



2016 Case Challenge

Urban Change and Impact on Chronic Disease of Vulnerable Populations in DC



NATIONAL ACADEMY OF MEDICINE

Leadership • Innovation • Impact | *for a healthier future*

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

Contents

Acknowledgments	3
Disclaimer	4
Instructions	5
Case: Funding Announcement—Urban Changes and Impact on Chronic Disease of Vulnerable Populations in DC	7
Scenarios	9
Background	11
Urban Renewal, 11	
Chronic Disease History in DC, 13	
Health Equity in DC, 16	
Issues Affecting Low-Income Populations in Gentrifying Areas	18
Race, Discrimination, and Oppression, 18	
Economic and Social Mobility, 20	
Affordable Housing and Homelessness, 21	
Accessibility and the Built Environment, 26	
Health and Education, 33	
Food and Nutrition, 34	
Health Care and Social Services in Changing Neighborhoods, 37	
Conclusion	41
Appendixes	
A: Acronyms List	42
B: Resource List, stratified by national, regional and DC-specific	43
C: References	44
D: Judging Rubric	49
E: Team Biographies	51
F: Guide for Student Teams and Faculty Advisors	54
G: Student Team Guidelines and Rules	57
H: Presentation Day Agenda	61

Acknowledgments

The authors would like express their appreciation to Sweta Batni (Georgetown University Global Infectious Diseases program graduate, former Case Challenge case writer), Leigh Carroll (MIT Department of Urban Studies and Planning, former National Academies of Sciences, Engineering, and Medicine [NASEM] staff), Paula Lantz (University of Michigan School of Public Policy, formerly George Washington School of Public Health), and Rachel Thornton (Johns Hopkins School of Medicine) for reviewing the case and providing valuable feedback. The authors also thank the NASEM Case Challenge staff for their guidance during case development, Amy Geller, Alina Baciuc, Darla Thompson, and Sophie Yang (Health and Medicine Division, NASEM).

Disclaimer

All characters, organizations, and illustrative vignettes described in the case are fictional and do not reflect the views of actual organizations (e.g., Department of Transportation) or specific individuals. The case scenario is complex and does not necessarily have a single correct or perfect solution, thus encouraging teams to develop a judicious balance of creative, interdisciplinary, and evidence-based approaches. The authors of this case study have provided facts and figures within the case as well as appendices with resources and references to help teams create their solutions. The data provided are derived from independent sources, may have been adapted for use in this case, and are clearly cited such that teams can verify or contest the findings within their recommendations whenever pertinent. Teams are responsible for justifying the accuracy and validity of all data and calculations that are used in their presentations, as well as defending their assertions in front of a panel of subject matter experts who will be serving as judges representing different stakeholders.

Instructions

Task: Develop a feasible and creative proposal that will address urban changes and impact on chronic disease of vulnerable populations in Washington, DC. Present your proposed solution(s) to address the challenge at the Case Challenge competition to be held on October 16, 2016.

Scope: The proposal is limited to a budget of \$2 million USD to be used during a 5-year span. Your proposal and presentation should specify which sector(s), groups of people, or organizations your intervention(s) will engage and provide a justification for these selections. Staff salaries for the intervention should be covered within the allowed budget.

Case Information: The case includes some initial background statistics and information relevant to the case topic. However, in your presentation, you do not need to address all the information presented in the case. Rather you can use the provided materials as a reference to help guide your response.

Outside Resources: Teams should also consider outside resources for a deeper understanding of the problem and a stronger proposal. However, registered team members must generate the case solution independently. Faculty advisors and other individuals who are used as a resource should not generate ideas for the case solutions, but can provide relevant information, guide students to resources, provide feedback on ideas and proposals for case solutions and recommendations generated by the students, and provide feedback on draft slides/practice presentations.

Judging: Refer to the judging rubric (see Appendix D) to see the criteria on which you will be assessed. Judges will represent organizations working with DC residents, city planners, workforce development, health and housing, and clinical care.

If you have questions about the case, please email Hannah Rishq at hr2404@columbia.edu prior to 9:00am on Friday, October 14. She will forward your question and her answer to all of the participating teams.

On the day of the presentation, please remember the following:

- Arrive at the National Academy of Sciences building (2101 Constitution Avenue, NW, Washington, DC) **between 11:15am and 12:00pm** on October 16, 2016. The security guard will direct you to the business center to check in.
- Bring a copy of your presentation in PowerPoint format on a flash drive and give it to the Case Challenge organizers **by 12:00pm**.
- Your presentation should be no longer than 15 minutes and will be followed by 10 minutes of Q&A.
- Dress professionally, as you are representing your school in front of an audience. However, please do not wear anything that would identify your school.

For more information on the Case Challenge guidelines and logistics, refer to the attached guide for student teams and faculty advisors.

If you have questions about the event, please email Sophie Yang (syang@nas.edu).

We are really looking forward to hearing your ideas for contributing to a thriving DC community. Thanks for participating, and have fun!

Case: Funding Announcement—Urban Changes and Impact on Chronic Disease of Vulnerable Populations in DC

Introduction

The Quality Communities Foundation of Washington, DC, Maryland, and Virginia (DMV) is pleased to announce a grant funding opportunity for any non-profit organization working with the local DMV community to promote well-being and health in vulnerable populations. Specifically, this grant should mitigate the negative effects of urban change on the city's most vulnerable populations, including residents from low-income minority communities, those who are displaced or at risk of displacement, and those who are homeless.

