

## Addressing the Global Burden of Disease Attributable to 10-24 Year Olds

Adolescence is characterized by relatively low mortality. Young people entering adolescence have survived the ravages of infant and child mortality and most do not yet face the chronic health problems of middle age and the end of life. Age-specific global mortality is U-shaped: high in infancy, declining into the teen years before slowly rising with age (1). However, a recent series of reports has broadened our understanding of health and mortality among young people (2,3).

In 2004, 2.6 million deaths occurred among 1.8 billion young people 10-24 years worldwide; virtually all of these deaths (97%) were in low- and middle-income countries (2). Intentional and unintentional injuries are predominant causes of death in this group and these are exacerbated by urbanization, interpersonal violence, and access to weapons. HIV and tuberculosis are also prominent contributing to 11% of deaths in this age group. Mortality rises sharply between age 10 and 25 years. Additionally, mortality due to pregnancy-related causes (15% of deaths to females 10-24 years) rises sharply as young women enter the childbearing period.

While marked declines have occurred in child mortality over the past 50 years - particularly from communicable disease - declines have been much slower among young people (3). While in 1955, mortality among children and youth was highest among 1-4 year olds, by 2004, mortality rates among male youth (15-24 years) were 2 to 3 fold higher and among female youth mortality rates were the same as rates among 1-4 year olds. Compared to children, youth have benefited less from the epidemiological transition in the second half of the 20<sup>th</sup> Century (3).

In today's Lancet, Fiona Gore and colleagues (4) provide new estimates on the global burden of disease (GBD) among young people, 10-24 years, using cause-specific disability adjusted life years (DALYs) calculated by WHO region for the year 2004. The use of DALYs refines our understanding of mortality and morbidity by identifying both *years of life lost* due to premature mortality (YLL) and *years lost to disability* (YLD). The authors should be congratulated for marshaling a massive amount of data to generate these new estimates. This work is important in generating health status data by region and national income and by age of young people - as well as identifying leading risk factors for incident DALYs such as alcohol and other drug use, neuropsychiatric conditions, unsafe sex, and iron deficiency. These data show us that there is a greater disease burden related to disability (YLD) among young women compared to young men, while young men have a greater burden related to mortality (YLL). Neuropsychiatric conditions, respiratory diseases, and iron deficiency contributed substantially to disability, but less often to mortality. Not surprising, greater mortality is documented among poor countries; more surprising is the considerable disease burden from disability - even among higher income countries.

The report Gore et al, however, ultimately underestimates the disease burden attributable to ages 10-24 – as readily acknowledged by the authors. While DALYs provide a useful measure of the burden of disease at a specific age, they tell us little about the age period that contributes to the etiology of these diseases. While this limitation is a general problem of DALYs, it becomes particularly important when considering youth. Lifecourse epidemiologic perspectives are increasingly showing that a broad range of disorders of adulthood, including cancers, cardiovascular disease, and neuropsychiatric disorders, have their origins in childhood and youth. For example, tobacco use is most commonly initiated before age 20 but most of the disease burden related to tobacco is identified much later in the lifecourse. Therefore, population measures for assessing the health of young people need to consider the importance of this initiation of health risk behaviors and conditions during this lifestage. Alcohol and other drug use and unprotected sexual behaviors initiated during adolescence may have short-term or long-term health consequences. Initiation of smoking and establishment of unhealthy dietary and physical activity patterns have primarily long-term consequences.

Health promotion and disease prevention efforts with young people must recognize both the burden of disease among young people and the influence of risk behaviors at this age on health in later life. As such, health interventions should address the behaviors and social conditions that have both short- and long-term health consequences. Critical to health promotion for young people are interventions that enhance resilience and protective factors, such as efforts designed to increase adolescent connectedness to communities, schools and families (5). At the same time, targeted public health interventions are essential to reduce morbidity and mortality – e.g., enforcement of seat belt laws, redesign of cars, imposition of tobacco taxes, and distribution of condoms. Failure to act today will assuredly result in failure tomorrow.

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