

## Why Adolescent Health Matters

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**Fifty years ago**, the very notion of adolescence, teenagers and youth was only starting to be recognised as a ‘life stage’, with little appreciation of the significance of health issues affecting the young at this time. Even 30 years ago, if you had asked people to describe which life stage they thought was the healthiest, many would unthinkingly have said ‘adolescence’. At that time, in both high-income as well as low- and middle-income countries, the ravages of infectious diseases and congenital conditions were still disproportionately affecting the very young, such that under-5 mortality dwarfed mortality in all other age groups across the developmental age span.

Since then, dramatic reductions in infant and child mortality around the globe have brought a new focus on the health of adolescents and young adults as the 10- to 24-year-old age group has experienced far less improvement in their health when compared to both younger and older age groups. It is also appreciated that the burden of illness in adolescents differs greatly from that of infants and young children, as well as differing from older adults. In Australia, the impact of accidents and injuries increases dramatically across adolescence. Anxiety, depression, and eating disorders become more common across the adolescent years. Substance use peaks in young adulthood as does psychosis. Sexual health problems such as sexually transmitted infections become more prominent at this time.

Developmental disorders that have their onset in childhood, such as ADHD and autism, commonly persist into adolescence with different social consequences, as is also the case with the complications of congenital disorders such as prematurity. Many chronic physical conditions such as diabetes and epilepsy persist through adolescence but are similarly experienced differently, with one result being a high rate of comorbid mental disorder. The severity of other chronic conditions such as asthma may improve around puberty. However, functional somatic disorders such as migraine and abdominal pain are often experienced for the first time in adolescence, and commonly continue into adult life. This complex and changing profile of adolescent health is challenging for developing both clinical services, as well as comprehensive policy responses.

### **What is adolescence?**

Adolescence describes the developmental stage between childhood and adulthood.

Across time, whether adolescence has been appreciated as a distinct life stage or not, it has long been appreciated as a period that is challenging to adult society. For example, Socrates is reported to have written in 450 BC that: 'Our youth love luxury. They have bad manners and contempt for authority. They show disrespect for their elders and love idle chatter in place of exercise. Children are now tyrants not the servants of the household. They contradict their parents, chatter before company, gobble up their food and tyrannise their teachers.' In contemporary society, aware of young people's spending power, low levels of physical activity, high rates of obesity and frequent use of interactive and screen-based technologies, Socrates would no doubt feel quite at home within a group of contemporary parents, politicians or media commentators who repeatedly express concerns about the deteriorating 'moral compass' of the young. While it seems almost natural for older generations to be concerned about the ones that follow, and there is indeed reason for some concern,

it is also important to remember the tender age at which so many advancements have been made across the ages, whether the achievements are scientific (Charles Darwin was only 22 when he set sail on the HMS Beagle), sporting (at the age of 16 years, Jessica Watson set the record for the youngest person to sail solo around the world) or technical (Mark Zuckerberg was still a Harvard University undergraduate when he launched Facebook).

The onset of puberty has long been accepted as the starting point of adolescence, while key social and role transitions such as completion of education, achievement of relative financial independence, marriage and children historically marked the end of adolescence. These endpoints formerly occurred within the few years from the late teens to the early twenties and were fairly consistent with the achievement of legal maturity. Now, as young people commonly participate longer in education, stay at home longer and marry and have children later, the end of adolescence has become less distinct with a number of these social transitions more commonly occurring a decade later. Fifty years ago, for example, the mean age of first child-bearing in women was around 20 years; it is now 30 years. Another critical difference is that in comparison to earlier years which were typified by a relatively linear sequence to social and role transitions (eg completing secondary school, getting a job, getting married, having children), contemporary transitions are increasingly more complex, more interconnected, and less linear. Thus, a young person might take a gap year after completing secondary school, work part-time during tertiary studies, work fulltime for a few years before commencing further studies (that may be full-time or part-time), all the while living at home and being sexually active with a person they are unlikely to marry.

