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SPECIAL ARTICLE

Age of onset of mental disorders and use of mental health services: needs, opportunities and obstacles

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Purpose of review. In this review, we provide an update of recent studies on the age of onset (AOO) of the major mental disorders, with a special focus on the availability and use of services providing prevention and early intervention.

Recent findings. The studies reviewed here confirm previous reports on the AOO of the major mental disorders. Although the behaviour disorders and specific anxiety disorders emerge during childhood, most of the high-prevalence disorders (mood, anxiety and substance use) emerge during adolescence and early adulthood, as do the psychotic disorders. Early AOO has been shown to be associated with a longer duration of untreated illness, and poorer clinical and functional outcomes.

Summary. Although the onset of most mental disorders usually occurs during the first three decades of life, effective treatment is typically not initiated until a number of years later. There is increasing evidence that intervention during the early stages of disorder may help reduce the severity and/or the persistence of the initial or primary disorder, and prevent secondary disorders. However, additional research is needed on effective interventions in early-stage cases, as well as on the long-term effects of early intervention, and for an appropriate service design for those with emerging mental disorders. This will mean not only the strengthening and re-engineering of existing systems, but is also crucial the construction of new streams of care for young people in transition to adulthood.

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Introduction

In all areas of medicine, the study of the age of onset (AOO) of illnesses has attracted increasing interest over time. As Kessler *et al.* (2007) observed, the study of the AOO enables us to calculate the projected lifetime risk of disorders, and makes it possible to capture the topography of onset and clarify disorder aetiopathogenesis, so that primary prevention, prevention of secondary disorders and early intervention strategies can be targeted in an efficient, timely and cost-effective manner.

Epidemiological data about AOO, however, face several problems: retrospective reports from community-based surveys, typically of an incomplete range of disorders, are often hampered by recall bias, making uncertain the timing of the disorder onset, and retrospective measures of treated incidence samples even for psychotic disorders are known to be incomplete. Certainly for the mood, anxiety, substance use and personality disorders, where treated incidence and prevalence are low as a proportion of the total, AOO data ascertained this way may be of uncertain accuracy. Moffitt *et al.* (2010) provided a clear example of these problems. The authors followed up the representative 1972–1973 Dunedin New Zealand birth cohort (n = 1037) to age 32 years (achieving a 96% retention), and compared it with the National New Zealand Mental Health Survey (NZMHS), as well as with two US samples. The prevalence of lifetime disorder at the age of 32 years approximately doubled in prospective as compared with retrospective data for all four disorder types. In the case of children and adolescents, Angold *et al.* (1996) showed that when symptoms have persisted longer than 3 months, the month of onset usually cannot be accurately reported, while with symptoms lasting a year or more, even the year of onset is usually uncertain.

This paper reviews recent studies about AOO, and its relationship with treatment delay, with special attention to studies that relate onset to the prospects for prevention and early intervention.

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When do disorders start?

Most mental disorders begin in adolescence and early adulthood, with these disorders now revealed as the major contributors to the burden of disease in young people (Murray & Lopez 1996; McGorry *et al.* 2007*a*, *b*, 2008). In a recent *Lancet* paper, Gore *et al.* (2011) described the Global Burden of Disease (GBD) in young people analysing all-cause and cause-specific disability-adjusted life-years (DALYs) across global regions for people aged 10–24 years. They used data from WHO's 2004 GBD, and found that the total number of incident DALYs in those aged 10–24 years represents 15.5% of total DALYs for all age groups. Moreover, the main cause of DALYs for 10–24-year-olds was neuropsychiatric disorders (45%) and the main risk factor was alcohol (7% of DALYs).

In the National Comorbidity Study Replication, Kessler *et al.* (2005) found that half of all lifetime cases started by the age of 14 years and three-fourths by the age of 24 years. Later onsets were mostly of comorbid conditions, with estimated lifetime risk of any disorder at age 75 years (50.8%) only slightly higher than observed lifetime prevalence (46.4%). The patterns for mental and substance use disorders are virtually the mirror image of those seen in the chronic physical disorders, which prompted Insel & Fenton (2005) to characterize mental disorders as the 'chronic diseases of the young'.