The Quality Communities Foundation is committed to nurturing healthy and vibrant local neighborhoods that are racially, ethnically, socially, and economically diverse. Local is defined as the entire Washington, DC metropolitan area. Currently, many health promotion programs do not directly address the potential effects of urban change—e.g., having to move or losing neighbors, a shift in neighborhood services and amenities—on the health and quality of life of at-risk populations. Like other urban areas across the United States, the District of Columbia (DC) has been experiencing more than two decades of rapid change in demographics, economy, and landscape. Those changes have multiple and intertwined effects on the city's health profile by displacing or destabilizing long-time residents, limiting or shifting available health care and social services, and shaping the factors (employment, access to necessities, transportation, etc.) that contribute to people's health and well-being.

The Quality Communities Foundation hopes that this grant will encourage a local-level intervention that will promote health-supporting conditions within the rapidly changing Washington, DC area.

The grant will last five years and include \$2 million in total costs. This will be awarded to the non-profit organization that develops a multi-faceted, interdisciplinary, innovative, and evidence-based solution targeted at improving the health and well-being of vulnerable populations negatively affected by urban change in the Washington, DC metro area. The most successful solution will provide feasible interventions that the applicant organization can readily implement in partnership with DC local government agencies and/or community organizations. Proposed plans should prioritize the issues, justify the choice of intervention(s), specify the implementation and evaluation strategy, and provide budget estimates for the use of funds within the time frame specified.

This grant solicits submissions through an open, competitive process to eligible non-profit organizations working on issues relevant to improving the well-being of vulnerable

DC area populations negatively influenced by urban change. Teams will present their proposals to the Quality Communities Foundation's board of advisors on October 16, 2016. For more detailed evaluation criteria, please see Appendix D.

The Challenge

You work for a small, non-profit organization headquartered in DC that works with socioeconomically at-risk populations (e.g., low-income, homeless). The director of your organization has tasked your team to apply for funding. Therefore, your goal as a team is to develop and propose an interdisciplinary, innovative, equitable, justifiable, and financially sound plan that would be supported by the DC government, potential partner organizations, and the broader population of DC area residents. When writing your proposal, your director has approved your team to hire more skilled personnel as needed to help you implement your proposed solution(s) and meet this challenge. The salaries of any additional personnel must be within the total funding allotted above and must be accounted for in your budget estimates. Good luck!

Scenarios

The following scenarios, adapted from real-life situations, portray the diverse range of issues faced by vulnerable groups such as low-income minority populations in changing urban areas. These scenarios demonstrate the conditions created by recent, and ongoing, policies that put certain groups at risk. You are not limited to directing your solution(s) to the specific issues presented in these examples. Rather, these examples are intended to provide your team with different ideas of issues that affect vulnerable populations in areas undergoing urban change, for which you may choose to design your intervention(s).

Scenario 1: A 27-year-old resident of Adams Morgan, Maria Portos, has type 2 diabetes. Her family has lived in Adams Morgan for at least three generations. Her grandparents moved to DC from El Salvador in 1940. Her parents worked multiple jobs throughout her childhood to make sure there was always food on the table. Until recently, her neighborhood was considered a food desert due to lack of available nutritious options. Maria still lives in the home that her grandparents moved into in 1940 with her parents. Maria also has her own 5-year-old child and works three part-time jobs to support herself and her family. She does not have health insurance and found the process of enrolling in DC's health insurance marketplace (created by the Affordable Care Act) confusing and inaccessible. She is too old to benefit from her parent's health insurance and her child is on Medicaid. Maria is unable to afford her diabetes medication out-of-pocket and can usually get by with free visits and treatment from her local community health clinic. Maria is worried about keeping her jobs and caring for her child while trying to manage her health. Additionally, she recently learned that her child is at risk for early onset type 2 diabetes.

Scenario 2: Jackson Williams is an 11-year-old who lives in Southwest DC with his mom, three siblings, and his grandmother. He was born prematurely and diagnosed with asthma as an infant. Jackson's apartment complex is not smoke-free and the environmental tobacco smoke has been strongly exacerbating his asthma symptoms. Jackson is the eldest child and becoming keenly aware of the struggles that his family faces. Recently, his mother began to consider a move to Prince George's County because they are barely able to afford rent, and food at the neighborhood grocery stores has rapidly increased in price. The neighborhood that Jackson lives in is tight-knit and people care for each other. Jackson does not want to leave his friends and Jackson's mother does not want to lose the social support she has from her neighborhood.

Scenario 3: Beatrice Berg is a 76-year-old widow who lives in Bloomingdale. She lives alone and has limited physical mobility because of a bad knee. She uses a walker to get around and can no longer drive due to failing eyesight. Beatrice lives about one mile from the metro but there is a bus stop right outside her apartment building. She has three children who live in the DC area, but they work full-time and have families of their own. Beatrice has rented the same apartment for over 50 years. She is finding it increasingly difficult to pay for costly medication and afford groceries and other

necessities in her area. Beatrice is eligible for Medicaid and receives Social Security benefits but is on a very tight income. She told her youngest daughter that she needs a home aide to help her with basic tasks. Her daughter responded that she is unable to afford one so she may have to move in with one of her children.

