

Children with Complex Mental Health Problems: Needs, Costs and Predictors over One Year

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Background: Little is known regarding children of greatest concern with complex mental health problems. **Method:** A one-year prospective study of psychiatric diagnosis, psychosocial functioning, need status and service receipt in 60 children identified as most concerning. **Results:** Thirty-two (53%) had two or more disorders. The mean number of needs per child was five. One year later mean needs were unchanged but with considerable individual variation. Mean weekly costs were £1017 (€1627) (*SD* = £957 (€1531)). Higher costs related to social factors rather than diagnosis or need. **Conclusions:** The mean annual cost of services to children with complex mental health problems is ten times that in other studies of children with mental health problems.

Keywords: Disadvantage; needs assessment; health economics

Introduction

Although mental health problems in children occur commonly within the general population (Meltzer et al., 2000) many of these are time limited or require relatively focused interventions. There are, however, a small number of children who present at the interface of education, social care and mental health services with complex mental health problems and who are believed to have high levels of need that require costly packages of care (Health Advisory Service, 1995). However, as neither their needs nor the associated costs to agencies have previously been systematically studied it is not clear whether resources are allocated most appropriately or whether those children perceived as most needy get the most resources (Hill & Mather, 2003; Kroll et al., 2002; McCann et al., 1996; Nicol et al., 2000). This is a one-year prospective study of needs, psychosocial functioning and costs in a cohort of such children, specifically designed to test three main hypotheses:

- psychiatric diagnoses would predict neither levels of need nor economic costs;
- enduring levels of need would best predict economic costs;
- social or demographic factors would better predict health gain than would economic costs.

Method

Study design

The study took place within Manchester, which is a large city in North West England with a total population

in 2001 of 392,819, of whom 107,258 were aged 0–19 years, and 81% were of White ethnic group (National Statistics Online, 2003). It was a prospective longitudinal study of a cohort of children identified by the four statutory agencies responsible for child welfare within Manchester (Child and Adolescent Mental Health Services, Social Services, Youth Justice Service, Education Authority) as being of greatest concern to them due to complex mental health problems. The children were assessed at time of entry to the study and again after an interval of one year.

Participants and recruitment

There are no agreed definitions for a hierarchy of severe and complex mental health problems and this handicaps any ascertainment of the most disturbed or needy children. We elected to study those young people identified by services as being the most concerning to them as we considered that this was most likely to determine service responses and interventions. Child Mental Health Services across Manchester, Manchester Social Services, Manchester Youth Justice Service and Manchester Education Authority were therefore each asked to identify those children aged 8–18 years about whom they had greatest professional concern by virtue of complex or difficult emotional, behavioural or mental health disturbance.

Each agency was to determine its own list without reference to any of the other agencies involved so as to be able to assess the degree of commonality and overlap between the sectors. District consultant child psychiatrists identified the CAMHS cases, child care team managers the social service cases, principal education

psychologists the education cases, and youth offending team managers the youth justice cases. No further guidance regarding selection of participants was given beyond that they should be the children about whom they had greatest professional concern.

For each identified child the key worker or professional most involved in delivery of care to the child or family was asked to complete a brief questionnaire giving basic demographic data regarding the child (age, gender, current domicile, ethnicity) and the reasons for identification for participation within the study (high risk, high cost, high complexity, high carer or agency stress, high severity, high conflict). This list of potential concerns was derived from the HAS report *Together we stand* (Health Advisory Service, 1995) as being those features most associated with young people requiring coordinated multiagency involvement. The research worker (AW) then obtained consent to participation in the study from both the identified child and an adult holding parental responsibility for him/her (parent or Manchester Social Services where a Care Order was in operation). The three Manchester Local Research Ethical Committees gave their approval for the study (refs: NOR/99/029; SOU/99/075; CEN/99/105/CA).

Measurement instruments

The research worker (AW) interviewed children and primary carers at time of entry to the study and again after a follow-up period of one year. At initial assessment both the carer and, where possible, the child were interviewed using a combination of the child version of the Schedule for Affective Disorders and Schizophrenia (K-SADS-PL: Kaufman et al., 1996) and the Salford Needs Assessment Schedule for Adolescents (SNASA: Kroll et al., 1999). The research worker also completed the Health of the Nation Outcome Scales for Children and Adolescents (HoNOSCA: Gowers et al., 1999) from the information obtained in the interview.

