

National cancer control efforts should address the system, not its individual parts, says new report

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Current cancer control efforts in the United States typically are fragmented and uncoordinated, but taking a systems approach to

establish a U.S. National Cancer Control Plan would address the challenge more holistically, says a new report from the National Academies of Sciences, Engineering, and Medicine. The report recommends a national strategy for cancer control, based on the principles of systems engineering, to coordinate the priorities and actions of multiple stakeholders, improve resource integration, and promote joint accountability.

Of the World Health Organization's nearly 200 member countries, the U.S. is one of the few that does not have a centralized national plan for [cancer](#) control. While the multiple organizations involved in cancer control have been successful individually, persistent fragmentation does not permit the systemic changes needed to maximize benefits for patients and society, says [Guiding Cancer Control: A Path to Transformation](#).

The challenge of cancer control starts with the complex nature of cancers themselves. Cancers can occur in many human tissues and organs, yielding potentially hundreds of different types and subtypes. Beyond individual genetic makeup and demographic characteristics, a number of factors can complicate efforts to predict, prevent, treat, and survive cancer. Among them are socio-[economic status](#), access to high-quality health services, public policies, and environmental exposures.

The Academies' report offers 10 conclusions supported by 25 findings. Their central message is that national cancer control efforts should address the overarching system, not just its individual components.

In 2018, about 600,000 people in the United States died from cancer, and about 1.7 million people received a new diagnosis of cancer. Additionally, the national economic toll of cancer is estimated to be nearly \$600 billion annually. The nation's cancer control system will need to become much more effective, efficient, and responsive to shifts

in technology and policy to successfully address the expected wave of cancers in an aging population, said the committee that wrote the report.

"The U.S. declared a 'war on cancer' nearly 50 years ago. While we have seen encouraging progress in some aspects of cancer control—such as declining death rates for certain types of cancer—the disease continues to take a toll on patients, their loved ones, and society," said study chair Michael Johns, who is executive vice president for health affairs emeritus and professor of medicine and public health at Emory University. "Cancer is complex, and there will be no single solution that can succeed across all cancers or affected populations. That's why we need a new approach to cancer control—one that moves people, institutions, and resources out of their silos."

Governance of a Multiagency National Cancer Control Plan

The U.S. Department of Health and Human Services (HHS), in cooperation with a wide range of [federal agencies](#), should lead the U.S. National Cancer Control Plan, the report recommends. The plan should aim to:

- Improve availability of preventive, screening, diagnostic, therapeutic, palliative, and survivorship interventions
- Encourage delivery of care and social services aligned with the preferences and values of patients and families
- Leverage [scientific advances](#) to improve therapies and better understand their scientific, clinical, and economic impacts
- Integrate a broad range of data sources, including clinical, social, and behavioral data
- Use cloud computing, machine learning, and artificial intelligence tools for continuous analytics, rapid reporting of

trends and patterns, and improved forecasting and performance reviews

- Minimize waste stemming from conflicting clinical practices and guidelines
- Launch and expand public engagement, literacy, and outreach activities

"Process' Versus 'System' of Cancer Control

The process of cancer control refers to the actions taken in cancer control efforts—starting from basic risk awareness through prevention, detection, treatment, and survivorship care. By contrast, the system of cancer control refers to its multiple participants who interact with and influence each other. The system begins with patients and their families, and extends to hundreds of groups working on different aspects of cancer control. They include at least 12 federal agencies, 65 states and territories, health providers, hospitals and medical facilities, insurers, biopharmaceutical and medical device companies, philanthropic groups and foundations, academia and research organizations, employers, advocacy groups, and more recently, technology companies. This resulting "system of systems" has given rise to conflicting medical guidelines, uncoordinated activities, and often disconnected technologies—which hampers care quality and value.

A Dashboard for Multicriteria Decision-Making

In support of a U.S. National Cancer Control Plan, HHS and the federal partner agencies should fund and support an independent organization or a consortium to prototype and develop a planning and monitoring tool that would be publicly available, evolvable, and customizable across contexts and organizations, recommends the report. The committee envisions a dynamic dashboard that would reflect the current state of

cancer control efforts and allow users to simulate, predict, and analyze how the system would react to possible policy changes or interventions.

For example, federal policymakers could use the tool to predict the range of possible outcomes from introducing new treatments (such as immunotherapies) versus prevention efforts (such as campaigns to encourage people to get HPV vaccines). Another potential use could be to assess which policies are most likely to reduce disparities in cancer outcomes among various groups. The tool could pull information including behavioral differences (such as tobacco use or dietary choices), differences in health insurance coverage, and differences in treatment adherence.

The Convergence of Biology, Big Data Analytics, and Technology

In the coming years, the system of [cancer control](#) will become even more complex with the large-scale aggregation of genomic, environmental, behavioral, and other patient data. Continued innovations in big data—large amounts of data from different sources including cancer registries, electronic health records, insurance claims, and sensor technologies—will require sound storage mechanisms and new capabilities and competencies.

While the goal of the planning and monitoring tool is to guide decision-making, the tool will only be as good as the data informing it, says the report. It recommends that HHS and partner agencies periodically consult with state and local governments, as well as the private and nonprofit sectors, to ensure the planning tool is refreshed with the latest data.

More information: Guiding Cancer Control: A Path to

Transformation. National Research Council. 2019. Washington, DC:
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