Background

Urban Renewal

Cities go through waves of change. Different terms have been used to refer to urban change over the past century, and like the changes themselves, the language used to describe them—whether “urban renewal,” “redevelopment,” or “gentrification”—is highly contested and viewed both positively and negatively (Kennedy & Leonard, 2001). Urban renewal is often defined as the transformation of neighborhoods from low economic value to high economic value. This change has the potential to cause displacement of long-time residents and businesses (CDC, 2009). Effects can include increase in rents and property values while also changing the district’s character and culture. Ruth Glass coined the term gentrification in 1964 to explain the social structure and housing market changes happening in London. She expressed in the following quote from her book *London: Aspects of Change*:

“One by one, many of the working class quarters of London have been invaded by the middle-classes—upper and lower. Shabby, modest mews and cottages—two rooms up and two down—have been taken over, when their leases have expired, and have become elegant, expensive residences... Once this process of 'gentrification' starts in a district it goes on rapidly until all or most of the original working-class occupiers are displaced and the whole social character of the district is changed” (Atkinson & Bridge, 2005).

The definition of urban renewal, sometimes called reinvestment or revitalization, has changed over the years. As the civil rights movement was uprising, urban renewal was an inconspicuous change that related solely to the housing market and renovation of existing properties (Atkinson & Bridge, 2005). More recently, Atkinson and Bridge broadened the definition to include vacant land and new neighborhoods for buyers to partake in urban renewal. Now the concept of gentrification has expanded to become a new form of neoliberal urban policy where cities provide incentives to prioritize the often “creative” or entrepreneurial class of newcomers over long-term, poorer residents (Atkinson & Bridge, 2005).

The realities of unaffordable housing strongly affect residents in communities undergoing urban change, such as those in Washington, DC. The modern displacement of residents in urban communities around the country began in the early twentieth century with a succession of policies that displaced earlier urbanites (Fullilove & Wallace, 2011). In the first wave of displacement in the 1930s, minority neighborhoods were redlined¹ by federal government agencies, such as the Home Owners Loan Corporation and the Federal Housing Administration, as risky investments (Fullilove & Wallace, 2011; Greer, 2012). Therefore, racial and ethnic groups were denied mortgage loans and forced to live in older or dilapidated housing. Redlining is defined as the

¹ Redlining refers to the lines drawn on lenders’ maps to indicate geographic areas whose residents they considered a high risk.

practice of refusing or restricting loans in an area that is seen as a poor investment by a financial institution due to the area's socioeconomic composition (Greer, 2012). As a result, redlining creates disparities by preventing residents and potential private investors from improving certain neighborhoods. After disinvestment, the areas deemed to be run-down were seized and sold to developers for revitalization purposes through the federal Housing Act of 1949 (Fullilove & Wallace, 2011). This displaced millions of low-income residents from previously redlined and disinvested neighborhoods. Deindustrialization and the resulting loss of manufacturing jobs combined with the foreclosure crisis of the 2000s have precipitated the current wave of urban renewal (Fullilove & Wallace, 2011).

Why urban change matters to health. Health is the result of a range of factors beyond access to health care services and the quality of those services. Education, employment and income, and the built environment are among the other so-called “social determinants of health.” Place is a crucial influence on health—as framed by the work of the Robert Wood Johnson Foundation (RWJF) Commission to Build a Healthier America, one's zip code can matter more to health than one's genetic code (Slater, 2011). Therefore, the places where people play, pray, learn, live, and work are essential to creating or impeding good health. When cities change, so do the places people inhabit. Often, displacement of individuals, families, and whole communities is the result, destroying social fabric, generating new sources of stress and instability, and leaving lives unmoored, all with negative effects on health (NASEM, 2016). Changes in the city may also include a shift in the range of health care and social services available, as “redevelopment” makes some organizations unable to renew leases, or as buildings are torn down and rebuilt, dramatically changing the landscape.

In Washington, DC, newer residents are more likely to have higher incomes and more likely to be white, single, and childless (Rabinowitz, 2015). The changing population affects the “availability of affordable housing for longtime residents” as well as schools in the changing districts (Rabinowitz, 2015).

Some argue that the term displacement is more descriptive than “gentrification” because it clearly notes the process of poor communities losing their homes and relocating to a more affordable location, such as suburban areas, when the wealthier community moves into these neighborhoods. The “demographic inversion” where a city becomes richer and suburbs become poor is a result of urban “renewal.”

Health effects of gentrification. According to the Centers for Disease Control and Prevention (CDC), “[v]ulnerable populations (can include but are not limited to the low income, displaced, homeless, and/or segregated populations) typically have shorter life expectancy; higher cancer rates; more birth defects; greater infant mortality; and higher incidence of asthma, diabetes, and cardiovascular disease” (CDC, 2009). Additionally, low-income populations have an unequal share of residential exposure to hazardous substances such as lead paint (CDC, 2009). During the past decade, the proportion of children decreased across the neighborhoods of Washington, DC at varying rates. For example, the number of children in the Woodland/Fort Stanton area dropped 2 percent

while Near Southeast/Navy Yard showed a 51 percent decrease (Rabinowitz, 2015). This trend can be correlated with the trend of the decrease in the African American population and the increase in median income (NeighborhoodInfo DC, 2016).

