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“Future Directions in Cancer Prevention and Control: Workforce Implications for Training, Practice, and Policy” Symposium, October 17 to 18, 2009, The University of Texas M. D. Anderson Cancer Center

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Recent efforts to assess the future workforce in oncology have elicited concern and action from several agencies and organizations; however, none have specifically focused on the workforce in cancer prevention or addressed the impact that prevention activities could have on the future burden of cancer in the United States. As the potential for prevention to reduce such burden is substantial, and because disparities in cancer still exist, which could be reduced by efforts in prevention, the necessity to consider the readiness of the current and future cancer prevention workforce to meet cancer prevention needs in clinical and public health practice is urgent.

At The University of Texas M. D. Anderson Cancer Center, a symposium was organized on October 17 and 18, 2009, to begin characterizing the state of the cancer prevention workforce, both employed and in training. Our objectives included describing gaps and anticipating needs of the workforce, and identifying data needed for accurate characterization, even if currently unavailable. In preparation, organizers considered different models for evaluating workforce needs through an iterative process with experts from cancer prevention and cancer education and training. Eventually, five topic areas were organized into working groups that served as the structure for the symposium: (a) health policy and advocacy; (b) translation to the community; (c) implementing cancer prevention into clinical practice; (d) health services infrastructure and economics; and (e) discovery, research, and technology.

At the symposium, attendees gathered for a keynote address that highlighted the progress of cancer education throughout the past 50 years and was followed by a poster session with

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awards. Workgroup leaders gave brief overviews to orient participants to the focus of each topic before breaking into self-selected groups. In addition to wireless Internet connection access, each group had available printed articles, reports, and other resources gathered by organizers to facilitate discussion as they clarified the focus of their topic and developed a strategy for producing an article to describe the current state of the cancer prevention workforce for each of the five topic areas, the factors that influence the preparedness of the workforce, and our ability to forecast its future needs. During debriefing at the end, representatives from the National Cancer Institute (NCI), American Cancer Society, and American Society for Preventive Oncology spoke briefly about cancer prevention workforce training, education, funding, and future directions from their perspective as part of a funding agency or nonprofit organization.

Synthesis of Workgroup Discussions

HEALTH POLICY and ADVOCACY

To achieve progress in cancer prevention, the gaps between the perceived role of the scientific workforce, cancer prevention advocacy, and policy development must be diminished. These gaps result in part from the inability to disseminate evidence-based cancer prevention research and best practices across disciplines and to articulate these messages effectively to decision makers for translation into cancer prevention policy. This ineffectiveness prevents improvement of the public health through cancer prevention and control, and diminishes the efforts of the cancer prevention workforce.

Group Description: The Health Advocacy and Policy Workgroup was composed of six members, representing academic institutions, federal agency, and a national cancer cooperative group.

Discussion: During the group's discussion, it was suggested that although the cancer prevention workforce is deemed highly motivated, a wide range seemed to exist of both knowledge of and interest in supporting advocacy and policy within the workforce. The lack of education in cancer prevention advocacy, particularly for advocacy training targeted at cancer prevention professionals, was also thought to be problematic. Currently, it seems as though a considerable proportion of cancer prevention professionals do not understand the implications of advocacy, or the lack of it, for policy development to support cancer prevention in clinical and public health practice. Some investigators may feel that their research alone is sufficient effort for preventing cancer, in part because they are not trained to participate in—or are not aware of—the efforts needed to translate research outcomes into policy, and then into practice. Training the workforce to express their research findings more effectively to policymakers was suggested as another way to promote positive change. Research outcomes, both positive and negative, need to be disseminated for appropriate action through advocacy or policy development, or both. Helping individuals understand the interdependent roles that individuals play in the process of discovering, developing, and disseminating evidence-based cancer prevention information and practice is a responsibility for all members of the workforce. This would also require that cancer prevention professionals understand and prioritize “pressing issues” to help set appropriate advocacy priorities, rather than having research be driven by funding.