The case of mood and anxiety disorders

Epidemiological studies consistently indicate that anxiety disorders are among the most prevalent mental disorders among children, with cross-sectional studies showing that up to 20% of paediatric patients score above the identified clinical cut-offs for one or more anxiety disorders (Rockhill *et al.* 2010). Anxiety disorders have relatively equal prevalence rates among young boys and girls, but then become more common in females, with a 2:1–3:1 female preponderance by adolescence (Rockhill *et al.* 2010).

Separation anxiety disorder (SAD), with prevalence approximately 5% before puberty, represents the only specific anxiety disorder that primarily occurs in children and adolescents, but not in adults; social phobia and generalized anxiety disorder (GAD) frequently co-occur with it; the latter become more prevalent during adolescence, again with rates around 5%. While the overall rate of anxiety disorders changes relatively little from childhood to adolescence, the nature of disorder does, with SAD most common in young children, whereas social phobia is most common in adolescence (Pine, 2009). In general, while some anxiety disorders have a median AOO within childhood (particularly specific phobias and separation anxiety), most of the high prevalence anxiety disorders typically emerge during early adolescence and early adulthood.

In a 14-year follow-up of 1580 subjects aged 4–16 years (Roza *et al.* 2003), anxiety disorders were more frequent than mood disorders until the age of 25 years, both in males and females. After the age of 25 years, the cumulative incidence of anxiety disorders did not increase, in contrast to the cumulative incidence of mood disorders. Adolescent onset of anxiety disorders is also associated with more severe and disabling forms of these illnesses (Paus *et al.* 2008).

The National Comorbidity Survey Replication-Adolescent Supplement (NCS-A) reported prevalence and onset data on 10 123 adolescents in the USA using a modified version of the CIDI. Anxiety disorders were the most common (31.9%), followed by behavioural disorders (19.1%), mood disorders (14.3%) and substance use disorders (11.4%); the overall prevalence for any disorder with severe impairment and/or distress was 22.2%. The median AOO was 6 years for anxiety disorders, 11 years for behaviour disorders, 13 years for mood disorders and 15 years for substance use disorders. Given that the upper limit of the sample was censored at 18 years, therefore excluding later onsets, these figures must be interpreted cautiously in terms of defining the span and focus of prevention and early intervention efforts, which must extend from childhood through to the mid-20s at least on the basis of Kessler *et al.*'s findings (Kessler *et al.* 2005).

In Germany, a prospective, longitudinal follow-up study (over 7–10 years) evaluated 3021 participants aged 14–24 years at baseline assessment. The AOO distributions of anxiety varied according to the type of disorder, with social and specific phobias typically emerging during childhood, compared to GAD and panic disorder, which characteristically emerged in adolescence and early adulthood. The latter pattern of onset was similarly observed for depressive disorders (Beesdo *et al.* 2010).

Several studies have examined correlations between the AOO of depression and the course or nature of illness, with an earlier onset associated with more chronic illness (Angst *et al.* 2009), a greater number of depressive episodes among females, but not males (Essau *et al.* 2010) and longer episode duration, increased suicidality and need for hospitalization (Korczak & Goldstein, 2009). In the large sample ($N = 89\,037$) of the WMH Survey Initiative, data from 18 countries were analysed and the average AOO, ascertained retrospectively, was 25.7 in the high-income and 24.0 in low- to middle-income countries. The female:male ratio was about 2:1, and in

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high-income countries, younger age was associated with higher 12-month prevalence (Bromet *et al.* 2011).

Of particular concern from an early intervention perspective, the latency to treatment initiation was found in one study to be significantly longer in those with childhood (mean = 12.9 years) and adolescent onset (mean = 6.3 years) compared to adult-onset depression (mean = 2.4 years) (Korczak & Goldstein, 2009). Given the well-documented adverse outcomes associated with prolonged duration of untreated psychosis (DUP) (Marshall *et al.* 2005), this finding underscores the need for greater early identification and intervention in emerging depressive disorders (Hetrick *et al.* 2008). Also intervening with subthreshold symptoms in adolescents might be effective in reducing the risk of full-syndrome depression (Garber *et al.* 2009).