The World Health Organization (WHO) defines 'adolescence' as 10 to 19 years, while 'youth' is defined as the years between 15 and 24. Commonly these ages are combined with the more encompassing term 'young people', which most

widely refers to 10 to 24 year olds. Differentiation into early adolescence (10–14 years), mid adolescence (15–19 years) and early adulthood (20–24 years) is now being used more consistently as ‘cut-points’ to report global data by the WHO. This differentiation provides a more nuanced picture of the dramatically changing health profile across the adolescent and young adult years, while also enabling greater national and international comparison. Too often, combining adolescent data with that of younger children (e.g., 0–19 age cuts) or older adults (e.g., 15–35 age cuts) has been, albeit not intentionally, a mechanism that has rendered invisible the changing burden of health across this important life stage.

In Australia, as in many other developed countries, young people constitute about one in five of the total population. In 2009, for example, there were 3.9 million 12 to 24-year-old Australians, who constituted 18% of the population. The number of young people has been increasing over the last three decades, growing from 3.4 to 3.9 million between 1982 and 2009. However, due to increased life expectancy and low fertility, the proportion of young people of the total population has been steadily declining. In contrast, continuing high fertility rates in low and middle-income countries result in young people now constituting about one in three of the total population. As nine out of ten young people live in low and middle income countries, this results in a staggering number of young people globally. For example, by 2011, India is projected to have a population of 240 million 10 to 24-year-olds!

The majority of adolescents rate their own health, including their mental health, as good. Many adolescents describe the period of adolescence as enjoyable and exciting, and as a time of satisfaction in achieving many milestones, such as first relationships, completing school, getting a job and learning to drive. In contrast, adolescence is commonly viewed — at least by the media — as a period of turmoil. However it is a time of increased health risk, as the adolescent health and development is greatly influenced by the social and environmental context in which young people grow up. How young people

negotiate the adolescent and young adult years — in terms of how successfully or less successfully they transition into adult roles and responsibilities — is now appreciated to significantly affect their health and wellbeing, both in the adolescent and young adult years as well as into later adult life.

### **What is the burden of illness in adolescence?**

Mortality rates are a key measure of the health of a population. Yet until very recently, we lacked global data about this critical health indicator in adolescents. In 2009, the publication of a landmark study revealed that globally there are at least 2.6 million deaths in 10 to 24-year-olds annually.<sup>1</sup> It showed that there is a marked rise in mortality from early adolescence (10–14 years) through to mid adolescence (15–19 years) and into the young adult years (20–24 years). It also showed that there are major differences in the leading causes of death across the developmental years from early through late adolescence and young adulthood. While the reasons for this vary by geographical region and sex, there are consistent patterns globally. For example, mortality rates are almost fourfold higher in low and middle-income countries than in high-income countries. The highest mortality in the young is in sub-Saharan Africa.

The leading causes of death in the adolescent and young adult age group (see Table 1) are from accidents and injuries (both unintentional such as road traffic accidents and self-inflicted such as suicide), infections (including tuberculosis, meningitis and HIV/AIDS), socially related causes (such as violence, war and fire-related events), and environmentally related causes (such as drowning). Maternal conditions are a leading cause of female deaths in sub-Saharan Africa and South East Asian regions, but are less prominent in other countries. Importantly, the majority of deaths in adolescence are preventable, with prominent preventable causes of death being road traffic accidents, violence, self-inflicted injury, HIV/AIDS and tuberculosis.

**Table 1**  
10 Most Common Causes of Death by Age Group in Young People in Low- and Middle-Income Countries<sup>1</sup>

Rank	10–14 years	15–19 years	20–24 years	Total
1	Lower respiratory tract infections	Road traffic accidents	Road traffic accidents	Road traffic accidents
2	Road traffic accidents	Self-inflicted injuries	HIV/AIDS	Self-inflicted injuries
3	Drownings	Violence	Violence	Violence
4	Malaria	Lower respiratory tract infections	Self-inflicted injuries	Lower respiratory tract infections
5	Meningitis	Drownings	Tuberculosis	Tuberculosis
6	HIV/AIDS	Tuberculosis	Lower respiratory tract infections	HIV/AIDS
7	Tuberculosis	Fire-related	Fire-related	Drownings
8	Diarrhoeal diseases	HIV/AIDS	War	Fire-related
9	Protein-energy malnutrition	Leukaemia	Drownings	Meningitis
10	Self-inflicted injury	Meningitis	Maternal haemorrhage	War

In young Australians, the causes of death are different from the overall population, reflecting the influence that this stage of life has on the susceptibility to death from certain causes. Among all ages, cancer and cardiovascular diseases account for almost two-thirds of deaths. However, in 12 to 24-year-olds, injuries and poisonings are the leading cause, accounting for a similar proportion of deaths.<sup>2</sup> The three leading causes of deaths in young people have remained unchanged over the past few decades; injury and poisoning, cancers and diseases of the nervous system including cerebral palsy and epilepsy.

