Editorial

Reducing premature mortality among young and middle-aged adults

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The death of an individual in early and middle adulthood is an untimely event whose tragic effects are experienced by the parents, siblings, partners, children[1-3] and friends of the deceased individual. Preventing premature death is a foremost goal of health care and public health programs, and of society at large.

Premature mortality is a measure of unfulfilled life expectancy. While conventional definitions of premature mortality and Years of Potential Life Lost[4] include all people from birth to age 65[5] or 75[6] years, such designations obscure our understanding of factors preventable in adulthood. For example, deaths in childhood largely occur in infancy—due to birth defects and preterm birth. At the other end of the lifespan, by including seniors aged 65 to 75 years—who account for the greatest number of deaths—the cause of death is skewed toward cancer and cardiovascular disease. Among Canadians of all ages, the top five causes of death are cancer (30%), heart disease (21%), stroke (6%), lung disease (5%) and unintentional injury (4%).[7] However, upon restricting to Canadians aged 25 to 34 years, the top five leading causes of death shift to unintentional injury (29%), suicide (20%), cancer (12%), heart disease (5%) and homicide (5%).[7] For those aged 35 to 44 years, the top five leading causes of death include unintentional injury, suicide and liver disease, the latter often due to alcohol overuse and injection drug use. In Toronto, the causes of premature death follow the same pattern.[8]

Of all deaths occurring among Canadians aged 20 to 64 years, 20% are among those aged 20 to 44 years.[9] Most premature deaths in young and middle-aged adults are also highly preventable. About 6% of all these deaths in Canada are alcohol-related—more than twice as much for men (7.6%) as for women (3.5%).[10] In Russia, where alcohol consumption has emerged as a major public health concern, it is estimated that 43% of reported deaths among males aged 25 to 54 years are attributable to hazardous drinking.[11] In Ontario, in 2010, one in eight deaths among adults aged 25 to 34 years was opioid-related,[12] and across the country we see the unfolding of an opioid epidemic that has consumed, and then ended, the lives of so many Canadians.

Mental illness and criminal behaviour are also interconnected in their effect on premature mortality. Within two large Swedish studies of 15 337 adults with bipolar disorder, age- and sex-matched to 20 adults randomly sampled from the general population, 22% engaged in suicidal or criminal acts after bipolar disorder diagnosis, compared with 4.6% of those in the general population (adjusted relative risk [RR] 3.0, 95% confidence interval [CI] 2.9–3.2).[13] People with bipolar disorder had a risk of suicide 14.6 (95% CI: 12.1–17.6) times higher, especially those with a history of attempted suicide, or an alcohol- or drug-use disorder.[13] Among 475 delinquent and 456 matched nondelinquent boys followed from age 14 to age 65 years, 6.1% versus 2.4%, respectively, died unnatural deaths before age 40 years. This outcome was predicted by juvenile antisocial behaviour and alcohol overuse, and the deaths were most likely from homicide and poor self-care.[14] Among repeat criminal offenders in Finland, the risk of death before age 30 years is 29 times higher than that for nonoffenders.[15] Of those who experience incarceration within a Canadian provincial correctional facility, the standardized mortality ratio is 4.0 (95% CI: 3.9–4.1), with injury and poisoning accounting for 38% of all deaths,[16] and the most pronounced RRs among the youngest offenders, especially women.[16] We see similar statistics for those in a Canadian federal correctional facility.[17] Thus, it is apparent that some adults prone to premature death are caught in a web of mental illness, substance use and criminality, often starting from youth.

There are some "generic risk factors" for premature mortality due to intentional and unintentional causes, especially risk factors clustered around mental illness. Neeleman systematically examined 163 cohorts and found that several known risk factors for suicide—including prior deliberate self-harm, alcohol and drug misuse and severe mental illness—were also associated with nonsuicidal death.[18] Lai et al. evaluated 22 epidemiological survey studies of the prevalence of psychiatric illness in people with a substance-use disorder.[19] Those with an illicit drug-use disorder had higher odds of major depression (3.8 times higher [95% CI: 3.0–4.8]) and higher odds of an anxiety disorder (2.9 times higher [95% CI: 2.6-3.3]). The odds ratios among people with an alcohol-use disorder were 2.4 (95% CI: 2.2–2.6) and 2.1 (95% CI: 2.0–2.2), respectively. Hence, we can use

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these generic risk factors – including prior deliberate self-harm, substance use and severe mental illness – to identify adults at risk for premature mortality, of which several are amenable to intervention, even starting in childhood.[18]

It is no coincidence that the increasing prevalence of addiction to hyperpalatable obesogenic foods[20] and the emergence of "globesity"[21] have led many to view obesity as a noncommunicable disease, and one whose major impact on premature mortality has yet to be realized.[22] Those predisposed to food addiction also tend to have higher depression scores,[20] a greater likelihood of having been abused as a child[23] and less access to physical activity facilities, especially in areas with low socioeconomic status and among certain minority groups,[24] including Indigenous children and youth.[25] Certainly, acknowledgement of and proper accounting for these and other inequities can help young adult populations to achieve a healthier body mass, as highlighted in the current issue of *Health Promotion and Chronic Disease Prevention in Canada*, by Bhawra et al.,[25] Frankish et al.[26] and Rao et al.[27]

In another paper published in the current issue, Steensma and colleagues present national data on health-adjusted life expectancy (HALE)—a hybrid measure not only of quantity of life, but of quality of life as well.[28] Across Canada, about 45% of the variation of HALE by health region was previously explained by differences in socioeconomic status,[29] and Steensma et al. suggest that things may be worse in Newfoundland and Labrador and Prince Edward Island, especially among males.[28] This analysis may in fact be conservative, considering that the data were available only up to 2010, and the study could not include people living on Indian reserves, certain remote areas of Ontario and Quebec and within the three Canadian territories—areas where disability-free life expectancy (a metric similar to HALE) tends to be worse.[29] Certainly, a consideration of HALE that specifically focusses on those aged 20 to 45 years can reveal the degree to which some of the factors that influence premature loss of life also concomitantly reduce quality of life in early and middle adulthood.

Dealing with premature mortality among young and middle-aged Canadians starts with a clear definition of who is at highest risk, the likely predisposing factors and some sensible solutions that are multipronged, evidence-based and realistic. Alongside completed and ongoing research in the treatment of mental illness and addictions, as well as the primary and secondary prevention of intentional and unintentional injury, we should expect not only to reduce the number of premature deaths in Canada, but to enhance the well-being of those whose lives are spared from such an untimely fate.

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