



## Commentary

## Highlights From a Workshop on Opportunities for Cancer Prevention During Preadolescence and Adolescence

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**Keywords:** Cancer prevention; Adolescent health; Translational research

## A B S T R A C T

In an effort to explore opportunities for cancer prevention during preadolescence and adolescence, the Cancer Prevention Across the Lifespan workgroup within the Division of Cancer Prevention and Control at the Centers for Disease Control and Prevention (CDC) convened an informal panel of experts for a 2-day workshop August 9–10, 2011. In this report, we provide highlights from the workshop. A central theme of the workshop was that preadolescence and adolescence are times of unique susceptibility and vulnerability within the lifespan. Participants discussed the evidence linking exposures during adolescence (e.g., risky behaviors, chemicals, medical imaging procedures) and subsequent cancer risk during adulthood. Participants also discussed potential opportunities to intervene on risk factors for cancer at multiple levels during adolescence, the importance of more focused approaches to adequately address health disparities, and the ongoing need for transdisciplinary and translational prevention research. Future opportunities for the CDC include further leveraging surveillance data from sources such as the National Health and Nutrition Examination Survey, the Youth Risk Behavior Surveillance System, and the National Children's Study and continuing to build on collaborations with other federal agencies and with national, state, and local organizations. Many ideas and insights generated during the workshop will be put into action as CDC continues to explore opportunities for cancer prevention during youth and across the lifespan.

Published by Elsevier Inc on behalf of Society for Adolescent Health and Medicine.

Despite advances in cancer research during the past 40 years, U.S. cancer incidence and death rates have shown only small declines, and incidence rates for some cancers have increased in recent years [1–6]. Cancer has emerged as a leading cause of death, and the number of adults with cancer is expected to grow as the U.S. population ages [7]. New public health approaches to cancer prevention are needed [7–9]. Staff within the Division of Cancer Prevention and Control at the Centers for Disease Control and Prevention (CDC) organized the Cancer Prevention Across the Lifespan (CPAL) workgroup in an effort to foster innovative,

public health approaches to cancer prevention. The workgroup is exploring the following overarching questions:

- Where is the evidence linking specific risk factors with cancer causation the strongest?
- Which of these cancer causes or risk factors could be modified through environmental changes, health policies, systems change, or other social or public health interventions?
- What specific public health activities have been demonstrated to be effective or to show promise at the community level to address these cancer risk factors?
- How do the answers to these questions differ across the lifespan?

The CPAL workgroup decided to use the Action Model to Achieve Healthy People 2020 Goals as the framework for its efforts (Figure 1). This model illustrates the determinants of

Publication of this article was supported by the Centers for Disease Control and Prevention.

All authors are federal employees and have no conflicts of interest to disclose.

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health across the lifespan and the need for intervention at multiple levels to improve health outcomes [10]. In addition, the workgroup used the four Strategic Directions of the National Prevention Strategy (healthy and safe community environments, clinical and community preventive services, empowered people, and elimination of health disparities) as a guide to identifying the most effective and achievable strategies for prevention [11].

The CPAL workgroup began addressing the overarching questions listed here by focusing first on preadolescents and adolescents (roughly ages 8–18). We recognize this phase of life could potentially begin and end at other ages as well. This is an age group already targeted by the CDC for cancer prevention efforts with regard to tobacco use, ultraviolet radiation, and the human papillomavirus (HPV) vaccine [3,12–20]. Over time, the CPAL workgroup plans to address cancer prevention at every age, from the prenatal period through late adulthood. The workgroup reviewed the current literature to identify evidence linking exposures and risk factors during preadolescence and adolescence and cancer risk during adulthood. In addition, the workgroup asked experts in a variety of fields to weigh in on relevant research findings and discussion topics.

