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Economic impact of childhood psychiatric disorder on public sector services in Britain: estimates from national survey data

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Running head: The economic impact of childhood psychiatric disorder on public sector services

Abstract

Background

Approximately one in ten children aged 5-15 in Britain has a conduct, hyperactivity or emotional disorder.

Methods

The British Child and Adolescent Mental Health Surveys (BCAMHS) were used to identify children aged 5-15 with a psychiatric disorder, and their use of health, education and social care services. The costs of these services were estimated for each child with a psychiatric disorder and grossing weights applied to estimate the economic impact at the national level.

Results

The estimated additional health, social care and education costs associated with child psychiatric disorders totalled £1.47bn in 2008. There are wide differences in the distribution of resources provided to children and young people, with the lion's share of the costs being associated with frontline education and special education resources.

Conclusions

These figures demonstrate the huge financial and societal costs relating to child psychiatric disorder, particularly for the education system. Early and effective

intervention in childhood might alter developmental trajectories in a way that could provide significant savings in adulthood as well as childhood.

> Comment [TRS1]: (Consider revising)

Keywords

Cost, economic impact, child, adolescent, mental health, psychiatric, hyperactivity, conduct, emotional, disorder, BCAMHS

Introduction

With many countries now facing economic challenges on a scale not seen for generations, governments have to take difficult decisions about the level and distribution of public expenditure. The UK government has embarked on a process of spending cuts and revenue generation that will inevitably mean reductions for some people in their access to and level of support from health, education, social care and other services. Therefore it is imperative to understand the economic consequences of addressing the needs of different population groups to provide a platform for discussing both short-term priorities and longer-term aspirations.

In this context of acute fiscal challenge, we looked at one particular and complex area of public responsibility: the care, support and treatment of psychiatric disorders in young people. Using service utilisation data from the British Child and Adolescent Mental Health Surveys (BCAMHS) (Meltzer, Gatwood, Goodman and Ford, 2000), we sought to estimate the costs – at individual level and also nationally – of health, social care and education service use by children and young people in relation to psychiatric disorder.

Methods

Data sources

The BCAMHS (Meltzer et al., 2000) used centralised records held by the Child Benefit Centre as a sampling frame to obtain a nationally representative sample of 5-15 year olds in Britain. It is the only national survey in this area conducted in Britain, and one of only a few internationally. All children were drawn from postal code sectors, covering 90% of all British children.

Figure 1 summarises the survey process. The main 'baseline' survey (time 1) was carried out in 1999 and was supplemented by two follow-up surveys conducted 20 months later (time 2) and three years later (time 3).

At time 2, parents of all 929 children identified as having a psychiatric disorder at baseline and a 1 in 3 sample of those without any disorder (3063 children) were invited to complete a postal questionnaire. Parents who indicated contact with frontline professionals or specialised services, those whose children had significant psychological difficulties but reported no service use, and a stratified sample of those who reported meetings with teachers but no other services were then invited to take part in a semi-structured telephone interview asking for more detail concerning contact with services, including frequency of use since the baseline survey was conducted.

The time 3 follow-up aimed to recruit all children who were sampled at time 2 regardless of whether postal questionnaires were returned. All parents who reported

any service contact were contacted for telephone interview at time 3, together with 63 parents of children who had a psychiatric disorder but reported no contact with services.

(Figures 1 about here)

The costs described in this paper build on analysis of parent-reported service use over the time 2 and 3 periods (amounting to three years) for a sample of 2461 children and young people covered by the initial baseline survey who were successfully followed up across all time points (Ford, Hamilton and Goodman, 2005).

Assessment of Psychiatric Disorder

The Development and Well-being Assessment, involving interviews with parents and children aged 11 or over with a shortened questionnaire to teachers where families consented, was used to assess presence of psychiatric disorder at baseline and time 3 (Ford et al., 2005). A small team of clinical raters used data from all available informants to assign diagnoses according to ICD-10 criteria.

