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Toward a Better Understanding of Prostate Cancer Statistics

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Toward a Better Understanding of Prostate Cancer Statistics

National health statistics document a decade-long increase in the incidence of prostate cancer the likes of which have never been seen for this or any other cancer. In 1986, 91 out of 100,000 US men were diagnosed with prostate cancer. ln 1994, this rate had increased 60%, to 144 per 100,000. (1) This striking trend has certainly not gone unnoticed by clinicians, policy-makers, or the public. The widespread use of prostate specific antigen (PSA) screening has no doubt contributed greatly to the rise in incidence. PSA-detected tumors tend to present earlier in their natural history than tumors detected through other means. If this early detection increases likelihood of successful treatment resulting in reduced mortality, then screening clearly has conferred a benefit. If, however, patients with screen-detected tumors are merely diagnosed earlier but have outcomes no different than those detected through other means, the benefit of early detection is obviously questionable.

Determining whether PSA screening leads to mortality benefits and answering other related questions, such as what treatment approach is best for early-stage disease, are difficult research propositions. Randomized clinical trials explicitly designed to address these questions are now in the field but will not yield results for nearly a decade. In the interim, patients, physicians, and health officials must return to descriptive statistics to help inform their decision-making. In doing so they turn to prostate cancer mortality rates. Time trends in these rates at the population level, as well as comparisons of these rates across prospectively followed case series with different diagnostic or treatment histories have been, and will continue to be, undertaken as we wait for clinical trial data. If PSA screening is effective, the increase in incidence observed in population data during the late 1980s and early 1990s will ultimately be followed by a decline in prostate cancer mortality rates. Also, if aggressive surgical treatment of localized lesions differs in effectiveness from a non-interventionist "watchful waiting" tactic, variation in prostate cancer mortality rates should emerge across the historical cohorts managed under these alternative approaches. Thus, prostate cancer cause-specific mortality statistics will be prominent in the interim analyses completed over the next decade, addressing many key questions in prostate cancer.

While cause-specific mortality rates are widely used and are generally perceived as straight-forward statistics, there are a number of potential drawbacks to this measure for prostate cancer. A research project underway at the Center for Research in Medical Education and Health Care at Jefferson Medical College, in collaboration with Saint Louis University's Prevention Research Center and the Centers for Disease Control and Prevention, is exploring these issues. First, researchers are attempting to determine whether the commonly used prostate cancer cause-specific mortality rates based on underlying cause of death listed on death certificates accurately estimate the mortality burden associated with the disease. Since 80% of prostate cancer cases are over 65 and 17% are over age 80, (2) prostate cancer patients are likely to be facing other chronic diseases as they fight their cancer. Under these circumstances, attribution of a single underlying cause of death, even in the presence of cancer, becomes more difficult. Preliminary findings presented by the Jefferson team at the Society for Epidemiologic Research's 30th annual meeting this

Spring in Edmonton, Canada suggest that cause-specific mortality rates may under-report prostate cancer's contribution to mortality by 15%.

The Jefferson research team is also investigating whether a key statistical assumption, known as "independence of competing risks," commonly used in calculating cause-specific mortality rates for patient case series, is appropriate when series is comprised of older prostate cancer patients. In future projects, the Jefferson group hopes to expand its work to determine the extent to which these potential technical problems impact inferences drawn from these statistics and, if needed, to develop easy tools for overcoming the problems in prostate cancer cause-specific mortality rates.

References

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