A novel concept would be to include training for team work as well as for advocacy and policy development in career preparation for multidisciplinary research. Also, incentives could be offered to teaching institutions to encourage collaborations across disciplines and constituencies. Opportunities accessible to students from different settings, disciplines, schools, and countries at different times throughout their training could be offered through

modular courses. Other strategies include programs that target legislators and policymakers for training in methods to identify best practices and translate them into policy.

Impeding uptake of prevention practices and possibly perpetuating cancer health disparities, lack of awareness of the need to provide culturally and linguistically appropriate cancer prevention programs and information stems in part from the absence of key stakeholders in discussions and decision making about allocating resources for cancer prevention. Engaging stakeholders can come from building the capacity and leadership of communities and mobilizing their efforts in these activities, which has been effective in past, as with increased use of mammography over time by women from different race and ethnic groups. However, funding for these advocacy training and related activities seems to be narrow and not typically focused on cancer prevention.

HEALTH SERVICES RESEARCH

A major challenge to conducting health services research in the setting of cancer prevention is that the newness of the field demands its definition at the same time that opportunities are being discussed for the application of health services research methods to cancer prevention strategies. Defining the field will help identify and enumerate potential end users, and facilitate growth in the number of people translating cancer prevention research into practice.

Group Description: The Health Services Research Workgroup included seven participants, representing various perspectives, including academic research and small business. Although the original topic centered on infrastructure and economics in health services, the discussion shifted to what was renamed “Cancer Prevention Health Services Research” (CP-HSR), and focused instead on defining and promoting the field.

Discussion: Prevention efforts are likely to reduce a large proportion of the burden of cancer; however, few prevention approaches have been rigorously evaluated for efficiency and effectiveness using health services research methods. Work in this field needs to include attracting and retaining a critical mass of health services researchers and providers to improve cancer prevention through evidence-based policy, regulation, education, and practice.

The CP-HSR workgroup provided five broad recommendations: (a) build consensus on the definition of CP-HSR; the diverse range of potential cancer prevention activities; and the providers, practitioners, and others involved in them, and improve the integration of these definitions into cancer prevention research and practice. (b) Increase funding and resources for CP-HSR, making them available to a range of investigators from entry-level researchers to senior investigators. (c) Expand the cancer prevention workforce engaged in health services research focused on cancer prevention and control by providing training and educational opportunities to current providers, and by recruiting new providers using incentives and reducing barriers to entry into the field, or both. (d) Recruit and promote minority scholars and practitioners in cancer prevention research and practice as a means to decrease disparities in cancer prevention. (e) Develop and use models for conducting health services research focused on cancer prevention and control, such as that employed by the Veterans Affairs health care system.

DISCOVERY, RESEARCH, and TECHNOLOGY

As discoveries, innovative research, and ground-breaking technology drive science rapidly forward, several factors limit our ability to supply a workforce capable of supporting and accelerating the field of cancer prevention, potentially prohibiting progress-translating research into practice at an appropriate pace. The Discovery, Research, and Technology

Workgroup focused on how to create a workforce able to keep up with ever-changing technology, and how to facilitate communication, access to a cross-disciplinary knowledge base, and passion across various scientific disciplines, to attract and retain savvy and technologically capable individuals to the practice of prevention, not just treatment, of cancer.

Group Description: Nine members encompassed a wide array of scientific specialties along several stages of the career trajectory, from tenured professors, clinicians, and surgeons; to postdoctoral fellows and graduate student trainees; to educators and administrators dedicated to ensuring the success of cancer prevention trainees. Members brought unique perspectives from several disciplines, including cancer genetics, cancer epidemiology, radiation physics, surgical oncology, pharmacogenetics and genomics, and cancer training and education, representing two major comprehensive cancer centers and one major federal organization within the United States.