The effects of urban renewal are continually debated. Places where most changes were seen during the past decade include:

- Near Southeast, Navy Yard
- Downtown, Chinatown, Penn Quarter, Mount Vernon Square, North Capitol Street
- Shaw, Logan Circle
- Howard University, Le Droit Park, Cardozo/Shaw
- Edgewood, Bloomingdale, Truxton Circle, Eckington (NeighborhoodInfo DC, 2016).

Chronic Disease History in DC

Chronic diseases such as diabetes and hypertension are defined as generally incurable illnesses affecting individuals' health for at least one year (Goodman et al., 2013). Chronic diseases require ongoing medical care may impair an individual's activities of daily living (Goodman et al., 2013). The World Health Organization (WHO) differentiates between non-communicable and infectious diseases, using the former to represent the term chronic disease (WHO, 2015). Conditions or behaviors that contribute to chronic disease are called intermediate risk factors (WHO, 2015). Though not a disease, obesity is a significant risk factor because of its association with numerous chronic illnesses including diabetes and cardiovascular disease (DOH, 2014c). Diabetes, obesity, cardiovascular disease, and asthma are all interrelated conditions because they often occur together and can engender or exacerbate one another.

Prevalence of chronic disease in low-income communities. Chronic diseases in vulnerable populations cause greater consequences as a result of limited access to health care, increased exposure to harmful products such as tobacco and unhealthy food, and limited financial resources (WHO, 2015). The cost of chronic illness can be direct payment for goods and services associated with health care or indirect loss of a household wage earner. These circumstances could quickly place an intolerable burden on an already economically strapped family (WHO, 2015).

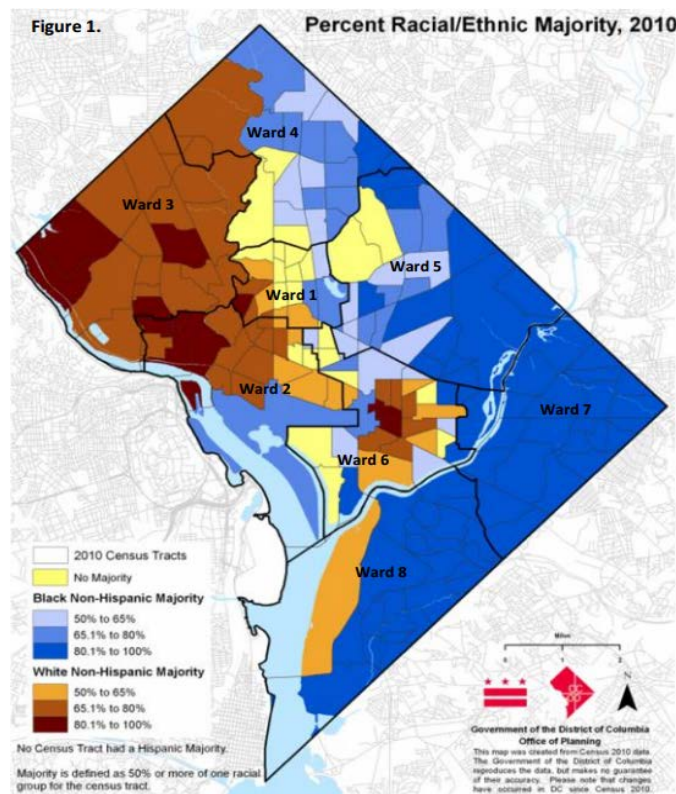
The following provides a brief overview of chronic disease rates in Washington, DC and some examples of local resources that seek to address the need for preventive and treatment services. In 2010, eight of 15 leading causes of death in Washington, DC were due to non-communicable chronic diseases (see Table 1) (DOH, 2014b).

Table 1: Overview of Chronic Disease in DC

	US -- # of deaths	US -- % of deaths	DC -- # of deaths	DC -- % of deaths
Total deaths	2,468,435	100.0%	4,672	100.0%
1. Cardiovascular disease	597,689	24.2%	1,306	28.0%
2. Cancer	574,743	23.3%	1,041	22.3%
3. Respiratory disease, including asthma	138,080	5.6%	147	3.1%
4. Stroke	129,476	5.2%	196	4.2%
7. Diabetes	69,071	2.8%	145	3.1%
8. Kidney disease	50,476	2.0%	84	1.8%
12. Chronic Liver disease and cirrhosis	31,903	1.3%	54	1.2%
13. Hypertension	26,634	1.1%	57	1.2%
Total chronic disease in top 15 causes of death	1,618,072	65.6%	3,030	64.9%

Based on maps from DataLensDC, Wards 7 and 8 are currently undergoing urban transformation indicated by several measures: changes in median income, proportion of African Americans, and proportion of children under the age of 18 (Rabinowitz, 2014; See Figure 1). At the same time in 2011, Wards 7 and 8 had the highest prevalence of numerous chronic diseases and risk factors among all the wards (DOH, 2014a). In many cases, the disparities between Wards 7 or 8 and the wealthiest, Wards 2 and 3, were two- to five-fold in disease prevalence.