In the one-year follow-up interview the SNASA and HoNOSCA were repeated but not the K-SADS-PL. Additionally, in the one-year follow-up interview, information on the use of all services received by the young person from health, social services, education, youth justice and the voluntary sector over the intervening year was recorded using previously established methodology specific to this age group (Byford et al., 1999).

The K-SADS-PL is a semi-structured interview that identifies psychiatric symptoms and diagnoses psychiatric disorders according to DSM-IV criteria (American Psychiatric Association, 1994). The SNASA is a needs focused semi-structured interview that gathers information across 24 domains of a young person's life (self care, diet and food, physical illness, school attendance, school performance, weekday occupation, social relations, family relations, cultural or racial related difficulties, destructive behaviour (property), destructive behaviour (persons), oppositional or disruptive behaviour, inappropriate sexual behaviour, drug or alcohol misuse, depressed mood, deliberate self-harm, hyperactive or attention problems, obsessive compulsive symptoms, anorexic symptoms, anxiety or symptoms of post-traumatic-stress disorder, hallucination or delusion symptoms, leisure activities, accommodation problems, and benefits or money difficulties). For each domain, the interview gathers information on problem

severity (5-point scale), client cooperation (3-point scale), client perception of problem (3-point scale), and carer stress (4-point scale). It also gathers information about interventions that have been offered recently or not offered.

Based upon these levels of severity, co-operation, client perception, and carer stress SNASA identifies cardinal problems, defined as problems for which some form of intervention is worth offering. Experienced doctors (in this study AC & AO'M) then rate these cardinal problems into three categories of need status: 'in need of an intervention that has not yet been given'; 'problems that are *persistent* despite all suitable and appropriate interventions having been offered'; and '*suspended* need', i.e. an intervention has been offered recently, but it is too soon to assess whether it has benefited the individual. Follow-up SNASA ratings of need were done blind to initial ratings and where possible were completed by a different rater.

HoNOSCA is a global assessment of psychosocial functioning over 13 domains (disruptive behaviours; overactivity; self harm; substance misuse; learning difficulties; physical illness; abnormal beliefs; non-organic symptoms; emotional symptoms; peer relationship difficulties; excessive dependency; family difficulties; school nonattendance) each scored on a 0–4 rating scale. These are then compressed into four subscales of behaviours (disruptive behaviours; overactivity; self harm; substance misuse), impairments (learning difficulties; physical illness), symptoms (abnormal beliefs; non-organic symptoms; emotional symptoms) and social deficits (peer relationship difficulties; excessive dependency; family difficulties; school nonattendance) together with an overall score. Lower scores indicate better levels of functioning whilst higher scores indicate greater degrees of impairment. It is completed on the basis of all information available to the rater at the time of completion.

Economic data

The perspective of the cost analysis was that of all service providing sectors. At the follow-up, interview details of the child's use of all health, social services, education, youth justice and voluntary sector services over the 12-month follow-up period were collected using a questionnaire specific to the study, based upon previous research in similar subjects (Byford et al., 1999; Harrington et al., 2000). Unit costs were calculated on a local level where possible and taken from appropriate sources (CIPFA, 2001; CIPFA, 2002; Department for Education and Skills, 2002; HM Prison Service, 2001). Manchester Education Authority provided the cost of all educational establishments on an individual basis. Where local unit costs were unavailable, nationally published costs were used, taking non-London costs where possible and appropriate (Department of Health, 2000; Harries, 1999; Netten, Rees, & Harrison, 2001). All unit costs are UK pounds sterling and were for the year 2000–2001. Published unit costs were inflated to 2000–2001 prices where necessary using the retail price index and the Hospital and Community Health Service pay and price index (Netten et al., 2001). The cost in Euro (€) is given in parentheses, where £1: €1.6, which was the rate in January 2001.

