

Promising Progress From Healthy People 2020 and Cancer Incidence Update

Robert L. Ferris, MD, PhD 

In the field of cancer, good news is always precious and should be cherished. This year's update of cancer death rates and progress in achieving health goals is one of those times. Although not all news was ideal, overall cancer death rates continued to decline among both males and females, particularly for the most lethal entities, including lung cancer, which saw a roughly 2% decreased mortality rate.¹ Other tobacco-related cancers, including larynx and bladder cancer, experienced further reduced incidence and death rates. These welcome trends reflect population science success in reducing cancer risk factors while increasing screening test use.² Coupled with breakthrough treatment advances such as cancer immunotherapy and genome-targeted treatments, these 2 reports bode well for continued improvements.

However, although the reduced mortality data were good, incidence rates leveled off among males and increased slightly among females. In addition, Healthy People 2020 objectives were not yet met overall for major cancer risk factors such as excess body weight, alcohol use, and cigarette smoking. Although the decrease in lung cancer was substantial, it continued to be the leading cause of cancer death and accounted for 25% of all cancer deaths. Unfortunately, the incidence increased for female breast, uterine, kidney, liver, and pancreatic cancers associated primarily with obesity.

Clearly, cancer screening and early detection permit earlier effective treatment if we assume that the patient has access to the health care system. However, the effects on incidence are more complex because screening can lead to either increases or decreases in the number of diagnosed cases.³ For example, incidence may actually increase through the detection of indolent cancers, or the incidence of some malignancies may decrease when screening tests detect precancerous lesions (adenomatous colon polyps or cervical intraepithelial neoplasias) that are treated before they progress to cancer. Indeed, an increased thyroid cancer incidence has been attributed to routine ultrasound-guided fine-needle aspiration biopsy.⁴ We have seen a slowing of these trends to reduce the overdiagnosis and overtreatment of relatively low-risk tumors and prevent attendant morbidities and costs. The Healthy People 2020 review indicates that full penetration of recommended screening tests is suboptimal, with rates ranging from <10% for lung cancer to 60% for colorectal cancer, 72% for breast cancer, and 81% for cervical cancer.² For some reason, breast and cervical cancer screening use has declined, and this may coincide with declines in screening rates. New mammogram and ultrasound modality trials enrolling those with dense breast tissue⁵ may improve on that modality because the cost and anxiety of indeterminate screening may detract from the enthusiasm and confidence of the screened population to undergo screening tests.

Well-recognized declines in death rates from cutaneous melanoma continued, with the 2-year survival for metastatic melanoma increasing by nearly 5%. This feat is likely due to the integration of immunotherapy into standard regimens at increasingly earlier stages in addition to genome-driven, precision oncologic therapies, which have now been extended to lung cancer. As mentioned, because the latter is the highest mortality malignancy nationally, such an impact on non-small cell lung cancer becomes manifested in the overall reduced mortality that we see this year. In addition to new (expensive) therapies, we see the benefit of the implementation of screening, such as low-dose computed tomography scans for current/former smokers, although these tools may be contrasted by a very different cost calculation than improved survival due to costly therapeutic innovations. The potentially earlier diagnosis due to the implementation of low-dose computed tomography screening in high-risk populations is being improved by scientific advances such as radiomics and molecular screening adjuncts.⁶

As the US population continues to age, the number of cases and deaths for many cancers continues to increase, whereas the age-standardized incidence and death rates have decreased. This finding confirms the notion that the behavior of several cancers, such as breast cancer in older women (>70 years), appears to be less aggressive, and the toxicities of

Corresponding Author: Robert L. Ferris, MD, PhD, University of Pittsburgh, 5150 Centre Avenue, Suite 500, Pittsburgh, PA 15232. (ferrisrl@upmc.edu).

Hillman Cancer Center, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania

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aggressive treatment are less well tolerated. This has been known for prostate cancer: autopsy specimens after death due to other causes have contained histologically identified cancer cells that do not appear to have contributed to the individual's eventual demise and may have coexisted for decades.⁷ Thus, we should not always regard cancer in the elderly uniformly; rather, we need to conduct basic research and dedicated clinical trials in those older than 70 years. Interventions should be tailored for older patients so that treatment-related morbidity and mortality do not exceed those of the disease.⁸

Taken together, the results are very positive but somewhat mixed in these 2 reports. There is clearly some great news, and a path is clear to continued improvements: avoidance of inciting carcinogenic risk factors, cost-effective screening and prevention, and cancer control efforts such as human papillomavirus (HPV) vaccination and reductions in smoking uptake or enhancements of cessation. However, the Healthy People 2020 goals of an 80% HPV vaccination rate (at least 2 doses) and a reduction in the smoking prevalence down to 12% are aggressive goals that are not yet met (despite our being currently in the year 2020 now). Current HPV vaccine rates are <55% in most states, and the smoking rate is on the order of 15% nationally, so there is a ways to go. The reports are a call to develop and fund concrete action plans, not just to set out stretch goals. The successes seen in lung cancer incidence and mortality are a result of multifactorial interventions and should motivate us: when we apply appropriate resources across the United States, we can measurably affect this terrible set of diseases by improving and expanding prevention and screening and by funding the basic and translational science that has given us today's real therapeutic gains from genomically

targeted precision oncology and cancer immunotherapy, with the latter's attendant overall survival benefits.

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