Figure 1: Percent Racial/Ethnic Majority, 2010



Diabetes. In 2010, the prevalence of diabetes in DC was 8.7 percent, equal to the national average (DOH, 2011). A disorder characterized by high blood glucose, diabetes can cause complications such as nerve damage, kidney failure, and increased risk for infections (Black, 2002). Such complications can lead to a high rate of disability among those afflicted (Black, 2002). In the United States, diabetes-associated mortality is about 21 per 100,000 people whereas in some parts of DC, the rate is more than double that (DOH, 2011).

With regard to race and ethnicity, diabetes affects the non-Hispanic black population most frequently at a similar rate both nationally and in the District (DOH, 2011). According to the District of Columbia Department of Health's (DOH's) *Annual Health Report*, Wards 7 and 8 had the highest rates of diabetes in the District in 2010 (DOH, 2014a). These two wards also had the highest concentration of non-Hispanic blacks, with 95 and 94 percent non-Hispanic black populations in Wards 7 and 8, respectively (DOH, 2013; NeighborhoodInfo DC, 2012).

The District of Columbia Diabetes Control Program. T launched its Diabetes Control Program, which seeks to reduce the burden of diabetes on its city. Through community partnerships, it provides information on resources available for diabetes prevention and treatment and promotes sound policy decisions regarding diabetes (DOH, 2014c).

Obesity. Defined as having a body mass index (BMI) equal to or greater than 30, obesity has become epidemic in many developed countries (DOH, 2014). Consequences of obesity range from intermediate risk factors like high blood cholesterol and sleep apnea to chronic illnesses such as cancer and heart disease (DOH, 2014). Causes of obesity are multifactorial, stemming from factors like high-caloric intake, low level of physical activity, and low-quality nutrition (DOH, 2014). The built environment has a significant impact on obesity outcomes. Compared to the rest of the nation, Washington, DC has nearly the lowest rate of adult obesity (Levi et al., 2015). However, DC has the highest rate of racial disparity for obesity and the highest prevalence of overweight children (Howard University Hospital, 2016).

DC Healthy Schools Act. This law was passed in May 2010 and aims to reduce childhood obesity by providing more nutritious school meals and expanding students' access to them. This is achieved by giving local schools financial incentives to comply with nutritional standards and to meet benchmarks for student participation (DC Hunger Solutions, 2010a).

Asthma. Poorly controlled asthma causes missed days of work and school (CDC, 2013). It also may significantly limit one's physical activity, which can contribute to a higher BMI (CDC, 2013). In Washington, DC, current and lifetime asthma for adults and children exceeds the national average, and asthma affects nearly one in five children under the age of 18, twice the national average (DOH, 2013). Nationally, African American adults and children are more likely to have asthma than their white counterparts (CDC, 2013). Emergency department (ED) visits can be a marker for

poorly controlled asthma and in DC, over 95 percent of all pediatric ED visits are made by African Americans and Latinos (CDC, 2013).

Healthy People 2010 Objective: Met. In response to the federal Clean Air Act, Healthy People 2010 set a goal to improve the air quality for all residents of the District (DOH, 2013). In 2015, the District met standards for all air pollutants including ozone, also known as smog (Metropolitan Washington Council of Governments, 2015).

Heart disease. Modifiable risk factors for developing coronary heart disease are cigarette smoking, elevated blood cholesterol, physical inactivity, obesity, and diabetes—all factors that are shaped by social, environmental, and economic determinants of health (IOM, 2011). The CDC identified Washington, DC as having the highest rate of preventable deaths from heart disease, stroke, and high blood pressure in the country. Non-Hispanic blacks are twice as likely as whites to die from preventable heart disease and stroke and these deaths occur not only in older individuals but also in those below age 65 (DOH, 2016d). According to the Behavioral Risk Factor Surveillance System, residents most likely to suffer from heart disease reside in Ward 8, where the population is 95.6 percent African American (DOH, 2014a).

The Cardiovascular Health Program. The Cardiovascular Health Program is a state-level program that takes aim at heart disease, diabetes, obesity, and other related risk factors. It creates community partnerships to help residents prevent or manage heart disease. It also works to improve residents' access to health care services to help with prevention and management (DOH, 2014b).

Health Equity in Washington, DC

Health equity has been defined as “the fair distribution of health determinants, outcomes, [and] resources within and between segments of the population” (Murphy et al., 2008). Above, we discussed disparities in some of the determinants of health. In this section, we focus on a key metric of health equity, namely life expectancy. Murphy and colleagues point to “globalization and gentrification” as key causes of growing disease disparity among high- and low-income residents living in inner cities. They reiterate that although clinical care can have a direct impact on an individual's health, “living conditions associated with varying levels of social and economic development are more significant in determining whether people become ill” (Keene & Geronimus, 2011). As such, data on health equity in Washington, DC can provide further information on the public health determinants of chronic disease that affect different populations stratified by race, level of education, and level of income.

The RWJF Commission to Build a Healthier America observed life expectancy rates along the different metro lines in Washington, DC. The disparities they found were astonishing. For example, within the red metro line, which covers a distance of 30 miles, there is a nine year difference in life expectancy from one end to the other. While no further analysis was performed, these findings illustrate the vast differences in life expectancy between neighboring areas in DC (RWJF, 2016).

