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# Five years on: public sector service use related to mental health in young people with ADHD or hyperkinetic disorder five years after diagnosis.

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## ABSTRACT

### **Background**

Little is known about ongoing service use among young people with ADHD, but this information is important to the development of services to support these young people.

### **Methods**

A cohort of young people with ADHD or hyperkinetic disorder (n=115) was followed up five to seven years after diagnosis. We present details of their use of public sector services over the 12 months preceding reassessment, and compare them to young people with ADHD from a large epidemiological study.

### **Results**

Most children remained in contact with CAMHS, with high rates of contact with schools, educational professionals and the criminal justice system. Nearly all had taken medication at some point, while many still were using it. There were low reported rates of psychological and group interventions within the last twelve months, but this does not rule out earlier access to such treatments.

### **Conclusions**

Children with ADHD utilize long term support from public sector services, and cross agency strategies or clinics may help to optimize functioning.

### **Key words**

ADHD, hyperkinetic disorder, service use, medication

### **Key messages for practitioners**

- **Many children with ADHD continue to need support from CAMHS into adolescence and early adulthood.**
- **Many children with ADHD need additional support at school on a long term basis.**
- **Health visitors, general practitioners and teachers were the first professionals approached by parents, so their knowledge and understanding of ADHD is very important.**
- **Girls with ADHD are less likely to be referred to CAMHS.**

## INTRODUCTION

Little is known about the long-term outcome of attention deficit / hyperactivity disorder (ADHD) in relation to service use, yet this kind of information is important for those planning and developing services. Symptoms of ADHD persist into adolescence and adulthood in a significant proportion of children, although estimates of persistence vary according to how cases are defined (Barkley et al., 2002; Farone et al., 2006; Steinhausen et al., 2003; Willoughby, 2003). Children with ADHD have higher rates of conduct disorder in adolescence and antisocial personality disorder and substance abuse in adulthood in comparison with young people attending non-psychiatric medical clinics (Manuzza et al., 1998; Taylor et al., 1996). They have lower academic attainment, lower status jobs and are more likely to become involved in criminal activities (Babinski et al., 1999; Hartsough & Lambert, 1999; Manuzza et al., 1993; Taylor et al., 1996). Although effective interventions exist, few studies have followed children beyond eighteen months,

or examined outcomes other than psychopathology (Gillberg et al., 1997; MTA cooperative group, 2004a; Paternite et al., 1999). We present data on service use over a twelve month period from a British cohort of young people who had been identified as having ADHD or hyperkinetic disorder in secondary health care clinics at least five years before and compare their service use to that of children with ADHD from a general population survey.

## **METHOD**

### **Samples**

#### *Clinic group*

The Cardiff Longitudinal ADHD Study sample (CLASS) consists of 375 British children with suspected ADHD, aged between 6-15 years, who were recruited from Child and Adolescent Mental Health Services (CAMHS) and paediatric clinics in North and South West England and South Wales. Children with learning disability (IQ<70), neurological conditions, Tourette's syndrome, pervasive developmental disorder or who were looked after by the local authority were excluded. This analysis included those whose initial assessment was at least five years previously, were aged 12 or over, and who had ADHD or hyperkinetic disorder according to DSM IV or ICD 10 at baseline (n=157) (American Psychiatric Association, 1994; World Health Organization, 1993). Children who only met criteria for DSM III-R ADHD at baseline (n=41) were excluded from this analysis. All but five of the 157 eligible young people were successfully traced five years later, and 126 (80%) participated in the follow up study, with 115 parents providing information on services.

#### *Epidemiological group*

The 1999 British Child and Adolescent Mental Health Survey involved 10,438 children aged 5-15 (Meltzer et al., 2000). The three year follow up sample comprised all those with a disorder (n=929) in the initial survey and a random third of those without disorder (n=3063) (Meltzer et al., 2003). In the three year follow up, some parents were selected for detailed telephone interviews about service use, either because of reported service contact (n=411) or because the parents reported persistent concerns about their child's mental health but had not reported seeking help (n=63), with a response rate of 85% (Ford et al., 2005). Children who participated in the three year follow up telephone interviews and were age 12 or over at follow up were selected as an epidemiological comparison group (n=242).

### **Psychiatric diagnoses**

#### *CLASS*

The presence of the psychiatric disorders listed in Table 1 in CLASS was assessed at both time points using the parent version of the Child and Adolescent Psychiatric Assessment (CAPA) and the Child Attention Deficit Hyperactivity Disorder Teacher Telephone Interview (ChATTI) (Angold et al., 1995; Holmes et al., 2004). The CAPA is a semi-structured diagnostic interview that was administered by trained psychology graduates and a post-doctoral researcher. The ChATTI was required to assess whether the child fulfilled the pervasiveness criterion for ADHD or hyperkinetic disorder. Diagnoses were

assigned using DSM IV (ADHD) or ICD 10 (all other diagnoses) criteria with high inter-rater reliability ( $\kappa=1.0$  for both ADHD and hyperkinetic disorder at time 1).

