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The Cancer Prevention and Control Research Network: Accelerating the implementation of evidence-based cancer prevention and control interventions

Jennifer Leeman^{a,*}, Karen Glanz^b, Peggy Hannon^c, Jackilen Shannon^d

^aUniversity of North Carolina, School of Nursing, 120 N. Medical Drive, Chapel Hill, NC 27599-7460, USA

^bUniversity of Pennsylvania, Perelman School of Medicine and School of Nursing, 801 Blockley Hall, 423 Guardian Drive, Philadelphia, PA 19104-6021, USA

^cUniversity of Washington, Department of Health Services, 1959 NE Pacific Street, Magnuson Health Sciences Bldg, Box 357660, Seattle, WA 98195, USA

^dOregon Health and Science University, School of Public Health, 3181 SW Sam Jackson Park Road, Portland, OR 97239, USA

Abstract

This editorial provides a high level overview of the articles included in this supplement.

Keywords

Cancer prevention and control; Implementation science; Implementation determinants; Health disparities

In 2019, nearly 2 million Americans will receive a cancer diagnosis and over 600,000 will die of cancer (Siegel et al., 2019). Cancer incidence and mortality are disproportionately high among people who live in rural counties, are low socioeconomic status, and are members of underserved racial and ethnic groups (Siegel et al., 2019; Henley et al., 2017). Numerous, multilevel factors contribute to these disparities in cancer diagnoses, morbidity, and mortality (Davis et al., 2017; Martens et al., 2016; Wheeler et al., 2014; Plumb et al., 2017; Holden et al., 2010). These factors are present at the level of the individual patient, community, healthcare providers, healthcare system, and the wider socio-political context (Damschroder et al., 2009). Identifying the factors that contribute to disparities is essential to the development of interventions that precisely target those factors and effectively reduce disparities. Also, the more we know about determinants of disparities, the better we can disseminate and implement effective interventions.

This journal supplement reports the findings from a portfolio of research studies, evaluations, and action-oriented projects that address the multilevel factors that contribute to

*Corresponding author: jleeman@email.unc.edu (J. Leeman).

disparities in cancer incidence and mortality. These studies were conducted by members of the Cancer Prevention and Control Research Network (CPCRN), a national network of centers that collaborate on research to reduce the burden of cancer, especially among those at greatest risk (cpcrn.org). Much of this research is done in engaged partnership with public health and community partners with the goal of accelerating the implementation of evidence-based cancer prevention and control interventions into practice. The Centers for Disease Control and Prevention (CDC) and the National Cancer Institute (NCI) have funded the CPCRN since 2002 as part of the CDC-funded Prevention Research Centers program. During that time the network has included between three and ten centers over the course of four rounds of funding.

This special issue of *Preventive Medicine* reports on initiatives and findings from the most recent round of funding (2014–2019), which included eight collaborating centers based at Case Western University in Ohio, Oregon Health Sciences University, and the Universities of Iowa, Kentucky, North Carolina, Pennsylvania, South Carolina, and Washington. Each of the CPCRN collaborating centers engages in cross-center research studies and also conducts community-engaged research in their own communities and regions. By conducting research at these two levels the CPCRN is able to create a “network of networks” that researchers then leverage to develop cross-institution, multi-state research studies (Ribisl et al., 2017). Networking across centers allows CPCRN to engage the breadth of expertise needed to address the multilevel factors that contribute to health disparities, including expertise in geography, economics, policy, implementation science, and multilevel modeling in addition to cancer prevention and control and health disparities research. Presently, CPCRN includes over a hundred investigators from departments of epidemiology, health behavior, medicine, nursing, nutrition, psychology, and sociology, among others. Networking across centers also allows the CPCRN to leverage each collaborating center’s network of state and local partners. As a result, cross-center research studies engage research partners and study participants from diverse settings and populations across the United States.

This supplement provides a sampling of the types of research that are possible within a network of geographically dispersed centers. The research presented here addresses the following broad questions:

1. What multi-level factors contribute to disparities in cancer outcomes?
2. What strategies will speed the implementation of cancer prevention and control interventions in settings that reach those at greatest risk for poor cancer outcomes?

What multi-level factors contribute to disparities in cancer outcomes?

