

**RESEARCH ARTICLE**

**Cancer Care Accelerator: An Innovative Transdisciplinary Approach to Redress Cancer Disparities in Harlem**

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## Abstract

Accelerators, an innovation in trans-disciplinary team science, are a new model to spark ideas and approaches to redress disparities. We describe the Cancer Care Accelerator, a cross-sector collaboration comprising cancer advocates, patients, clinicians, researchers, public health leaders and funders charged to reduce disparities and the cancer burden in Harlem. We describe the process and early initiatives of this Accelerator which began its focus on key risk factors for cancers with undue burden in Harlem, namely, access and insurance. First, the group helped design a project connecting patients with social distress to a community organization that can address social needs. Plans to expand research and educational in-reach and outreach for cancers that are highly prevalent with disparate outcomes are underway. Early projects focus on discrete achievable outcomes of treatment, screening and education. Subsequent works will utilize community-based cancer needs assessment findings to stimulate new projects. The Accelerator may serve as a model to aid with priority setting, idea generation and implementation for endeavors addressing population-level cancer disparities.

## 1. Introduction

Accelerators, groups of trans-disciplined stakeholders, are an innovative approach to foster rapid generation of novel solutions to address and ultimately, eliminate disparities.<sup>1</sup> They bring community perspectives and creative ideas to the forefront using interdisciplinary, translational research methods to address complex problems such as cancer disparities. The newly required Community Outreach and Engagement (COE) section of Cancer Center Support Grants<sup>2</sup> highlights and acknowledges the key role communities play in addressing the complex problems they face. This field is rapidly evolving with national COE leaders offering advice on approaches to guide the charge of Community Outreach and Engagement as well as city and state-wide efforts to address the cancer burden.<sup>3,4</sup> Early work using Accelerators in the areas of genomics, digital medicine, environmental health and

big data have been described.<sup>1</sup> Building on prior Accelerator initiatives, we offer our experience applying the innovative accelerator model to cancer care, bringing together community representatives, patients, advocates and public health officials to set priorities and design projects to reduce disparities in cancer in Harlem. We describe the processes we undertook aiming to attain this objective.

## 2. The Approach

### 2.1 Formation of Cancer Care Accelerator

In December 2017, the Icahn School of Medicine at Mount Sinai's Tisch Cancer Institute, located at the cusp of East Harlem and serving East and Central Harlem, launched a "Cancer Disparities in Harlem," community engagement initiative to reduce the cancer burden and disparities in East and Central Harlem. We recruited leaders of community- and faith-based organizations, cancer advocacy organizations representing

the common and disparate cancers in Harlem, safety-net health care providers in the neighborhood, members of city and state departments of health tasked with addressing cancer issues, survivors of cancers common in the community, and researchers focused on community-based

participatory research and epidemiology (Table 1). The intent was to build trust among stakeholders from different backgrounds, develop common goals and strong partnerships to better serve the cancer-related needs of the local community.

Table 1: CCA Members

Organization	Cancer Type	Role
Alive and Kicking	Colon	Advocate
American Board of Internal Medicine-Hematology	Blood cancers	Advocate
American Cancer Society	All cancers	Advocate/ Funder
Cancer Care	All cancers	Advocate
Faith-based/Navigator/Instructor	All cancers	Faith-Based/survivor
Faith-based (NYC Clergy Breakfast Organizer)	All cancers	Faith-Based
Family Medicine	All cancers	Harlem Provider
Global Liver Institute	Liver	Advocate
Harlem Doctors	All cancers	Harlem Provider
Harlem churches' ministry representative	All cancers	Faith-Based
Institute for Family Health Center of Harlem	All cancers	Provider-FQHC
Lung Cancer Alliance	Lung	Advocate
Lymphoma Foundation	Lymphoma	Advocate
National Executive Service Corps		Community Organization
NYC-Department of Health	All cancers	Public Health Agency
NYS-Department of Health	All cancers	Public Health Agency
Prostate Net Foundation	Prostate	Advocate/Survivor
SHARE	Breast, Ovarian	Advocate
Susan G. Komen Foundation	Breast, Ovarian	Advocate/ Funder
West Harlem Environmental Action (WEACT)	All cancers	Advocate
Witness Project of Harlem	Breast	Advocate/ Survivor
Mount Sinai Researchers (n=4)	All cancers	Researcher
Mount Sinai Tisch Cancer Institute		Administrator

Once formed, our Cancer Care Accelerators (CCA) commenced reviewing population-based data from the New York City Department of Health and Mental Hygiene (NYC-DOHMH) for the neighborhoods (Central Harlem, East

Harlem) including socio-demographics, cancer risk factors (e.g. obesity, smoking, poverty, hepatitis), screening behaviors, vaccination rates, and data from the NYS Cancer Registry of neighborhood level cancer incidence and mortality.

