



Twenty years of collaborative research to enhance community practice for cancer prevention and control

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Abstract

The Cancer Prevention and Control Research Network (CPCRN) was established in 2002 to conduct applied research and undertake related activities to translate evidence into practice, with a special focus on the unmet needs of populations at higher risk of getting cancer and dying from it. A network of academic, public health and community partners, CPCRN is a thematic research network of the Prevention Research Centers Program at the Centers for Disease Control and Prevention (CDC). The National Cancer Institute's Division of Cancer Control and Population Sciences (DCCPS) has been a consistent collaborator. The CPCRN has fostered research on geographically dispersed populations through cross-institution partnerships across the network. Since its inception, the CPCRN has applied rigorous scientific methods to fill knowledge gaps in the application and implementation of evidence-based interventions, and it has developed a generation of leading investigators in the dissemination and implementation of effective public health practices. This article reflects on how CPCRN addressed national priorities, contributed to CDC's programs, emphasized health equity and impacted science over the past twenty years and potential future directions.

Keywords Applied public health research · Community-based intervention · Cancer disparities · Implementation science · Health equity · Research network

Introduction

In the United States, continuing disparities in cancer incidence and mortality across different population groups have been attributed to a combination of factors amenable to intervention [1]. To reduce these avoidable disparities, the Centers for Disease Control and Prevention (CDC) collaborated with the National Cancer Institute (NCI) to establish the Cancer Prevention and Control Research Network (CPCRN) in October 2002 (www.cpcrn.org) to enhance

knowledge on what works to reduce cancer risk and improve early detection. Over the last 20 years, CPCRN has worked to accelerate the adoption and implementation of evidence-based cancer prevention and control strategies in communities. Efforts focus on populations that are medically underserved and groups at higher risk of cancer and cancer death. Further, CPCRN works to advance dissemination and implementation research in cancer control through the development of conceptual advances in key research constructs, improvement of measures and methods, and production of knowledge on translation processes.

CPCRN is the oldest and largest thematic network of CDC's Prevention Research Centers Program, which supports Prevention Research Centers (PRCs) at academic research institutions across the United States (<https://www.cdc.gov/prc/index.htm>). The universities funded as PRCs work with local communities to undertake research on methods and programs to avoid or reduce the risks for chronic illnesses. Since its inception, 20 PRCs have participated in one or more funding cycles for CPCRN (Table 1). For the current cycle (2019–2024), there are collaborating centers at eight universities, with one collaborating center also serving

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Table 1 Cancer Prevention and Control Research Network centers, 2002–2024

Prevention Research Centers	Cycle 1 2002– 2004	Cycle 2 2004– 2009	Cycle 3 2009– 2014	Cycle 4 2014– 2019	Cycle 5 2019– 2024
Case Western Reserve University				X	
Emory University Rollins School of Public Health		X	X		X
Harvard University School of Public Health/Boston University School of Public Health	X	X	X		
Morehouse School of Medicine		X			
New York University School of Medicine/City University of New York School of Public Health					X
Oregon Health & Science University				X	
St Louis University		X			
St. Louis University/ Washington University in St. Louis			X		
Texas A&M University			X		
University of Arizona					X
University of California, Los Angeles		X	X		
University of Colorado, Denver			X		X
University of Kentucky				X	
University of Kentucky/West Virginia University	X				
University of Iowa				X	X
University of Pennsylvania				X	
University of North Carolina at Chapel Hill		X	X	X	X
University of South Carolina, Columbia Arnold School of Public Health	X		X	X	X
University of Texas Health Science Center at Houston	X	X	X		
University of Washington	X	X	X	X	X

as the coordinating center. Investigators from these universities work together in cross-center workgroups on research projects that are aligned with key strategic priorities at CDC. Over the years, the growing expertise and knowledge base of the investigators have caused CPCRN to move forward in innovative ways [2, 3]. The network has funded 22 institutions over five cycles. Moreover, in the previous and current cycles, additional investigators have been invited to collaborate on specific projects within CPCRN as affiliates members. The current CPCRN listserv includes 275 individuals.