Statistical analysis

Outcomes. All analyses were carried out within SPSS for Windows versions 10 or 11, comparing categorical variables within contingency tables and continuous variables using Student's *t*-test or analysis of variance. Analysis of variance (categorical variables) and simple linear regression (continuous variables) investigated univariate associations between pre-specified baseline variables (gender, age, ethnic group, living situation, economic costs, comorbidity at entry, persistent problems at entry, difficult family relationships at entry, professional concern, excluding high cost) and HoNOSCA score at follow-up. Multiple regression, using established methodology (Byford et al., 2001) was then used to identify factors independently associated with HoNOSCA score.

Costs. Costs per child per week were calculated. Analysis of variance was used to examine differences in total cost by identifying agency. Where two agencies had identified a child, cost information was included in the calculation for both agencies, to allow accurate assessment of the total cost per child from each agency. A cost function analysis explored the impact of baseline factors on cost (Knapp, 1998). A limited set of baseline factors (referring agency, age, gender, ethnic group, living situation, comorbidity at entry, HoNOSCA score at entry, level of need at entry, sexualised behaviours at entry, difficult family relationships at entry) were pre-selected from previous evidence (Byford et al., 2001; Byford, Barber, & Harrington, 2002; Chisholm et al., 1997; McCrone et al., 1998) and clinical experience. Univariate and multiple regression explored associations between the pre-specified baseline variables and total cost using the same methodology as outlined above for outcomes.

Standard least squares regression was used on untransformed costs. This permits inferences to be made about the arithmetic mean, which logarithmic transformation of costs or conventional non-parametric tests do not (Barber & Thompson, 1998). Due to the small number of participants ($n = 56$) it was not considered necessary to test for non-linearity using a generalised linear model. Additionally, a generalised linear model is only applicable if the relationship between predictive factors and cost is likely to be multiplicative (Dunn et al., 2003), which was not considered to be the case here. The main analyses were, however, compared with non-parametric bootstrap regression to assess the robustness of confidence intervals and *p* values to non-normality of the cost distribution (Barber & Thompson, 2002).

Results

The cohort

Figure 1 shows the participant flow from referral to follow-up. Ninety-six children were identified including 10 identified by two agencies. This probably underestimates the true degree of potential overlap, as it was not possible to ensure that agencies were fully blind to each other's lists. Sixty children and their carers consented to participate in the study. There were no significant differences between participants and non-

participants in either demographic characteristics or agency concerns. Table 1 shows the demographic characteristics and the agency concerns of both participants and non-participants. One-year follow-up assessments were completed on 56 young people (93%). Two refused follow-up and two could not be traced.

Diagnosis, need and psychosocial functioning at time of entry

In 31/60 (52%) of the cohort the initial K-SADS-PL, HoNOSCA and SNASA interviews were undertaken with both the carer and the child. In 24/60 (40%) it was only possible to interview the carer and in 5/60 (8%) only the child. The 60 children had 114 current psychiatric disorders. Only 5 children (8%) had no disorder and 32 (53%) had co-morbid disorders including 7 young people (12%) suffering from 4 or more disorders concurrently. Eighteen different disorders were present, the two commonest being conduct disorder (32/60; 53%) and major depressive disorder (19/60; 32%). The pattern of lifetime diagnoses was similar to that of current diagnoses. A full diagnostic breakdown is shown in Table 2.

The mean number of problems experienced by each child was nine (range 2–19; *SD* 3.12). On average over five of these (range 1–12; *SD* 2.69) were designated as needs (i.e. problems for which there was a potential intervention not currently being offered) and almost two (range 0–11; *SD* 2.17) as problems persisting despite all suitable interventions having been offered. Eight types of need were experienced by one-third or more of children and accounted for over 70% of total need (Table 3). There was no significant difference in need between children identified by each agency.

The mean HoNOSCA score for each child was 17.87 (range 3–30; *SD* 6.20). Current psychiatric co-morbidity was associated with higher HoNOSCA scores (i.e. poorer psychosocial functioning) (ANOVA: $F = 4.521$; $df = 59$; $p = .007$) and having more problems (ANOVA: $F = 7.433$; $df = 59$; $p = .000$). The number of domains of concern expressed by the identifying agency, however, was unrelated to psychosocial impairments (HoNOSCA scores) or to areas of need identified by the SNASA.