## 2.2 Review of cancer burden and risk factors in catchment area

Review of New York State Cancer Registry (2012-2016) incidence and NYCDOHMH Vital Statistics Bureau (2016) mortality data (see Table 2) revealed that Central and East Harlem have the 3<sup>rd</sup> and 5<sup>th</sup> highest age-adjusted incidence rates of cancer, and the 2<sup>nd</sup> and 3<sup>rd</sup> highest age-adjusted cancer mortality rates among all New York City neighborhoods. Further, Central Harlem has the highest rates of colorectal cancer incidence in the whole of NYC, as well as highest mortality rates of several cancers including prostate, colorectal and multiple myeloma. East Harlem has the 5<sup>th</sup> highest incidence rates of liver, pancreatic and lung cancer, the 6<sup>th</sup> highest incidence rates of colorectal cancer, is #1 in mortality from liver cancer and #3 for breast cancer mortality.

Additionally, the incidence rates of lung, prostate, breast, liver and colorectal cancer diagnosed at the distant (late) stage is markedly higher in Central and East Harlem compared with its wealthier southern border neighbor, the Upper East Side and NYC overall. Risk factor data, obtained from NYC Community Health Survey,<sup>5</sup> reveal that poverty, poorly maintained renter occupied housing, high rates of obesity, HIV infection, smoking, alcohol use, Hepatitis C and lack of health insurance are a few of the social determinant related and biologic risk factors contributing to the higher cancer rates in Central and East Harlem. Further,

rates of mammography screening for breast cancer are low in Central Harlem having dropped in recent years.