A comparison of trends in African American and white life expectancy between 1990 and 2009 shows that despite improvement in life expectancy for both African American and white residents, DC had large racial gaps in life expectancy for both males and females (Harper et al., 2014).

Although the measurement of effects of urban change continues to evolve, several studies have tracked implications for health care access over time by looking at specific public health concerns. A study conducted in New York City from 2008 to 2010 attempted to measure the relationship between gentrification and pre-term birth. The study found that living in a highly gentrified neighborhood was protective for non-Hispanic whites compared to those living in a neighborhood with a low level of gentrification. The odds ratio of preterm birth was significantly elevated for non-Hispanic blacks who live in highly gentrified communities (Huynh & Maroko, 2014).

Issues Affecting Low-Income Populations in Gentrifying Areas

Race, Discrimination, and Oppression

As discussed, the background of urban renewal is one of complex roots and history and has significant implications for the health and well-being of the individuals and communities affected. Some of these issues are interrelated with race and ethnicity, social class, and economic status,² and therefore any discussion regarding urban renewal would be incomplete without a discussion of economic social mobility.

Racial discrimination, privilege, and oppression shape health outcomes. It is generally accepted that discrimination can present itself in two ways: covertly or overtly. In health care, covert discrimination is often through the “denial of information on the latest medical treatments” while overt discrimination is “disrespect, poor quality communication, or language barriers between doctor and patient” (Story et al., 2014). Just as discrimination can impact health outcomes, so can the closely related concept of privilege. Privilege is a “state of being preferred or favored in society combined with a set of conditions that systematically empower select groups based on specific variables, such as race and gender, while systematically disempowering others” (Story et al., 2014). Generally, privilege can be used as a form of oppression when the dominant group uses that privilege to “distinguish others from themselves” (Story et al., 2014). Understanding privilege has been shown to have a direct effect on health by members of the dominant group (white) reporting higher levels of health than the minority group. All of this has been linked to the concepts of internalized, personally-mediated, and institutional racism (Jones, 2000), and systems of discrimination, privilege, and oppression have been shown to have direct effects on health.

Many studies have found direct links between race and health. A 2001 study looked at the issue of racism and cardiovascular disease and found that racial discrimination and internalization of negative racial group attitudes were both risk factors for cardiovascular disease among African American men. This study was conducted with a group of African American men and was based on the researcher's hypothesis that cardiovascular issues can be fostered by the “internalization and denial of racial discrimination.” Through a series of logistic regressions, the researchers found that agreement with negative stereotypes of African Americans was positively associated with cardiovascular disease. The authors also found that African American men who “reported no experiences of discrimination and held negative racial group attitudes [had the highest] risk of cardiovascular disease and their cardiovascular health was the poorest” (DeLilly & Flaskerud, 2012).

² The term intersectionality is often used to refer to the intersection of social identities, such as being African American, poor, and female, and experiencing discrimination or oppression in connection with all these facets of one's being.

Another study found a connection between experiencing discrimination and having hypertension. This study involved a group of 1,110 African American men and women and sought answers to three research questions that hoped to address how racial discrimination, gender discrimination, and frequency of racial and gender discrimination may be related to having hypertension (DeLilly and Flaskerud, 2012). The researchers noted that “the psychosocial aspects of denial were observed in men and women who reported having never experienced discrimination,” and they found that this same group had higher rates of hypertension (DeLilly & Flaskerud, 2012). This finding further provides evidence that denial that one has experienced discrimination and internalization of discrimination pose a serious health risk.

Another study found that “perceived experiences of racism are associated with increased incidence of breast cancer among U.S. black women” (DeLilly & Flaskerud, 2012). In the analysis of results from a questionnaire, the researchers controlled for breast cancer risk factors and found that younger African American women who reported frequent discrimination were at higher risk for breast cancer compared to those who reported infrequent discrimination. The precise correlation between these diseases and discrimination is still unknown, however these studies suggest that there is a relationship and that racial discrimination can be a social determinant of health. Furthermore, these studies show that when discussing issues of health care inequality, it is vital to discuss racism.

In addition to the ways race and racism influence health care access and quality, race and racism also influence access to housing through discrimination. The U.S. Department of Housing and Urban Development (HUD) released a report in 2013 that addresses the continued discrimination faced by minorities in the housing market. The report found that “African Americans, Hispanics, and Asians learn about fewer housing options than equally qualified white people” (Gonzalez, 2013). Table 2 presents data from the report showing that minorities almost always learn of and are shown significantly fewer apartments and homes relative to whites.

Table 2: Percentage Less of Units or Homes Minorities Are Shown Compared to Whites

	Renters		Homebuyers	
	Learn About	Shown	Learn About	Shown
Black	-11%	-4%	-17%	-18%
Asian	-10%	-7%	-15%	-19%
Hispanic	-12%	-7%	-	-
Source: Gonzalez, 2013.				

This research further reinforces the idea that while blatant discrimination may not be as present as it has historically been through housing and segregation laws, that does not mean discrimination in the housing market has been solved.