Service use

Parents were asked to detail whether they had contacted services since baseline at time 2 and over a one-year retrospective period at time 3. The telephone interviews also asked for details regarding frequency and duration of contact. The semi-structured telephone interview was developed for these follow-up studies, and is at least moderately reliable with good validity when assessed against records from a tertiary referral clinic (Ford, Hamilton, Dosani, Burke and Goodman, 2007). It was based on questions about service contacts drawn from existing research tools (Ascher, Farmer, Burns and Angold, 2007; Beecham and Knapp, 2001; Stiffman et al., 2000).

Service use data were constructed by combining information on whether or not services had been used as reported in the time 2 postal questionnaire and time 3 survey interviews (Ford et al., 2005) with information on the volume of resource use reported in the telephone interviews, where available. Since data were not available for volume or frequency of contact with social workers and other social services professionals, it was assumed that one assessment was carried out per follow-up period. Receipt of respite care was estimated at two weeks where reported. All cost estimations are carried out in relation to total service contacts for the entire three-year follow-up period, based on data collected at each follow-up survey.

Parents were asked to indicate service contacts that were made specifically in response to concerns about a child's 'emotions, behaviour and concentration'. However, during the interviews it became clear that parents were also indicating professional contacts

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that were not strictly related to these kinds of difficulties. Therefore interview responses were graded on a 0-4 scale based on how closely related to emotional and behavioural problems each contact with services had been (0= no relevance, 4 = completely related): only contacts graded at 3 and 4 were included as an assumed response to emotional-behavioural difficulties. Service use and cost estimations therefore only reflect costs *directly* related to psychiatric disorder. For example, additional educational support related to dyslexia would not be counted as related to psychiatric disorder (coded 0), while seeing a school doctor for assessment of special educational needs in relation to an autism spectrum disorder would be classified as mostly related (code 3).

Unit costs

Unit costs were attached to service use frequencies, and included estimates of long-run social marginal opportunity costs attributable to the utilisation of resource inputs (Beecham and Knapp, 2001). Resource units were typically measured in terms of total minutes of contact with specific types of professionals (such as school nurses) or in terms of discreet units of contact with specific facilities (such as day hospital visits). All costs are estimated at 2007/2008 values.

Costs are 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 main source of health and social service unit cost data was the annual handbook published by the Personal Social Services Research Unit (Curtis, 2008). Where 2008 costs were not available, unit costs were estimated on the basis of earlier figures (Netten and Curtis, 2003; Curtis, 2007) by applying inflation indices (Curtis, 2008). The cost of social services assessment was derived and updated from a review of the Assessment Framework (Department of Health, 2003).

The unit costs associated with special schools provision for children and young people were inflated to 2008 levels from Education Cost Statistics for 2000-2001 published online by the Chartered Institute for Public Finance and Accountancy, providing costs of attendance at special schools. These estimates were adjusted upward for children with funded residential placements and downward for day placements based on the proportional difference in local authority residential and day care costs for elderly people (Netten and Curtis, 2003).

Teacher costs were derived from the mid-point of relevant salary scales published by the National Union of Teachers with an add-on for related costs and institutional overheads. The costs of special educational needs officers were derived from the senior teachers' salary scale. Contacts with teaching support staff (e.g. learning assistants) were costed using the mid-point salary on the unqualified teacher pay scale. Estimates of annual costs of conducting Special Educational Needs Tribunals (covering salaries, administration, accommodation and staff training) were derived from the Report of the Review of Tribunals (Lord Chancellor's Department, 2001).

The unit costs for a small number of health and education professionals for whom we could not find published estimates were approximated using estimates for similar services. London adjustments were made (Netten and Curtis, 2003).

Cost estimation

The estimation of mean costs for each service category introduces three statistical issues: estimation of statistical uncertainty surrounding the average estimates; adjustment of mean values to reflect survey design and selective follow-up; and missing data on reported service use and cost.

Statistical uncertainty surrounding estimated means was measured using standard errors, and 95% confidence intervals were generated via a non-parametric bootstrapping of the cost data. The right-skewed nature of costs within the sample - typical of resource use data - invalidates standard methods of inference and uncertainty measurement which assume normality (Thompson and Barber, 2000). The bootstrap involves repeated sampling with replacement from the cost data (1,000 replications in this instance) to generate a sampling distribution of mean costs upon which the bootstrapped standard errors are based. The non-parametric nature of this approach implies that no prior assumptions are made regarding the way the cost data are distributed across the population of interest.