Discussion: Within this topic, group discussion identified several factors that were felt to influence the present research environment. A major issue was a perceived lag in technology development and implementation of new tools due to gaps in the skills of the current workforce. For example, few cancer risk prediction models exist, and of these, most do not yet incorporate specific aspects of lifestyle or environmental exposures. Limited development of novel technology may result in part from underutilization of other specialties and disciplines outside traditional health science fields (e.g., engineering, physics), in spite of strength in several disciplines, including epidemiology, genetics/genomics, molecular biology, and virology. Indeed, absence of professionals from non-health science disciplines reduces opportunities for trans-disciplinary collaborations, although too few opportunities for such collaborations were felt to exist in general. Another problem was the difficulty in attracting young scientists because career trajectories within the field of cancer prevention were perceived to be comparatively unclear. Moreover, retaining a sufficient workforce was also of concern. Some thought that the existing emphasis toward treatment at most cancer centers and the attractiveness of commercial research support might draw some junior and more senior scientists away from careers in prevention, particularly ones from disciplines outside health science.

IMPLEMENTING CANCER PREVENTION INTO CLINICAL PRACTICE

Despite considerable evidence linking lifestyle behaviors with cancer risk and survival, many may not follow guidelines for prevention or continue to engage in risky behaviors. Initiatives have been made to bridge gaps between research, clinical practice, and the community, but the least successful efforts have been those aimed at implementing cancer prevention strategies for the public.

Group Description: The multidisciplinary workgroup Implementing Cancer Prevention into Clinical Practice consisted of nine individuals, including oncologists, a dentist, a dean of faculty development at a cancer research institution, and graduate students in health-related disciplines.

Discussion: In preliminary discussions, members felt that current clinical practice focuses less on prevention and more on treatment. Clinicians may be reluctant to implement cancer prevention in their practices because of limited incentives to do so. For example, reimbursement rates for cancer screening may not be high enough to motivate clinicians to promote cancer prevention rigorously. Furthermore, during the limited time patients and providers have together, patients may not always receive recommendations for cancer prevention, such as lifestyle changes and cancer screening. Sufficient time for consultation with patients is vital to provide adequate guidance about implementing strategies and to

answer patient questions, but also because existing guidelines can be ambiguous or even controversial (e.g., prostate cancer). As a result of insufficient time discussing prevention strategies, patients may have deficient cancer knowledge and incomplete understanding of behavior modification skills, which may be barriers to prevention and early cancer detection. Ambiguous and conflicting messages can also result in public confusion about appropriate cancer prevention practices, such that confused individuals may not participate in recommended prevention practices or screening appropriately. Furthermore, individuals may also be confused by physicians whose recommendations are based on different guidelines. Coordinated and reinforcing messages from health professionals throughout the health care system could strengthen cancer prevention messages, but are currently lacking.

For successful prevention of cancer, provision of cancer prevention activities and care must also be culturally and linguistically appropriate, particularly in diverse communities. Within the workforce, health care providers, from genetic counselors to community health workers, and the scientists who work with them may not be well matched in their socioeconomic and ethnic diversity, which serves as another barrier to successful communication and program implementation. Although many resources and tools exist for cancer prevention, they are not being used as widely or as effectively as they could be.

Education and training in cancer prevention is not well coordinated at all levels of clinical professional preparation. For example, cancer prevention in medical school curricula is especially lacking. Currently, no clinical residency training programs focus specifically on cancer prevention. Preventive medicine training programs may include some cancer prevention, but this is not always standardized in training approach or educational content. Moreover, practitioners are not required to maintain certification for cancer prevention and current continuing medical education in cancer prevention does not include groundbreaking strategies, such that practitioners are not continuously updated on recent advances in cancer prevention. Without comprehensive cancer prevention education, clinicians cannot know the full potential of cancer prevention nor can they acquire the skills they need to effectively implement prevention in their practices. However, continuing medical education will be useless unless clinicians are held accountable for implementing cancer prevention strategies into their clinical practice and cancer prevention is incorporated in their standard of care.

