone.

Methods: A cost-utility analysis from a societal perspective based on a randomized controlled intervention trial was performed. The setting was a city in central Sweden with a population of 130000. A total of 112 adolescent girls, 13–18 years old, with internalizing problems participated in the study. They were randomly assigned to intervention (n=59) or control (n=53) group. The intervention comprised dance twice weekly during eight months in addition to usual school health services. Costs for the stakeholder of the intervention, treatment effect and healthcare costs were considered. Gained quality-adjusted life-years (QALYs) were used to measure the effects. Quality of life was measured with the Health Utility Index Mark 3. Cost-effectiveness ratios were based on the changes in QALYs and net costs for the intervention group compared with the control group. Likelihood of cost-effectiveness was calculated.

Results: At 20 months, quality of life had increased by 0.08 units more in the intervention group than in the control group ($P = .04$), translating to 0.10 gained QALYs. The incremental cost-effectiveness ratio was USD \$3,830 per QALY and the likelihood of cost-effectiveness was 95%.

Conclusions: Intervention with dance twice weekly in addition to usual school health services may be considered cost-effective compared with usual school health services alone, for adolescent girls with internalizing problems.

(Trial registration: Name of the trial registry: Influencing Adolescent Girls' With Creative Dance Twice Weekly. Trial registration number: NCT01523561. 2013 Philipsson *et al*; licensee BioMed Central Ltd).

- Phillips LJ *et al* (2009) Cost implications of specific and non-specific treatment for young persons at ultra high risk of developing a first episode of psychosis. *Early Interv Psychiatry* 3(1): 28–34.

Aim: Costs associated with mental health treatment for young persons at ‘ultra’ high risk (UHR) of developing a psychotic disorder have not previously been reported. This paper reports cost implications of providing psychological and pharmacological intervention for individuals at UHR for psychosis compared with minimal psychological treatment.

Method: Mental health service costs associated with a randomized controlled trial of two treatments (Specific Preventive Intervention: SPI and Needs-Based Intervention: NBI) for UHR young persons were estimated and compared at three time points: treatment phase, short-term follow up and medium-term follow up.

Results: Although the SPI group incurred significantly higher treatment costs than the NBI group over the treatment phase, they incurred significantly lower outpatient treatment costs over the longer term.

Conclusion: This study indicates that specific interventions designed to treat young persons who are identified as being at UHR of psychosis might be associated with some cost savings compared with non-specific interventions.

- Ruby A *et al* (2013) Economic analysis of an internet-based depression prevention intervention. *Journal of Mental Health Policy and Economics* 16(3): 121–130.

Background: The transition through adolescence places adolescents at increased risk of depression, yet care-seeking in this population is low, and treatment is often ineffective. In response, we developed an Internet-based depression prevention intervention (CATCH-IT) targeting at-risk adolescents.

Aims: We explored CATCH-IT programme costs, especially safety costs, in the context of an Accountable Care Organization as well as the perceived value of the Internet programme.

Methods: Total and per-patient costs of development were calculated using an assumed cohort of a 5,000-patient Accountable Care Organization. Total and per-patient costs of implementation were calculated from grant data and the Medicare Resource-Based Relative Value Scale (RBRVS) and were compared to the willingness-to-pay for CATCH-IT and to the cost of current treatment options. The cost effectiveness of the safety protocol was assessed using the number of safety calls placed and the percentage of patients receiving at least one safety call. The willingness-to-pay for CATCH-IT, a measure of its perceived value, was assessed using post-study questionnaires and was compared to the development cost for a break-even point.

Results: We found the total cost of developing the intervention to be \$138,683.03. Of the total, 54% was devoted to content development with per patient cost of \$27.74. The total cost of implementation was found to be \$49,592.25, with per patient cost of \$597.50. Safety costs accounted for 35% of the total cost of implementation. For comparison, the cost of a 15-session group cognitive behavioral therapy (CBT) intervention aimed at at-risk adolescents was \$1,632 per patient. Safety calls were successfully placed to 96.4% of the study participants. The cost per call was \$40.51 with a cost per participant of \$197.99. The willingness-to-pay for the Internet portion of CATCH-IT had a median of \$40. The break-even point to offset the cost of development was 3,468 individuals.

