Cancer continues to be one of the leading causes of morbidity and mortality in the US. Although the treatment of cancer has evolved over the past decades with the use of targeted therapies and immunotherapy, many of these new treatments are expensive and are not readily available to everyone. Moreover, the recent success with treatment advances are not generalized to all cancer types, as some cancers continue to be devastating without significant progress in treatment options. Hence, early detection through population screening remains a critical armament against cancer.

A recent Science article (1) summarizes concerns with cancer screening programs, many of which have been around for decades. There is evidence to show that with specific cancer types there has been a reduction in morbidity and mortality. However, since their introduction, evidence-based methods for evaluating program effectiveness have not been implemented stringently. Although cancer screening tests have the potential to meaningfully impact health and healthcare, they themselves have not been evaluated with the same rigor as in other areas of medicine. Many cancer screening tests have remained largely static (i.e., some protocols have been unchanged for almost 20–30 years), despite evolving treatments and diagnostic technologies. Because of this lack of continuous evaluation, the benefit-to-harm ratio for different screening tests, screening intervals, and thresholds for positive diagnosis remain relatively unknown and/or unstandardized.

One possible solution is to implement randomized controlled trials (RCTs) for screening tests. However, a problem that arises in most modernized countries is that many individuals have already undergone screening or have refused screening. Thus, RCTs independent of national screening programs are not possible, as there is no control group for comparison.

The authors propose to use so-called “learning screening programs.” Effectively, individuals enrolled in national screening programs would agree (or opt out) to be randomized into testing arms that evaluate different diagnostic tests, intervals, or thresholds (one of the arms could be the current program). Endpoints, such as cancer incidence, mortality, and benefit-to-harm ratio, would then be analyzed for each arm and the best screening test (e.g., the test that most effectively reduces mortality without over-diagnosis of patients) would subsequently be rolled out to all individuals. Whenever a new test method, interval, or cut-off is proposed, the testing cycle would start again. The article gives several examples of learning screening programs currently being assessed in other countries and their possible applicability to current cancer screening programs in the US.

There are a few challenges to be considered, as mentioned by the authors. Independent ethical oversight must be provided. Another issue is funding. Although the authors state “randomization does not increase costs in already functioning, conventional, screening programs,” in our view, funding may be an issue as there are costs associated with ethical oversight and data analysis, for example. It is unclear if this funding will come from public health programs or research budgets. Nevertheless, this article gives a valuable perspective on cancer screening, which if implemented, in our view, would be beneficial to national programs.

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