Over the past five years, CPCRN workgroups have studied multiple factors that contribute to disparities in cancer prevention and control, with a particular focus on populations living in rural regions of the US and on methods for modeling the impact of multi-level factors on cancer outcomes. In their paper in this supplement, Zahnd and colleagues (2020a) provide a conceptual framework describing three levels of factors that contribute to rural disparities in cancer outcomes (micro, macro, and supra-macro) and offer recommendations for multilevel

statistical modeling in rural cancer research. They conceptualize the micro-level to include individual-level risk factors and distinguish those that are non-modifiable (e.g., age, race/ethnicity, genetics) from those that are modifiable (e.g., diet, physical activity, and other lifestyle behaviors). At the macro-level, risk factors pertain to the social and physical context and include area-level socioeconomic status, ruralurban status, social networks, and access to healthcare providers. The supra-macro level includes health policies and their impact.

Authors of three other papers in this supplement report the findings of CPCRN research on rural health disparities in cancer outcomes. Odahowski et al. (2020) report the findings from their research on rural versus urban differences in cancer survivors' reports of financial hardship resulting from cancer treatment. Using data from the 2011 Medical Expenditure Panel Survey (MEPS), they found that cancer survivors living in rural areas were more likely to report experiencing financial hardship than those living in urban areas, with much of the difference due to differences in demographic factors. They also found that younger age, nonwhite race, and uninsured or public health insurance were associated with a greater risk for financial hardship. Eberth et al. (2020) studied cancer mortality-to-incidence ratios by US congressional district. By analyzing data from a national database (US Cancer Statistics), they found that populations in the South and Midwest regions of the US had a higher risk of mortality following a cancer diagnosis than populations in other regions. Other factors that increased the risk of cancer mortality included living in a congressional district with a high proportion of residents who were rural or were Non-Hispanic Black or in a state that had not expanded Medicaid. In a third paper, Zahnd et al. (2020b) address the challenges to using population-based survey data to study rural disparities. These challenges include the small numbers of rural respondents and the use of divergent sampling and analysis methods among others. In their paper, Zahnd et al. examine how "rural" is characterized in four, population-based surveys: 1) Health Information National Trends Survey (HINTS); 2) National Health Interview Survey (NHIS); 3) Behavioral Risk Factor Surveillance System (BRFSS); and 4) Medical Expenditures Panel Survey (MEPS). They then describe the challenges of using these surveys and proposed solutions to address these challenges in rural cancer studies.

Over the past five years, one of the cross-center workgroups has applied several types of simulation models to estimate the impact of a range of policy alternatives and interventions on colorectal cancer (CRC) screening rates and outcomes across diverse populations. Hassmiller Lich et al. (2020) report findings from this workgroup's use of microsimulation to estimate the effects of health insurance expansion and reduction scenarios on CRC-related health and economic outcomes in North Carolina. Through the use of microsimulation, they were able to estimate the effects that Medicaid expansion, Medicare-for-all, and coverage reductions would have on the percentage of the population that was up-to-date with screening, cases of CRC averted, and healthcare costs in North Carolina.

These papers illustrate how the CPCRN is able to leverage geographically dispersed, interdisciplinary teams of investigators to study the individual, geographic, policy, and other multilevel factors that increase risk for poor cancer outcomes. As detailed below, an understanding of these factors is critical to developing interventions and implementation strategies that precisely target those factors and reduce health disparities.

What strategies will speed the implementation of cancer prevention and control interventions in settings that reach those at greatest risk for poor cancer outcomes?

The challenge of slow translation from evidence to practice is well documented (Bryant et al., 2014). Adopting and implementing evidence-based interventions can be especially challenging in settings that serve those at greatest risk for poor cancer outcomes, as these settings (such as federally qualified health centers [FQHCs]) often have limited resources and/or competing priorities (Allen et al., 2014). The articles in this section of the special issue examine strategies to speed the implementation of evidence-based cancer screening interventions at multiple levels, including patient, health system, and the “outer setting,” or the context in which health systems and other organizations function. Finally, one article documents the impact of the CPCRN (beyond peer-reviewed publications) using CDC’s Science Impact Framework.