Discussion and limitations: Developing Internet-based interventions like CATCH-IT appears economically viable in the context of an Accountable Care Organization. Furthermore, while the cost of implementing an effective safety protocol is proportionally high for this intervention, CATCH-IT is still significantly cheaper to implement than current treatment options. Limitations of this research included diminished participation in follow-up surveys assessing willingness-to-pay.

Implications for health care provision and use and health policies: This research emphasizes that preventive interventions have the potential to be cheaper to implement than treatment protocols, even before taking into account lost productivity due to illness. Research such as this business application analysis of the CATCH-IT programme highlights the importance of supporting preventive medical interventions as the healthcare system already does for treatment interventions.

Implications for Further Research: This research is the first to analyze the economic costs of an Internet-based intervention. Further research into the costs and outcomes of such interventions is certainly warranted before they are widely adopted. Furthermore, more research regarding the safety of Internet-based programmes will likely need to be conducted before they are broadly accepted.

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■ [Rund BR *et al* \(1994\) The Psychosis Project: outcome and cost-effectiveness of a psychoeducational treatment programme for schizophrenic adolescents. *Acta psychiatrica Scandinavica* 89\(3\): 211–218.](#)

Examined which of two treatment programmes was more efficient in the rehabilitation of early-onset schizophrenics: a psychoeducational approach or standard reference treatment, including individual therapy, milieu therapy, and neuroleptic medication. 24 patients evenly divided into a schizophrenic and a control group were evaluated. Clinical outcome was assessed by relapses during the two-year period and changes in psychosocial functioning as measured by the Global Assessment Scale (RL Spitzer and J Endicott, 1978).

Results showed that the more effective programme measured by relapse was also the cheaper, the psychoeducational programme. Those with poor pre-morbid psychosocial functioning benefit most from this treatment. The cooperativeness of their parents and their ability to change their emotional attitudes toward them are crucial to treatment effectiveness.

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- Schmidt U *et al* (2007) A randomized controlled trial of family therapy and cognitive behavior therapy guided self-care for adolescents with bulimia nervosa and related disorders. *Am J Psychiatry* 164(4): 591–598.

Objective: To date no trial has focused on the treatment of adolescents with bulimia nervosa. The aim of this study was to compare the efficacy and cost-effectiveness of family therapy and cognitive behavior therapy (CBT) guided self-care in adolescents with bulimia nervosa or eating disorder not otherwise specified.

Method: Eighty-five adolescents with bulimia nervosa or eating disorder not otherwise specified were recruited from eating disorder services in the United Kingdom. Participants were randomly assigned to family therapy for bulimia nervosa or individual CBT guided self-care supported by a health professional. The primary outcome measures were abstinence from binge-eating and vomiting, as assessed by interview at end of treatment (6 months) and again at 12 months. Secondary outcome measures included other bulimic symptoms and cost of care.

Results: Of the 85 study participants, 41 were assigned to family therapy and 44 to CBT guided self-care. At six months, bingeing had undergone a significantly greater reduction in the guided self-care group than in the family therapy group; however, this difference disappeared at 12 months. There were no other differences between groups in behavioral or attitudinal eating disorder symptoms. The direct cost of treatment was lower for guided self-care than for family therapy. The two treatments did not differ in other cost categories.

Conclusions: Compared with family therapy, CBT guided self-care has the slight advantage of offering a more rapid reduction of bingeing, lower cost and greater acceptability for adolescents with bulimia or eating disorder not otherwise specified.

- Sheidow AJ *et al* (2004) Treatment costs for youths receiving multisystemic therapy or hospitalization after a psychiatric crisis. *Psychiatr Serv* 55(5): 548–554.

Objective: The authors conducted a cost analysis for multisystemic therapy, an evidence-based treatment that is used as an intensive community-based alternative to the hospitalization of youths presenting with psychiatric emergencies.