In addition to mortality as a key health indicator are the contributions to health and wellbeing from non-fatal conditions. This includes the continuation of conditions from infancy and earlier childhood, together with the contribution of conditions that have their first onset in adolescence. Many causes of ill health are more commonly psychosocial than biological in adolescence and tend to reflect unhealthy patterns of risk behaviours and mental disorders. These issues tend to cluster in individuals, are initiated or have their onset

in early adolescence and progressively increase in prevalence to early adulthood. Many of the consequences are not experienced until later adult life when they contribute to the adult burden of disease from chronic illness (eg the delayed effect of smoking on adult heart and lung disease). However, the resulting harms are preventable, with growing evidence that early detection and intervention can reduce ongoing negative effects.

Around one in five adolescents are estimated to have a chronic physical, developmental, behavioural, or emotional condition and also require health and related services beyond that required by young people generally. This includes about 10% of adolescents who are estimated to have a disability that causes some form of limitation or restriction. In Australia, there has been a true increase in the rate of serious chronic conditions due to the combination of improved survival of previously fatal conditions and a true increase in incidence of other conditions such as asthma, allergies and anaphylaxis, and immunologically-driven disorders such as type 1 diabetes and chronic inflammatory bowel disease, together with a rise in previously uncommon conditions such as obesity and its complications.<sup>3</sup> Young people with chronic health conditions experience comorbid risk behaviours and mental disorder at a higher rate than otherwise healthy young people. This has been described as a 'double whammy' of disadvantage, referring to the greater risk of poor outcome that commonly accompanies risk behaviours (such as tobacco, substance use and sexual behaviours) in the specific context of an underlying chronic condition (e.g., alcohol lowers the seizure threshold in young people with epilepsy).<sup>4</sup>

A snapshot of some of the major health issues affecting young people in Australia is summarised in the table below. The data refer to 12 to 24-year-old Australians unless otherwise stated and come from the latest Australian Institute of Health and Welfare report, 'Young Australians Their Health and Wellbeing 2011'.<sup>2</sup>

**Table 2**  
A Snapshot of Health Issues Affecting Australian Young People<sup>2</sup>

Health Issue	Frequency
Obesity and overweight	35% of young Australians were estimated to be overweight or obese: 23% overweight but not obese; 12% obese.
Risky substance use	11% of young Australians were daily smokers; 30% drank alcohol at risky or high-risk levels for short-term and 12% for long-term harm. One in 5 had used an illicit substance in 2007.
Emotional distress	9% of 16- to 24-year-old Australians had high or very high levels of psychological distress in 2007, and 1 in 4 had experienced a mental disorder.
Chlamydia notifications	Over the last decade, there has been a large increase in notifications for STIs, especially chlamydia, in which there has been a fivefold increase
Sexual intercourse	27% of Year 10 and 56% of Year 12 students had experienced sexual intercourse. 68% of sexually active students had used a condom at their most recent sexual encounter.
Violence	7% of young adults were victims of physical or sexual assault, and almost half were victims of alcohol- or drug-related violence.
Chronic health conditions	60% had a long-term health condition.
Disability	11% of 12- to 24-year-olds had a disability with specific limitations restrictions; a quarter of these had profound or severe core activity limitations.
Abuse and neglect	Four in every 1,000 young people aged 12 to 17 were the subject of a substantiated report of abuse or neglect. Indigenous young people were 'over-represented' at 5 times the rate of other young people.
Parent health	16% of parents living with young people rated their health as fair or poor, and around 1 in 5 had poor mental health. An estimated 16% of young people lived with a parent with a disability.
Civic engagement	Around 60% of 18- to 19-year-olds were registered to vote.