## 2.3 Setting Priorities:

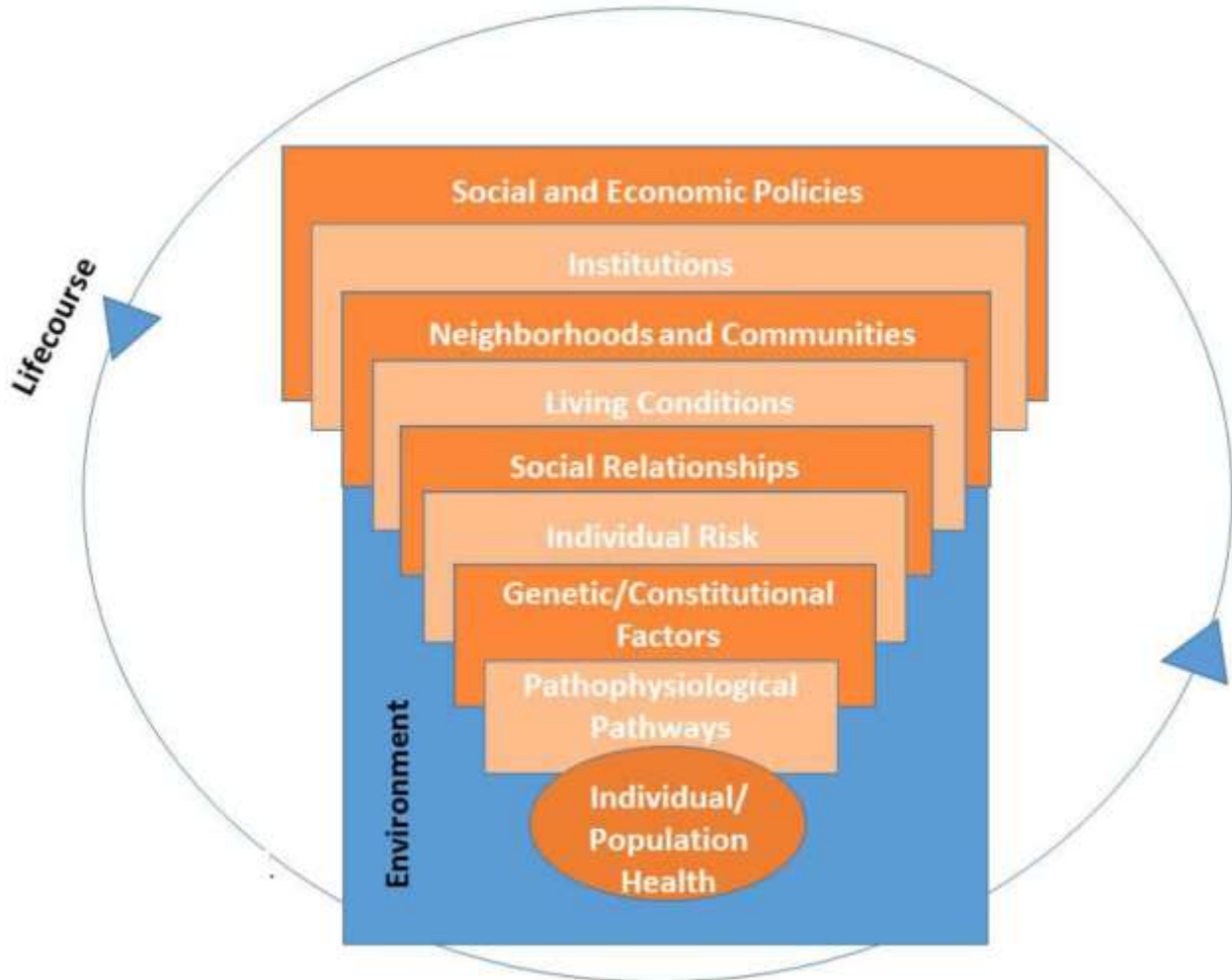
Given the broad and seemingly overwhelming charge to the Cancer Care Accelerator to reduce cancer disparities and to enable distinct projects to emerge, it was clear the group needed an approach to help set priorities. Toward this end, the CCA reviewed several multi-level models featuring specific applications that could help the group set priorities. The Kaplan multilevel approach and the Bay Area Regional Health Inequities Initiative (BARHII) conceptual framework were favored.<sup>6,7</sup> Employing these models allowed for exploration of the connection between social inequities and health in East and Central Harlem including social economic policies, social relationships, institutions, neighborhoods and communities, pathophysiological pathways and genetic/constitutional factors, and informed a model representing the CCA's approach (see Figure 1). This model guided the CCA in selecting the following ten factors of focus: availability of health services, insurance coverage, obesity, mental health, chronic disease, family history, preventive health, cultural identity, fear of cancer, and housing based on the group's voting.<sup>8</sup> The group chose to focus on these risk factors common to many cancers, rather than homing in on just a few highly prevalent cancer types.

**Table 2:** Cancer Incidence, Mortality, Risk Factors & Late Stage at Diagnosis\*

Cancer site	Central Harlem	East Harlem	Upper East Side	NYC	USA
<b>Incidence rates</b> of top cancers in catchment area, NYC and USA (2020-2016)					
Breast (w)	148	130	155	126	128
Lung	64	59	48	47	55
Colorectal	51	44	31	39	39
Multiple Myeloma	9	11	8	9	7
Pancreas	17	15	13	13	13
Melanoma	3	4	31	10	22
Liver	17	20	6	11	9
Uterine (w)	41	33	28	31	28
<b>Mortality rates</b> of top cancers in catchment area, NYC and USA (2016)					
Lung	35	33	22	27	43
Breast	22	29	14	20	21
Prostate	42	29	23	20	20
Colorectal	22	16	12	14	15
Liver	10	18	5	8	6
Pancreas	14	17	9	12	11
Ovary*	6	10	12	6	7
Leukemia*	6	4	10	7	7
Multiple myeloma	5	4	3	3	3
<b>Risk factors</b> prevalence in catchment area, NYC and USA (2017)					
Obesity %	26	29	13*	25	38
Smoking %	17	19	8*	13	16
HIV positive rate /10 <sup>5</sup>	61	52	15	29	12
HCV rate /10 <sup>5</sup>	100	130	24	72	65
Alcohol-related hospitalization rate/10 <sup>5</sup>	1956	3199	1,517*	1335	1034
Mammogram %	61	79	81*	75	65
Colonoscopy screening %	79	67	84*	70	60
Pap smear %	88	86	85*	85	69
HPV vaccination %	67	71	55	59	43
Uninsured %	9	11	4	10	11
Living in poverty %	25	43	12	13	15
Living in public housing %	25	43	12*	13	-
<b>Late Stage at Diagnosis</b>					
Breast	14	10	7	8	43
Colorectal	12	11	6	9	6
Lung	31	28	19	23	33
Prostate	22	15	8	10	9