Methods: Data from a randomized clinical trial that compared multisystemic therapy with usual inpatient services followed by community aftercare were used to compare Medicaid costs and clinical outcomes during a four-month period post-referral and a 12-month follow-up period. Data were from 115 families receiving Medicaid (out of 156 families in the clinical trial).

Results: During the four months post-referral, multisystemic therapy was associated with an average net savings per youth treated of \$1,617 compared with usual services. Costs during the 12-month follow-up period were similar between treatments. Multisystemic therapy demonstrated better short-term cost-effectiveness for each of the clinical outcomes (externalizing behavior, internalizing behavior, and global severity of symptoms) than did usual inpatient care and community aftercare. The two treatments demonstrated equivalent long-term cost-effectiveness.

Conclusions: Among youths presenting with psychiatric emergencies, multisystemic therapy was associated with better outcomes at a lower cost during the initial post-referral period and with equivalent costs and outcomes during the 12-month follow-up period.

■ [Stallard P *et al* \(2013\) A cluster randomised controlled trial to determine the clinical effectiveness and cost-effectiveness of classroom-based cognitive-behavioural therapy \(CBT\) in reducing symptoms of depression in high-risk adolescents. *Health Technology Assessment* 17 \(47\): i-xvii+1–109.](#)

Background: Depression in adolescents is a significant problem that impairs everyday functioning and increases the risk of severe mental health disorders in adulthood. Although this is a major problem, relatively few adolescents with, or at risk of developing, depression are identified and referred for treatment. This suggests the need to investigate alternative approaches whereby preventative interventions are made widely available in schools.

Objective: To investigate the clinical effectiveness and cost-effectiveness of classroom-based cognitive-behavioural therapy (CBT) in reducing symptoms of depression in high-risk adolescents.

Design: Cluster randomised controlled trial. Year groups (n=28) randomly allocated on a 1:1:1 basis to one of three trial arms once all schools were recruited and balanced for number of classes, number of students, Personal, Social and Health Education (PSHE) lesson frequency, and scheduling of PSHE.

Setting: Year groups 8 to 11 (ages 12–16 years) in mixed-sex secondary schools in the UK. Data were collected between 2009 and 2011. **Participants:** Young people who attended PSHE at participating schools were eligible (n=5,503). Of the 5,030 who agreed to participate, 1,064 (21.2%) were classified as 'high risk': 392 in the classroom-based CBT arm, 374 in the attention control PSHE arm and 298 in the

usual PSHE arm. Primary outcome data on the high-risk group at 12 months were available for classroom-based CBT (n=296), attention control PSHE (n=308) and usual PSHE (n=242).

Interventions: The Resourceful Adolescent Programme (RAP) is a focused CBT-based intervention adapted for the UK (RAP-UK) and delivered by two facilitators external to the school. Control groups were usual PSHE (usual school curriculum delivered by teachers) and attention control (usual school PSHE with additional support from two facilitators). Interventions were delivered universally to whole classes.

Primary outcomes: Clinical effectiveness: symptoms of depression [Short Mood and Feelings Questionnaire (SMFQ)] in adolescents at high risk of depression 12 months from baseline. Cost-effectiveness: incremental cost-effectiveness ratios (ICERs) based on SMFQ score and quality-adjusted life-years (from European Quality of Life-5 Dimensions scores) between baseline and 12 months.

Process evaluation: reach, attrition and qualitative feedback from service recipients and providers.

Results: SMFQ scores had decreased for high-risk adolescents in all trial arms at 12 months, but there was no difference between arms [classroom-based CBT vs. usual PSHE adjusted difference in means 0.97, 95% confidence interval (CI) -0.34 to 2.28; classroom-based CBT vs. attention control PSHE -0.63, 95% CI -1.99 to 0.73]. Costs of interventions per child were estimated at 41.96 for classroom-based CBT and 34.45 for attention control PSHE. Fieller's method was used to obtain a parametric estimate of the 95% CI for the ICERs and construct the cost-effectiveness acceptability curve, confirming that classroom-based CBT was not cost-effective relative to the controls. Reach of classroom-based CBT was good and attrition was low (median 80% attending >60% of sessions), but feedback indicated some difficulties with acceptability and sustainability.