Another important area for early intervention, and one in need of careful study of the AOO, is bipolar disorder (Hamshere *et al.* 2009; Perlis *et al.* 2009; Baldessarini *et al.* 2010; Tijssen *et al.* 2010). Several studies have utilized large, multicentre samples, ranging from 1369 (Hamshere *et al.* 2009) to 3658 (Perlis *et al.* 2009) subjects, recruited to clinical trials or other studies of bipolar disorder. Many onsets occurred in the 20s of study subjects, and in all studies earlier onsets showed greater severity and other defining clinical characteristics. Tijssen *et al.* (2010) took a different perspective, sampling adolescents ($n = 1395$) between 14 and 17 years and following them up for up to 10 years. They found that experiencing (hypo) manic symptoms is a common adolescent phenomenon that infrequently predicts (current) mental health care use.

The case of substance use disorders

Epidemiological studies have consistently shown that prevalence of alcohol and drug use and abuse increases with age during adolescence and peaks in early adulthood. Vega *et al.* (2002) compared lifetime prevalence and age of first use (onset) for alcohol, cannabis and other drugs in six international sites. In their sample ($N = 27\,255$), age of first use was similar across study sites: in particular, alcohol use onset increased at the age of 11 years, and the curve accelerated in mid-adolescence to a peak age of 18 years. This was followed by a rapid decrease in new onsets during early adulthood (the early 20s) and a gradual tapering off thereafter. Cannabis had a short but intense onset period with rapid acceleration of first use between mid- and late adolescence, then a rapid decrease after the age of 16–18 years, while drugs other than alcohol and cannabis had a longer onset curve, with lower onset rates during adolescence, but new onsets extending into middle adulthood (peak age of first use in all sites occurred at the age of 18 years).

Degenhardt *et al.* (2008) assessed substance use disorders using a large dataset from 17 countries participating in the WMH surveys ($N = 43\,249$). Results shows a remarkable similarity in the AOO distributions for specific types of drug across countries: the median AOO for substances was: alcohol between 16 and 19 years for all countries (with the exception of South Africa: 20 years), cannabis between 18 and 19 years (except for Nigeria and Israel: 22 years; Lebanon: 21 years) and cocaine between 21 and 24 years.

Childhood and adolescent conduct disorder have strongly been associated with both early initiation and progression in different types of substance use and abuse (Rutter *et al.* 2006; Goodman, 2010). Indeed in a recent US study, Slade *et al.* (2008) found that having a substance use disorder by the age of 16 years was associated with higher risk of incarceration for substance-related offenses in early adulthood and with more extensive criminal justice system involvement, as compared with having no disorder or having a disorder beginning at a later age.

In the 10-year prospective German study mentioned earlier ($N = 3021$), Behrendt *et al.* (2009) studied the association of early substance use (e.g. alcohol, nicotine or cannabis) in adolescence and the risk of developing substance use disorders. Their findings show that first alcohol use mainly occurred between the age of 10 and 16 years, first nicotine use between the age of 11 and 17 years and first cannabis use between the age of 14 and 19 years; overall early substance use was associated with an elevated risk of substance use disorder for all the substances considered.

These findings again underscore the need for early, targeted interventions for substance and alcohol-related disorders among young people especially.

The case of psychotic disorders

Disorder-specific estimates of AOO distributions for affective and non-affective psychotic disorders have not been separately reported in any of the WMH surveys, or in any other surveys of common mental disorders, due to the under-representation of these cases in community surveys.

In a Danish registry study (Thorup *et al.* 2007), two cohorts were established by linking data from the Danish Civil Registration System with data from the Danish Psychiatric Central Register, which covers all incident cases of schizophrenia from 15 to 71 years. The authors estimated the gender- and age-specific incidence rates of schizophrenia for people aged up

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to 71 years. The median age at onset for males and females was 27 and 29 years, respectively. Despite their somewhat divergent findings, these studies that cover most of an individual's life span suggest that the median AOO of schizophrenia for males is in the late 20s and for females is in the mid-30s.

In the well-known ABC cohort study, Häfner *et al.* (1998) found that, in a sample of 232 subjects with schizophrenia, 21% experienced disorder onset (defined as the first psychotic symptom) by the age of 21 years, 59% in the age range of 21–35 years and only a fifth after the age of 35 years. A consistent result of this study was a 3–4 years higher AOO for women by any definition of onset, which was not explainable by social variables, such as differences in the male–female societal roles, but related perhaps to a protective effect of oestrogen (Häfner, 2003).

Data about the AOO also come from selected, rigorous epidemiological studies on the incidence of schizophrenia. In the well-known WHO multinational DOSMED study (Jablensky *et al.* 1992), 70% of male patients and almost 60% of female patients had illness onset before 25 years of age.