Need and psychosocial functioning at one-year follow-up

Of the 56 young people followed-up at one year, HoNOSCA, SNASA and health economic interviews were undertaken with both the carer and the young person in 26 cases (45%). In 26/56 (46%) it was only possible to interview the carer and in 5/56 (9%) only the young person. At follow-up, the mean numbers of problems, needs and persistent problems per child was unchanged. This masked considerable individual variation with movement in and out of need in many domains (problems: mean change = -0.07 , range = -10 to $+17$, *SD* = 5.27; needs: mean change = -0.30 , range = -6 to $+8$, *SD* = 3.14; persistent problems: mean change = -0.55 , range = -7 to $+10$, *SD* = 2.36). Table 4 shows the continuity and discontinuity over time for the eight commonest needs.

A greater change in number of problems correlated with both a higher initial number of problems and a

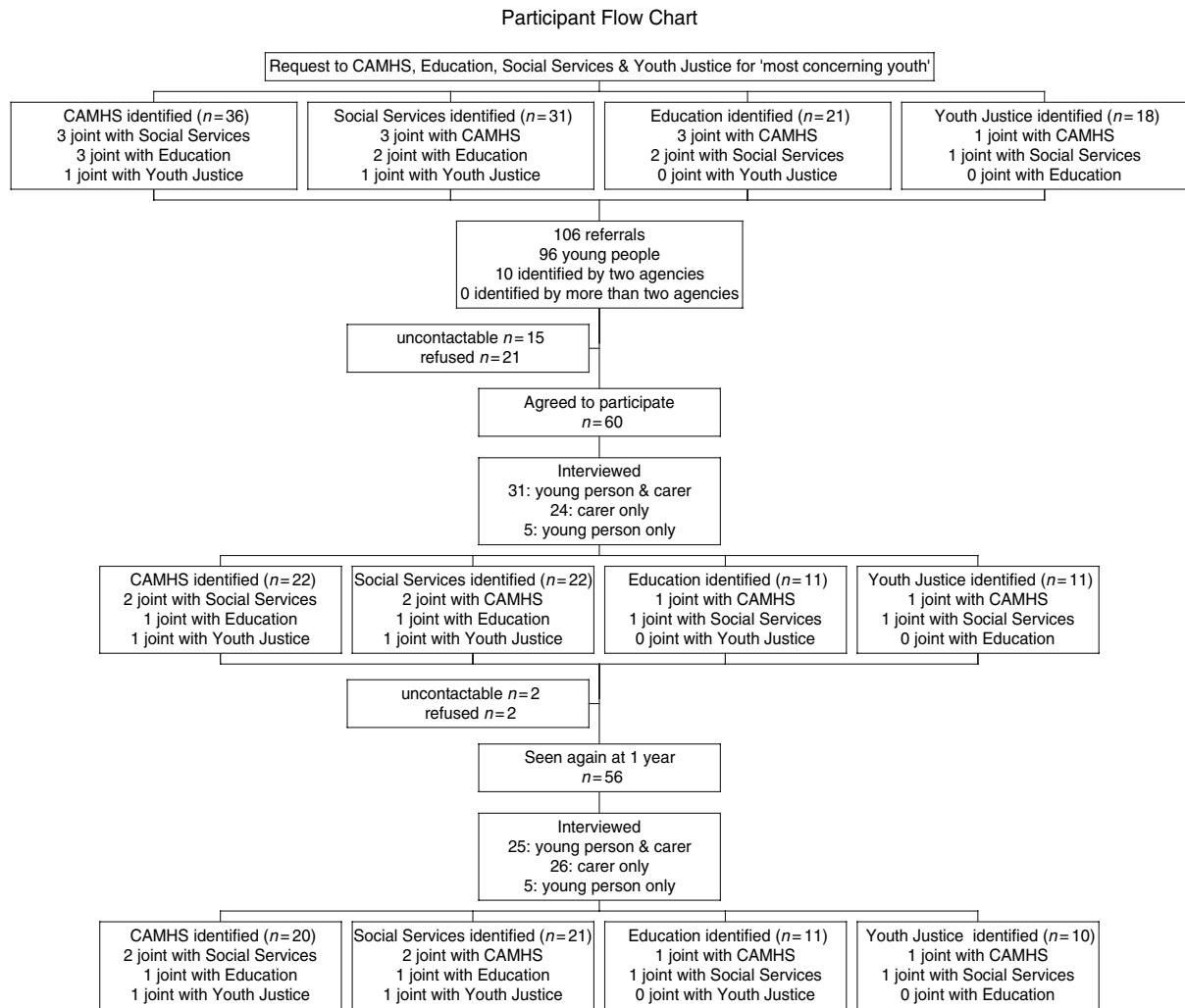


Figure 1. Participant flow chart

higher initial HoNOSCA score and more weakly with current major depressive disorder at entry [mean reduction in problems of 2.81 (*SD* = 3.64) where depression present, compared with mean increase in problems of 1.02 (*SD* = 5.45) where depression currently absent (ANOVA: *F* = 6.695, *df* = 55, *p* < .05)] but these correlations accounted for only 5% of the var-

iance. There was no association between change in number of problems and age, ethnicity, gender, co-morbidity or number of concerns.

There were improvements in psychosocial functioning across the whole cohort, with a reduction in mean HoNOSCA scores of 18% from 17.61 to 14.38 (*p* = .001). Univariate and multiple regression analy-

Table 1. Demographic characteristics and factors of concern of participants and non-participants

Demographic characteristics	Participants (<i>n</i> = 60)	Non-participants (<i>n</i> = 36)	Sig
Gender	48 male, 12 female (80% male)	25 male, 11 female (69% male)	ns
Abode	25 in parental home (42%)	19 in parental home (52%)	ns
