Accelerating Rural Cancer Control Research

*Presentation to the NCI Council of Research Advocates*

Robert T. Croyle, PhD

*Director, Division of Cancer Control and Population Sciences*

*Acting Director, Center for Global Health*

May 20, 2019
Background

- 14-19% of the US population lives in non-metropolitan (rural) counties
- Notable challenges, compared to urban areas:
  - Lower educational attainment
  - Higher proportion of elderly individuals
  - Higher poverty
  - Lower access to health services
  - Higher rates of behavioral risk factors (tobacco use, obesity)
- Only 3% of NCI DCCPS grants focus on rural populations
Making the Case for Investment in Rural Cancer Control: An Analysis of Rural Cancer Incidence, Mortality, and Funding Trends

Kelly D. Blake, Jennifer L. Moss, Anna Gaysynsky, Shobha Srinivasan, and Robert T. Croyle

Abstract

Estimates of those living in rural counties vary from 46.2 to 59 million, or 14% to 19% of the U.S. population. Rural communities face disadvantages compared with urban areas, including higher poverty, lower educational attainment, and lack of access to health services. We aimed to demonstrate rural-urban disparities in cancer and to examine NCI-funded cancer control grants focused on rural populations. Estimates of 5-year cancer incidence and mortality from 2009 to 2013 were generated for counties at each level of the rural-urban continuum and for metropolitan versus nonmetropolitan counties, for all cancers combined and several individual cancer types. We also examined the number and size of rural cancer control grants funded by NCI from 2011 to 2016. Cancer incidence was 447 cases per 100,000 in metropolitan counties and 460 per 100,000 in nonmetropolitan counties (P < 0.001). Cancer mortality rates were 166 per 100,000 in metropolitan counties and 182 per 100,000 in nonmetropolitan counties (P < 0.001). Higher incidence and mortality in rural areas were observed for cervical, colorectal, kidney, lung, melanoma, and oropharyngeal cancers. There were 48 R- and 3 P-solicitation rural-focused grants funded from 2011 to 2016 (33% of 1,655). Further investment is needed to disentangle the effects of individual-level SES and area-level factors to understand observed effects of rural on cancer.

Cancer Epidemiology, Biomarkers & Prevention. © 2017 AACR.

Introduction

Estimates of the total population living in nonmetropolitan (rural) counties in the United States vary from 46.2 [1] to 59 million [2] people, compared with more than 250 million people living in urban areas. This represents 14% to 19% of the U.S. population [1, 2]. Rural communities are known to face disadvantages compared with urban areas, including higher poverty rates, lower educational attainment, a higher proportion of elderly individuals, lack of access to health services, and a lack of resources needed to support the public health infrastructure [3]. As a result of these and other factors, rural communities face elevated rates of morbidity and mortality, as well as greater percentages of potential excess deaths from the five leading causes of death, including cancer [4]. Individuals in rural counties not only have an 8% higher overall cancer mortality than those in urban areas, but a rural-urban disparity in mortality has also been observed for lung, colorectal, prostate, and cervical cancers, although, in several cases, adjusting for socioeconomic status attenuates or completely explains the relationship between rurality and higher cancer mortality [5].

Additional rural-urban disparities across the cancer control continuum have been documented, although the existing literature is nascent and methodologically inconsistent compared with other research identifying race, economic, and age-based disparities in diagnosis, treatment, and survival of cancer [6]. At least two studies have demonstrated that cervical cancer incidence is higher in rural areas [7, 8]. There is also some evidence that rural residents are less likely to get screened for cancer [8]. For example, an analysis of 2008 Behavioral Risk Factor Surveillance System data showed that rural women were less likely to meet recommendations for mammography than urban women, that the proportion of women reporting appropriate cervical cancer screening decreased as rurality increased, and that individuals from rural areas were less likely to report colorectal cancer screening than individuals from urban areas [9]. Furthermore, rural individuals may be less likely to receive follow-up testing after receiving abnormal screening results [10], and although findings are not consistent with regard to rural-urban differences in stage at diagnosis, some research suggests that women from rural areas are more likely to be diagnosed with more advanced breast cancer compared with their urban counterparts [11].