### *Epidemiological sample*

Psychiatric diagnoses at Time 1 were made according to DSM IV (ADHD) or ICD 10 (all other disorders) using the Development and Well-being Assessment (DAWBA), which combines structured interviews with parents and children aged over 11 and a postal questionnaire to teachers with a clinical review of verbatim transcripts about reported symptoms (Goodman et al., 2000). As with the clinical sample, children with ADHD or hyperkinetic disorder include children with comorbid disorders. However, in the comparison with CLASS (see Table 1), “conduct disorders” excluded those with a comorbid hyperkinetic disorder who were already accounted for, and “emotional disorders” excluded those with a comorbid disruptive disorder to avoid double counting of young people in the table.

### **Service use**

Service use related to mental health was measured in both samples using the Children’s Service Interview with parents, which combines a semi-structured approach with a structured screen, and shows moderate or better reliability and concordance with clinical records (Ford et al., 2007a). In both samples, we collected data on service use over the preceding 12 months.

### **Socio-demographic and educational measures in CLASS**

Intellectual and reading ability were assessed at baseline using the Wechsler Intelligence Scale for Children (WISC III) and the Weschler Objective Reading Dimension (WORD) (Wechsler, 1991; Wechsler, 1993). In accordance with DSM IV criteria, children scoring at a significantly lower level on the WORD than would be predicted by their age and intelligence quotient were classified as having a specific reading disorder. Parents supplied demographic data, and socio-economic status was classified as high (professional or managerial), medium (non-manual or skilled manual) and low (unskilled manual or unemployed) according to the classification used in the 1991 census (Office for National Statistics, 1995).

### **Analysis**

The analysis was conducted using SPSS version 12.01 and STATA version 8. After demonstrating that there were no significant differences in baseline characteristics between the young people from CLASS with service use information and those that did not participate at Time 2, or who participated but did not complete the Children’s Services Interview (details available on request), we compared service use in CLASS to the epidemiological sample. We described the patterns of service use using means and standard deviations where the distribution of continuous variables is approximately normal, and medians with the inter-quartile range where the data were significantly skewed. We explored patterns of service use in CLASS by using logistic regression to adjust for contact with other services, and by stratifying the sample according to the

persistence of ADHD or hyperkinetic disorder at Time 2 and the presence of comorbid oppositional defiant or conduct disorder at baseline.

## **RESULTS**

### **Comparison of service use among epidemiological and CLASS samples**

The age and gender of CLASS and the different groups within the epidemiological samples differed significantly, but there was no significant difference between the age of the young people with ADHD in both groups ( $t=0.9$ ,  $p=0.3$ ). Young people in CLASS were more likely than young people from the epidemiological survey to have had contact with most services within the preceding twelve months; the exceptions being specialist educational resources and secondary health care. When the comparison was restricted to the young people from the epidemiological sample with ADHD, young people from CLASS were significantly more likely to access primary healthcare ( $\chi^2=21.4$ ,  $p<0.001$ ), CAMHS ( $\chi^2=14.1$ ,  $p<0.001$ ), and teachers ( $\chi^2=18.1$ ,  $p<0.001$ ), but not secondary health care, special educational needs resources or the police and youth justice system. These results emphasize that children selected from clinics are not representative of children with a disorder in the community and that the following descriptions can only be applied to children whose ADHD or hyperkinetic disorder has been identified by secondary health care.

*Insert Table 1*

### **Recognition of ADHD in the CLASS sample**

Parental reports of the age at which they first became worried about their child in relation to ADHD varied greatly, ranging from infancy to 11 years, with the peak age of concern in the toddler and preschool years (mean 3.8 years, standard deviation 2.2). Half the parents reported discussing their concerns with a professional within six months, but some waited several years to do so (median 0.5 years, inter-quartile range 0-2 years). The first professional approached was commonly a teacher (46%) or primary health care staff (general practitioner 33%, health visitor 16%) emphasizing the need for both groups to be able to identify ADHD; particularly as parents reported several years delay between the first professional contact and receiving a diagnosis (median 2.5 years, inter-quartile range 1-4 years).