Patient navigation is considered an evidence-based intervention for improving cancer screening rates (Steinwachs et al., 2010; Hou and Roberson, 2015). However, there are limited data describing the activities navigators engage in and the barriers they encounter in navigating patients to cancer screening and follow-up and treatment when screening results are positive. Barrington et al. (2020) conducted a national survey of patient navigators affiliated with CDC’s Colorectal Cancer Control Program (CRCCP) and National Breast and Cervical Cancer Early Detection Program (NBCCEDP). They found that patient navigators reported high levels of structural barriers to screening (such as transportation barriers and screening conflicting with work hours). This was the first survey of patient navigators affiliated with national screening programs serving un/underinsured and low-income patients. Findings provide guidance for how CRCCP and NBCCEDP to strengthen their training and support for patient navigators to address structural barriers, if sufficient support from the navigators’ organizations can be secured.

Davis and colleagues conducted a microsimulation to aid health systems in selecting the combination of patient and provider-level interventions that will maximize impact on CRC screening rates among Medicaid enrollees in Oregon (Davis et al., 2017). Medicaid enrollees are a distinct audience from the patients served by CRCCP and NBCCEDP yet also experience low cancer screening rates (Bonafede et al., 2019). Davis et al. compared five strategies in their microsimulation, including patient-oriented strategies (patient reminders, mailed FIT, patient navigation, and mailed FIT + patient navigation) and a provider-oriented strategy (academic detailing + provider audit and feedback) (Davis et al., 2017). All of these strategies are consistent with Community Guide strategies for increasing CRC screening (Task Force on Community Preventive Services, n.d.). Based on expected impact and cost effectiveness, Davis et al. recommend that health systems implement mailed FIT with or without patient navigation and patient reminders (Davis et al., 2017).

Quality improvement (QI) collaboratives are often used to increase uptake of evidence-based interventions (EBIs) in healthcare settings, but reports of their impact often provide minimal detail on the strategies used or the extent of participants’ engagement. Rohweder et al.

(2020) report on an evaluation of a QI collaborative to increase the use of evidence-based CRC screening interventions. Their findings illustrate both the successes of a QI collaborative, and the challenges of securing consistent engagement of FQHC staff, and their methods provide a model for similar evaluations in other settings.

The effort reported by Leeman et al. (2020) complements Rohweder and others' paper, as it uses theoretical analysis applied to case studies of CPRN researchers' initiatives to implement evidence-based interventions to improve CRC screening in FQHCs. Their article describes a cross-center workgroup's review of the applicability of key organizational theories to implementation science and practice, and illustrates of intervention implementation efforts in FQHCs.

One hallmark of the CPRN is the ability of member centers to adopt and replicate or adapt interventions and implementation strategies developed at other member centers, achieving twin goals of building the evidence for an intervention or strategy and (if successful) increasing impact by implementing it in new settings. Glanz and colleagues (2020) implemented the Evidence Academy model, an implementation strategy originally developed at the University of North Carolina three times from 2015 to 2018 (Rohweder et al., 2016). They held three conferences based on the Evidence Academy model in Pennsylvania; one conference focused on prostate cancer, a second on food access and obesity prevention, and third on tobacco control science. Regional audiences for the conferences included community members, practitioners, researchers, and government leaders, spanning representatives of the multi-level factors discussed in this supplement. Lessons learned from the evaluation findings and ongoing activities can be applied to future adaptations of the Evidence Academy model.

The last article in this special issue examines the impact of CPRN activities using key indicators from the CDC's Science Impact Framework (Centers for Disease Prevention and Control, n.d.), which is based on the "historical tracing method" articulated by Ruegg and Jordan (Ruegg and Jordan, 2007). The aim of this analysis was to describe whether and how CPRN network and center activities have shown impact beyond peer-reviewed publications. They found strong support for the CPRN's achievements in four domains of the Science Impact Framework: disseminating science, creating awareness, catalyzing action, and effecting change.

Taken together, the articles in this special issue emphasize the importance of context in addressing persistent disparities in cancer outcomes and provide encouraging results that can aid public health practitioners and policy makers in implementing interventions and strategies that work to reduce the cancer burden in diverse communities. Importantly, the articles herein are collaborative products that successfully leveraged the extensive expertise of multidisciplinary investigators working across the country to produce high-quality team science. An illustrative portfolio of work, the articles in this supplement highlight the diversity and strength of scientific ideas that a robust thematic research network like CPRN can produce, where the network's contribution to science and practice is clearly "greater than the sum of its constituent parts".

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