Impact of the network

Addressing CDC's and NCI's priorities

CPCRN serves a key function supporting the efforts of CDC's Division of Cancer Prevention and Control (DCPC) to advance its strategic priorities. These include reducing cancer risk, scaling best practices to increase appropriate cancer screening test use for the right populations, and improving the health and wellbeing of cancer survivors. Health equity and collaboration are overarching guiding principles. CPCRN works across network centers and in collaboration with a broad range of community partners, including public health agencies, health care providers,

and nonprofit organizations. Network activities improve our understanding of the implementation of effective cancer prevention and control interventions and accelerate their adoption in the real world, an area of research core to NCI's Division of Cancer Control and Population Sciences (DCCPS). Thus, CPCRN plays a critical role in the translation of evidence of what works into practice, with particular attention to populations experiencing disparities in cancer outcomes. CPCRN activities related to cancer risk reduction, cancer screening, and health and wellness among cancer survivors align well with CDC's strategic priorities. Cross-center efforts to understand contextual and individual determinants of cancer risk (<https://cpcrn.org/projects>) and determine barriers and facilitators to uptake of human papillomavirus (HPV) vaccination [4, 5] can inform efforts aimed at primary cancer prevention (reduced cancer incidence). Network investigators collaborate with local partners and national programs to examine the implementation and sustainment of evidence-based approaches to promote cancer screening [2, 6–8]. Investigations of financial toxicity and other issues affecting those diagnosed with cancer further efforts to improve the well-being of cancer survivors [9, 10]. CPCRN's long-standing experiences in both community-based participatory research and collaboration with community, clinical, academic, and public health organizations are unique

strengths [2, 3]. The network is well-suited to advance progress toward reducing cancer disparities and inequities in local communities and nationally.

Contributions to CDC's cancer prevention and control programs

DCPC receives congressional appropriations to support four foundational programs: the National Breast and Cervical Cancer Early Detection Program (NBCCEDP), the Colorectal Cancer Control Program (CRCCP), the National Comprehensive Cancer Control Program, and the National Program of Cancer Registries (NPCR). These programs have benefitted from a symbiotic relationship with CPCRN from its inception [2, 3, 11]. The data generated through the implementation of these programs have informed the research conducted by CPCRN investigators. For example, cancer incidence data from NPCR were used to identify populations at higher risk of cancer, and data generated from the CRCCP were used to assess the effectiveness of interventions to increase colorectal cancer screening uptake [2, 3, 7]. Moreover, the research by CPCRN has enhanced the implementation of evidence-based interventions and strategies in the programs.

The collaborative partnership between DCPC programs and CPCRN has been strongest for the two cancer screening programs: NBCCEDP (breast and cervical cancer screening) and CRCCP (colorectal cancer screening). Both programs seek to address long-standing health inequities in the receipt of recommended cancer screening tests and appropriate follow up among populations that are medically underserved. CPCRN researchers have worked to build the capacity of program awardees to implement strategies found by the Guide to Community Preventive Services (<https://www.thecommunityguide.org/>) to increase screening uptake, in the context of populations served by safety-net health care programs. Scientifically rigorous research methods have been used to understand what works, why, and for whom in the implementation of evidence-based strategies. As described in the 2017 paper by Ribisl et al., a CPCRN workgroup developed and implemented an annual survey of CRCCP awardees to measure the implementation of evidence-based interventions, an important component of the program's evaluation. Another CPCRN workgroup focused on federally qualified health centers to understand the implementation of cancer prevention and control programs among populations that are medically underserved [2]. Consistent with the community-based participatory research framework of the PRCs, the research has been conducted in partnership with communities of local providers, clients, and program staff.

Emphasis on health equity

CPCRN has worked to enhance large scale efforts to reach populations that are medically underserved and reduce avoidable illness and death due to cancer. Health equity has always been a cross-cutting theme of the network. Many projects have focused on populations that are uninsured or underinsured, people from racial and ethnic minority groups, residents of rural areas, and patients served by federally qualified health centers [2, 12–14].

Three working groups are specifically focused on reducing health disparities and achieving health equity. The Health Equity Workgroup is developing resources for network members to aid in advancing health equity in cancer prevention and control [15, 16]. These resources include: a set of guiding principles for health and racial equity; tools for measurement and evaluation of health and racial equity principles; and case studies to serve as examples of principles and guidance on how to implement them. This workgroup also offers technical assistance on integrating health and racial equity in research projects. To address cancer disparities in rural communities, the Rural Cancer Workgroup leverages the network's resources to conduct innovative research to improve cancer outcomes for people living in rural areas and build capacity among rural health care providers and organizations to implement evidence-based interventions. Finally, the Social Deprivation Interest Group is working to identify the best indicators to measure social determinants of health and social deprivation, factors that contribute to cancer health disparities.