### **Mental health service interventions over the 12 months preceding Time 2 in CLASS**

Psychopathology at follow up is explored in depth in a companion paper (Fowler et al., submitted), but almost two thirds (60%) of the young people still met criteria for either ADHD or hyperkinetic disorder at Time 2. A similar proportion (70%) had been in contact with CAMHS within the year preceding Time 2, rising to 80% among those who still met criteria for a diagnosis of ADHD or hyperkinetic disorder. There were no reported contacts with adult mental health services, although there were 14 young people aged 17+ in the sample, three of whom still met diagnostic criteria for ADHD or hyperkinetic disorder. There were no reports of admissions to adolescent day or inpatient units.

### *Insert Table 2*

Table 2 shows that most young people had attended CAMHS for a few relatively brief appointments during the previous twelve months and mostly saw psychiatrists and nurses. Nearly a fifth (18%) saw two CAMHS professionals, mostly a psychiatrist and a nurse (87%), while only one saw more than two clinicians. Seeing more than one CAMHS professional was not related to baseline socio-demographic characteristics or the level of psychopathology at baseline or follow up. As shown in Table 3, the commonest interventions by CAMHS within the last twelve months were to monitor mental state and / or height, weight, and blood pressure and to recommend and / or prescribe medication. There were no reports of group interventions for either parents or young people, while two young people had received anger management packages.

### **Medication in CLASS**

By Time 2, nearly all the young people (93.0%) had taken medication at some point, particularly methylphenidate (91.3%), while a few young people had taken dexamfetamine (6.1%), atomoxetine (4.3%), antipsychotics (2.6%), or clonidine (0.9%). Over a third (37.4%) of children had tried a modified-release preparation of methylphenidate. The mean age of starting medication reported by parents was 8 years old (standard deviation 1.9).

At the Time 2 assessment, 66.1% of young people were taking medication. Nearly two thirds were taking some sort of stimulant; 36.5% modified-release methylphenidate, 26.1% immediate-release methylphenidate, and 2.6% dexamfetamine. A few young people were taking non-stimulant drugs; 1.7% antipsychotics, 0.9% clonidine, and 0.9% atomoxetine. Two young people were also taking melatonin while there was no reported use of pemoline, selective serotonin re-uptake inhibitors or tricyclic antidepressants. Given the high proportion of young people taking stimulant medication at both time points, the prevalence of tics was low (8.7% at Time 1, 4.3% at Time 2), with very few young people having “persistent” tics (2.6%) or an onset of tics (1.7%).

General Practitioners were prescribing with the support of a specialist for most (81.8%) of the young people taking medication at follow up, while paediatricians recommended or prescribed medication for two young people. The majority of young people taking medication at follow up still met criteria for either ADHD or hyperkinetic disorder (71%), compared to 39% of those not taking medication ( $\chi^2=10.6$ ,  $p=0.001$ ). Among young people no longer meeting diagnostic criteria, the mean number of ADHD symptoms was higher, but not statistically so, in young people taking medication as opposed to those who were not taking medication (10.8 (6.1) v. 8.0 (6.1),  $t=1.5$ ,  $p=0.1$ ). Interestingly, reported symptoms levels were very similar among the young people still meeting diagnostic criteria for ADHD or hyperkinetic disorder at follow up, whether or not they were taking medication (15.9 (3.1) on medication v.16.1 (2.6),  $t=0.3$ ,  $p=0.8$ ). However, parents in contact with CAMHS whose children were taking medication were more likely to report that CAMHS contact had lead to improvement (61% v. 31%), and less likely to report that CAMHS contact had made no difference (35% v. 46%) or made

things worse (5% v. 15%) than the parents of children not taking medication ( $\chi^2=9.2$ ,  $p=0.03$ ).

In addition to meeting diagnostic criteria for ADHD or hyperkinetic disorder, taking medication at follow up was associated with higher levels of comorbidity (56.0% versus 29.7%,  $\chi^2=6.9$ ,  $p=0.009$ ) and ADHD symptomatology (mean number of symptoms 12.8 versus 7.8,  $t=2.5$ ,  $p=0.01$ ) at Time 2. The level of symptoms and comorbidity at Time 1, age, gender, socioeconomic status, intellectual ability and specific reading disorder were not associated with medication status at follow up. There were too few young people who had never taken medication to analyze further.

### **Mental health related contacts with non-mental health services over the 12 months preceding Time 2 in CLASS**

*Insert Table 3*

Table 3 shows the interventions accessed from different sources. Alternative health therapy was reported by only one parent, and there were no reported contacts with nurses or health visitors. The latter is not surprising given the age of the sample and that most contacts with primary health care involved the prescription of medication in shared care with mental health services (85%). There were too few contacts with hospital or community paediatrics to analyze in detail, but all but one contact was with a doctor.

