EDITORIAL

When Prevention Works, Nothing Happens

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In Winslow's classic definition, public health is defined as "the science and art of preventing disease, prolonging life and promoting physical health."[1[p178]] Public health has certainly evolved with time but the basic premises of the "3 Ps"—preventing disease and injury, promoting health (physical, mental, and social well-being), and prolonging a high-quality life—still hold. Dermatology plays a key role in public health in many ways, but especially in the field of skin cancer prevention. New approaches, new strategies, and new data need to be recognized and highlighted for us to be effective in this component of our public health mission.

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The public health model includes an important pathway to achieve the goal of the 3 Ps. This model consists of 4 major steps: (1) surveillance—what is the problem? (2) risk factor identification—what is the cause? (3) intervention and evaluation—what works? and (4) implementation—how do you do it? The goal of public health is to get to that last stage, which includes the implementation of policies, regulations, and initiatives that would have a positive impact on the health of the population. However, we do not get to that last stage without robust and scientifically valid information and data from the first 3 steps.

Using this model, what do we know? Surveillance data report that nearly 5 million people in the United States are treated for skin cancer at a cost of $8.1 billion.[2] As for risk factor identification, exposure to ultraviolet radiation (UVR) from sunlight and artificial sources is a known cause of skin cancers. In 2002 the National Institutes of Health, through its interagency National Toxicology Program, concluded that "exposure to sunbeds and sunlamps is known to be a human carcinogen based on sufficient evidence of carcinogenicity from studies in humans, which indicate a causal relationship between exposure to sunbeds and sunlamps and human cancer."[3[p188]] That leads us to various interventional approaches of decreasing UVR exposure through behavioral changes, protective measures, and public health policies and regulations that together result in a decrease or elimination of such exposures and hopefully a decrease in skin cancers.

Critical to the public health model is the pursuit of new data that allow us to accentuate or modify prevention approaches. The more information we have, the more robust we can be in our public health approach. In this issue of *JAMA Dermatology*, Lergenmuller et al[4] report the results of a cohort study that showed a distinct dose-response association between indoor tanning and the risk of cutaneous squamous cell carcinoma (SCC). This is an important study that further adds to the data on risk factor identification; the uniqueness of the study being a deeper dive into artificial sources of UVR and their role in the development of SCC. Melanoma is the least common of the 3 types of skin cancer, but it has received the greatest research interest in terms of its relationship to indoor tanning because it accounts for a higher mortality rate. Fewer epidemiologic studies of the relationship of basal cell carcinoma (BCC) and SCC to indoor tanning have been performed, so this study fills an important gap. The goal of such research is to effect change and, as the authors state, their results strengthen the justification of developing policies that regulate indoor tanning.[4]

With more research such as this, we in public health have the potential to expand the reach of specific skin cancer prevention initiatives. The Healthy People initiative is a comprehensive set of national goals and objectives for improving the health of Americans. First released in 1979 by the Department of Health and Human Services, it is a science-based set of 10-year national objectives for promoting health and preventing disease. It includes a vision, mission, goals, focus areas, criteria, objectives, and action plans for achieving the targets. The objectives listed in the current Healthy People 2020 pertinent to indoor tanning include (1) reducing the proportion of adolescents in grades 9 to 12 who report using artificial sources of UV light for tanning, and (2) reducing the proportion of adults aged 18 years or older who report using artificial sources of UV light for tanning.[5] Healthy People 2030 will be released early in 2020. Although the final objectives are not yet public, a preliminary listing of the proposed new objectives shows that only 1 objective related to skin cancer remains—reducing the proportion of adolescents in grades 9 to 12 who report sunburns. No specific objectives pertaining to the use of artificial sources of UV light for tanning are proposed.[6] Public health decision making can work in mysterious ways. Perhaps new data, such as those presented in this journal, will turn the future tide.