Adjustments for sampling design were made by applying existing sampling weights developed by the main follow-up survey investigators and the Office of National Statistics (ONS) to the cost estimates to accurately weight according to the prevalence of different types of disorder at general population level (Ford et al., 2005). These

weights were multiplied by sampling weights developed by the ONS to adjust for regional over-sampling and to weight the main baseline survey back to the general population with respect to age and gender. Population weights and adjustments for sample clustering were also applied to the cost data to account for clustering effects within primary sampling units (PSUs). Taylor series linearization methods (Heeringa and Liu, 1998; Stata Corporation, 2003) were used to adjust estimated means and standard errors using the derived weights and adjustment factors.

Estimates of total costs at the individual level were based upon the sum of interactions with nearly 30 types of services or professionals at each time period. Not all records included complete data on the frequency or intensity for all services: complete data on frontline education resources were available for less than half the sample; between 19% and 24% of the sample were missing some data for other service categories. A multiple imputation method was used to replace missing individual cost values (Graham 2009; Schafer, 1997). Reflecting the stochastic nature of the imputed values, multiple imputation was used to derive five complete datasets on the basis of observed values. A separate variable for intensity was imputed as a conditional variable on the basis of an imputed dichotomous indicator for receipt to maximise the level of homogeneity between observed and imputed values. In order to minimise the amount of observed data discarded, missing values were imputed for individual services separately by follow-up period. This also allowed us to utilise the high level of correlation between

time 2 and time 3 service use indicators in the imputation process. Values generated were checked manually to ensure that no nonsensical values were generated.

Results

Table 1 provides summary statistics for each individual cost component over the entire three-year follow-up period, based solely on the observed (non-imputed) cost data.

(Table 1 about here)

Table 2 presents estimates of the mean cost per child for the three-year follow-up period for all children with a psychiatric disorder, alongside an annual equivalent. The estimates relate to *all* children and young people who were identified as having a disorder at baseline irrespective of whether their parents reported that they had used services. Aggregated service categories have been calculated using the multiple imputation techniques described to impute missing cost elements.

(Table 2 about here)

The findings illustrate stark differences in the distribution of resources provided to children and young people with psychiatric disorder and emphasise the large impact on the education sector. For example, for the three-year period the estimated mean cost of

support per child delivered by frontline education services across all children with a disorder is over 11 times the estimated mean for mental health service contacts. The bootstrapped confidence intervals are fairly wide, and reflect variance in costs as well as the relatively small sample size and level of missing data. Costs are generally higher for children with behavioural disorders (hyperkinetic and conduct) compared with children with emotional disorders (see Table 3 and Figure 2). The difference between disorders for each service setting are not significant, although the sample may be inadequately powered for detecting differences in mean costs by disorder type. The general pattern again points to a higher resource impact on education services. Primary care and paediatric/children's health services are the lowest cost service category in resource terms.

(Table 3 about here)

(Figure 2 about here)

National annual cost estimates for the population of children with any behavioural or emotional disorder aged 5-15 living in Great Britain were calculated by combining mean costs reported in Table 2 with current prevalence estimates in the British population. The latter are derived using prevalence data from the British Survey of Child and Adolescent Mental Health (Meltzer et al., 2000) and size of population estimates for the 5-15 age group using ONS mid-2008 population estimates. Results are summarised in

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Table 4. Overall, we estimate the health, education and social service costs of mental health problems for children aged 5-15 years amounted to at least £1.465 billion.

(Table 4 about here)

Discussion

Approximately one in ten children aged 5-15 in Britain has conduct disorder, hyperactivity or emotional disorders as defined by ICD-10 criteria (Meltzer et al., 2000). Responding to the needs of these children has inevitable economic implications. The higher costs associated with education service contacts indicated by our findings arose because of the high levels of utilisation relative to other services both in terms of prevalence and frequency of contacts (Ford et al., 2005). This may relate to easier access or more children with low levels of need within schools who would not reach current thresholds for intervention by specialist mental health services. In a sizeable proportion of cases the parent would not be aware that their child had a mental disorder. Many children with significant psychosocial problems were being taught within special schools, the most costly of the education resource items. By contrast, only three children in the sample were admitted to an inpatient psychiatric unit, one of the most expensive resources provided to patients with complex needs.