### **New understandings of adolescents and their health**

Adolescence has long been appreciated as a period of development marked by rapid changes in body size, shape and composition. Recent studies suggest that there may be other long standing effects of puberty as the transition through puberty marks the onset of health problems related to behaviour and emotional control.<sup>5</sup> Puberty is initiated in childhood with a cascade of endocrine changes that lead to sexual maturation and reproductive capacity. Its consequences for health and wellbeing are profound and paradoxical. On one hand, puberty propels the individual into dimorphic physical

maturation with peaks in strength and fitness. On the other hand, puberty is accompanied by a rise in emotional and behavioural problems with long lasting effects. Health problems include major affective and anxiety disorders, eating disorders, deliberate self-harm, tobacco and substance use, psychotic states and functional somatic disorders. A growing body of research shows that these problems do not emerge until the onset of puberty, and that these health and behavioural problems are strongly associated with pubertal stage (rather than chronological age). This has given rise to a view of puberty as a sensitive period, in which there is heightened sensitivity to social and environmental influences that become manifest as mental and behavioural disorders. The interest in puberty as a sensitive period especially relates to how these patterns of response might become biologically embedded or 'hard-wired' and thus more resistant to later interventions and how interventions at this critical time may alter this trajectory.

Recent advances in brain imaging technology have also helped contribute to new understandings of adolescents and their health. In contrast to earlier beliefs that the brain was fully formed by the end of childhood, there is now evidence that adolescence is a period of profound brain growth and change, with maturation continuing into the mid-20s.<sup>6</sup> Brain connections and signalling mechanisms selectively change during adolescence, with some of the most important changes taking place in the prefrontal cortex, the region responsible for organisational ability, strategic thinking and impulse control. At the start of puberty, thinning of the grey matter of the frontal lobes occurs as redundant synapses become 'pruned' and more efficient. This is accompanied by an increase in myelination, leading to enhanced speed and distance of neuronal signalling. Dopamine inputs to the prefrontal cortex also increase dramatically and may contribute to the development of more mature judgment and impulse control during adolescence. Age-related changes have also been observed in other areas of the brain. The relative importance of genetic and environmental factors

in influencing brain development in adolescence is yet to be established. However, the adolescent brain is more vulnerable to stress and environmental exposures, such as alcohol and other drugs, than previously appreciated.

We have also gained a stronger understanding about what interventions are effective in adolescence. For many years, adolescent-targeted prevention efforts largely focused on health education approaches. There is now increasing interest in interventions that target the social environment. Not only have these been shown to be more effective, but they can also benefit multiple domains of interest (in contrast to single domains, such as tobacco use or sexual activity for example) and are thus likely to be more cost effective. The leading study in this area is a Victorian-based randomised controlled trial known as the Gatehouse Project that showed that changes in the social environment in early secondary school could dramatically reduce young people's risks for multiple different risk behaviours, such as tobacco and substance use, early onset sexual intercourse and antisocial behaviours.<sup>7</sup> Within the school social environment the intervention aimed to increase young people's sense of safety and security and to increase their participation within the school. Thus the intervention focused more on the antecedents of risk (e.g., bullying and social isolation) rather than on any individual risk behaviours (e.g., tobacco use).

Finally, there is now more solid appreciation that particular groups of young people are at greater risk than others for poor health and life outcomes. In Australia, the socially marginalised and excluded such as indigenous and homeless young people, those living under protective or justice orders, and for example, unaccompanied refugees who have experienced violence in their country of origin, are increasingly recognised to have substantially reduced life chances than young people in general. Specifically the mortality rates of Australia's indigenous young people are closer to those in sub-Saharan Africa than to other Australians. And sadly, three years

after leaving the Victorian justice system, the mortality rate of male offenders is nine times higher than the baseline rate.<sup>8</sup> Indeed, the mortality rate of young offenders is higher than in equivalent age groups with those mental disorders that have the highest mortality such as schizophrenia and eating disorders. In this regard, in addition to thinking about what types of interventions are appropriate to universally deliver to the young, there is growing awareness of the value of targeting interventions to the most socially disadvantaged populations that have the greatest health risks and the most reduced life chances.