Finally, in a recent study aimed at comparing the long-term outcome in 723 consecutive first-episode psychosis patients (age range of 14–30 years), Amminger *et al.* (2011) found that the mean age of patients with adult (e.g. after the age of 18 years) onset was quite low (22.6 years). They found that individuals with an early onset who received early intervention and treatment had significantly fewer positive symptoms and significantly superior functioning on measures assessing global, social/occupational and community functioning compared to patients with adult-onset disorder, equally treated. Their findings suggest that early detection and specialized treatment for first-episode psychotic patients may specifically improve long-term functional outcome, and to some extent symptomatic outcome in people with early-onset schizophrenia as compared to adult-onset schizophrenia.

Meta-analytic evidence also indicates that younger age at the onset of schizophrenia is associated with a positive family history for psychosis (Esterberg *et al.* 2010) and that the AOO of psychosis for cannabis users is 2.7 years younger than for non-users (Large *et al.* 2011). Heavy use of cannabis in adolescence is also associated with a substantial increase in the risk of experiencing psychotic episodes (Kuepper *et al.* 2011). Moreover, in the Dunedin Longitudinal Study, self-reported symptoms about delusional beliefs and hallucinatory experiences at the age of 11 years were significantly associated with an increased risk of developing a schizophrenia-spectrum disorder by the age of 26 years (Rutter *et al.* 2006).

Studies conducted in minors recruited from child psychiatric settings have emphasized a relationship between the AOO of schizophrenia and the course of illness, with earlier onset (before 18 years of age) possibly associated with a more chronic form of the disorder (for reviews, see Kyriakopoulos & Frangou, 2007; Vyas *et al.* 2011), and more severe cognitive deficits (Rajji *et al.* 2009), with impairments in general intellectual ability (IQ), attention, executive function and memory consistently found in early-onset cases of schizophrenia (Frangou, 2010).

These findings support the view that severity of the disease process may be associated with different ages at onset; indeed late adolescence is likely to reflect a critical period in brain development, making it particularly vulnerable for the onset of psychopathology (Walker *et al.* 2004; Paus *et al.* 2008).

However, the traditional reluctance of child and adolescent psychiatrists to assign severe psychiatric diagnoses to minors could contribute to an overrepresentation of more severely ill chronic cases (Krausz & Muller-Thomsen, 1993). This diagnostic reluctance, combined with a hesitancy to prescribe antipsychotic medication, inevitably increases the DUP and may contribute to poorer outcome in people with earlier onset. Therefore, such hesitancy, particularly in many child and adolescent mental health services, should be reassessed.

Social inequalities and individual resilience

In a project sponsored by the WHO Regional Office for Europe, an expert group has summarized the evidence on social determinants of health, and has identified 10 main variables that can affect people's health (Marmot, 2005): among these, eight have a direct, and often profound influence on people's mental health, namely the social gradient, stress, early life, social exclusion, work, unemployment, social support and substance use. Although there is no space for a thorough discussion of all these factors, we point to the relevance of Socio-Economic Status (SES) as potential risk factor for a variety of mental health outcomes. For instance, a growing body of meta-analytical work suggests that higher incidence and worse outcomes of psychotic disorders are associated with growing up in an urbanized area, being in a minority group position, using cannabis and suffering from developmental trauma (van Os *et al.* 2010).

The association between family Socio-Economic Position (SEP) and mental health problems among adolescents has been studied in a large cohort ($N = 2230$) enrolled in the TRAILS study: the authors found that in early adolescence the risk of mental health

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problems increased with decreasing SEP, particularly in the case of externalizing problems (Amone-P'Olak *et al.* 2009). Van Oort *et al* (2011) have studied the association between SES and emotional and behavioural problems comparing a US cohort ($N = 833$) and a Dutch cohort ($N = 708$) of youths. Although the healthcare systems differ between the US and The Netherlands, socio-economic disparities in emotional and behavioural problems were similar: in both countries, lower SES predicted cumulative prevalence rates for externalizing problems (withdrawn and aggressive behaviour).