Evidence also suggests that there are rural-urban differences in cancer treatment. For example, rural women are more likely to receive mastectomies than breast-conserving surgery, and rural men are more likely to receive external beam therapy than radiosurgery for prostate cancer [12, 13].
Invasive Cancer Incidence, 2004–2013, and Deaths, 2006–2015, in Nonmetropolitan and Metropolitan Counties — United States

Abstract

Problem/Condition: Previous reports have shown that persons living in nonmetropolitan (rural or urban) areas in the United States have higher death rates from all cancers combined than persons living in metropolitan areas. Disparities might vary by cancer type and between occurrence and death from the disease. This report provides a comprehensive assessment of cancer incidence and deaths by cancer type in nonmetropolitan and metropolitan counties.

U.S. death rates for all cancers by race/ethnicity, 1992-2014

Source: National Center for Health Statistics data as analyzed by NCI.
Data are age-adjusted to the 2000 US standard population using age groups: <1, 1-4, 5-14, 15-24, 25-34, 35-44, 45-64, 65-74, 75-84, 85+. 
As mortality from cancer has fallen, rural-urban disparities have grown larger.
PRELIMINARY RESULTS


METHODS: The average annual percent change (AAPC) was calculated based on 2007–2016 mortality rates using the National Cancer Institute Joinpoint software. The nonmetropolitan trend was extended from the 2016 mortality rate until it crossed the target, assuming a constant AAPC.
Trends in Cancer Mortality by Locality and Within Rural Region (“Noncore”)
Number of Rural Oncologists Per 100,000 Rural Residents

Source: ASCO
Planning and Engagement Efforts

- Development of NCI’s Rural Cancer Control Research Initiative
  - Kick Off: May 18, 2016 NCI blog

- Cancer in AI/AN Populations, Nov. 10, 2016, OKC

- Rural Cancer Control Workshop, Memphis, May 4-5, 2017

- HRSA/NCI/CDC Webinar, August 30, 2017

- FCC-NCI Collaboration on Broadband and Cancer announced, November 3, 2017

- National Academy Workshop on Small Populations Research, January 18-19, 2018

- Rural Health Policy Institute, February 6-8, 2018

- Advancing the Science of Cancer in Latinos, February 21-23, 2018

- National Rural Health Association Annual Meeting, May 8-11, 2018

- NCI Conference on Rural Cancer Control, May 30-31, 2018

- ASCO’s 2nd State of Cancer Care in America event, Closing the Rural Cancer Care Gap, April 10, 2019
Scientific Challenges

Heterogeneity of “Rural”

- Example: rural Alaska vs. rural Mississippi
- “Grain size” of counties (and, therefore, data sources):
  - 3,142 total; Iowa has 99; Arizona has 15

Structural Factors that Affect both Research and Practice

- Access to care
- Limited access to clinical trials
- Lower physician density
- Distance to facilities – transportation
- Poor telecommunication infrastructure for telemedicine/telehealth
- SES and other area-level correlates and confounders

Cultural Factors

- Trust in institutions, medical providers, and government-sponsored programs
- Non-traditional comorbidities such as opiate drug use
- Cancer-related fatalism
NCI’s Role as a Research Agency

- Leverage extensive research infrastructure, grant portfolio and scientific community
- Encourage more grant applications focused on rural populations
- Extend reach of clinical trials programs
- Engage NCI-funded cancer centers (n=70) in rural cancer control research (community outreach and engagement requirement)
- Support partnerships and training of new investigators
Examples of funded NCI R01 Grants

Implementing Cancer Prevention Using Patient-Provider Clinical Decision Support.
PI: Thomas Edward Elliott, Health Partners Institute

Comparative effectiveness in interventions to improve screening among rural women.
PI: Electra Paskett, Ohio State University

Enhancing prevention pathways towards tribal colorectal health.
PI: Shiraz Mishra, University of New Mexico Health Sciences Center

Community intervention to reduce tobacco use among pregnant Alaska Native women.
PI: Christi Patten, Mayo Clinic Rochester
## NCI Center for Reducing Cancer Health Disparities: U54 & P20 Grants with a Rural Component

<table>
<thead>
<tr>
<th>Grant #</th>
<th>Institution</th>
<th>Principal Investigator (PI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U54CA202995</td>
<td>Northeastern Illinois University</td>
<td>Christina Ciecierski</td>
</tr>
<tr>
<td>U54CA203000</td>
<td>Northwestern University at Chicago</td>
<td>Melissa Andrea Simon</td>
</tr>
<tr>
<td>U54CA202997</td>
<td>University of Illinois at Chicago</td>
<td>Robert Andrew Winn</td>
</tr>
<tr>
<td>P20CA192966/87</td>
<td>Washington University Southern Illinois Univ. Sch of Med</td>
<td>Graham Colditz Laurent Brard</td>
</tr>
<tr>
<td>P20CA202907/08</td>
<td>University of Illinois at Chicago</td>
<td>Catherine Balthazar Robert Winn</td>
</tr>
<tr>
<td>P20CA202921/23</td>
<td>University of Oklahoma Norman Cherokee Nation</td>
<td>Paul Spicer Sohail Khan</td>
</tr>
</tbody>
</table>
National Community Oncology Research Program (NCORP)
Overview