Over half (57%) of the young people who were still attending school or college had officially recognized special educational needs, of which 90% were related to mental health. Slightly less than a third of these young people had a “statement”, and half had had these needs officially recognized for eight years (inter-quartile range 6-9) at Time 2, suggesting that educational difficulties persist for young people with ADHD. Many young people had additional help at school, which was provided by learning support assistants (53%), teachers (33%) or behavioural support workers (14%).

Nearly all (87%) the families in contact with social services had approached social services themselves and nearly half (47%) had undergone an assessment. Only 33% had an allocated social worker, while one young person was put in contact with an outreach worker. No families were offered respite care and none of the young people had been in the care of the local authority over the previous year. While extensive involvement with the criminal justice system was uncommon, being stopped by the police or cautioned was extremely common (Fowler et al., submitted).

### **Patterns of service use within CLASS**

*Insert Table 4*

Table 4 shows the rates of contact with each type of provision according to the presence or absence of ADHD or hyperkinetic disorder at follow up and the presence or absence of oppositional defiant or conduct disorder at baseline. The largest of the groups had



persistent ADHD or hyperkinetic disorder with oppositional defiant or conduct disorder at baseline, while the size of the other three groups limits the power of our comparison. Contact with schools, primary health care and CAMHS was most prevalent in the two groups with persisting ADHD / hyperkinetic disorder, while the groups with conduct disorder at baseline were most likely to be without a school place or in contact with the criminal justice system.

## **DISCUSSION**

### **Substantive findings**

As this study provides a great deal of information about children with ADHD in the UK, we have picked out a few key points for specific comment. Nearly all the young people had taken stimulant medication at some point, which is encouraging given the Health Technology Appraisal that stimulant medication may be most cost-effective as a first line treatment (NICE, 2006). The two-year follow up of the Multimodal Treatment Study of ADHD (MTA) sample demonstrated persisting but decreased impact of both medication and psychological treatment (MTA cooperative group, 2004b). The extent of the deterioration was partially explained by the proportion taking medication in each group at follow up, but parental decisions about medication were linked to adverse effects, indicating that symptom control alone is an inadequate means for assessing outcome (MTA cooperative group, 2004a). Most of the health service contacts in this study were related to medication, although a few young people had accessed psychological interventions within the last twelve months. It is possible that parents did not recall or recognize non-pharmacological treatments, or that many young people had received psychological interventions closer to the time of diagnosis. While the MTA trial suggests that medication offers the largest impact, it remains possible that behavioural management does benefit some areas of functioning, maybe helpful for specific groups (e.g. those with anxiety disorder) and may reduce the dosage of medication needed (Taylor, 1999). Thus, an international consensus statement suggests that behavioural management remains part of, but should not be the only, service offered to children with ADHD (Kutcher et al., 2004). There is also the need for intervention for comorbid disorders, particularly oppositional defiant or conduct disorder.

An epidemiological study of four US communities found that only 12.5% of children with ADHD had been treated with stimulants in the previous 12 months and those prescribed stimulants who did not reach diagnostic criteria still had evidence of pervasive hyperactivity (Jensen et al., 1999). However, national surveys of physicians and prescriptions suggest large increases in prescriptions of stimulant drugs, while the Great Smoky Mountain study suggested that most of children taking these drugs did not meet diagnostic criteria for ADHD (Angold et al., 2000; Hoagwood et al., 2000). In contrast, epidemiological studies in Britain have found evidence of under-prescribing among those with hyperkinetic disorder (Ford et al., 2003; Green et al., 2005). Symptoms may be masked in children taking medication, and these findings may in part relate to whether information about medication fed into the diagnostic process. While 29% of the young people taking medication in the follow up of CLASS no longer met diagnostic criteria, it should be remembered that the whole sample met stringently applied diagnostic criteria at baseline. Although young people taking medication had higher levels of symptomatology

than those that were not, this difference disappeared when broken down according to the presence or absence of a diagnosis, reiterating that symptom control is not the only issue for families and clinicians in decisions about medication.

We found that children with ADHD made heavy demands on the education system and youth justice systems. According to the Department for Education and Skills (2006), only 2.9% of the school population has a statement of special educational and only 1% attend special schools (versus 28% and 8% respectively in CLASS). Given that the core symptoms are often most troubling within school, this is not surprising, but research is required to develop and evaluate interventions that maximize the chances of academic and vocational success for young people with ADHD. Similarly, an epidemiological sample of young people with all types of psychiatric disorder followed up over three years reported 9.5% had been in contact with the police while 3.2% had been formally cautioned or convicted (versus 21% and 10.5% respectively in CLASS) (Ford et al., 2005). Results from the CLASS sample suggest that comorbid oppositional defiant disorder and conduct disorder may have driven a large part of this association. Given that most of these young people had been in contact with services during the preceding year, this suggests that despite interventions that reduce symptoms, there is a need to look to additional interventions that might improve other adverse outcomes for these young people in real-life clinic settings, not just randomized controlled trials.