TRANSLATION TO COMMUNITY

Despite the value of approaches to investigate and facilitate implementation of cancer prevention practices into communities, such as community-based participatory research (CBPR), a number of issues limit successful translation of cancer prevention research into community settings. First, few researchers have the skills, experience, and knowledge to bridge the gap between cancer prevention science and the community effectively. At the same time, communities are not oriented to working with scientists. As a result, too few community-based educational programs in cancer prevention exist, particularly evidence-based programs with adequate plans for evaluation. The lack of community capacity to design and implement programs is further compounded by barriers created by policies of funding agencies that hinder implementation and maintenance of funding for CBPR, which includes culturally appropriate study designs, and use of validated methods to assess the member-voiced needs of communities. Other barriers include isolation of stakeholder groups within infrastructures that communicate poorly with one another, resulting in duplicative efforts and producing silos of resources and information.

Group Description: The group was comprised of a 10-member interdisciplinary team representing clinical, education, and research leadership involved in academic and community-based cancer prevention and control activities across the nation.

Discussion: The most pressing issues identified by the group related to barriers in four areas. (a) Policy: Government agencies need to be more receptive to developing policy and support mechanisms for integrating and sustaining community-based practices. (b) Networking infrastructure: Information, research, training methods, and resources are frequently duplicative, and mechanisms are needed to promote network building to improve communication among community agencies. For example, the demise of the NCI-funded Cancer Information Service (CIS) has had resounding ramifications for CBPR. (c) Research culture, climate, and mindset: Differences in both the individual mindset and institutional culture of key stakeholder groups often results in rigidity and overspecialization, impeding collaborations. (d) Education: Targeted education and training initiatives, particularly for CBPR participants—both scientific and community based—were identified as essential to address each category of barriers and needs identified, but current translational and CBPR educational resources are limited.

The team outlined recommendations to address each barrier. For example, to reduce silos of information, research methods and duplicate infrastructures of translational research, a clearinghouse of information, research, training methodology, and resources need to be developed or expanded, such as the NCI's Cancer Control P. L.A.N.E.T. Also, mechanisms for building networks among community agencies are imperative to successful provision of cancer prevention services, and could include establishing coalitions and providing cultural sensitivity and leadership training. Pilot initiatives could serve as models for broader applications and dissemination. Funding mechanisms for supporting proven partnerships between investigators and communities need to be implemented and maintained, and need to include funding for evaluation. Researchers and key stakeholders engaged in these activities need support to ensure the cultural competency of their approaches and programs, and to adequately address issues related to patient literacy and translation services.

Expanded education and training opportunities must be developed and supported to enhance current CBPR initiatives and to address future workforce needs. Possible strategies could include continuing medical education and community-based training initiatives targeted to the existing workforce to both foster readiness for and provide better understanding of evidence-based strategies. Efforts aimed at government agencies will foster better integration of community-based prevention practices. Additional initiatives should target the community to educate, train, assess, and evaluate outcomes of education in the community setting, including cross-training among professionals in public relations, public health, and information technology to promote understanding, appreciation, and communication between different disciplines involved in collaborative work. Schools of public health could add curricula for specific majors and certification programs for allied health workers to make different levels of training available to individuals throughout the workforce pipeline. We also need better training in qualitative research methods, and greater funding to support educational initiatives.

