Social Determinants of Health and Their Influence on Cancer Risk & Outcomes

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Applying Big Data to Address Social Determinants of Health in Oncology
National Cancer Policy Forum Workshop, October 28, 2019
World Health Organization definition of Social Determinants of Health:

*Conditions in which people are born, grow, live, work, and age*

Shaped by distribution of money, power, or resources at global, national & local levels

Mostly responsible for health inequities - unfair and avoidable differences in health status within and between countries

*National Academies, 2019*
Social, Economic & Cultural Factors Affect Disparities Across Cancer Continuum

Bilal & Diez-Roux, N Engl J Med 2018
Cancer Mortality Rates by Race/Ethnicity, US 2016

Age-adjusted per 100,000 people

Source: CDC & NCI
Current cigarette smoking: Adults aged 25+

NOTE: Smoked 100 cigarettes in their lifetime and now smoke every day or some days.

SOURCE: NCHS, Health, United States, 2016, Figure 10 and Table 48. Data from the National Health Interview Survey (NHIS).
Deaths from Cancer: Rural vs. Urban Populations

AGE-ADJUSTED MORTALITY RATE

YEAR

RURAL/NONMETROPOLITAN

URBAN/METROPOLITAN

NIH NATIONAL CANCER INSTITUTE
Conceptual Model of Health Care Disparities

Patient Factors:
Race/ethnicity, age, insurance, SES

Community Factors:
Poverty, segregation

Health System Factors:
Workforce, access, cultural & technical skill

Quality of Care Received

Outcomes

Ayanian World J Surg 2008
Multi-level Factors Affecting Quality of Cancer Care

Health System
Organization & Practice Setting
Provider Characteristics
Patient Characteristics

Proactive Provider Team
Productive Encounters
Activated Patients

↑ Quality of Cancer Care

↓ Cancer Morbidity & Mortality

Adapted from Zapka et al. Med Care 2008
Intersectional theory applied to the cancer care continuum

“Multiple social statuses (SES, race/ethnicity, gender & others) experienced simultaneously as dynamic, interdependent processes affect cancer risk, diagnosis, treatment & outcomes”
Five-Year Cause-Specific Relative Survival with Lung Cancer by Gender, Race & County-Level Poverty

Williams et al.  
Health Serv Res 2012
Social risk factors associated with health care outcomes independently of quality of care:

- Socioeconomic position
- Race, ethnicity, cultural context
- Gender identity and sexual orientation
- Social relationships
- Residential and community context
<table>
<thead>
<tr>
<th>Social Risk Indicators</th>
<th>Data Availability</th>
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Applying Intersectionality to Big Data & Social Determinants of Cancer Risk & Outcomes

- Address data limitations for social risk – area measures, surveys, EHR data
- Take life-course and multi-level approaches to analyze social risk factors
- Incorporate bio-social and gene-environment interactions
- Prioritize resilience factors as well as risk factors
- Develop and implement actionable policies to address social determinants of health nationally and in states, communities and health care systems

Williams et al. Health Serv Res 2012