### **Clinical and policy implications**

Two thirds of CLASS still met diagnostic criteria for ADHD, and many were still involved with CAMHS, suggesting that ADHD clinics should be developed with long term contact in mind. A retrospective assessment of childhood ADHD in a large epidemiological sample of adults in the USA reported an association between treatment in childhood with persistence in adulthood, even after controlling for severity (Kessler et al., 2005). In contrast, a follow up children treated with stimulants into young adulthood showed better social functioning and mental health among those with a good response to medication (Paternite et al., 1999). Either way, clinical services for adults with ADHD need developing as increasing numbers of young people “graduate” from CAMHS.

Training and supervision in the detection of ADHD for teachers and primary health care professionals might avoid some of the delays in diagnosis and intervention reported in this study, provided that CAMHS and child health services were able to deal with the volume of children referred. Our finding that girls were under-represented in CLASS is not novel, but suggests that clinicians and others working with children need to be more alert to ADHD in girls and young women (Szatmari, 1992; Sharp et al., 1999).

### **Methodological issues**

To our knowledge, this is the largest and longest follow up of a cohort of children with ADHD in Britain. It used the same standardized measures at both time points. We were able to compare findings with those from a national epidemiological sample. However, the epidemiological comparison group was small and based over a wider geographical area, used a different measure of psychiatric disorder and psychiatric disorder was assessed three rather than five to seven years prior to follow up. The latter might be

expected to increase the rates of services use, making our findings of lower rates of service use in the epidemiological sample robust.

Despite following 115 children, the CLASS sample is too small to examine the outcomes of different subgroups of children. Hence, our analysis is largely descriptive. Although we have talked about “persistent” ADHD and hyperkinetic disorder, in fact we have two snap shots of these young people at least five years apart and although clinical experience would suggest that there would be a high degree of persistence in those meeting diagnostic criteria at both time points, we actually know nothing about their functioning between assessments. We collected service use data from parents only, and thus may have missed some contacts that parents did not know about, which is particularly likely for the police and school counsellors. However, investigators have reported high levels of agreement between parents and children about service contact, with agreement improving in older children (Ascher et al., 1996; Stiffman et al., 2000).

## CONCLUSION

Many children from CLASS continued to meet criteria for ADHD or hyperkinetic disorder in adolescence, and most were still involved with CAMHS. It is encouraging that most had received evidence-based treatments but few parents recalled non-pharmacological interventions, although these might have been accessed earlier in the child’s therapeutic pathway. Young people with ADHD in childhood need and seem to access substantial input from the education system in addition to CAMHS. Disappointingly, a significant proportion of young people were involved in low-level offending despite long-term contact with services. Interventions aimed at improving comorbid disorders may further improve outcomes. As children with ADHD need long term support from public sector services, it is important to identify cross agency strategies and interventions that may help to optimize functioning.

## REFERENCES

- American Psychiatric Association (1994). *Diagnostic and Statistical Manual of Mental Disorders*. 4<sup>th</sup> edition. Washington DC: American Psychiatric Association.
- Angold, A., Prendergast, M., Cox, A., Harrington, R., Simonoff, E., Rutter, M. (1995). The Child and Adolescent Psychiatric Assessment. *Psychological Medicine*, 25, 739-753.
- Angold, A., Erkanli, A., Egger, H., & Costell, E.J. (2000). Stimulant treatment for children: a community perspective. *Journal of the American Academy of Child and Adolescent Psychiatry*, 39, 975-984.
- Ascher, B.H., Farmer, E.M.Z, Burns, B.J., & Angold, A. (1996). The Child and Adolescent Service and Assessment (CASA): description and psychometrics. *Journal of Emotional and Behavioral Disorders*, 4, 12-20.
- Babinski, L.M., Hartsnough, C.S., & Lambert, N.M. (1999). Childhood conduct problems, hyperactivity-impulsivity and inattention as predictors of adult criminal activity. *Journal of Child Psychology and Psychiatry*, 40, 347-355.
- Barkley, R., Ficscher, M., Smallish, L., & Fletcher, K. (2002). The persistence of Attention-Deficit / Hyperactivity Disorder into young adulthood as a function of