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This study did not provide data about the extent to which psychiatric disorder was recognised and the types of intervention delivered within these service contacts. Some children with repeated behaviour-related education and specialist educational input might have had an undetected psychiatric disorder. Therefore there might be scope to reduce the costs to the education sector by improving detection and appropriate intervention for childhood psychiatric disorder within schools.

Differences in costs across types of disorder were also apparent. The higher mean costs estimated for behavioural disorders may reflect the greater likelihood of contact being made with services among children and young people with either a behavioural and particularly a hyperkinetic disorder (Ford et al. 2003). It may also reflect genuine differences in resource requirements for dealing with different disorders once some level of service contact has been established (Evans-Lacko et al. 2011). Behavioural problems - because of their more externalising and potentially more disruptive nature - may be more likely to provoke a response from parents in terms of seeking professional help, as well as from teachers and other education professionals within the school environment. By contrast, internalising difficulties arising from anxiety and depression in childhood and adolescence may be more difficult to detect, or may also be interpreted by parents or teachers as in some sense 'normal' or not in need of treatment. Other studies have also demonstrated that depressive symptoms among children are associated with lower levels of health service use (Riley et al. 1993). Nevertheless, early-onset anxiety and depression may lead to significant costs in adult life in terms of adult

psychiatric disorder, substance misuse and the ensuing impact on productivity (Kim-Cohen et al 2003; Knapp et al 2011).

Strengths and limitations

Our estimates were built up from the first national epidemiological survey of child and adolescent mental health problems in Great Britain, using data collected from parents through face-to-face and telephone interviews. An early review of this field noted a dearth of economic evaluations in relation to childhood mental disorder (Knapp 1997). Since then, studies have begun to offer decision-makers insights into economic implications of different courses of action; however, almost all previous economic studies are based on local data collections, postal questionnaires or (incomplete) agency administrative records. Consequently, although we set out a number of limitations to our study in the paragraphs that follow, the data analysed in this paper provide considerable incremental methodological gains. The availability of valid and reliable national estimates of mental health-related service costs for children and young people allow us to better contextualise expenditures relative to other health conditions, and also between service sectors to make more informed policy recommendations. This study also benefitted from an unusually large, national, population-based sample.

Children and parents from more disadvantaged social backgrounds were under-represented in the follow-up sample (Ford et al. 2003): this type of selective drop-out

may bias downwards health service utilisation estimates (Reijneveld and Stronks 1999). This group would have been expected to have higher disorder prevalence, particularly the disruptive disorders that lead to extensive contacts within the education system. Whether this is as serious a problem as regards the reporting of education service contacts is open to question, although, as noted earlier, not all parents who reported contact with school staff were approached for interviews at time 2.

Ford *et al* (2003, 2005) previously highlighted issues associated with the service utilisation estimates. As we were unable to interview all parents at follow-up, this is likely to have led to underestimation of service contacts during the follow-up period. Additionally, a few children were assigned diagnoses on the basis of teacher and self-report. Exclusion of children who are looked after by local authorities who have high rates of psychiatric disorder and complex needs will also mean that we are underestimating actual costs of all children with psychiatric disorder (Meltzer *et al* 2004).

Cost estimates can only be as reliable as the resource utilisation data upon which they are based. All service contact data are based on parent report using semi-structured interviews. Self-report data may be open to recall bias in terms of the frequency, type or nature of service use. Despite these caveats there is evidence that parent-reported or patient self-reported service contacts are at least as reliable as other sources, including administrative records (Stiffman et al. 2000; Patel et al 2005). Moreover, the instrument

used to assess service use in this study has evidence of moderate to strong reliability and validity (Ford et al., 2007).

The statistical uncertainty surrounding estimated mean costs is considerable, as evidenced by wide confidence intervals. This is partly down to the limited number of children with identified disorders in the follow-up dataset, combined with both the large variation in observed costs and the use of imputations where data were missing for specific cases. The degree of uncertainty is likely to have been underestimated given that the unit costs used to cost service contacts were implicitly treated as non-stochastic and without sampling error.