Ethnicity	51 white (85%)	26 white (77%; <i>n</i> = 34)	ns
Mean age (years)	14.0 (range 8.2–18.6; <i>SD</i> = 2.5)	14.6 (range 9.4–18.9; <i>SD</i> = 2.6)	ns
Domain of concern	Participants (<i>n</i> = 66*)	Non-participants (<i>n</i> = 40*)	Sig
High risk	54 (82%)	28 (70%)	ns
High stress	58 (88%)	35 (88%)	ns
High conflict	34 (52%)	20 (50%)	ns
High cost	33 (50%)	17 (43%)	ns
Complexity	51 (77%)	27 (68%)	ns
Severity	57 (87%)	32 (80%)	ns
Mean number of domains of concern	4.35 (<i>SD</i> = 1.16)	3.98 (<i>SD</i> = 1.33)	ns

*10 children independently identified as 'of greatest concern' by two agencies

Table 2. K-SADS-PL psychiatric disorders - current and lifetime at initial interview

Diagnosis	Currently present		Lifetime history	
	<i>n</i>	%	<i>n</i>	%
Conduct disorder	32	53	32	53
Major depressive disorder	19	32	25	42
Generalised anxiety disorder	8	13	8	13
Attention deficit hyperactivity disorder	8	13	8	13
Oppositional defiant disorder	7	12	7	12
Enuresis	6	10	7	12
Alcohol abuse	6	10	7	12
Obsessive compulsive disorder	4	7	4	7
Alcohol dependence	4	7	4	7
Schizophrenia	4	7	4	7
Specific phobias	3	5	3	5
Substance abuse	3	5	3	5
Encopresis	2	3	2	3
Social phobia	2	3	2	3
Separation anxiety	2	3	2	3
Substance dependence	2	3	2	3
Post traumatic stress disorder	1	2	2	3
Agoraphobia	1	2	1	2

Table 3. Most common problems, needs and persistent problems at time of entry to study

Problem domain	Number of children (60) with...					
	Problems		Needs		Persistent Problems	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Social relationships	56	93	44	73	12	20
Family relationships	45	75	39	65	6	10
Accommodation	30	50	30	50	n/a*	
Hostile behaviour	40	67	28	47	12	20
Educational performance	37	62	24	40	13	22
Oppositional disruptive behaviour	30	50	24	40	6	10
Destructive behaviour	29	48	21	35	8	13
Mood disorder	27	45	20	33	7	11

*Problems with accommodation are always defined as needs by SNASA

sis showed this improvement was predicted only by being male and by having fewer persistent problems at entry but these predicted only 10% of HoNOSCA variation.

