New analysis shows fewer years of life lost to cancer

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Since the enactment of the National Cancer Act in 1971, the U.S. has spent hundreds of billions of dollars in cancer research and treatment. And yet, the cancer mortality rate—the historic benchmark of progress—has only declined modestly while the mortality rates of other leading causes of death have declined substantially. This difference has led many to question whether we've made progress in the 'War on Cancer'. The answer is definitively yes according to Norris Cotton Cancer Center research published Monday in the *Journal of Clinical Oncology*.

"Our findings show that we have made steady progress against the burden of many cancers for decades," said lead author Samir Soneji, PhD, assistant professor for Geisel School of Medicine at Dartmouth and the Dartmouth Institute for Health Policy and Clinical Practice. "We have underestimated the progress because, as fewer and fewer people die from heart disease, stroke, and accidents, more and more people are living longer and having more years in which to develop and die from cancer."

According to Soneji the accuracy of existing measurements for the nation's progress against the burden of cancer are limited because they reflect progress against other diseases. Soneji and his colleagues Hiram Beltrán-Sánchez, PhD, and Harold C. Sox, MD, measured the effect of cancer prevention, screening, and treatment on the burden of cancer mortality while taking account of the increased incidence of cancer because people are living longer as a result of progress against other

leading causes of death.

To solve a problem first identified by the National Cancer Institute (NCI) 20 years ago, Dartmouth cancer researchers started with a measure of the burden of cancer mortality called the years of life lost due to cancer, which reflects how much longer we might expect to live if cancer did not exist. They then separated the favorable effect of advancements in cancer care from the unfavorable effect on cancer incidence due to advancements in the care of other diseases, notably cardiovascular disease.

"We estimate how the years of life lost from cancer are directly affected by cancer mortality and indirectly affected by increased cancer incidence because of greater longevity due to improvements in primary prevention, detection, and treatment of other disease," said Soneji. With this approach cancer control researchers at Norris Cotton Cancer Center were able to measure how much progress the U.S. has made against the burden of cancer mortality in America.

Soneji's research concluded that the decrease in lung cancer mortality rates between 1985 and 2005 tripled their contribution to reducing the years of life lost due to cancer. Yet not all of this progress was actually realized because other-cause mortality rates also decreased. The resulting increase in life expectancy and its consequent increase in lung cancer incidence partially offset this progress. "The decline in cigarette smoking, which began in the 1960s, is almost certainly the main reason the burden of lung cancer mortality declined," said Soneji.

Authors Soneji, Beltrán-Sánchez, and Sox also found consistent progress in reducing the burden of colorectal cancer mortality since 1985. More recent, but less consistent, progress has been made in reducing the burden on prostate and breast cancer deaths.

"Our approach reveals more accurately the aggregate contribution of cancer prevention, screening, and treatment on progress against cancer," said Soneji.

To date, survival time and mortality rates have been the leading population-level measures of cancer burden. These measures assess the effect of prevention, screening, and treatment on cancer, but they fail to account for changes in other-cause mortality rates. In contrast, Soneji and his colleagues used a more comprehensive measure that accounts for both changes in cancer mortality rates and changes in other-cause mortality rates. By accounting for progress against other leading causes of death, researchers can now more accurately assess progress against cancer. Whether historical progress in cancer continues in the future depends, in large part, on whether cigarette smoking continues to decline and effective screening detects earlier and more treatable stages of cancer.

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