We were unable to study contact with police and other youth justice services due to the low frequencies and high rate of missing data. Crime-related costs (criminal justice system costs only) are likely to be a significant component of overall costs among younger people aged between 10 and 28 (Scott *et al*, 2001).

Mental health service costs reported here rely on published unit cost data that do not include an explicit allowance for the cost of medication administered to children with psychiatric disorders. While levels of receipt are likely to be high - Ford *et al* (2003) report that 68.8% of children with a hyperkinetic disorder who were in contact with mental health services during the first follow-up period were prescribed

methylphenidates - the costs involved are generally small in comparison to many of the other services described.

Policy considerations

The education system bears the largest cost burden of all public sector services in relation to psychiatric disorders among children and young people. These costs are not just restricted to the delivery of specialist services targeting the needs of children and young people with these kinds of difficulty: there are also sizeable costs incurred within mainstream schools, including the provision of additional teaching inputs as well as time spent meeting and discussing problems with parents. Importantly, contact with services was not synonymous with appropriate identification and management of mental health need with any service. From a public policy perspective, these resource commitments may imply a diversion of education resources away from other socially beneficial activities within or outside the education sector, although over recent years considerable work has been done to increase awareness and effective management of emotional and behavioural issues within schools in recognition of their impact on the ability of pupils to access the school curriculum. Early identification and effective intervention with young children before problems develop to the levels requiring specialist mental health services and/or specialist educational input has the potential to greatly reduce costs, particularly on the education sector (Allen, 2011). Our findings

underline the importance of these initiatives, which might be vulnerable in an era of budget constraint. To cut them might well be a false economy.

The wider social costs in adulthood associated with serious behavioural and emotional problems in childhood observed in other studies (Scott et al. 2001; Knapp et al. 2002) suggest that the social benefits of limiting or preventing these types of difficulties are likely to be felt beyond the education sector. Children with conduct disorder are also more likely to use up police time and to come into contact with youth justice services. There is also potential for important welfare gains for affected families in terms of reduced disruption to family life, while behaviourally or emotionally disturbed children and young people may themselves experience improvements in both school performance (a partial determinant of whether and how well they are likely to fare in the labour market) as well their ability to make friends and form stable relationships Romeo et al (2006). When they reach early adulthood, children with emotional problems or with ADHD are likely to have more employment difficulties and lower earnings (Knapp et al 2011). Indeed, there is increasing evidence that many adult psychiatric disorders have their roots in childhood. Half of adults with psychiatric disorder at age 26 in the Dunedin cohort had a psychiatric disorder before age 15, increasing to three-quarters by age 18 (Kim-Cohen et al., 2003). It is possible that effective intervention in childhood might alter developmental trajectories in a way that could provide significant savings in adulthood as well as childhood (Bonin et al 2011).

In summary, this study provides national-level evidence on the impact of childhood psychiatric disorder on public sector service budgets. It demonstrates that the highest service-related cost impacts fell on the education system, particularly on schools. These new figures help describe the context within which it is possible to explore the cost-effectiveness of interventions to support children with emotional and behavioural disorders, both in schools and elsewhere. They are a reminder to researchers, practitioners and policy-makers of the huge financial and societal costs relating to childhood psychiatric disorder.

KEY POINTS:

- Approximately one in ten children aged 5-15 in Britain has a conduct, hyperactivity or emotional disorder
- The estimated additional health, social care and education costs associated with childhood psychiatric disorders totalled £1.47bn in 2008
- Higher mean costs were estimated for children with hyperkinetic disorders than for those with conduct or emotional disorders
- The education system bears by far the largest cost burden of all public sector services when responding to child and adult adolescent psychopathology.

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Figure 1: Study design and sampling strategy

Time 1	**Initial interview/questionnaire (Jan-May 1999)** *Sample* 10,438 respondents *Survey modality* In-person interview (children and parents) and postal questionnaire (teachers) *Measures* Development and Well-Being Assessment Strengths and Difficulties Questionnaire (SDQ) British Picture Vocabulary Test and British Ability Reading Scales Socio-demographic variables

Time 2	**Postal questionnaire (Oct 2000)** *Sample* 3992 (929 with disorder + 3063 without) invited 2954 surveys completed 2393 willing to be contacted by telephone *Survey modality* Postal questionnaire *Measures* Parental SDQ + service use	**Phone interview (Nov 2000-Mar 2001)** *Sample* 499 parents invited 439 interviews completed *Survey modality* Telephone interviews *Measures* Contacts with any source of help since Time 1