Economic evaluation

Table 5 shows total costs by sector over the 12-month follow-up period. The mean total cost per child per week was £1017 (€1627) or just over £52,000 (€83,200) per year. There was significant variation within this; weekly costs ranged between £24-£4000 (€38-€6400) and yearly costs between £1300 - £201,000 (€2080 - €321,600). Analysis of variance showed a significant difference in total costs per week between those

Table 4. Continuity and discontinuity of needs

Problem domain	Need present ...					
	At entry only		At entry and one year		At one year only	
	<i>n</i> (60)	%	<i>n</i> (56)	%	<i>n</i> (56)	%
Social relationships	13	22	31	55	10	18
Family relationships	12	20	27	48	9	16
Accommodation	20	33	10	18	14	25
Hostile behaviour	14	23	14	25	8	14
Educational performance	18	30	6	11	13	23
Oppositional disruptive behaviour	9	15	15	27	10	18
Destructive behaviour	9	15	12	21	4	7
Mood disorder	10	17	10	18	14	25

children identified by Social Services and those identified by the Youth Justice Service ($F = 4.1, p < .05$). The total cost of those identified by the Education Authority and CAMHS did not differ significantly from any other identifying agency.

Table 5 also highlights the large differences in the relative financial burden between providing sectors, particularly in terms of social services, responsible for 51% of total costs, and education, responsible for 38%. The burden for health, criminal justice and the voluntary sector were approximately 5%, 5% and 1% respectively.

The significant cost burden on social services and the education authority is largely due to the provision of non-domestic accommodation, with 60% of children in the study spending time in social services foster or residential care or residential schools over the follow-up period. Residential accommodation accounted for 52% of the total costs of the whole study group. Time spent in each accommodation type was strongly related to the identifying agency, with those identified by Social Services spending most time in residential or foster care and those identified by the Education Authority spending most time in residential education. This contrasts with the relatively little time any of the children spent in inpatient hospital services for any reason.

The financial burden on the health service was relatively low at £55 (€88) per child per week (5% of total costs). Contact with mental health services was particularly low, with 28 children (50%) having no contact. Only two study participants were admitted to hospital for psychiatric reasons, and both had long length of stays (mean 110 days); neither of these had been identified for the study by CAMHS. On average, young people had six outpatient psychiatric appointments, but this hides wide variation with subjects having up to 65 psychiatric consultations over the one-year follow-up period. Individuals from all referring agencies used other hospital services, including inpatient, outpatient and accident and emergency services. In primary care, young people saw a general practitioner an average of two times over the follow-up period, with a particularly low contact rate (0.3) in the Youth Justice group. This difference may reflect the time that these individuals spent in custody, where health professionals other than general practitioners may have been accessed.

Table 5. Total costs over the one-year follow-up; mean per child per week £

Sector providing services	Identifying agency					z%
	Social Services (n = 21)	Education (n = 11)	Youth Justice (n = 10) Total costs £ mean (SD)	CAMHS (n = 20)	Total (n = 56)*	
Education	303 (307)	725 (1135)	24 (76)	446 (472)	394 (620)	39
Social Services	1122 (968)	55 (171)	250 (409)	268 (632)	525 (825)	52
Health Service	56 (159)	13 (15)	75 (133)	56 (74)	55 (119)	5
Criminal Justice	40 (75)	17 (52)	117 (112)	2 (5)	35 (72)	3
Voluntary Sector	14 (50)	9 (24)	1 (1)	2 (5)	8 (32)	1
Total	1545 (1027)	824 (1229)	507 (483)	787 (668)	1017 (957)	100
Total € (SD)	2472 (1643)	1318 (1966)	811 (723)	1259 (1069)	1627 (1531)	

*Some young people were independently identified by two agencies and thus the number by agency add up to more than the total number of young people.

The financial burden on the criminal justice sector was also low (5% of total costs). Youth custody accounted for around 60% of total criminal justice costs and the average number of days in youth custody was highest for children identified by the Youth Justice Service. Other significant cost drivers in this sector were contacts with the youth offending team and days in court.