\*Cancer Incidence: Age-adjusted annual average cancer incidence rates per 100K for 2011-2016: NYS Cancer Registry. NYC Dept. of Health & Mental Hygiene Bureau of Vital Statistics; Age-adjusted mortality rates (2016).  
Late Stage Cancers: Age-adjusted annual average cancer incidence rates per 100K for 2011-2016: NYS Cancer Registry.

**Figure 1: Multi-level Model Domains**



Institute of Medicine. 2000. *Promoting Health: Intervention Strategies from Social and Behavioral Research*. <https://doi.org/10.17226/9939>. Adapted and reproduced with permission the National Academy of Sciences, Courtesy of the National Academies Press, Washington, D.C.

During ensuing discussions, CCA members expressed the need to gain a better understanding of how to provide better access to services, care coordination and patient navigation to ensure timely treatment. Members also prioritized: (a)

prevalent cancers with pressing health needs (liver, prostate, breast, lung, colorectal); (b) intervention settings (community, healthcare delivery sites, policy); and (c) target areas (improve access to health services and insurance coverage, cancer prevention,

screening and education, and cancer care). Members voted on specific priority areas to address with the most votes received by: addressing financial hardship and improving access (30%), community education (22%), cancer patient-reported measures (22%), and policy change (17%).

The group also reviewed a similar cancer disparities-focused collaborative in California, the San Francisco Cancer Initiative, to inform their approach toward similar goals which entailed developing smaller, focused working groups or “task forces.”<sup>4</sup> Apprized with the catchment area data and assessments of project feasibility, the CCA group decided to adopt a similar approach forming two subcommittees to address important cancer-related issues that disproportionately affect our Harlem population, access and education- shared challenges across various cancers. Two subcommittees were formed: 1) Financial Hardship and Improving Access to Care Subcommittee; and 2) Community Health Education Subcommittee. Their goals and initial planned projects are described below.

#### 2.4 Financial Hardship and Improving Access to Care Subcommittee

The goal of this subcommittee is to address the difficulties faced by community members in accessing cancer screening and treatment by identifying barriers including ability to pay for and access care. The subcommittee planned two projects. The first project and first grant designed and submitted focused on cancer patients with financial strain and transportation challenges. It targeted patients with the high priority cancers who have cancers including

lung, colorectal or multiple myeloma. The proposed trial will identify and address these access barriers by partnering with a Community-Based Organization (CBO). A second proposed project focused on increasing mammography screening by partnering with Federally Qualified Health Centers, easing access for both patients and staff who often forego breast cancer screening due to access challenges.

#### 2.5 Community Health Education Subcommittee

The goal of the Community Health Education Subcommittee is to provide community members with relevant culturally significant and accurate information about cancer services available to them and options for follow-up in case of a positive finding or diagnosis. The CCA is collaborating with faith-based organizations, Federally Qualified Health Centers, the Witness Project of Harlem and Esperanza y Vida to provide breast cancer screenings and educational materials. Another planned project focuses on liver cancer screening as Harlem leads NYC neighborhoods in liver cancer incidence and mortality. The CCA is in discussions with pharmacists to develop and implement targeted messages about liver cancer screening for high-risk patients. “Hot-spot” pharmacies will be identified via the volume of medications commonly prescribed for cirrhosis, a condition placing patients at high risk for liver cancer. The educational intervention will include information on liver cancer, screening, and ways to cover the cost of screening.

The group is considering training community health-advisors via an existing



faith-based initiative, Multi-faith Initiative on Community and Health through Early Awareness & Learning,<sup>9</sup> thereby increasing knowledge and spreading cancer screening awareness via churchgoers. Similarly, there is discussion of ways to educate providers to identify and address social determinants of health that impact patients. This approach, to be implemented at a Harlem-based clinic, will utilize a Social Determinant of Health Screening tool and resource assistance website.<sup>10</sup> In addition, professional organizations such as Harlem Docs, and Manhattan Central Medical Society, a local affiliate chapter of the National Medical Association, the largest and oldest national organization representing African American physicians and their patients, will be engaged for similar purposes.