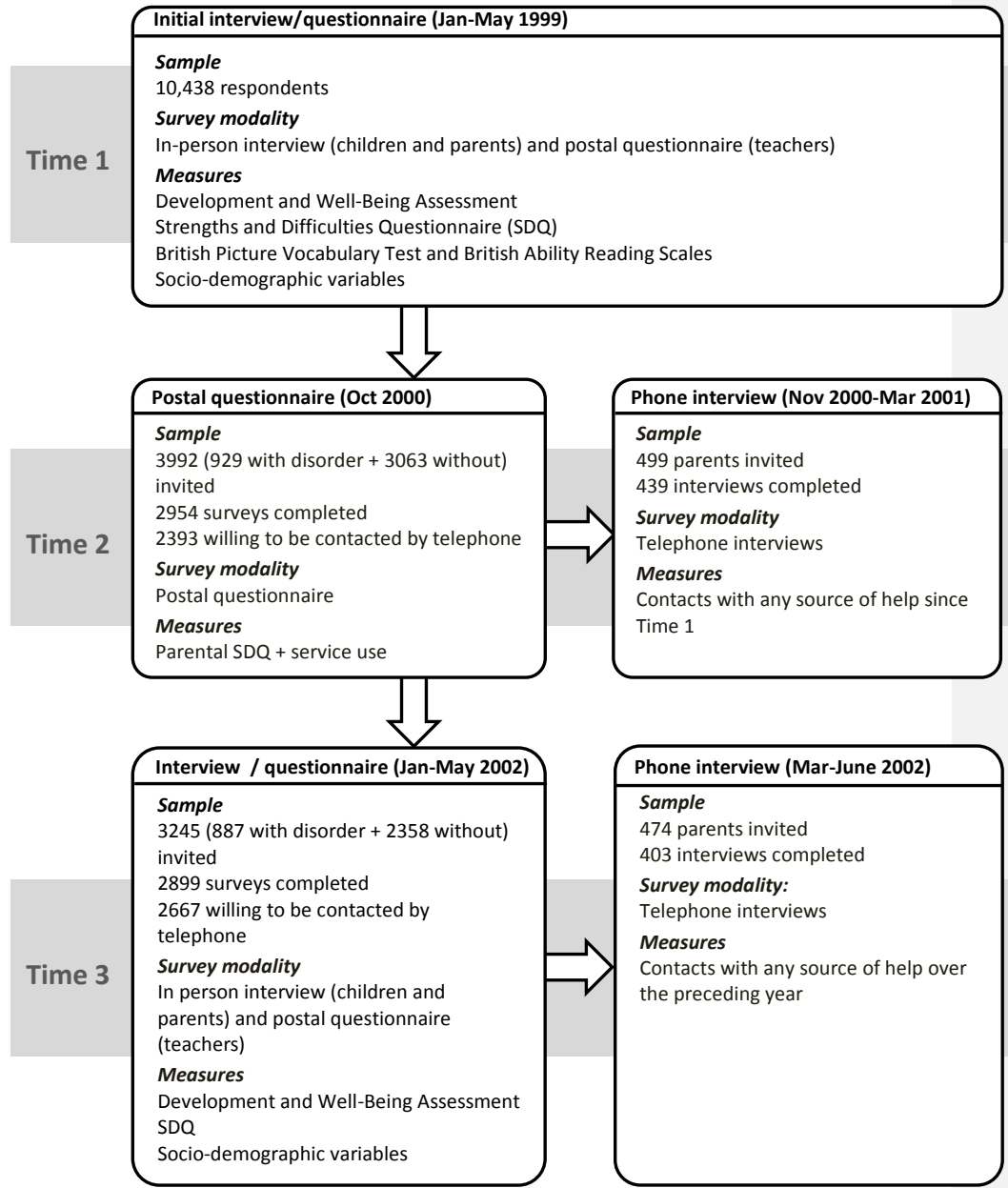|		
Time 3	**Interview / questionnaire (Jan-May 2002)** *Sample* 3245 (887 with disorder + 2358 without) invited 2899 surveys completed 2667 willing to be contacted by telephone *Survey modality* In person interview (children and parents) and postal questionnaire (teachers) *Measures* Development and Well-Being Assessment SDQ Socio-demographic variables	**Phone interview (Mar-June 2002)** *Sample* 474 parents invited 403 interviews completed *Survey modality:* Telephone interviews *Measures* Contacts with any source of help over the preceding year