- A national NCI-supported network that brings cancer prevention clinical trials and cancer care delivery research (CCDR) studies to local communities
  - designs and conducts cancer prevention, control, screening, and post-treatment surveillance clinical trials;
  - designs and conducts cancer care delivery research (CCDR) studies;
  - participates in treatment and imaging clinical trials conducted by the NCI National Clinical Trials Network (NCTN); and
  - integrates health disparity questions into its research priorities.
NCORP Community Site, MU Community Site and Research Bases Geographic and Organizational Diversity

- Investigators (3,919)
- Components/Subcomponents (965)
Linking and Amplifying User-Centered Networks through Connected Health (L.A.U.N.C.H.)

- NCI has partnered with the Federal Communications Commission to address the broadband health connectivity gap in rural areas of the U.S.
  - More likely to die of cancer and report lower quality treatment experiences
  - More likely to be without broadband internet
- The long-term goal of this partnership is to improve cancer outcomes by better connecting rural patients to their cancer care teams.
  - Pilot Demonstration Project: University of California at San Diego, the University of Kentucky, and the biopharmaceutical company Amgen to redesign access to care using biosensors, smartphones, patient-reported outcomes
Examples of Current Cancer Centers Initiatives

- HPV Vaccination Uptake
- Tobacco Use Assessment and Treatment Capacity
- Population Health Assessment in Cancer Center Catchment Areas
- Rural Cancer Control Research Capacity
Population Health Assessment in NCI Cancer Center Catchment Areas

- Administrative supplement program to NCI-designated (P30) Cancer Centers
- To enhance cancer centers’ capacities to acquire, aggregate, and integrate population data from multiple sources in order to facilitate community-focused, comprehensive cancer control activities
- 15 awards in FY16, and 14 awards in FY18
- Includes a Rural Health Working Group
## Population Health Assessment in Cancer Center Catchment Areas