Science impact

CPCRN continues to have far-reaching impact for science, practice, and beyond. The network's scientific contributions are clear, with over two thousand publications by CPCRN-related investigators since the network was established, including hundreds involving cross-center collaborations [17, 18]. CPCRN's partnered and engaged research has helped advance science on multiple fronts, including implementation science, economic evaluation of intervention implementation, modeling intervention impact, and health disparities and health equity research, among others. CPCRN investigators have been awarded 27% of NCI's grants funded through the Trans-NIH Dissemination and Implementation Research Program Announcements between 2008 and 2022 (Dissemination & Implementation Grants (R01, R03, R21) | IS | DCCPS/NCI/NIH (cancer.gov)). Recent publications, including some in this supplement, illustrate examples of innovative approaches undertaken by the network. Leeman et al. emphasize the benefits of aligning implementation science with improvement practice to enhance implementation and sustainment of evidence-based

approaches [19]. O’Leary et al. propose expanding methods used in implementation economics to include quantitative and qualitative approaches [20]. CPCRN has also disseminated findings through one-pagers and fact sheets, written in plain language, that are widely shared with partners.

Network impact extends beyond disseminating science through traditional channels such as publications, to include building capacity, catalyzing action, and effecting change [17]. Network investigators have collaborated with DCPC program awardees and other clinical and community partners to accelerate adoption of evidence-based interventions, such as CPCRN’s partnership with the CRCCP to evaluate the use of interventions recommended in the Guide to Community Preventive Services (www.thecommunityguide.org/cancer/index.html) [2]. CPCRN has also developed training curricula, including *Putting Public Health Evidence in Action*, that builds capacity among community programs and practitioners to implement evidence-based interventions (<https://cpcrn.org/training>). The CPCRN Scholars program (<https://cpcrn.org/projects>) trains students, researchers, practitioners, and other health professionals in implementation science related to cancer prevention and control [21]. In addition, CPCRN investigators have served as faculty for NIH’s Training Institute on Dissemination and Implementation Research in Health, faculty for NCI’s Training Institute on Dissemination and Implementation Research in Cancer (<https://cancercontrol.cancer.gov/is/training-education/training-in-cancer/TIDIRC-open-access>), and leaders for the Consortium for Cancer Implementation Science (<https://consortiumforcanceris.org/>). Through such activities, CPCRN has helped shape and expand the cancer prevention and control workforce and build the capacity of local, state, and national organizations to translate applied cancer research into public health practice. Network impact may also extend beyond cancer control, with application to translation efforts for other health conditions, including COVID-19 [22].

Future directions

Although progress has been made in the United States to reduce overall cancer death rates, incidence rates have increased for some common cancers and disparities persist in cancer incidence and mortality among certain racial and ethnic populations [23]. Black persons continue to experience the highest overall cancer death rate [23]. The growing number of older adults are projected to result in a 50% increase in the number of new cancer cases from 2015 to 2050 [24], and therefore the number of cancer survivors will also continue to increase. Moreover, the proportion of adults up-to-date with recommended cancer screening continues to fall below national targets [25].

The CPCRN has established a firm foundation over the past 20 years to address the profound challenges that lay ahead. CPCRN consists of an expansive, national network of highly skilled, interdisciplinary investigators working at the cutting-edge of implementation science for cancer prevention and control. The structure of CPCRN, with its Coordinating Center and Steering Committee, facilitates collaboration across centers and with a growing number of affiliate members. As a national network, CPCRN is uniquely positioned to develop and disseminate advances in scientific knowledge about the implementation of effective interventions to a broad range of public health practitioners and partners.

One of the newer CPCRN cross-center workgroups has been focusing on organizational theory for implementation science. More could be understood about organizational influences on the implementation of community-based interventions for populations experiencing poverty. The application of theory together with systematic processes such as implementation mapping could inform the development of innovative, evidence-based interventions to address persistent cancer health disparities.

CPCRN’s central focus on health equity and its work at the community level drives its research on sustainable solutions for disparities in cancer risk, screening services, and health and wellness among cancer survivors. At the community level, more evidence-based policy and environmental interventions could help address the underlying social determinants of health that contribute to cancer health inequities. As a result of lessons learned from working with communities, practice-based evidence and experience could be integrated into CDC’s work. Modeled estimates of the projected impact of different intervention strategies on cancer outcomes could be used to assess the comparative value of different strategies. Complex problems require complex solutions.

Conclusion

Over the last two decades, CPCRN has been a leader in the dissemination and implementation of applied public health research to address cancer health inequities. Collaboration across disciplines, institutions, federal agencies, and a wide range of partners has been key. The many accomplishments of CPCRN demonstrate the value of long-term investments in the funding and technical support of a collaborative research network.

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Declarations

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Consent for publication I consent to the publication of this paper.