Figure 2: Health, social service and education resource use: mean cost over three-year follow-up for all children/young people with a disorder
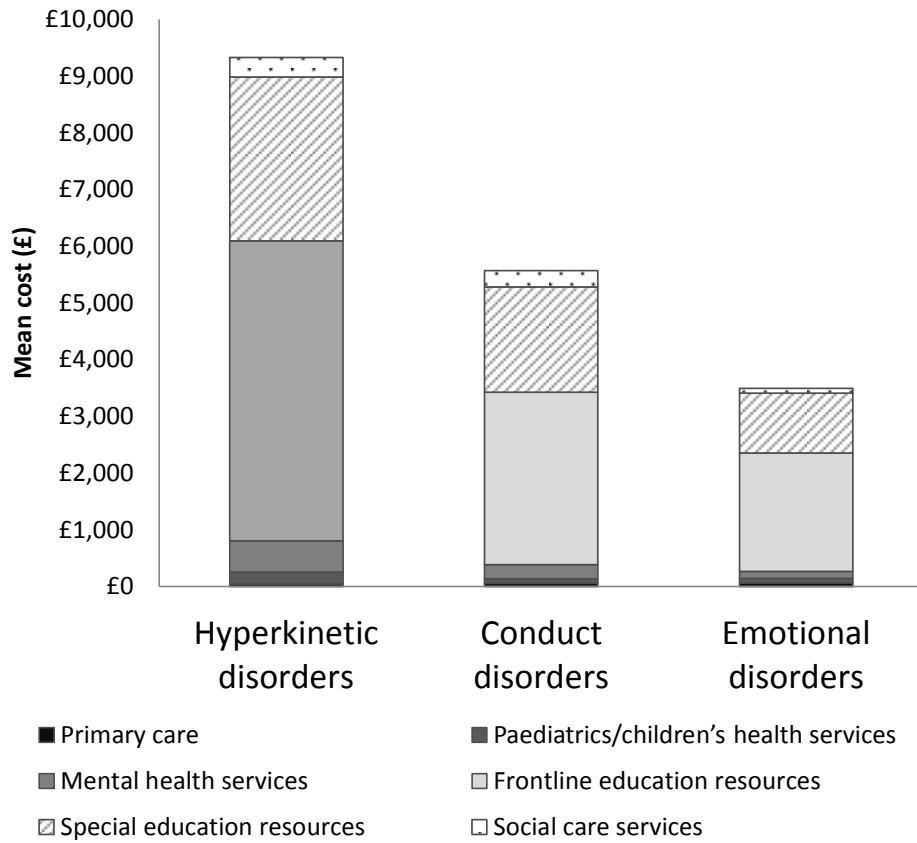
Table 1 Mental health-related service use and costs by service setting over three-year follow-up for children and young people with psychiatric disorder (N=445): summary statistics

	Proportion in receipt (%)	Mean cost per user (£)	Std dev (£)	N
Primary care				
General practitioner	24.9%	190.11	435.09	361
Health visitor	2.5%	317.00	576.31	366
Paediatrics / children's health service				
Paediatric inpatient	1.4%	335.74	122.40	367
Paediatrician	9.6%	572.83	516.17	363
A & E	2.2%	86.25	31.94	361
Community nurse	0.5%	401.37	538.94	368
School nurse	4.6%	47.66	51.48	351
Dietician	1.1%	32.34	12.94	366
Occupational therapy	0.8%	265.93	209.08	368
Speech therapy	1.9%	2,007.46	3,174.12	365
Physiotherapy	1.6%	319.48	192.19	367
Mental health services				
Psychiatric inpatient	0.3%	1,988.00	.	367
Child psychiatrist	7.1%	1,457.12	1,470.88	366
Psychologist	10.7%	334.62	582.26	366
Family therapy	0.5%	398.97	43.40	368
Counselling	3.8%	192.97	209.17	368