Five years ago, in July of 2014, the Office of the US Surgeon General in conjunction with the Centers for Disease Control and Prevention (CDC) and other partners released the first ever Surgeon General's Call to Action to Prevent Skin Cancer.[7] How did this happen? Oftentimes, opportunity is about the right time, the right people, in the the right place! Combine an Assistant Secretary for Health (Dr Howard Koh, a dermatologist), with an acting US Surgeon General (me, a dermatologist), with an interested and enthusiastic cadre at the CDC, and a public health initiative unfolds. The Call to Action is a science-based document to stimulate action nationwide to solve a major public health problem. This raised the issue of skin cancer prevention to a higher level of priority and attention and provided clear action steps to move the topic forward. The document listed 5 strategic goals including (1) increase opportunities for sun protection in outdoor settings; (2) provide

individuals with the information they need to make informed, healthy choices about UV exposure; (3) promote policies that advance the national goal of preventing skin cancer; (4) reduce harms from indoor tanning; and (5) strengthen research, surveillance, monitoring, and evaluation related to skin cancer prevention. But as other subsequent Surgeons General came into office, new priorities took over, and initiatives just as this became secondary. Once again, the hope is that new data help in reprioritizing public health initiatives.

A great coordinating organization in skin cancer prevention has been the National Council on Skin Cancer Prevention, whose mission is to prevent skin cancer through education, advocacy, and raising awareness. Working with the American Cancer Society, the National Council supports the Indoor Tan-Free Skin Smart Campus Initiative. This program helps promote skin cancer prevention on university and college campuses with an emphasis on limiting access to indoor tanning.[8] In addition, activities have been occurring on a global scale. In 2017 the World Health Organization (WHO) took on an initiative regarding artificial tanning devices and this includes a listing of WHO policy options to decrease risk from tanning beds.[9]

Regulations play a role in skin cancer prevention as well. Ultraviolet indoor tanning devices and their use are regulated by federal, state, and local governmental entities in the United States. In 2014, the US Food and Drug Administration (FDA), reclassified the regulatory status of these devices from class I (low-risk devices) to class II devices (moderate- to high-risk devices) and required premarket review before the marketing of any new indoor tanning device. In addition, the FDA required that the labeling of these products state that the products should not be used by anyone younger than 18 years, with warnings included in promotional materials for all sunlamp products and UVR lamps (boxed warning).[10]

Indoor tanning is age restricted in many states in the United States, and at least 44 states and the District of Columbia regulate indoor tanning for minors.[11] Some counties and cities also regulate the use of tanning devices. Research shows that states with indoor tanning laws that include age restrictions had lower rates of indoor tanning among minors.[12]

So, is all this working? There is a decrease in the use of tanning beds and therefore exposure to carcinogenic UVR from artificial sources. Data from the 2015 Youth Risk Behavior Surveillance System showed that nationwide, 7.3% of high school students had used an indoor tanning device 1 or more times during the 12 months before the survey.[13] The prevalence of indoor tanning device use was higher among female (10.6%) than male (4.0%) students; higher among white female (15.2%) than white male (3.7%) students. The prevalence of indoor tanning device use was higher among white (9.4%) than black (3.7%) and Hispanic (4.7%) students, higher among white female (15.2%) and Hispanic female (5.8%) than black female (2.1%) students, and higher among white female (15.2%) than Hispanic female (5.8%) students. Most importantly during 2009 to 2015, a significant linear decrease occurred in the prevalence of indoor tanning device use (from 15.6% to 7.3%).[13]

Many issues remain unsolved, and we need good science to help us advance in skin cancer prevention. Regarding UVR exposure from sunlight, these issues include continued controversies about vitamin D and those revolving around sunscreen use, the safety of their ingredients, their environmental impact (damage to coral reefs), and the FDA approval of new formulations. We will have to rely on good science to resolve these issues and to assist public health in the path forward.

There is a saying that "when prevention works—nothing happens." This reflects both the success of prevention strategies, there is no disease and therefore nothing bad happens to the person. It also reflects the fact that oftentimes we do not appreciate or celebrate the successes of prevention. Let's make nothing happen! Let's keep on track on that bold and noble mission of preventing skin cancer.

ARTICLE INFORMATION

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