Conclusions: Classroom-based CBT, attention control PSHE and usual PSHE produced similar outcomes. Classroom-based CBT may result in increased self-awareness and reporting of depressive symptoms. Classroom-based CBT was not shown to be cost-effective. While schools are a convenient way of reaching a wide range of young people, implementing classroom-based CBT within schools is challenging, particularly with regard to fitting programmes into a busy timetable, the lack of value placed on PSHE, and difficulties engaging with teachers and young people. Wider use of classroom-based depression prevention programmes should not be undertaken without further research. If universal preventative approaches are to be pursued, their clinical effectiveness and cost-effectiveness with younger children (aged 10–11 years), before the incidence of depression increases, should be investigated. Alternatively, the clinical effectiveness of indicated school-based programmes targeting those already displaying symptoms of depression should be investigated.

■ Valmaggia LR *et al* (2009) Economic impact of early intervention in people at high risk of psychosis. *Psychol Med* 39(10): 1617–1626.

Background: Despite the increasing development of early intervention services for psychosis, little is known about their cost-effectiveness. We assessed the cost-effectiveness of Outreach and Support in South London (OASIS), a service for people with an at-risk mental state (ARMS) for psychosis.

Method: The costs of OASIS compared to care as usual (CAU) were entered in a decision model and examined for 12- and 24-month periods, using the duration of untreated psychosis (DUP) and rate of transition to psychosis as key parameters. The costs were calculated on the basis of services used following referral and the impact on employment. Sensitivity analysis was used to test the robustness of all the assumptions made in the model.

Results: Over the initial 12 months from presentation, the costs of the OASIS intervention were £1,872 higher than CAU. However, after 24 months they were £961 less than CAU.

Conclusions: This model suggests that services that permit early detection of people at high risk of psychosis may be cost saving.

■ Van Steensel FJA *et al* (2014) Cost-effectiveness of cognitive-behavioral therapy versus treatment as usual for anxiety disorders in children with autism spectrum disorder. *Research in Autism Spectrum Disorders* 8(2): 127–137.

The study's aim was to evaluate the cost-effectiveness of CBT compared to treatment as usual (TAU). In total, 49 children aged 8–18 years with ASD and comorbid anxiety disorders, and their parents, participated; 24 were assigned to CBT and 25 were assigned to TAU. Outcome measures were the percentage of children free from their primary anxiety disorder and quality adjusted life years (QALYs). Costs were measured using a retrospective cost-questionnaire. Effects and costs were assessed at pre-, post-, and three months after treatment.

Effects and costs were not statistically different between CBT and TAU, however the incremental cost-effectiveness ratio (ICER) demonstrated that CBT dominates TAU. Bootstrapped ICERs demonstrated that CBT has a high probability to be more effective than TAU, however, the probability that either CBT or TAU is more costly did not differ much. Secondary analyses demonstrated fairly robust results. CBT seems a cost-effective intervention compared to TAU, however, long-term follow-ups and comparisons between CBT and specific TAUs are necessary. Cost-effectiveness analyses may help inform policy makers to decide how to treat anxiety disorders in children with ASD.

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- Wang LY *et al* (2011) The economic effect of planet health on preventing bulimia nervosa. *Archives of Pediatrics and Adolescent Medicine* 165 (8): 756–762.

Objectives: To assess the economic effect of the school-based obesity prevention programme Planet Health on preventing disordered weight control behaviours and to determine the cost-effectiveness of the intervention in terms of its combined effect on prevention of obesity and disordered weight control behaviours.

Design: On the basis of the intervention's short-term effect on disordered weight control behaviours prevention, we projected the number of girls who were prevented from developing bulimia nervosa by age 17 years. We further estimated medical costs saved and quality-adjusted life years gained by the intervention over 10 years. As a final step, we compared the intervention costs with the combined intervention benefits from both obesity prevention (reported previously) and prevention of disordered weight control behaviours to determine the overall cost-effectiveness of the intervention.