Univariate analyses showed that higher costs were associated with younger age, living away from parents and problems of inappropriate sexual behaviour at entry to the study. There were also non-significant trends for association between lower cost of services and a diagnosis of schizophrenia, and for association between higher cost of services and a diagnosis of major depression or conduct disorder. Multiple regression confirmed the associations with age (reduction of £110 (€176) per week for every additional year (95% CI £196-£240, $p = .001$)), living arrangements (living away from parents at baseline adds £591 (€946) per week (95% CI £132-£1050, $p < .05$)), and inappropriate sexual behaviours (such behaviour at baseline adds £752 (€1203) per week (95% CI £242-£1262, $p < .01$)). Children of White ethnic grouping were additionally found to be significantly more expensive in multivariate analysis (adds £542 (€867) per week (95% CI £1147-£63, $p = .078$)). These variables accounted for around 30% of the variation in total cost per week, which is similar to previous studies (Byford et al., 2001). Bootstrap regression results did not differ significantly from the results reported.

Discussion

Strengths and weakness of study

The main strengths of this study are the uniqueness of its focus, its multidisciplinary referral base, its high follow-up rate of 93%, and its structured assessments of needs and costs. The 60 children interviewed did not differ significantly from the 96 children identified and can therefore be taken as representative of those children at the apex of multiagency concern. There is no reason to suppose that the most concerning children of Manchester differ markedly from those in other European cities. Although the sample size was relatively small, by definition 'those children of greatest concern' are going to be a finite group and have not previously

been studied in depth. A further limitation was the exclusion of costs borne by young people and their caregivers, including productivity losses, thus the total costs reported are likely to underestimate the full economic impact of young people with complex mental health problems.

Key findings

There are five principal findings amongst this cohort of children. First is the degree of their psychiatric comorbidity with the majority having two or more disorders concurrently. Second, they have very high levels of unmet need in many areas of their lives and not just mental health. Third, the level of their needs appears to be persistent over time, albeit that there is movement in and out of need. Fourth, the costs of providing services to them are high but these fall mainly on agencies other than mental health. Fifth, these costs show marked variability, which has no discernable relationship with diagnoses, problems or needs.

Findings relative to initial hypotheses

As predicted, psychiatric diagnosis did not bear any clear relationship to either levels of need or to economic costs although there were trends relating to lower costs in schizophrenia and to higher costs in depression or conduct disorder. Co-morbidity of diagnosis, however, was associated with poorer functioning and higher levels of need but not with economic costs. Enduring need (i.e. persistent problems despite all interventions having been offered) was associated with less improvement in functioning but not with economic costs. Economic costs were best predicted by social and demographic factors (age and living situation) but also by the specific problem of inappropriate sexual behaviour. Health gain was very poorly predicted by anything, associations accounting for only 5% of the variance in change in need and 10% of the variance in change in functioning.

Findings relative to other studies

The rate of psychiatric disorder amongst these children is considerably higher than in other surveys of children accommodated by local authorities in the United Kingdom (Dimigen et al., 1999; McCann et al., 1996). The level of current psychiatric disorder of 92% in this group, 42% of whom were still living in their parental

home and only 54% of whom were in any form of residential care, is closer to McCann et al.'s estimate of 96% prevalence for adolescents within local authority residential care than their 57% accommodated with foster carers. Nonetheless, this still probably represents an underestimate in two ways. First, the K-SADS-PL does not enable diagnosis of autistic spectrum disorders unless they also meet criteria for an axis 1 diagnosis such as obsessive compulsive disorder. Second, internalising disorders (e.g. depression or anxiety) may have gone undiagnosed in some of those instances when only a carer was interviewed as they might not be able to describe the child's cognitions and emotions in sufficient detail. Similarly, some externalising disorders (e.g. conduct disorder or substance misuse) may have gone unrecognised when only a young person was interviewed who may have minimised certain aspects of their behaviour.