While the 2 inaugural subcommittees focus on the top voted issues, it is clear from the cancer statistics that to conquer disparate cancer burden requires efforts both within the community as well as within the health centers serving these communities. For example, East Harlem has a higher proportion of Latina residents as compared to Central Harlem. Latinas are at a reduced risk of aggressive triple negative breast cancer as compared to non-Latina women of African ancestry. One would expect that East Harlem, with higher mammography rates and lower breast cancer incidence would experience lower mortality from breast cancer. However, East Harlem's breast cancer mortality rate surpasses Central Harlem's suggesting that EH women may not be accessing high quality treatment for their breast cancers. To address quality of care issues, the CCA will work with

member researchers to review data from a Disparities Dashboard. The Dashboard, utilizing data from the tumor registry and electronic medical records, posts information, by race-ethnicity, stage, treatments received, dates of diagnosis and treatment, and other key quality utilization measures. Data feeding into the Dashboard are derived from a health system comprised of additional healthcare delivery sites serving the Harlem communities. Dashboard cancers are those for which there are disparate rates in Harlem including lung, breast, colorectal, prostate, multiple myeloma, gastric, hepatobiliary, pancreatic, ovarian and uterine cancer. Members of the CCA will work with medical centers' cancer infrastructure to implement interventions targeting disparate care. To begin, initial projects will focus on the higher volume hospital. Once proven effective, interventions will be implemented across the health system, utilizing the principles of implementation science.

Although the CCA chose to focus on risk factors rather than specific cancers at the outset, concern was expressed over the need to address prostate cancer as Central Harlem leads NYC in its incidence and mortality and its rate of late stage cancer at time of diagnosis is more than 2 times NYC's rate. Thus, a few approaches are currently in development. Based on work in Harlem assessing racial disparities in the quality of care men receive,<sup>11,13,14</sup> CCA research members designed and are implementing a Disparities Dashboard which includes prostate cancer. The CCA's environmental justice Community Based Organization helped develop a proposal



assessing environmental risk factors and prostate cancer in Harlem, as polycyclic aromatic hydrocarbons from diesel emissions are associated with prostate cancer and Harlem is home to bus depots emitting high levels of diesel fumes.<sup>15,16</sup>

The CCA and its subcommittees are still nascent and developing their next steps toward achieving equitable cancer outcomes and decreasing Harlem's disparate cancer burden. The group realizes that a population-based approach requires multi-pronged approaches. The Accelerator plans to work with creators of an interactive mapping program, Scan 360,<sup>12</sup> to help inform future directions. This software utilizes publicly available databases to map cancer incidence, mortality, environmental and behavioral risk factors by geographic area. We envision this tool will help spark targeted investigations and interventions interweaving social determinants of health, the built environment and community-based programs that address cancer risk and care.

### 3. Conclusion

Community and population-based approaches to reduce cancer disparities in Harlem will take years to substantively impact the cancer burden. However, early projects focus on discrete achievable outcomes of treatment, screening and education. Subsequent works will utilize community-based cancer needs assessment findings to stimulate new ideas. For example, we anticipate a need to educate both Harlem residents and providers about the import of prostate cancer screening for men at high risk given the changing messages about prostate cancer screening.<sup>17</sup>

We also envision a need to address access challenges to cancer pain medication in Harlem given increasing prescribing restrictions during an opioid crisis in a community with a known dearth of pharmacies carrying pain medications.<sup>18</sup> While our CCA focuses on our Harlem communities, our approaches may prove useful to other high-risk NYC neighborhoods. Central Harlem may have the highest mortality from prostate cancer, but neighborhoods in Brooklyn and Queens have higher incidence. Effective outreach programs developed to stimulate prostate cancer screening in Central Harlem may be expanded to other high prostate cancer incident neighborhoods.

Ultimately, funding the efforts of CCAs will require investment in infrastructure and NCI support of community-based research focused on reducing cancer disparities. Such efforts offer the opportunity to grow programs and partnerships addressing genomic, environmental and social determinants of health interactions and to develop and implement programs leading to the eradication of cancer disparities.

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