Setting: Middle schools. **Participants:** A sample of 254 intervention girls aged 10 to 14 years. **Intervention:** The Planet Health programme was implemented during the school years from 1995 to 1997 and was designed to promote healthful nutrition and physical activity among youth.

Main outcome measures: Intervention costs, medical costs saved, quality-adjusted life years gained, and cost-effectiveness ratio.

Results: An estimated 1 case of bulimia nervosa would have been prevented. As a result, an estimated \$33,999 in medical costs and 0.7 quality-adjusted life years would be saved. At an intervention cost of \$46,803, the combined prevention of obesity and disordered weight control behaviours would yield a net savings of \$14,238 and a gain of 4.8 quality-adjusted life years.

Conclusions: Primary prevention programmes, such as Planet Health, warrant careful consideration by policy makers and programme planners. The findings of this study provide additional argument for integrated prevention of obesity and eating disorders.

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- Wong KK *et al* (2011). Cost-effectiveness of an early assessment service for young people with early psychosis in Hong Kong. *Australian and New Zealand Journal of Psychiatry* 45(8): 673–680.

Objective: The Early Assessment Service for Young People with Early Psychosis (EASY) was developed in Hong Kong in 2001 to provide a comprehensive and integrated approach for early detection and intervention for young people suffering from first episode psychosis. The present study examined the cost-effectiveness of the service over a period of 24 months compared to standard care.

Method: This is a historical control study. Sixty-five patients who presented to the EASY service in 2001 with first episode psychosis were individually matched (on age, sex and diagnosis) with 65 patients who received standard psychiatric care in a precursor service (pre-EASY) between 1999 and 2000. A retrospective cost-effectiveness analysis was conducted over a period of 24 months. The overall average cost of service utilization per patient and the effects on hospitalization rate were compared using bootstrapping analysis. Cost per point improvement in Positive and Negative Syndrome Scale (PANSS) was also computed with sensitivity analysis. Only direct costs were analysed in the current study.

Results: There was no significant difference in service utilization between the EASY and pre-EASY standard care groups. The cost-effectiveness acceptability curve, which was used to explore uncertainty in estimates of cost and effects, suggested that there was a probability of at least 94% that the EASY model was more cost-effective than the pre-EASY service in reducing psychiatric inpatient admissions. EASY patients also showed superior results in average cost per unit improvement in PANSS.

Conclusions: EASY is likely to be more cost-effective in improving outcomes, particularly in reducing hospitalization and improving clinical symptoms among young people with first episode psychosis. This study provides a perspective from the east Asian region, and supports further development of similar services, particularly in the local setting. However, further studies with a longer follow up period and larger sample size are required to verify these findings.

(2011 The Royal Australian and New Zealand College of Psychiatrists).

■ [Wright DR *et al* \(2014\) The cost-effectiveness of school-based eating disorder screening. *American Journal of Public Health* 104\(9\): 1774–1782.](#)

We aimed to assess the value of school-based eating disorder (ED) screening for a hypothetical cohort of US public school students. We used a decision-analytic microsimulation model to model the effectiveness (life-years with ED and quality-adjusted life-years [QALYs]), total direct costs, and cost-effectiveness (cost per QALY gained) of screening relative to current practice.

The screening strategy cost \$2,260 (95% confidence interval [CI] = \$1,892, \$2,668) per student and resulted in a per capita gain of 0.25 fewer life-years with ED (95% CI = 0.21, 0.30) and 0.04 QALYs (95% CI = 0.03, 0.05) relative to current practice. The base case cost-effectiveness of the intervention was \$9,041 per life-year with ED avoided (95% CI = \$6,617, \$12,344) and \$56,500 per QALY gained (95% CI = \$38,805, \$71,250). At willingness-to-pay thresholds of \$50,000 and \$100,000 per QALY gained, school-based ED screening is 41% and 100% likely to be cost-effective, respectively. The cost-effectiveness of ED screening is comparable to many other accepted pediatric health interventions, including hypertension screening.

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