

WHY IS THE RISK OF CANCER HIGHER IN MEN THAN IN WOMEN?

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Men have a higher risk of being diagnosed and dying from cancer than women. While cancer incidence and mortality rates are higher in women than in men under age 55, the rate in men largely surpasses the rate in women after this age, so that overall, the age-standardized rate of cancer is 14% higher in men than in women. Cancer is more commonly diagnosed in males than females for all cancer types except breast and thyroid cancers. It is expected that 1 in 3.8 Canadian men will die from cancer, compared to 1 in 4.4 Canadian women.

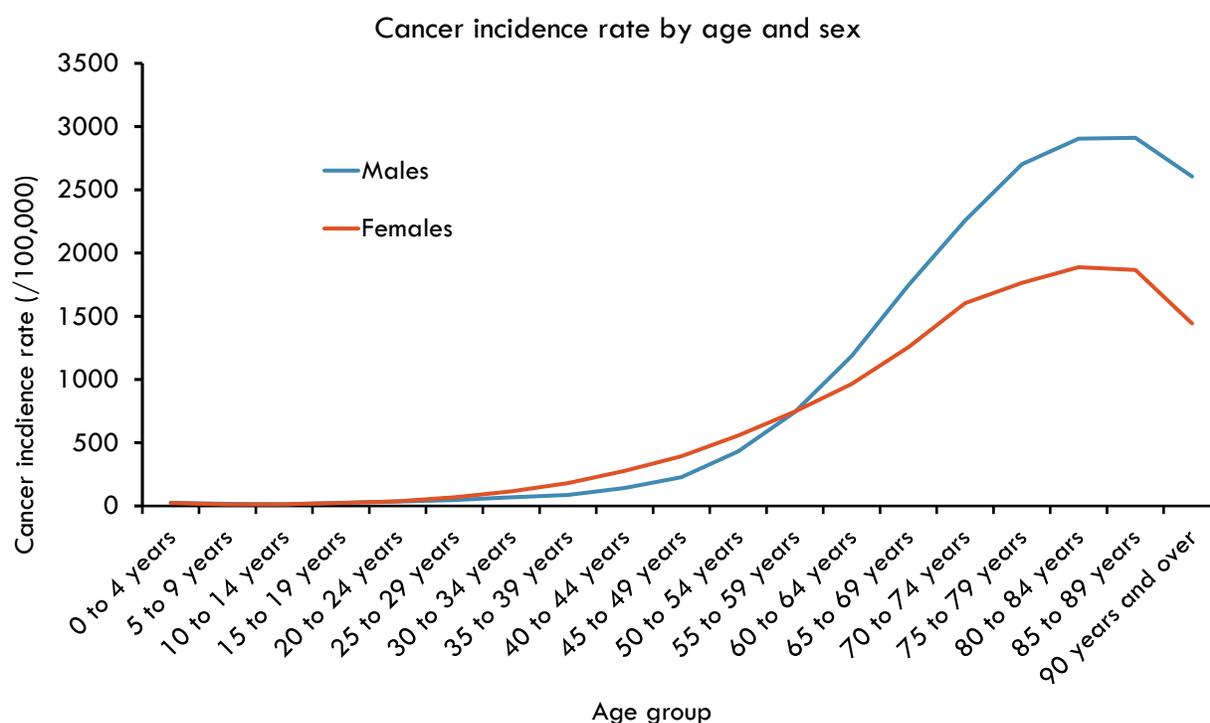


Figure 1. Cancer incidence rates, all sites combined, by age and sex in Canada (excluding Québec) 2017. Data from Statistics Canada, Table 13-10-0111-01, Number and rates of new cases of primary cancer, by cancer type, age group and sex.

This higher risk of cancer in men is consistently found across different countries, suggesting a larger pattern at play. This begs the question, why is the risk of cancer higher in men than in women? While this mystery is far from being completely resolved by science, evidence points to a complex interplay of biological and environmental reasons for why men are at higher risk.

Biology

Many have hypothesized that differences in cancer risk are due to genetic and hormonal differences between men and women. Because men have only one X chromosome while women have two, men are in general more vulnerable to diseases linked to genes on chromosome X, some of which may be linked to cancer. Another important candidate for explaining sex differences in cancer risk is likely to be hormonal differences which influence immune responses in men and women. In order for cancer to develop, malignant cells must first evade the immune system. Sex hormones (oestrogens and androgens) interact with the immune system, and as a general rule, women exhibit more robust cell-mediated and humoral immune responses than men. While immune system difference influence men and women's susceptibility to infections, they also affect their susceptibility to cancer due to the important role of the immune system in recognizing and destroying cancer cells.

Interestingly, some of the risk difference may be due to height differences between men and women. It is well established that the risk of cancer is correlated with height. A study by Walter and colleagues published in 2013 estimated that height could potentially account for up to 34% of the cancer risk difference between men and women. While the reason why height might increase cancer risk remains unclear, one hypothesis is that taller individuals may be at increased risk of cancer because they have a larger number of cells and a higher rate of cell divisions within tissues, leading to more opportunities for cancer to arise.

Environment

While it is tempting to ascribe sex differences to biological factors, we cannot ignore gender differences in environmental exposures as an important contributor to the difference in cancer risk between men and women. Over the past century, we have acquired substantial knowledge on the major environmental causes of cancer: tobacco smoking, alcohol consumption, obesity, poor diet, sun exposure, and infections with cancer-causing pathogens. Unfortunately, men tend to be more exposed to many of these cancer risk factors than women due to differences in lifestyle and occupation. Men are more likely than women to be heavier smokers, be heavier drinkers, be overweight, have higher sunlight exposure due to outdoor occupations, and acquire some of the infectious pathogens which cause cancer.

Because many of these risk factors are preventable, the higher risk of cancer in men is not immutable and can potentially be reduced through preventive interventions. To prove this point, the age-standardized incidence rate of cancer in men has been declining over the past decade, largely due to tobacco control efforts. While this is welcome news, clearly more needs to be done in terms of primary prevention to reduce the gender gap in cancer risk, a large part of which is likely avoidable.

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