In their review, Fryers *et al.* (2003) have identified several studies providing evidence of an association between markers of a less privileged social position (especially unemployment, less education and low income or poor standard of living) and higher prevalence of common mental disorders; moreover, they have also shown that a low SES has a potential to worsen mental disorders; a similar conclusion has been drawn by Amaddeo & Jones (2007); the latter authors have also stated that the precise factors linking SES and service utilization are still unclear.

Although these social variables are of great importance in shaping individual exposure to risk factors and enhancing healthy individual development, it is open to discussion what should be the role of psychiatrists and other mental health professionals in the wider social context to promote societal changes: do they have a direct duty to change (or promote the change of) the social environment? Is this a commitment directly linked to their profession? Or should they mainly be concerned about the correct application of their specific knowledge and skills, as it has been well described by Rosen (2006)? Moreover, despite the abundant literature on social factors and mental health, the precise boundary between mental health care and social work has never been well clarified (Carpenter, 2002).

The discussion so far has had a focus on social variables: on the other hand, the notion of resilience deals with the individual 'relative resistance to environmental risk experiences, or the overcoming of stress or adversity' (Rutter, 2006). This author has eloquently described the theoretical knots to be faced in conducting research on resilience. Luthar *et al.* (2006) have provided thoughtful inputs for this kind of investigations: studies on resilience should assign priority to 'factors that are salient in that particular life context', affecting a large number of people; attention should be given 'to indices that are relatively malleable. . . ., that tend to be relatively enduring in a child's life. . . ., that are generative of other assets'. These authors have stressed that an extensive body of research on childhood resilience shows that 'a strong, enduring relationship with at least one caring adult' meets all these criteria.

Specific interventions to increase resilience in children and adolescents through parenting and early interventions, and programmes for children at risk for mental disorders such as those who have a mentally ill-parent or have suffered parental loss or family disruption, have also shown to increase mental well-being and decrease depressive symptoms and the onset of depressive disorders (Saxena *et al.* 2006). Research in this area has to be strengthened, both in terms of better methodology and in clarity of objectives.

The continuity of psychopathogy

The research evidence reviewed abundantly here demonstrate that a large proportion of mental disorders commence in childhood, adolescence and early adulthood. Some may argue that, in the context of obvious maturational changes occurring at those life stages, mental disorders can remit, paving the road to a healthy adulthood. However, there is strong evidence pointing to a high level of continuity between childhood/adolescent and adult psychopathology.

Costello *et al.* (2003) analysed data on a representative sample of 1420 children aged 9–13 years at intake and followed them up until 16 years, examining also homotypic and heterotypic continuity. Their results showed that at any time, 1 in 6 will have a psychiatric disorder, and at least 1 in 3 will have experienced a mental disorder by the age of 16 years. Moving from childhood to adolescence, there was a rise in rates of depression and social phobia in females, which was not observed in males, while in middle adolescence the increase in substance abuse in both sexes was dramatic. During this period there was also a modest increase in panic disorder and GAD.

In another prospective investigation ($N = 1037$), Kim-Cohen *et al.* (2003) found that half of the individuals who met criteria for a major DSM-IV diagnosis at 26 years, first had a diagnosable disorder at 11–15 years of age, and three-quarters had a first diagnosis before 18 years. Adult disorders were generally preceded by their juvenile counterparts (e.g. adult anxiety was preceded by juvenile anxiety: homotypic continuity), and also by different disorders (e.g. heterotypic continuity).

Conduct disorders in childhood or adolescence are strong markers of adult psychopathology: in a group of 578 male and 674 female twins, McGue *et al.* (2006) found that early adolescent problem behaviour identified a subset of youth at especially high (and generalized) risk for developing adult psychopathology.

In a cohort study, Reef *et al.* (2009) found that almost one-fourth of 1365 children categorized as deviant

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were still regarded as deviant at 24-year follow-up. Out of all childhood problems, primarily anxious/depressed problems, aggressive behaviour and delinquent behaviour showed the strongest associations with adult psychopathology. Not surprisingly, the strongest predictor for adult internalizing problems were anxious and depressed problems in childhood, and the best predictors for adult externalizing problems was childhood delinquent behaviour.

The current evidence about the continuity of psychopathology highlights the strong need for effective, early interventions in young people in order to foster secondary and tertiary prevention and minimize the risks of chronic, disabling courses of mental disorders.