School counselling	4.7%	746.76	1,132.81	360
Community psychiatric nurse	0.8%	738.28	436.24	367
Frontline educational resources				
Parental meetings with teachers	45.1%	256.87	511.69	355
Extra time with teachers and teaching assistants	13.1%	13,907.29	20,606.40	321
Special educational needs coordinators	12.8%	139.99	146.28	360
Special educational needs tribunals	3.5%	2,550.35	852.74	351
Special educational resources				
Educational social worker	6.6%	120.50	141.96	365
Educational psychologist	7.4%	196.51	194.91	351
Special school status	4.3%	38,104.65	27,768.39	368
Social care				
Social services assessments	5.2%	1924.70	408.48	442
Social worker	6.6%	1643.74	3420.93	440
Respite care	0.7%	1512.00	654.72	439

Table 2: Mean costs per child over three-year follow-up for children with a psychiatric disorder: mean costs for all disorders (N=445)

	Mean cost per user: all children with a psychiatric over 3 years (£)	95% CI (lower)	95% CI (upper)	Mean annual (£)
Primary care	58.19	32.42	83.97	19.40
Paediatrics/children's health services	96.86	58.07	135.65	32.29
Mental health services	236.75	162.29	311.22	78.92
Frontline education resources	2949.22	1627.31	4271.12	983.07
Special education resources	1858.89	967.89	2749.90	619.63
Social care services	208.85	96.65	321.06	69.62
Total cost	5408.77	3687.27	7130.27	1802.92

a. Costs estimated for all 445 cases with a psychiatric disorder included in three-year follow-up

b. All costs adjusted for selection and non-response in follow-up sample and for sample clustering in main survey design at baseline

c. Imputed values used for missing service use data

d. Total costs are the sum of costs across each service category for each child/young person

Table 3: Mean costs per child over three-year follow-up by psychiatric disorder

(N=445)

	Mean cost: all children with a psychiatric disorder over 3 years (£)	95% CI (lower)	95% CI (upper)	Mean annual (£)
Hyperkinetic disorders				
Primary care	46.02	18.61	73.43	15.34
Paediatrics/children's health services	209.10	57.15	361.05	69.70
Mental health services	551.27	287.79	814.75	183.76
Frontline education resources	5286.88	1697.03	8876.73	1762.29
Special education resources	2888.47	360.42	5416.53	962.82
Social care services	342.33	0	866.29	114.11
Total cost	9324.08	4609.53	14038.60	3108.03
Conduct disorders				
Primary care	58.46	26.80	90.12	19.49
Paediatrics/children's health services	78.55	37.18	119.92	26.18
Mental health services	247.24	132.95	361.53	82.41
Frontline education resources	3041.13	1125.30	4956.96	1013.71
Special education	1854.68	367.35	3342.02	618.23

resources				
Social care services	289.26	122.77	455.76	96.42
Total cost	5569.32	3093.25	8045.39	1856.44

Emotional disorders

Primary care	61.19	19.24	103.15	20.40
Paediatrics/children's health services	79.33	19.91	138.76	26.44
Mental health services	126.19	28.87	223.52	42.06
Frontline education resources	2087.20	276.24	3898.17	695.73
Special education resources	1056.97	0	2252.62	352.32
Social care services	84.80	10.76	158.85	28.27
Total cost	3495.70	1041.62	5949.78	1165.23

a. Costs estimated for all 445 cases with a psychiatric disorder included in three-tier follow-up

b. All costs adjusted for selection and non-response in follow-up sample and for sample clustering in main survey design at baseline

c. Imputed values used for missing service use data

d. Total costs are the sum of costs across each service category for each child/young person

Table 4: Annual national costs of mental health service use for population aged 5-15

with emotional/behavioural disorder

Population aged 5-15 with disorder	Service type/setting	National cost estimate (£ million)
	Primary care	15.8
	Paediatric/children's health services	26.2
	Mental health services	64.2
813,000	Frontline education resources	799.2
	Special education resources	503.8
	Social care services	56.6
	Total cost	1,465.8

a. Figures may not add up to total shown due to rounding