- reporting sources and definition of disorder. *Journal of Abnormal Psychology*, 111, 279-289.
- Department for Education and Skills (2006). Special Educational Needs in England, January 2006. [www.dfes.org.uk/rsgateway/DB/SFR](http://www.dfes.org.uk/rsgateway/DB/SFR).
- Farone, S.V., Biederman, J., & Mick, E. (2006). The age dependent decline of attention deficit hyperactivity disorder: a meta-analysis of follow up studies. *Psychological Medicine*, 36, 159-165.
- Ford, T., Goodman, R., & Meltzer, H. (2003). Service over 18 months among a nationally representative sample of British children with psychiatric disorder. *Clinical Child Psychology and Psychiatry*, 8, 37-51.
- Ford, T., Hamilton, H., Dosani, S., Burke, L., & Goodman, R. (2007a). The children services interview: reliability and validity. *Social Psychiatry and Psychiatric Epidemiology*, 42, 36-49.
- Ford, T., Hamilton, H., Meltzer, H., & Goodman, R. (2007b). Child mental health is everybody's business; the prevalence of contacts with public sectors services by the types of disorder among British school children in a three-year period. *Child and Adolescent Mental Health*, 12, 13-20.
- Ford, T., Hamilton, H., & Goodman, R. (2005). Service contacts among the children participating in the 1999 British child and adolescent mental health survey and its follow-ups. *Child and Adolescent Mental Health*, 10, 2-9.
- Green, H., McGinnity, A., Meltzer, H., Ford, T., & Goodman, R. (2005). Mental health of children and young people in Great Britain, 2004. London: TSO.
- Gillberg, C., Melander, H., von Knorring, A., Janols, L., Thernland, G., Hagglöf, B., Eidevall Wallin, L., Gustafsson, P., & Kopp, S. (1997). Long-term stimulant treatment of children with attention-deficit hyperactivity disorder symptoms. *Archives of General Psychiatry*, 54, 857-864.
- Goodman, R., Ford, T., Richards, H., Melzer, H., & Gatward, R. (2000). The Development and Well-being Assessment: Description and initial validation of an integrated assessment of child and adolescent psychopathology. *Journal of Child Psychology and Psychiatry*, 41, 645-657.
- Hartsough, C.S., & Lambert, N.M. (1999). Childhood conduct problems, hyperactivity-impulsivity and inattention as predictors of adult criminal activity. *Journal of Child Psychology and Psychiatry*, 40, 347-355.
- Hoagwood, K., Kelleher, K.J., Feil, M.M.S., & Comer, D.M. (2000). Treatment services for children with ADHD: a national perspective. *Journal of the American Academy of Child and Adolescent Psychiatry*, 39, 198-206.
- Holmes, J., Lawson, D., Langley, K., Fitzpatrick, H., Trumer, A., Pay, H., Harrington, R., Thapar, A. (2004). The Child Attention Deficit Hyperactivity Disorder Teacher Telephone Interview (CHATTI): reliability and validity findings. *British Journal of Psychiatry*, 184, 74-78.
- Jensen, P.S., Kettle, L., Roper, M.T., Sloan, M., Dulcan, M.K., Hoven, C., Bird, H., Bauermeister, J., & Payne, J. (1999). Are stimulants overprescribed? Treatment of ADHD in four US communities. *Journal of the American Academy of Child and Adolescent Psychiatry*, 38, 797-804.
- Kessler, R.C., Adler, L.A., Barkley, R., Biederman, J., Connors, C.K., Farone, S.V., Greenhill, L.L., Jaeger, S., Secnik, K., Spencer, T., Ustun, T.B., & Zaslavsky,