Treatment delay and characteristics of adult treatment samples

In the WMH Survey initiative, delay to treatment has been carefully investigated cross nationally. Although in some countries the majority of people with lifetime disorders eventually make treatment contact with any (health or non-health) helping agency, there is tremendous between-country variation, less for mood disorders (88.1–94.2%) than for anxiety (27.3–95.3%), impulse control (33.9–51.8%), or substance disorders (52.7–76.9%). However, delay among those who eventually made treatment contact was significant, ranging from 6 to 8 years for mood disorders and 9–23 years for anxiety disorders. In this large dataset, poor access to treatment and delay among those who eventually made treatment contact were both associated with early AOO, being in an older cohort, and having selected socio-demographic characteristics such as being male, married and poorly educated (Wang *et al.* 2005).

Christiana *et al.* (2000) used self-report data from 3516 members of advocate groups for patients with anxiety or mood disorders in 11 European countries to study time to initial professional help-seeking after incident episodes. In all cohorts and all countries, time for initial help-seeking was inversely related to illness AOO.

Data about the socio-demographics of patients in treatment in Italy are of particular interest, since this country has closed all large Mental Hospitals starting in 1978, and since then embarked on providing a full network of community-based services for patients with mental disorders. We have comprehensive data from two registries covering two large regional areas: Lombardy (9 742.676 inhabitants) and Emilia-Romagna (4 337.979 inhabitants). In Lombardy, the rate per 10 000 population of patients in treatment with any public mental health service in 2005 (last year with available data) was 72 for males and 80 for females aged 15–24 years. The rates increased in parallel with aging (e.g. 139 for males and 142 for females aged 25–34 years; 155 for males and 180 for females aged 35–44 years, etc.). Even the treatment rates of males and females aged 65+ years were higher than rates for young people aged 15–24 years (Lora, 2008). The same report underlines that the percentage of new patients in contact with services has been decreasing, while the mean age of treated patients has been increasing. In the Emilia-Romagna Region, rates of patients in treatment at adult mental health services were 132.8 per 10 000 among people aged 18–24 years; however, treatment rates were almost double for those aged 45–54 years (226.6 per 10 000). Despite the peak AOO of mental disorders being in adolescence and young adulthood, patients in this region aged 18–34 years represent only 20% of the total of patients in treatment: the bulk consists of older adult patients (Bignami *et al.* 2008).

Although these data are cross sectional, they show that even in a country with extensive community mental health services like Italy, access to treatment is highest among older patients, with people aged 18–30 years being the minority. This may either mean that patients access treatment after a long delay since the disorder onset, or that many patients show a chronic course, despite having contacted services early: all available data seem to point to the former option.

Treatment issues for youth psychopathology

As most mental disorders emerge in childhood, adolescence and early adulthood, the state of Child And Mental Health Services (CAMHS) should be of primary concern to any mental health professional. The provision of CAMHS internationally is inconsistent, with Shatkin & Belfer's (2004) systematic survey finding that only 7% (14 of 191) of countries worldwide had a clearly articulated specific (e.g. stand-alone) child and adolescent mental health policy. Similarly, Costello *et al.* (2005) highlighted that in the US, one-fourth of the youngest population receive one-ninth of the treatment dollars.

A recent large US study examined the patterns of mental health service use by young people (16–25 years) based on a nationally representative 1997 Client/Patient Sample Survey and on population data from the US Census Bureau (Pottick *et al.* 2008). The annual rate of use of inpatient, outpatient and residential services was 34/1000 for 16- and 17-year-olds, and 18/1000 for 18- and 19-year-olds, rates that are considerably lower than the existing prevalence rates for mental disorders at this age. This confirms a paucity of service utilization just at the time when serious

mental health problems are beginning to emerge (Singh, 2009).

In Australia, Burgess *et al.* (2009) examined 12-month rates of service use for mental health problems and disorders in the general Australian adult population. Overall, 11.9% of the adult population made use of any services for mental health problems in a 12-month period and only 34.9% of people meeting diagnostic criteria for mental-disorder-accessed treatment services. However, people in the youngest age group (16–24-year-old), who had the highest rates of diagnosable mental disorder, concomitantly had the lowest rates of service access and use.