Economic and Social Mobility

Social class and social mobility play a significant role in many aspects related to health care, primarily in their effect on access to health care. The delivery of health care services to low-income populations itself faces obstacles. A group of psychologists explored how working with individuals of low-income status requires special attention to the notion of class, which they defined as not “an attribute that resides in the self” but rather “a manifestation and consequence of systems of power and inequalities reproduced by institutional structures” (Kim & Cardemil, 2012). The authors also believe that class is a fluid and relative state, and an individual’s perspective on her class can change as other social and environmental factors change. Additionally, social classes may be said to have cultural norms and values but nonetheless remain fluid constructs. Lastly, the authors posit that just as someone’s interpretation of their class is fluid, when discussing social class it is vital to consider the other components of an individual’s identity in providing services to patients. For example, assessment of social class and the specific needs of a given community should be used to decide whether a patient would benefit from group or individual therapy. The authors also believe that an explicit conversation about social class should be included in therapy (Kim & Cardemil, 2012). These insights are likely to be useful to clinicians working against the backdrop of urban change and the implications of social class for health and well-being.

The issue of social class can be looked at through a multitude of lenses, and often understanding an individual’s background can help to further understand their current situation. A study that looked at the relationship between equality and intergenerational mobility used the Gini coefficient and data from the Luxembourg Income Study to estimate a country’s level of income inequality (Andrews & Leigh, 2009). These economic comparisons were made between the 1970s and the 1990s in an attempt to compare two different generations. The authors found that countries with greater inequality also demonstrate lower levels of social mobility. As the authors state, “moving from rags to riches is harder in more unequal countries” (Andrews & Leigh, 2009). Applying this same idea to the issue of urban renewal begs the question: how is urban change impacting inequality and how will these impacts affect the next generation’s social mobility?

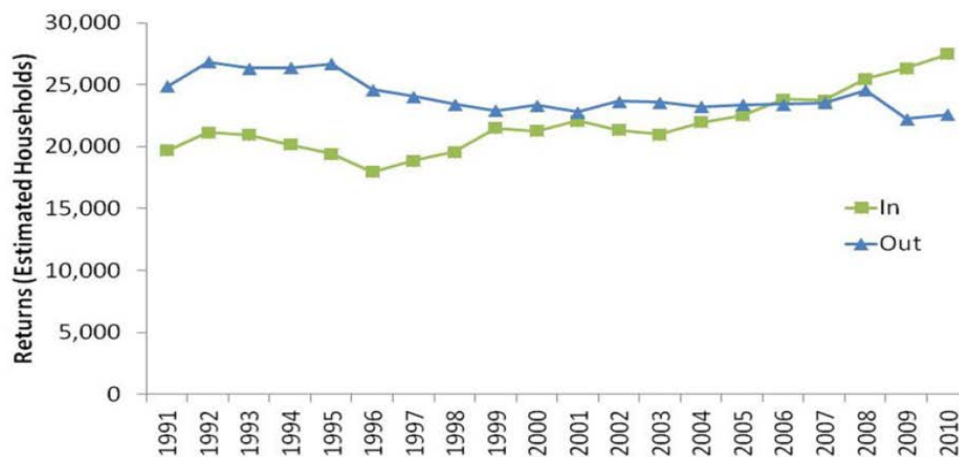
The issues outlined above are important for understanding urban renewal because they relate closely to the effect of displacement and the unintended consequences of renewal to further amplify the issues of social class and socioeconomic status. These issues are more complex than can easily be captured in this short discussion, but the biggest takeaway is that when urban renewal and displacement are discussed, the social mobility issues that arise often bleed into issues of health care. Understanding this can help develop appropriate methods to mitigate the negative effects of urban renewal.

Affordable Housing and Homelessness

When discussing urban renewal, a significant factor is the effect of community transformation on the pre-existing population. This is especially important with regard to housing opportunity and affordability. HUD defines affordable housing as housing that costs 30 percent or less of a family's combined income (HUD, 2016). For example, a family earning a combined annual income of \$30,000 should pay no more than \$9,000 per year for housing. Any percentage of income spent on housing above this amount is considered unaffordable because of the increased likelihood that the family will struggle to pay for other basic necessities, such as food and clothing (HUD, 2016).

The District of Columbia's wave of urban change and redevelopment began in the early 2000s with the election of Mayor Anthony Williams and city-wide efforts to invest in infrastructure (Sturtevant, 2013). While in office between 1999 and 2007, Mayor Williams set DC on track to attract higher income individuals and families via the development of retail businesses, restaurants, and condominiums (Sturtevant, 2013). This is evident in the amount of residential properties built in DC during that time period. For example, the Near Southeast/Navy Yard district had 599 residential properties built in between 2000 and 2010 (Tatian et al., 2015). In 2006, the ramifications of these investments became evident with in-migration surpassed out-migration of city residents, as seen in Figure 2 (Sturtevant, 2013).

Figure 2: Estimates of Households Moving Into and Out of the District of Columbia



Source: U.S. Internal Revenue Service.

According to several studies of DC revitalization, in-migration groups are typically young, childless, white college graduates or middle class African American or Hispanic households who value the city's diverse racial and economic climate (McKinnish et al., 2010; Sturtevant, 2013). According to Sturtevant, 53.7 percent of in-movers to Washington, DC are white and the rest of in-movers are of different ethnic origins (Sturtevant, 2013). Nearly 40 percent of these families move into the centrally located

districts of DC, which include Dupont Circle, Shaw, Penn Quarter, Chinatown, and the Downtown neighborhoods (Sturtevant, 2013). However, data shows that urban reinvestment and in-migration is spreading outside of this concentrated area and into nearby surrounding wards (NeighborhoodInfo DC, 2016). Projections for population growth predict that by 2020, the largest growing demographic group will be non-Hispanic white one- to two-person households (Tatian et al., 2015).