Symposium Synthesis and Themes

Several themes surfaced from the group discussions (Table 1). Most struggled initially to identify the parameters of their topic area, finding consensus difficult to reach in defining “what” cancer prevention activities are and “who” works in the field, given the breadth and complexity of the field. Many described current workforce activities occurring in discipline-specific “silos.” The impact of this work infrastructure was thought to contribute to frequent communication gaps between research, practice, and policy, leading to inconsistent recommendations and perpetuating miscommunication. Most groups expressed desire for a common “language” in cancer prevention or other tools for sharing information to alleviate problems with communication gaps within the workforce and to promote more synergistic

approaches to cancer prevention research and practice. Another common issue centered on workforce preparedness for innovation in cancer prevention. For example, with constant development of new technology, some groups questioned whether the field was well prepared to take full advantage for communication and research of new tools, such as social media (e.g., Twitter, Face-book), particularly because of their wide appeal to the public. Others wanted efforts to target in particular medical students early in their training to cultivate them as future leaders in cancer prevention research, but also for igniting change and promoting integration of cancer prevention into clinical practice and health policy. For the field as a whole, several groups mentioned the need for increased workforce diversity—from health care providers to community health workers to those shaping policy.

Future Directions

As an initial step toward coordinated planning for the future cancer prevention workforce, the central goal of those who assembled at the symposium is to publish articles about workforce issues relevant to topic areas within the field. During and after the symposium, groups continued to refine their topic areas, some expanding the scope and others focusing on specific aspects of their topic. For example, nursing in cancer prevention and international cancer prevention efforts were topics that were initially not represented by a single group but emerged as areas important for specific focus. Symposium organizers manage a Web site with resources and materials for working groups (<http://sites.google.com/site/cancerprevwkfbobchamberlain/>). Published together as a supplement in the *Journal of Cancer Education* in fall 2010, the articles will be useful for forming stakeholder-specific strategies to prevent workforce shortages in the field of cancer prevention and control as a means to strengthen the field and to meet the public's current and future needs in cancer prevention and control.

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Table 1

Workgroup discussion key points

Workgroup	Key points
Health Policy and Advocacy	<p>Education and training resources for cancer prevention advocacy is not adequate to meet current needs.</p> <p>Barriers need to be removed for, and opportunities afforded to, medical professional trainees who are interested in learning about cancer prevention and control.</p> <p>The cancer prevention workforce of the future needs to be better equipped to produce, identify, and analyze evidence and be able to articulate evidence-based information to policymakers to promote positive change.</p>
Cancer Prevention Health Services Research (CP-HSR)	<p>CP-HSR is an emerging multidisciplinary field whose application needs to be defined.</p> <p>Many people are involved in cancer prevention activities at the individual, local, regional, and national levels, but do not realize the impact of their work on this field.</p> <p>A need for more and diverse CP-HSR researchers exists.</p>
Discovery, Research, and Technology	<p>A technologically capable workforce may be attracted and retained through expanding representation and integrated participation of disciplines in cancer prevention.</p> <p>High-capacity infrastructure for multidisciplinary research may be strengthened by developing a visible career path trajectory and environment that nurtures multidisciplinary research in cancer prevention.</p> <p>A common language to permit collaborative process may be attained with a standardized cancer prevention-specific curricula for undergraduate, graduate, and continuing medical education program.</p>
Implementing Cancer Prevention into Clinical Practice	<p>Cancer prevention implementation in practice is impeded by current infrastructure and inconsistencies between cancer screening guidelines.</p> <p>Providers have limited time to discuss cancer prevention with patients.</p> <p>Cancer prevention activities need to exist in all aspects of clinical practice, including professional education, insurance reimbursement, and information infrastructure.</p> <p>The dissemination of best practices is hampered by lack of effective communication among practitioners, researchers, and general population.</p>
Translation to Community	<p>A large divide exists between academic researchers and community organizations.</p> <p>Lack of diversity among cancer prevention investigators and community health worker partners contributes to this gap (e.g., creates need for patient translation services, for which training is insufficient).</p> <p>Government agencies need to play a more active role in developing policy and support mechanisms for integrating and sustaining community-based practices.</p> <p>Cultural competency needs to be incorporated into effective cancer prevention practices.</p> <p>Building community networks through coalitions and leadership training could be a potential model for the cancer workforce.</p>