### **Clinical responses**

As shifting patterns of mortality have brought greater prominence to the adolescent and young adult age group, as the global burden of disease in adolescence is increasingly appreciated to stem from largely preventable causes, and as the complexity of health issues affecting the young has increased, so clinical and policy approaches need to reorient themselves to these problems. This, however, is an area that most health services around the globe, including Australia, are struggling with.

Australian general practitioners, as with other health disciplines around the world, say they lack knowledge, skills and confidence in working with adolescents when compared to other age groups.<sup>9</sup> Rigorous Victorian research has demonstrated that general practitioner skills and confidence can be increased by formal training in adolescent health.<sup>10</sup> In this regard it is pleasing that groups responsible for training health professionals such as the Royal Australian College of General Practitioners (RACGP) and the Royal Australasian College of Physicians (RACP) have started taking adolescent health more seriously. Given that over a quarter of the community based workload of general paediatricians relates to adolescent-aged patients aged 10 years and older,<sup>11</sup> it is timely that the RACP has recently committed to ensuring that all medical specialists in training (both adult and paediatric) will have access to training in adolescent health.

More widely though, the WHO has urged healthcare systems to become more oriented to the health issues and developmental challenges of working with young people. Using the framework of ‘Adolescent Friendly Health Services’, the WHO has urged health care systems to respond more urgently to the leading barriers experienced by young people in accessing health services. These barriers are largely service or system-level factors, and have been categorised in terms of service availability, accessibility, acceptability and equity.<sup>12</sup>

The relevance for Australia is that within 85% of GP encounters of young people for physical health problems lies an unidentified risk behaviour or mental health concern. We know that adolescents welcome the opportunity to discuss health issues such as contraception, substance use and sexually transmitted infection with health care providers and that they trust their advice. What we also know is that young people tend not to disclose risk-taking behaviours to health care providers unless asked about them, in part due to perceived barriers in accessing care such as the belief that such issues are not relevant for doctors or because of fear or embarrassment.

It is in response to these concerns that Australian researchers have asked whether in addition to changing the attitudes and skills of individual general practitioners, they can also change general practice as a system. The desired changes would make it more likely that young people who attend general practice — for whatever reason — would have a confidential environment provided in which they feel sufficiently safe to engage in assessment of their wider social and behavioural risks and in which the general practice is sufficiently supported to be able to respond. According to Associate Professor Lena Sanci, the lead researcher from the Department of General Practice at the University of Melbourne, the early data look promising. Studies such as these suggest that Australian general practice, which the majority of young Australians access at least annually, could become

more oriented to early intervention around a variety of health and developmental concerns in adolescents, such as sexual and reproductive health, tobacco and substance use, and mental disorders.

Beyond general practice, lie other health practitioners and health settings that are also important to reorientate to the changing epidemiology of youth health and of the changing demographics of their discipline. Not only do adolescents constitute over a quarter of the work of consulting general paediatricians, they also constitute about a fifth of the workload of children's hospitals.<sup>13</sup> Similarly, the training of nurses, of obstetricians and gynaecologists and of mental health professionals needs to change to better reflect that many of these clinicians also consult with adolescents and young adults as well as older adults.

Beyond discipline-specific expertise, multidisciplinary practitioners require common attitudes, knowledge and skills to provide 'adolescent friendly' healthcare to young people. This includes: knowledge of adolescent development and the changing burden of disease across the adolescent and young adult years; knowledge of the medico-legal context of working with young people and their '... families (especially as it relates to the provision of confidential health care to legal minors); skills to take a psychosocial history, provide anticipatory guidance and basic counselling; knowledge of when, where and how to refer young people with more significant concerns; and skills at building the capacity of young people to better look after their health as they mature'. A key challenge for child-focused clinicians who provide ongoing care to young people, regardless of the health problem of the adolescent or the discipline of the clinician, is the need to gradually shift their focus of engagement and communication from the parents to the young person themselves while maintaining communication with the parent. A key challenge for adult-focused clinicians is to appreciate that despite their physical maturation, many adolescents and young adults are still matur-

ing emotionally and cognitively and can still benefit from their parents being engaged with their healthcare in ways which are respectful of the young person.

The growing role of youth advisory committees within health services is an exciting way of ensuring that young people themselves can contribute to developing the type of clinical service that best meets their needs.