<table>
<thead>
<tr>
<th>Cancer Center</th>
<th>Project Directors</th>
<th>Population Health Assessment Catchment Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abramson Cancer Center</td>
<td>Karen Glanz</td>
<td>FY2016 □</td>
</tr>
<tr>
<td>Albert Einstein Cancer Center</td>
<td>Bruce Rapkin</td>
<td>□</td>
</tr>
<tr>
<td>Dana-Farber/Harvard Cancer Center</td>
<td>K. Vish Viswanath</td>
<td>FY2018 □</td>
</tr>
<tr>
<td>Duke Cancer Institute</td>
<td>Nadine Barrett</td>
<td>□</td>
</tr>
<tr>
<td>Fox Chase Cancer Center</td>
<td>Nestor Esnaola, Susan Fisher</td>
<td>□</td>
</tr>
<tr>
<td>Fred Hutchinson Cancer Research Center</td>
<td>Jason Mendoza</td>
<td>□</td>
</tr>
<tr>
<td>Herbert Irving Comprehensive Cancer Center of Columbia University</td>
<td>Mary Beth Terry</td>
<td>□</td>
</tr>
<tr>
<td>Huntsman Cancer Institute</td>
<td>Jakob Jensen</td>
<td>□</td>
</tr>
<tr>
<td>Indiana University Melvin and Bren Simon Cancer Center</td>
<td>David Haggstrom, Susan Rawl</td>
<td>□</td>
</tr>
<tr>
<td>Masonic Cancer Center at the University of Minnesota</td>
<td>DeAnn Lazovich</td>
<td>□</td>
</tr>
<tr>
<td>Memorial Sloan Kettering Cancer Center</td>
<td>Joseph Osborne</td>
<td>□</td>
</tr>
<tr>
<td>Moores Cancer Center at UC San Diego Health</td>
<td>Maria Elena Martinez</td>
<td>□</td>
</tr>
<tr>
<td>Norris Cotton Cancer Center at Dartmouth-Hitchcock</td>
<td>Tracy Onega</td>
<td>□</td>
</tr>
<tr>
<td>OHSU Knight Cancer Institute</td>
<td>Jackie Shannon</td>
<td>□</td>
</tr>
<tr>
<td>Roswell Park Comprehensive Cancer Center</td>
<td>Elizabeth Bouchard</td>
<td>□</td>
</tr>
<tr>
<td>Cancer Center</td>
<td>Project Directors</td>
<td>Population Health Assessment Catchment Areas</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>----------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Sidney Kimmel Cancer Center at Thomas Jefferson University</td>
<td>Grace Lu-Yao</td>
<td></td>
</tr>
<tr>
<td>The Ohio State University Comprehensive Cancer Center</td>
<td>Electra Paskett</td>
<td></td>
</tr>
<tr>
<td>The Tisch Cancer Institute at Mount Sinai</td>
<td>Nina Bickell</td>
<td>☑</td>
</tr>
<tr>
<td>The University of Texas MD Anderson Cancer Center</td>
<td>Sanjay Shete</td>
<td>☑</td>
</tr>
<tr>
<td>UAB Comprehensive Cancer Center</td>
<td>Wendy Demark-Wahnefried</td>
<td>☑</td>
</tr>
<tr>
<td>UCSF Helen Diller Family Comprehensive Cancer Center</td>
<td>Bob Hiatt, Urmimala Sarkar</td>
<td>☑</td>
</tr>
<tr>
<td>UK Markey Cancer Center</td>
<td>Robin Vanderpool, Bin Huang</td>
<td>☑</td>
</tr>
<tr>
<td>University of Colorado Cancer Center</td>
<td>Myles Cockburn</td>
<td>☑</td>
</tr>
<tr>
<td>University of Hawaii Cancer Center</td>
<td>Kevin Cassel, Hyeryeon Lee</td>
<td>☑</td>
</tr>
<tr>
<td>The University of Kansas Cancer Center</td>
<td>Babalola Faseru</td>
<td>☑</td>
</tr>
<tr>
<td>University of Michigan Rogel Cancer Center</td>
<td>Ken Resnicow</td>
<td>☑</td>
</tr>
<tr>
<td>University of Virginia Cancer Center</td>
<td>Rajesh Balkrishnan, Roger Anderson</td>
<td>☑</td>
</tr>
<tr>
<td>UPMC Hillman Cancer Center</td>
<td>Jian-Min Yuan</td>
<td>☑</td>
</tr>
<tr>
<td>Virginia Commonwealth University Massey Cancer Center</td>
<td>Bernard Fuemmeler</td>
<td></td>
</tr>
</tbody>
</table>
Rural Cancer Control – Administrative Supplements to NCI Cancer Centers

*21 Funded in FY18
*Second round of funding planned for FY19
Improving the Reach and Quality of Cancer Care in Rural Populations (R01 Clinical Trial Required)
RFA-CA-18-026

- To support observational/analytic research and pilot testing of interventions to identify, understand, and address predictors of low quality of cancer care in rural low-income and/or underserved populations

- To support cancer control intervention research to address known predictors of low quality of care (e.g., low reach due to distance) in rural low-income and/or underserved populations

- All studies will be required to employ the USDA’s Rural Urban Continuum Code (RUCC) to define nonmetropolitan geographic target areas of study

- To be awarded in FY19 (summer 2019)
DCCPS Cancer Moonshot Initiatives – with a focus on rural health

- Accelerating Colorectal Cancer Screening and follow-up through Implementation Science (ACCSIS) –
  - to generate effective implementation strategies that substantially improve CRC screening and follow-up rates in populations where baseline rates remain low
  - Funded 3 research grants and 1 coordinating center in FY18 (see next slide for details)
  - Plans to fund more research centers in FY19.

- Improving CRC Screening for American Indian populations –
  - FY18 funding to allow three cancer centers to build partnerships, procure tribal support; get tribal and Indian Health Service IRB approvals; and pilot test CRC implementation processes in each state
  - Funding planned for FY19 and 3 additional years.
  - University of New Mexico Cancer Center, University of Arizona Cancer Center, Stephenson Cancer Center at University of Oklahoma

(see next slide for details)
ACCSIS Projects

- **ACCSIS-Chicago (1 UG3 CA233220); Karen Kim, Blase Polite, U Chicago**

  Investigators propose to study the effectiveness of a multilevel intervention to improve CRC incidence and mortality among **at-risk populations in safety-net clinics** in Cook County, Chicago, Illinois. Multi-level intervention includes provider education; community outreach; provider reminder, assessment, & feedback system; patient navigation.

