

Progress has been made in war on cancer, but still many challenges

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Although there have been achievements in the battle against cancer, including a decrease in the rate of death and new diagnoses, cancer remains one of the leading causes of death in the U.S., with a need for continued improvement in the areas of prevention, detection and treatment, according to a commentary in the March 17 issue of *JAMA*, a theme issue on cancer.

Susan M. Gapstur, Ph.D., M.P.H., of the American [Cancer](#) Society, Atlanta, presented the commentary at a JAMA media briefing.

It has been nearly 40 years since the 1971 National Cancer Act was signed into law, which broadened the scope and responsibilities of the National Cancer Institute and vastly increased federal funding, with the intent of intensifying the campaign against cancer. Since then the so-called war on cancer has consumed more than 100 billion federal research dollars, and these funds have been more than matched by research investments from pharmaceutical companies, nongovernmental organizations and states, writes Dr. Gapstur and commentary co-author Michael J. Thun, M.D., M.S., of the American Cancer Society.

The investment in research has resulted in progress. A series of national consensus reports by cancer surveillance experts document a 15.8 percent decrease in the age-standardized death rate from all cancers combined between 1991 and 2006, and an almost 1 percent annual decrease in the rate of new diagnoses between 1999 and 2006. The authors add that one of the biggest successes to date in the primary

prevention of cancer is the reduction in cigarette smoking in the U.S., achieved initially through education. Nearly 40 percent of the decrease in the overall cancer death rate in men between 1990 and 2006 resulted from the reduction in [lung cancer](#) mortality. There have also been improvements in the early detection and treatment of a number of cancers, and the prognosis is excellent for most cancers diagnosed while still localized.

Despite these accomplishments and improvements, cancer is still a too common disease in the U.S. According to estimates from the American Cancer Society, in 2009, there were almost 1.5 million cases of all forms combined, which contributed to more than 560,000 deaths, making cancer the second leading cause of death in the U.S. As life expectancy has increased, the lifetime risk of being diagnosed with cancer has increased as well. Nearly 1 in 2 men and more than 1 in 3 women will be diagnosed with cancer. There are several types (pancreas, liver, ovary, lung, brain) that are highly lethal and remain non-responsive to current therapies. "Even the most vocal proponents of prevention and early detection recognize the need to improve cancer therapies," the researchers note.

They add that progress in the fight against cancer is complicated by the "phenomenal biological complexity of cancer in its various forms. Not only are there more than 100 different anatomical and histological subtypes, but also many of these have multiple molecular variants with different prognosis, clinical features, and susceptibility to treatment. The inherent genetic instability of cancers allows them to change rapidly and generate clones that are resistant to treatment. Indeed, many cancers are masters of disguise, camouflaged from host defenses."

Even though these challenges may be daunting, the authors write that the tools to move forward are also more sophisticated and better defined. "It has become clear that no single silver bullet or therapeutic arsenal will

win this war. Instead, it is essential to move forward on multiple fronts simultaneously, addressing the entire spectrum from primary prevention to early detection, treatment, and palliation. Each of these approaches provides opportunities to improve the application of existing knowledge and to conduct focused research that can identify and overcome critical barriers that thwart progress."

"The war on cancer has become considerably broader and more complex over time. Cancer is a [many-formed], complex, and highly adaptable disease. Although progress has been made in reducing cancer mortality rates, the number of persons affected by cancer will increase due to an aging population unless progress in cancer prevention and reducing incidence rates are accelerated. Nevertheless, advances and insights accumulated during the last 40 years provide a strong foundation on which to continue the fight against cancer," the authors conclude.

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