### **Policy responses**

How adolescence is viewed — whether as the healthiest stage of life or as an important developmental period through which a successful or less successful transition can majorly influence the future health and well being of adults and indeed, the next generation — has a major influence on how one views the significance of a comprehensive policy around adolescent health and development.

A key challenge for policy makers in Australia is to move beyond the current focus on single-health or single-risk issues to a more comprehensive policy around adolescent health and development at national and state levels of government. Currently, the policy environment is one in which the ‘noise’ that gets generated by the alignment of individuals, organisations and the media can result in sufficient traction within government to generate a new or particular policy focus, such as we have recently seen for youth mental health. While of course this feels positive, the history of previous advocacy efforts (e.g., sexual health, substance use, suicide prevention) has often been short-lived, insufficient policy responses that are commonly disconnected to ongoing investments by other levels of government, or that are even undermining of other interventions.

A downside of this reactive policy environment that responds to the ‘noisiest wheel’ of advocacy is that it most commonly results in a shifting policy environment without a sustained policy focus on adolescent health and development. Another limitation of this approach is how little focus there is on prevention efforts beyond the health sector. A further

concern is that while arguably over time, there is piecemeal investment in a range of different health problems affecting young people (e.g., tobacco, marijuana, psychosis, suicide prevention) this approach most obviously fails to deliver policy responses in relationship to the most socially marginalised and high-risk youth.

How might things change? As previously argued, data is a powerful mechanism to bring visibility to adolescent health and wellbeing. In Australia, the historical use of 14 years as the age at which childhood 'ended' — in terms of how data were commonly presented (e.g., 0–14, 15–34) — has been gradually changing. Indeed, the Australian Institute of Health and Welfare now publishes various reports that in their entirety 'cover all bases'. Thus, their 'Picture of Australia's Children 2009' spans the health and wellbeing of 0 to 14-year-old children, while the 'Young Australians Their Health and Wellbeing 2007' report spans 12 to 24 years. Their 2008 report 'Making Progress: the Health, Development and Wellbeing of Australia's Children and Young People' spanned 0 to 19 years. That's the good news. The frustration is that the available datasets on which they draw are commonly lacking coverage of the full age span covered by these reports, which limits their capacity to report on the key indicators of adolescent health and wellbeing. Thus, while national efforts to develop a minimum set of common indicators are warmly welcomed (and similarly needed by global organisations), until there is a data collection system that can populate these indicators, we will still not have the necessary data to fully understand the health and wellbeing of Australia's young.

Investments in Victoria provide a model for national action. The Victorian Child and Adolescent Monitoring System was recently established to support state government and community action by systematically monitoring how children and young people fare from birth to adolescence (0–19 years). The development of a set of agreed indicators preceded the development of a survey tool to measure adolescent health and

antecedent risk factors for poor health and life outcomes within family, peer, school and community domains. The large scale of the school-based survey (over 10,000 adolescents) allows reliable estimates to be provided to local government within metropolitan Melbourne and to regions elsewhere. This level of evidence will help promote more effective setting of priorities and more efficient allocation of resources. The assessment of antecedents to poor health will also promote prevention efforts being implemented beyond the health sector.

Data collection of this type will identify geographic 'hot spots' of risk, identifying areas that, for example, have high rates of violence, educational disengagement or substance use. This approach will also identify the proportion of 'high risk' individuals within different regions, whether they are deemed at high risk because of the extent that they report participating in a particular behaviour (such as substance use) or because of the extent of clustering of different behaviours within an individual. However, different approaches to school-based surveys are obviously needed to identify those young people who are most at risk by having prematurely disengaged with education.

As previously stated, it is the most socially marginalised of young people who commonly experience extensive clustering of risk behaviours and mental health states and who have the poorest life chances. This is also the cohort that is most likely to parent young. Generational cycles of disadvantage reinforce how important it is that these high risk populations are not ignored within the policy landscape. Arguably, efforts to ensure that all children have the healthiest start to life will start in adolescence before parenting has commenced. Currently, apart from the focus on indigenous health, there are few advocates for those young people with the most reduced life chances. The development of a comprehensive policy around the health and wellbeing of young people would go a long way to ensuring that we do not neglect the most disadvantaged adolescents, who we should remember, have the most to gain from such efforts.

### Endnotes

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