The low level of involvement with mental health services is in marked contrast to this high level of disorder and co-morbidity. In some instances the lack of involvement with mental health services was part of the child being identified as being 'of greatest concern'. This may account for the surprising low number of children identified who suffered from treatment resistant illness such as schizophrenia or anorexia nervosa, and that only two of those identified had lengthy inpatient stays in mental health beds. 'Professional concern' may sometimes relate to an inability to influence a situation rather than to severity of disorder.

Similarly, the mean HoNOSCA scores in this cohort are higher than those found in other studies of psychiatric outpatients or inpatients (Gowers et al., 1999; Yates, Garralda, & Higginson, 1999) indicating very high levels of psychosocial impairments. Furthermore, although the mean HoNOSCA scores had fallen by 18% by the time of follow-up they still remained higher than in those studies.

The average level of need at entry to the study was almost identical to those of boys recently admitted into secure care and assessed using similar methodology (Kroll et al., 2002). It is also similar to that of a highly selected sample of 'severely troubled and offending' adolescents seen and assessed within the Trent region, albeit using a different methodology (Nicol et al., 2000). Of particular concern, however, there was no change in the overall level of need in our cohort one year later, in contrast to the marked reduction in some needs in the boys in secure care (Kroll et al., 2002).

This apparent stability in overall level of need did mask significant variation, with some young people showing a marked reduction in need and others a marked increase. In particular, those young people with significant depression demonstrated a reduction in need over the course of the year, perhaps reflecting that, for some young people at least, depressive disorders can be an episodic rather than continuous disorder (Garrison et al., 1997). There is also improvement in education, suggesting perhaps that in these domains the children are benefiting from the interventions they are receiving. It is by no means certain that in a group with such a high level of psychosocial adversity that depression would spontaneously remit. It may be that, despite the relative lack of CAMHS involvement, the interventions offered by social care and education

have benefited the mental health of these youngsters. It is a point worth making that mental health problems respond to social/educational interventions and not solely to health interventions or psychological interventions.

The mean total cost of care packages per child at £52,000 (£83,200) per year is approximately 10 times higher than previous UK studies into the cost of caring for children with psychiatric problems (Harrington et al., 2000; Knapp, Scott, & Davies, 1999; Scott et al., 2001). Costs of a similar magnitude have been estimated to be associated with providing care in Norway to young people with a diagnosis of schizophrenia (Rund et al., 1994) and in the United States to young people with substance misuse complicating another psychiatric disorder (King et al., 2000). In both these studies, costs of providing residential treatments formed a major component of the overall costs.

The total cost in this study represents a minimum since the private cost to young people and their carers, including productivity losses, was not included. The greatest burden fell on social services (52% of costs) and the education authority (39% of costs), whilst the contribution from health services was only 5% of total costs. Only 50% of the children had any contact with any mental health services, which is strikingly low considering their rate of psychiatric disorder. It is, however, possible that this low engagement with mental health services may have been an influence in their being identified as 'of greatest concern'. Alternatively, mental health services may have been accessed in the past, yet mental health problems have persisted.

Implications for clinical services and future research directions

That younger children, those living away from their parents, and those with inappropriate sexual behaviour cost more is unsurprising when costs of education, residential accommodation and increased supervision are considered. Less explicable is the trend for those from a white ethnic group to cost more than non-white ethnic groups. Explanations might include those from non-white backgrounds having greater difficulties accessing services, poorer compliance rates or their families being less likely to request or agree to residential accommodation. These clearly merit further investigation.

Young people with complex and multiple problems are at the apex of multiagency concern, yet their considerable needs are not being met. This finding suggests that more formal needs assessment is necessary for effective targeting of resources, alongside exploration and development of potentially appropriate interventions. The relatively low number of children with major mental illnesses amongst this group and the high burden of costs upon social and educational sectors both point towards a need for working towards a more shared perspective on child mental health between the various agencies. Within the UK the proposed appointment of a Commissioner for Children (in line with most other European states) and the forthcoming NHS National Service Framework for Children will give high priority to the development of multiagency partnerships in the delivery of child mental health services,

as well as a strong emphasis upon the pivotal role of child and adolescent mental health services in providing care up to the age of 18 years (Department of Health, 2003). Service commissioners and providers in all areas concerned with the welfare and development of children will need to work together to ensure that the particular needs of this group of children are appropriately addressed and resourced.

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