- A.M. (2005). Patterns and predictors of **attention-deficit/hyperactivity disorder** persistence into adulthood: results from the national comorbidity survey replication. *Biological Psychiatry*, 57, 1442-1451.
- Kutcher, S., Aman, M., Brooks, S., Buitelar, J., van Daalen, E., Fergert, J., Findling, R.L., Fisman, S., Greenhill, L., Huss, M., Kusumaker, V., Pine, D., Taylor, E., Tyano, S. (2004). International consensus statement on attention deficit / hyperactivity disorder (ADHD) and disruptive behaviour disorders (DBDs): clinical implications and treatment practice suggestions. *European Neuropsychopharmacology*, 14, 11-28.
- Manuzza, S., Klein, R.G., Bessler, A., Malloy, P., & LaPadula, M. (1993). Adult outcome of hyperactive boys. Educational achievement, occupation rank and psychiatric status. *Archives of General Psychiatry*, 50, 565-576.
- Manuzza, S., Klein, R.G., Bessler, A., Malloy, P., & LaPadula, M. (1998). Adult psychiatric status of hyperactive boys grown up. *American Journal of Psychiatry*, 155, 493-498.
- Meltzer, M., & Gatward, R. with Goodman, R., & Ford, T.J. (2000) *Mental Health of children and adolescents in Great Britain*. TSO: London.
- Meltzer, M., Gatward, R., Corbin, T., Goodman, R., & Ford, T. (2003). *Persistence, onset, risk factors and outcomes of childhood mental disorders*. London: TSO.
- MTA cooperative group. (2004a). National Institute of Mental Health Multimodal Treatment Study of ADHD follow-up; changes in effectiveness and growth after the end of treatment. *Pediatrics*, 113, 762-769.
- MTA cooperative group. (2004b). National Insitute of Mental Health Multimodal Treatment Study of ADHD follow-up: 24-month outcomes of treatment strategies for ADHD. *Pediatrics*, 113, 754-761.
- NICE. (2006). Technology Appraisal 98: Methylphenidate, Atomoxetine, and Dexamfetamine for ADHD in children and adolescents. [www.nice.org.uk](http://www.nice.org.uk).
- Office for National Statistics. (1995). *Standard Occupational Classification* " 2<sup>nd</sup> Edition. London: HMSO.
- Paternite, C.E., Loney, J., Salisbury, H., Whaley, M.A. (1999). Childhood inattention-overactivity, aggressions, and stimulant medication history as predictors of young adult outcomes. *Journal of Child and Adolescent Psychopharmacology*, 9, 169-184.
- Sharp, W.S., Walter, J., Marsh, W.L., Ritchie, G.F., Hamburger, S.D., & Castellanos, FX. (1999). ADHD in girls: clinical comparability of a research sample. *Journal of the American Academy of Child and Adolescent Psychiatry*, 38, 40-47.
- Steinhusen, H.C., Drechsler, R., Foldenyi, M., Imhof, K., & Brandeis, D. (2003). Clinical course of attention-deficit / hyperactivity disorder from childhood toward early adolescence. *Journal of the American Academy of Child and Adolescent Psychiatry*, 42, 1085-1092.
- Stiffman, A.R., Horwitz, S.M., Hoagwood, K., Compton, W., Cotter, L., Bean, D., Narrow, W., & Weisz, J.R. (2000). The service assessment for children and adolescents (SACA). Adult and child reports. *Journal of the American Academy of Child and Adolescent Psychiatry*, 39, 1032-1039.
- Szatmari, P. (1992). The epidemiology of Attention-Deficit Hyperactivity Disorder. *Child and Adolescent Psychiatric Clinics of North America*, 1, 361-371.

- Taylor, E., Chadwick, O., Heptinstall, E., Danckaerts, M. (1996). Hyperactivity and conduct problems as risk factors for adolescent development. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35, 1213-1226.
- Taylor, E. (1999). Development of clinical services for Attention-Deficit/Hyperactivity Disorder. *Archives of General Psychiatry*, 56, 1097-1099.
- Wechsler, D. (1991). *Manual for the Intelligence Scale for Children- third edition UK, WISC-III(UK)*. Sidcup: The Psychological Corporation.
- Wechsler, D. (1993). *Wechsler Objective Reading Dimensions*. London: The Psychological Corporation.
- Willoughby, M.T. (2003). Developmental course of ADHD symptomatology during the transition from childhood to adolescence: a review with recommendations. *Journal of Child Psychology and Psychiatry*, 44, 88-106.
- World Health Organization. (1993). *The ICD-10 classification of mental and behavioural disorders; diagnostic criteria for research*. Geneva: World Health Organization.

**Table 1 Comparison of rates of socio-demographic characteristics and service use over the past 12 months among the epidemiological and CLASS samples**

Service	ADHD in community % (n=35)	Conduct disorder (no ADHD) in the community % (n=51)	Emotional disorder (no disruptive disorder) in the community % (n=41)	No disorder in the community % (n=109)	CLASS % (n=115)	P value
Mean age (standard deviation)	14.4 (1.9)	15.1 (1.8)	15.0 (1.8)	14.5 (1.9)	14.0 (1.7)	0.003
Female gender	20	35	44	49	7	<0.001
Mental health services	34	16	33	23	70	<0.001
Primary health care	17	22	42	34	62	<0.001
Secondary health care <sup>1</sup>	6	4	2	11	8	0.3
Schools <sup>2</sup>	31	37	37	38	71	<0.001
SEN professionals <sup>3</sup>	11	12	17	6	17	0.1
Social services	3	14	12	4	13	0.05
Police and youth justice	11	6	7	4	22	<0.001

1. Other secondary health care= contact with the school medical system, hospital and community paediatrics or adult secondary physical health care. 2. School contacts = teachers, Special Educational Needs Coordinators, learning support assistants and extra help from teachers. 3. SEN professionals = educational psychologists, educational social workers, and behavioral support workers.