In most developed countries, both child and adolescent mental health service and adult services use rigid age cut-offs to delineate service boundaries, which create discontinuities in provision of care. In the US, a survey of transition provision (e.g. between CAMHS and adult services) within 41 states found that a quarter of child services and half of adult services offered no transition support (Singh, 2009); in particular, many 16–18-year-olds failed to receive support and care during this difficult transition period. Young people with ongoing mental health problems who did not meet criteria for serious mental disorders were specifically excluded from adult services (Costello *et al.* 2005).

Moreover research indicates that young people tend to not seek professional help for mental health problems. Rickwood *et al.* (2007) found that young men tend to be even more reluctant to seek help than young women. Young people are generally more inclined to seek help if they have some knowledge about mental health issues and sources of help; feel emotionally competent to express their feelings; and have established and trusted relationships with potential help providers (e.g. school counsellors). Additional factors facilitating contact with services and seeking professional help among young people include the belief that mental health problems can have adverse consequences, that treatment can help, and that mental health problems have intra-psychic causes (Vanheusden *et al.* 2008).

Using data from a large longitudinal study of Dutch adolescents, Amone-P'Olack *et al.* (2010) investigated the association between different indices of family socio-economic position and use of mental health services: they found that adolescents were particularly more likely to use specialty mental health services with increasing levels of maternal education, but only when in the analyses the severity of mental problems was accounted for. Incomplete emotional literacy also appears to be an important barrier to service use among young people, and is an adjunct to mental health literacy. Specific beliefs about the need for professional help appear to be particularly strong barriers to seeking mental health care (Wilson *et al.*, 2011)

Policy planners should carefully consider these barriers and facilitators in sketching new services for children and adolescents. An example of a new initiative that has taken such factors into account is the Australian National Youth Mental Health Foundation, called headspace. Created in 2006 in response to the recognition that the existing health system needed to be more accessible and effective for young people aged 12–25 years, the Australian Federal Government funded a network of initially 30 (soon to be 90) youth mental health services that are specifically designed to be 'youth-friendly', to improve access to treatment, particularly early intervention for sub-threshold conditions in order to create greater cohesion among service providers who work with young people experiencing mental health problems (including not only clinical staff but also drug and alcohol services, youth workers and vocational/employment support). Initial service use data show that the headspace is improving access to care for young people, including young males who constitute 40% of the treated population. Furthermore, the majority of referrals to headspace comprise self-referrals from young people, followed by family or school counsellor referrals. Therefore, the bulk of headspace clients are actively help seeking, and despite the EI focus of the initiative, many already meet the diagnostic criteria for a psychiatric diagnosis or have high levels of psychological distress that attest to their need for care. That young people (both with and without experiences of mental health services) actively participate in shaping the design of headspace centres and treatment services (including sitting on interview panels to hire clinical and administrative staff) likely explains some of the success of headspace being regarded by young people as a youth-friendly and appropriate service for their needs. Formal evaluation will determine the impact of this initiative on improving health and social outcomes for the target population.

Conclusion and implications: avertable burden, coverage and timing of interventions

Prevention and early intervention are unquestionably the keys to reduce the burden of disease among children, adolescents and young people. Delay in the start of treatment can have multiple deleterious consequences, and mental health professionals should be well aware of this.

Public education campaigns to improve mental health literacy and help-seeking are the first step to

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increase coverage and access (Wright *et al.* 2006; Joa *et al.* 2008). Progressively scaling up the capacity of the health system, both the primary and specialist tiers of care, with easy access to care, assertive mobile detection strategies for 'hard to reach' cases, and genuine integration of multidisciplinary and age appropriate care are achievable objectives.

The topography of onset and impact of disorder means that if we are going to shrink the avertable burden of mental disorders, reduce suffering and improve productivity across the critical adult years of life, we must build strong, stigma-free and effective systems of care for children and young people up to the mid-20s (McGorry *et al.* 2007*b*; Patton *et al.* 2007). This means creating a novel youth mental health model overlapping with but discrete in culture and expertise from systems for younger children and older adults (McGorry, 2009). This reform is gaining ground in Australia (McGorry *et al.* 2007*b*, 2008; McGorry & Purcell, 2009), but similar programmes should be implemented everywhere. Prevention-oriented evidence-based programmes for younger children are also critical (Dadds *et al.* 1997; Sanders, 2008; Rapee *et al.* 2010). Investment in this stage of life is essential to address the hard fact that treatment delay is much more likely to occur if the onset is in children or young people. AOO is a vital statistic to guide our future mental health policies.

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