On August 9–10, 2011, the CPAL workgroup convened an informal panel of experts representing a diverse range of disciplines for a 2-day workshop. The workshop's purpose was to discuss opportunities for cancer prevention during preadolescence and adolescence and to consider where the scientific evidence may be strongest and where public health could have the largest impact. Discussions during the workshop focused on factors during youth that could impact cancer risk during adulthood. Workshop participants included Kimberly Applegate, Frank Biro, Bruce Blumberg, David Carpenter, Frank Chaloupka, Julianna Deardorff, Shanta Dube, Suzanne Fenton, Lindsay Frazier, Sarah Gehlert, Bill Kapogiannis, Lawrence Kushi, DeAnn Lazovich, Somdat Mahabir, Daisy Morales-Campos, Linda Morse,

John Santelli, Lee Strunin, and Tami Thomas. These participants contributed knowledge from various fields: adolescent medicine, pediatric oncology, pediatric radiology, developmental biology, endocrinology, toxicology, nutrition, epidemiology, behavioral science, health psychology, social determinants of health, anthropology, nursing, health education, school health, health economics, health policy, and translational science. In addition, staff from various divisions at the CDC also participated in the workshop. The full list of participants can be found in the Acknowledgments section.

The workshop agenda was structured so that participants could share their perspectives through individual presentations and engage in facilitated discussion. The first day focused on the “state of the science” and on discussing factors during preadolescence and adolescence that affect cancer risk during adulthood. The second day was devoted to discussions about translating the current scientific evidence into public health action and exploring promising strategies to reduce harmful exposures and risk factors. Highlights from the workshop discussions and opportunities for the future are described in the following section.

### Discussion Highlights

A central theme of the workshop was that preadolescence and adolescence is a time of unique susceptibility and vulnerability within the lifespan [8,21–23]. As children transition from childhood into near-adulthood, they experience many physical, biologic, social, and cultural changes. These changes make preadolescence and adolescence critical times to intervene on both exposures and behaviors that could have a lasting effect on their cancer risk during adulthood. Frank Biro described the sequence of pubertal events that occur during adolescence and explained that the timing of these events is related to both

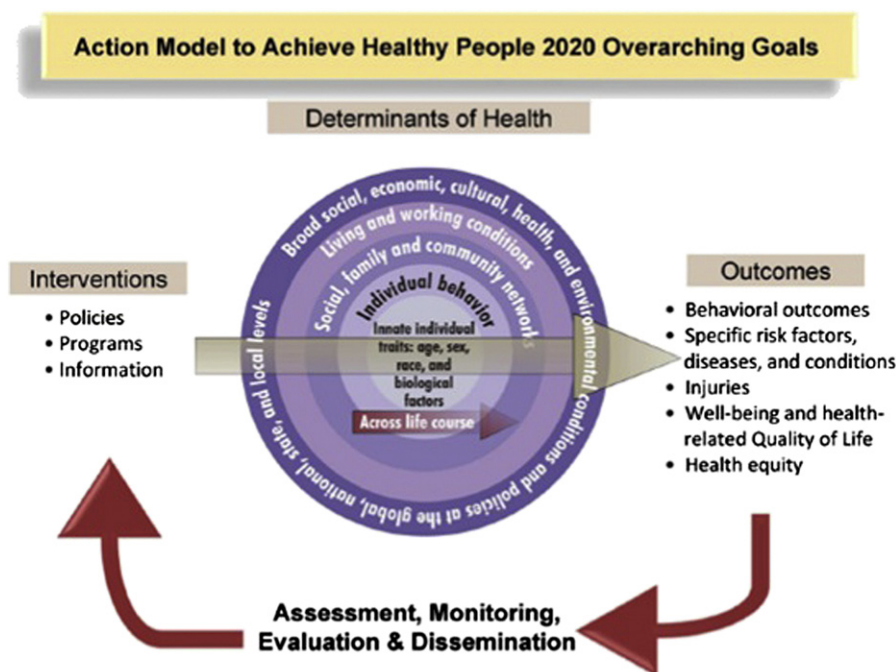


Figure 1. The action model to achieve *Healthy People 2020's* overarching goals [10].

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