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Editorial

Translating scientific discoveries into action to reduce the current and future burden of cancer

Despite significant advances in treatment and early detection, cancer is now the leading cause of death among Canadians, with one of every three deaths in 2017 attributed to cancer (Canadian Cancer Society's Advisory Committee, 2018). Moreover, every second Canadian can now expect to be diagnosed with cancer at one point in their life (Canadian Cancer Society's Advisory Committee, 2018). The cost of cancer, in both human and economic terms, is staggering and, given Canada's aging and growing population, will likely continue to rise into the future, with potentially dire consequences for the sustainability of the Canadian healthcare system (de Oliveira et al., 2018).

Unfortunately, progress in designing and implementing effective public policies and cancer prevention programs has been hampered by the lack of current, accurate and comprehensive information on the relative importance of the factors that drive cancer incidence in Canada. These factors include behaviours (such as smoking, alcohol use and physical inactivity), infections, as well as exposure to occupational and environmental carcinogens, such as radon and air pollution. Without this information, it is difficult to determine what factors prevention programs should target in order to achieve the biggest gains in reducing the cancer burden.

In this Special Issue, a multidisciplinary team of Canadian scientists reports findings from the Canadian Population Attributable Risk of Cancer (ComPARe) study, a large collaborative effort that aims to fill this gap. Combining data from the Canadian Cancer Registry with estimates of the prevalence of 20 largely preventable cancer risk factors, they estimate that out of 187,070 cases diagnosed in 2015 among Canadians aged 30 years or older, about 62,000 (or 33%) can be attributed to one or more of these risk factors. For individual cancer sites, the contribution of the selected risk factors ranges from about 6% for non-Hodgkin's lymphomas to 84% of lung and laryngeal cancers. Tobacco smoking remains the most important risk factor, responsible for over 38,000 cancer cases, or about 18% of all cancers diagnosed in 2015. Physical inactivity, sedentary behaviour and excess weight were collectively responsible for another 12% of cases. In total, behavioural risk factors were responsible for one of every five cancer cases, with no significant differences between men and women.

The study also projects that by the year 2042, the number of cancer cases attributable to these same risk factors will grow to about 102,000 every year. Given current trends, the proportion of colorectal cancers attributable to them is projected to increase from 43% in 2015 to 48% in 2042. On the other hand, the proportion of lung cancer cases due to preventable risk factors (smoking, radon and air pollution) will likely decline to 76% by 2042 (from 80% in 2015). Promisingly, the study also estimates that between 10,000 and 40,0000 cancer cases can be prevented each year using currently available prevention strategies.

When interpreting the study results, it is important to consider its limitations. First, these estimates were based on our current understanding of the causes and mechanisms of each cancer. The causes of some cancers, e.g. lung and cervical cancers, are well understood (Franco et al., 2001; Lee et al., 2012). Others, like most prostate and breast cancers are less so (Hsing and Chokkalingam, 2006). For some risk factors, e.g. diet, the current body of scientific evidence is far from conclusive (Key et al., 2002). The authors emphasize, and correctly so, that some of the risk estimates might be inaccurate due to well-known shortcomings of the observational epidemiologic studies used to generate them (e.g. confounding, measurement errors and various biases). More subtly, calculating population-attributable risk is based on the assumption that risk factors occur independently in the population and that one risk factor does not influence the effects of other risks factors. While necessary, and often correct, this assumption may not hold for all risk factors and all cancers. Finally, all estimates are averaged over the entire population; the actual disease burden might be higher in certain ethnic or socio-economic groups.

As the Guest Editor of this Special Issue, I would like to thank all the authors and the entire ComPARe study team. The publication of this issue would not have been possible without the timely and insightful feedback provided (anonymously) by more than 30 scientific reviewers from across the globe. I am also grateful to the assistance I received from Ms. Abbey Poirier in the Alberta Health Services' Department of Cancer Epidemiology and Prevention and Ms. Iryna Tsybukh in my office at the University of Manitoba. Their assistance was crucial, since the production of the Special Issue (including correspondence with the reviewers and the authors, and adjudicating submitted manuscripts and reviews) was conducted by the Guest Editor outside the Journal's electronic submission system, and without the involvement of the staff of Preventive Medicine's Editorial Office, to avoid any potential conflict of interest resulting from their membership in the ComPARe study.

I hope that the detailed results of this landmark work will garner the interest that they deserve from all stakeholders, including policymakers, so that effective and economical public policies and prevention programs can be designed, implemented and evaluated to effect a significant and lasting reduction in cancer burden in Canada. The ComPARe Study effort should also serve as a methodological and multidisciplinary roadmap for other countries to conduct their own similar assessments. The time has come to act on the key discoveries from cancer prevention research and turn them into measurable benefits for the population.

Conflicts of interest

SMM has received unrestricted research grants from Merck, GlaxoSmithKline, Sanofi Pasteur, Pfizer and Roche-Assurex for unrelated studies.

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