- **ACCSIS in Appalachia (1 UG3 CA233282); Mark Dignan, U Ky; Electra Paskett, OSU**

  Investigators propose to examine the impact of a multilevel intervention on improving CRC outcomes among **Appalachian populations** in Kentucky and Ohio. The intervention will consist of academic detailing, patient activation to include distribution of fecal immunochemical tests kits, and social support via a patient navigator.

- **Scaling Colorectal Cancer Screening Through Outreach, Referral, and Engagement (SCORE): A State-Level Program to Reduce Colorectal Cancer Burden in Vulnerable Populations (1 UG3 CA233251); Daniel Reuland, UNC-Chapel Hill**

  Investigators propose to assess the effectiveness of a multilevel intervention to improve CRC outcomes among **low-income and racial and ethnic minority populations in North Carolina**. The intervention will consist of a centralized colorectal cancer screening registry, distribution of fecal immunochemical test kits, patient navigation, an in-clinic patient decision aid, and establishing a colonoscopy access network.
The Cancer Trends Progress Report, continually updated since its first issue in 2001, summarizes our nation’s advances against cancer in relation to Healthy People® targets set forth by the Department of Health and Human Services. The report, intended for policy makers, researchers, and public health professionals, includes key measures of progress along the cancer control continuum and uses national trend data to illustrate where improvements have been made.

Read our Introduction and Director’s Message to learn more about the report.

**Prevention**
Tobacco, physical activity, diet, sun, environment, HPV immunization

**Early Detection**
Breast, cervical, colorectal, lung, prostate cancer screening

**Diagnosis**
Incidence, Stage at diagnosis

**Treatment**
Trends in cancer treatment

**Life After Cancer**
Financial burden of cancer care, Cancer survivorship

**End of Life**
Mortality, Person-years of life lost

The report, available only online, can be printed in part or in its entirety. Portions of the report are updated annually, while other sections are updated as new data become available. The full report is updated every year.

**Suggested Citation:**
Cancer Trends Progress Report

All material in this report is in the public domain and may be reproduced or copied without permission. Citation as to source, however, is appreciated.
Quick Profiles for States

Choose a state below to get a report of cancer statistics and other related topics.

Data Topics Across the Cancer Control Continuum

Cancer statistics, charts, and maps by data topic across the cancer control continuum.

- Demographics
- Screening & Risk Factors
- Cancer Knowledge
- Incidence
- Prevalence
- Mortality
2018 National Comprehensive Cancer Control
Status of Cancer Plans
Comprehensive Cancer Control National Partnership:
Opportunities for Rural Cancer Control

- State cancer plans provide
  - Description of current needs
  - Overview of current cancer control goals and strategies

- 56 of 66 funded programs include some reference to “rural/frontier” in their plans.

- Potential for linking research with state cancer control practice to address rural issues
Connected Health: Improving Patients’ Engagement and Activation for Cancer-Related Health Outcomes

President’s Cancer Panel
2014-2015 Series

The power and utility of connected health technologies are growing. Many forces are catalyzing a national U.S. effort to engage and activate individuals to be more proactive about their health and healthcare and to translate this engagement to enhanced activation among patients. These forces have important implications for the prevention and treatment of cancer and for optimal survivorship. They include but are not limited to:

- **“Meaningful Use”** incentives to healthcare providers focus on requirements to demonstrate “patient engagement” through health information technology (Phases 2 & 3).
- **The “Quantified Self”** movement is creating new tools to encourage and reinforce a variety of healthy behaviors relevant to cancer control.
- **The Internet** has made vast amounts of health information available, and social media platforms have

A patient with a complex chronic condition receives a prescription for an app that is downloaded to a mobile device. Using information the patient enters, the app delivers automated clinical coaching and sends reports to the physician, recommending evidence-based protocols for adjusting the patient’s treatment regimen, if needed. Equipped with a tool that offers personal, relevant
Challenges and Future Steps

- Worsening urban/rural health disparity
- Limited NCI research grant portfolio that we plan to grow
- Need to inform cancer control researchers about rural health policy issues
- Requires new collaborations between rural health and cancer control experts
- Facilitate interdisciplinary and cross-sector collaboration
- Leverage national cancer research infrastructure to improve cancer prevention, detection and care to reduce cancer burden in rural communities