**Table 2 Details of CAMHS service input in the past 12 months for the 80 young people in contact with CAMHS among the clinical sample.**

Professional discipline	% of CAMHS attendees seen <sup>1</sup>	Median number of appointments offered (inter-quartile range) <sup>2</sup>	Median duration of appointments in minutes (inter-quartile range) <sup>2</sup>
Nurse	23.8	2.0 (2.0-4.0)	13 (7-30)
Psychiatrist	90.0	2.0 (2.0-3.0)	30 (20-60)
Family therapist	1.3	6.0	60
Psychologist	2.5	1.5 (1.0-2.0)	75 (60-90)
Art therapist	1.3	25.0	60.0
Unspecified	1.3	3.0	13.0

1. Children could see more than one CAMHS professional, thus the total is more than 80. 2. Inter-quartile range gives the range of values that contains the middle 50% (ie. 25-75%) of responses.



**Table 3 Mental health related interventions reported by parents in the year preceding the Time 2 follow up in the clinical sample**

Source of help	Intervention	% (n= 115)
Informal services	Telephone help line	5.2 (6)
	Self help group	5.2 (6)
	Voluntary agency	9.6 (11)
	Internet	22.6 (26)
	Discussed with religious minister	0.9 (1)
Primary health care (All GP's)	Referred to specialist	2.6 (3)
	Prescribed drugs – specialist advice	52.2 (60)
	Prescribed drugs – own initiative	2.6 (3)
	Monitored growth / cardiovascular function	6.9 (8)
	Support / reassurance	8.7 (10)
Secondary health care (not mental health)	Assessment	0.9 (1)
	Advises / prescribed medication	1.7 (2)
	Advice on parenting	0.9 (1)
	Monitored growth / cardiovascular function	4.3 (5)
Mental health services	Assessment	0.9 (1)
	Prescribe / recommend medication	57.0 (65)
	Saw child alone	9.7 (11)
	Worked with family	67.0 (77)
	Saw parents alone	2.6 (3)
	Ordered investigation	0.9 (1)
	Monitored growth / cardiovascular function	63.5 (73)
Private mental health	Assessment	1.7 (2)
School	Statement of special educational need	26.1 (30)
	Extra help in classroom	22.6 (26)
	Extra help in small group out of class room	7.8 (9)
	Extra help 1:1 outside class room	6.1 (7)
	Special unit within mainstream school	1.7 (2)
	Special school	7.0 (8)
Social services	Parents approached social services for help	11.3 (13)
	Social services assessment	6.1 (7)
	Allocated social worker	4.3 (5)
	Referral to other services	1.7 (2)
	Outreach worker	0.9 (1)
Police and youth justice	Police contact no formal proceedings	5.3 (6)
	1 or more formal cautions	10.5 (12)
	Conviction	2.6 (3)
	Probation / community service	0.9 (1)
	Youth justice worker	6.1 (7)
	In prison	0.9 (1)

**Table 4 Percentage of mental health related contacts with public sector services during the past twelve months according to the presence or absence of ADHD or hyperkinetic disorder (HKD) at Time 2 and the presence or absence of oppositional defiant disorder or conduct disorder (ODD/CD) at Time 1 in the clinical sample**

	No ADHD / HKD at Time 2 with <b>no</b> ODD/CD Time 1 (n=20)	ADHD / HKD at Time 2 with <b>no</b> ODD/CD at Time 1 (n=22)	No ADHD / HKD at Time 2 <b>and</b> ODD/CD at Time 1 (n=26)	ADHD / HKD at Time 2 <b>and</b> ODD/CD at Time 2 (n=47)	$\chi^2$ (p value)
CAMHS	45	91	62	75	11.8 (0.008)
Primary health care	45	73	50	70	6.4 (0.09)
Other secondary health care <sup>1</sup>	5	5	8	11	1.1 (0.8)
Social services	0	9	23	14	5.7 (0.1)
Police & youth justice	5	14	39	30	7.5 (0.03)
Schools <sup>2</sup>	55	82	50	85	13.9 (0.003)
SEN professionals <sup>3</sup>	0	18	19	23	5.5 (0.1)
Statement	10	23	31	36	5.2 (0.1)
Mainstream school / college	90	83	62	84	To many cells with small numbers to test reliably
Special unit in mainstream	0	4	0	2	
Special school / college	0	13	14	6	
In employment	10	0	14	2	
PRU <sup>4</sup> or permanently excluded	0	0	10	6	

1. Other secondary health care = contact with the school medical system, hospital and community paediatrics or adult secondary physical health care. 2. School contacts = teachers, SENCO's, learning support assistants and extra help from teachers. 3. SEN professionals = educational psychologists, educational social workers, and behavioral support workers. 4. PRU = pupil referral unit.