References

- Islami F, Ward EM, Sung H et al (2021) Annual report to the nation on the status of cancer, part 1: national cancer statistics. *J Natl Cancer Inst* 113:1648–1669
- Ribisl KM, Fernandez ME, Friedman DB et al (2017) Impact of the cancer prevention and control research network: accelerating the translation of research into practice. *Am J Prev Med* 52:S233–S240
- White A, Sabatino SA, Vinson C, Chambers D, White MC (2019) The cancer prevention and control research network (CPCRN): advancing public health and implementation science. *Prev Med* 129S:105824
- Askelson N, Ryan G, McRee AL et al (2021) Using concept mapping to identify opportunities for HPV vaccination efforts: perspectives from the Midwest and West Coast. *Eval Program Plann* 89:102010
- Brandt HM, Vanderpool RC, Curry SJ et al (2019) A multi-site case study of community-clinical linkages for promoting HPV vaccination. *Hum Vaccin Immunother* 15:1599–1606
- Barrington WE, DeGross A, Melillo S et al (2019) Patient navigator reported patient barriers and delivered activities in two large federally-funded cancer screening programs. *Prev Med* 129S:105858
- Hannon PA, Maxwell AE, Escoffery C et al (2019) Adoption and implementation of evidence-based colorectal cancer screening interventions among cancer control program grantees, 2009–2015. *Prev Chronic Dis* 16:E139
- Walker TJ, Risendal B, Kegler MC et al (2018) Assessing levels and correlates of implementation of evidence-based approaches for colorectal cancer screening: a cross-sectional study with federally qualified health centers. *Health Educ Behav* 45:1008–1015
- Edward J, Petermann VM, Eberth JM et al (2022) Interventions to address cancer-related financial toxicity: Recommendations from the field. *J Rural Health* 38:817–826
- Petermann V, Zahnd WE, Vanderpool RC et al (2022) How cancer programs identify and address the financial burdens of rural cancer patients. *Support Care Cancer* 30:2047–2058
- Harris JR, Brown PK, Coughlin S et al (2005) The cancer prevention and control research network. *Prev Chronic Dis* 2:A21
- Hirschey R (2023) Prioritizing rural populations in state comprehensive cancer control plans: a qualitative assessment. *Cancer Causes Control*. <https://doi.org/10.1007/s10552-023-01673-3>
- Adams SA, Rohweder CL, Leeman J et al (2018) Use of evidence-based interventions and implementation strategies to increase colorectal cancer screening in federally qualified health centers. *J Community Health* 43:1044–1052
- Leeman J, Askelson N, Ko LK et al (2020) Understanding the processes that federally qualified health centers use to select and implement colorectal cancer screening interventions: a qualitative study. *Transl Behav Med* 10:394–403
- Adsul P (2023) Identifying research practices towards achieving health equity principles within the cancer prevention and control research network. *Cancer Causes Control*. <https://doi.org/10.1007/s10552-023-01674-2>
- Chebli P (2023) Principles to operationalize health and racial equity in cancer research: lessons learned from the cancer prevention and control research network. *Cancer Cause Control*. <https://doi.org/10.1007/s10552-023-01668-0>
- Ko LK, Jang SH, Friedman DB et al (2019) An application of the science impact framework to the cancer prevention and control research network from 2014–2018. *Prev Med* 129S:105821
- Cancer Prevention and Control Research Network. (2022) CPCRN, Progress Report: Executive Summary, 9/30/04 - 9/29/21. Available from https://cpcrn.org/news?open_id=366.
- Leeman J, Rohweder C, Lee M et al (2021) Aligning implementation science with improvement practice: a call to action. *Implement Sci Commun* 2:99
- O’Leary MC, Hassmiller Lich K, Frerichs L, Leeman J, Reuland DS, Wheeler SB (2022) Extending analytic methods for economic evaluation in implementation science. *Implement Sci* 17:27
- Friedman DB, Escoffery C, Noblet SB, Agnone CM, Flicker KJ (2022) Building capacity in implementation science for cancer prevention and control through a research network scholars program. *J Cancer Educ* 37:1957–1966
- Risendal BC, Hebert JR, Morrato EH et al (2021) Addressing COVID-19 using a public health approach: perspectives from the cancer prevention and control research network. *Am J Prev Med* 60:877–882
- Cronin KA, Scott S, Firth AU et al (2022) Annual report to the nation on the status of cancer, part 1: national cancer statistics. *Cancer* 2022:1–34. <https://doi.org/10.1002/cncr.34479>. <https://doi.org/10.1002/cncr.34479>. [First published: 27 October 2022](https://doi.org/10.1002/cncr.34479)
- Weir HK, Thompson TD, Stewart SL, White MC (2021) Cancer incidence projections in the United States between 2015 and 2050. *Prev Chronic Dis* 18:E59
- Sabatino SA, Thompson TD, White MC et al (2022) Cancer screening test use—U.S., 2019. *Am J Prev Med* 63:431–439

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