In contrast, DC residents displaced in the process of redevelopment are forced to move either to another location in the city or into the surrounding suburbs. The neighboring suburb African American residents are more likely to move to is Prince George's County, whereas white residents are more likely to move to other surrounding counties, such as Alexandria, or outside of the Washington metropolitan area, as shown in Figure 3 (Sturtevant, 2013).

Figure 3: Destinations of White and Black Out-Migrants

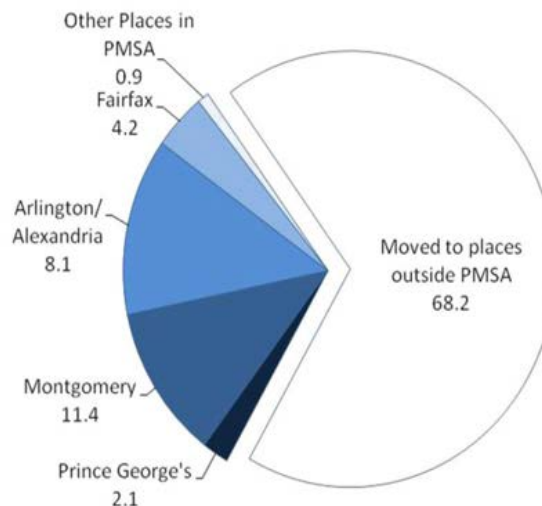


FIGURE 5A

Destinations of White Out-Migrants (%)

Source: 2006-2010 ACS 5-Year PUMS file.

The PMSA is the Washington DC Primary Metropolitan Statistical Area.

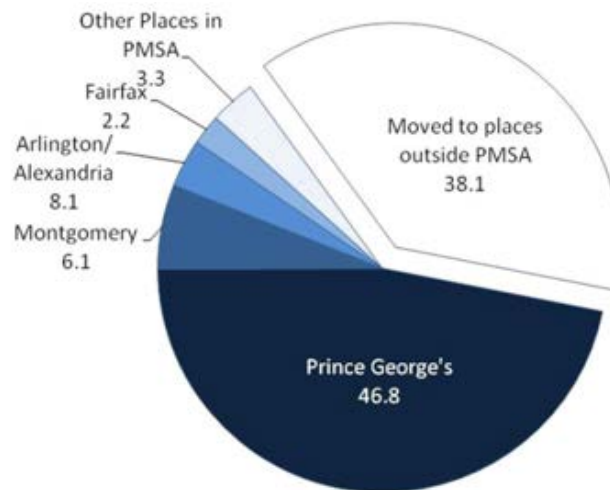


FIGURE 5B

Destinations of Black Out-Migrants (%)

Source: 2006-2010 ACS 5-Year PUMS file.

The PMSA is the Washington DC Primary Metropolitan Statistical Area.

One of the main reasons residents make the decision to out-migrate is the increasing cost of living that accompanies redevelopment. DC residents with incomes of approximately \$22,000 per year (the lowest quintile of renters) have experienced a 35 percent increase in rental prices simultaneously with stagnant wages for the past decade (Rivers, 2015). Meanwhile, the median wage per hour has only risen 36 percent from \$17.70 to \$24.01 between 1979 and 2012 (Bhat & Reed, 2014). These factors have led to the out-migration of the city's low-income population and the in-migration of those in higher income groups (McKinnish et al., 2010). A similarity between people moving in and out of DC is that both groups are likely to be between 25 and 34 years of age, and overall 42 percent of movers are in this age range (Sturtevant, 2013). This is probably due to younger individuals having more of a readiness to adjust to a new environment, whereas older individuals have more ties to their original community.

With increasing housing prices, lower income residents of the District face consequences of unaffordable housing such as homelessness. Homelessness is defined as the state of lacking permanent housing and includes occupying temporary public housing facilities or unstable housing, such as abandoned cars (National Health Care for the Homeless Council, 2016). With 40 percent of DC households experiencing the burdens of unaffordable housing between 2008 and 2012, the risk of homelessness is especially high in the city (Tatian et al., 2015). DC has one of the highest rates of homelessness when compared to other states and territories, with a prevalence of 119.9 per 10,000 people in 2014 (NAEH, 2015).

In general, populations at risk of experiencing homelessness include those struggling with poverty, unemployment, and cost burdens of affordable housing (NAEH, 2015). In addition, individuals suffering from mental health ailments or who have a low level of

education, those who are teen parents, and those struggling with substance abuse are more likely to face homelessness (APA, 2016). A typical homeless family is comprised of a single mother under the age of 30 with two young children under the age of five and an average household income at or below 50 percent of the poverty line (NAEH, 2012). Generally, a homeless family is likely to have poor social networks to rely on for assistance, such as advice, childcare aid, and sources to borrow money from (NAEH, 2012). These combined factors contribute to a family's high risk for homelessness.

Figure 4: Data on Child Homelessness and Poverty

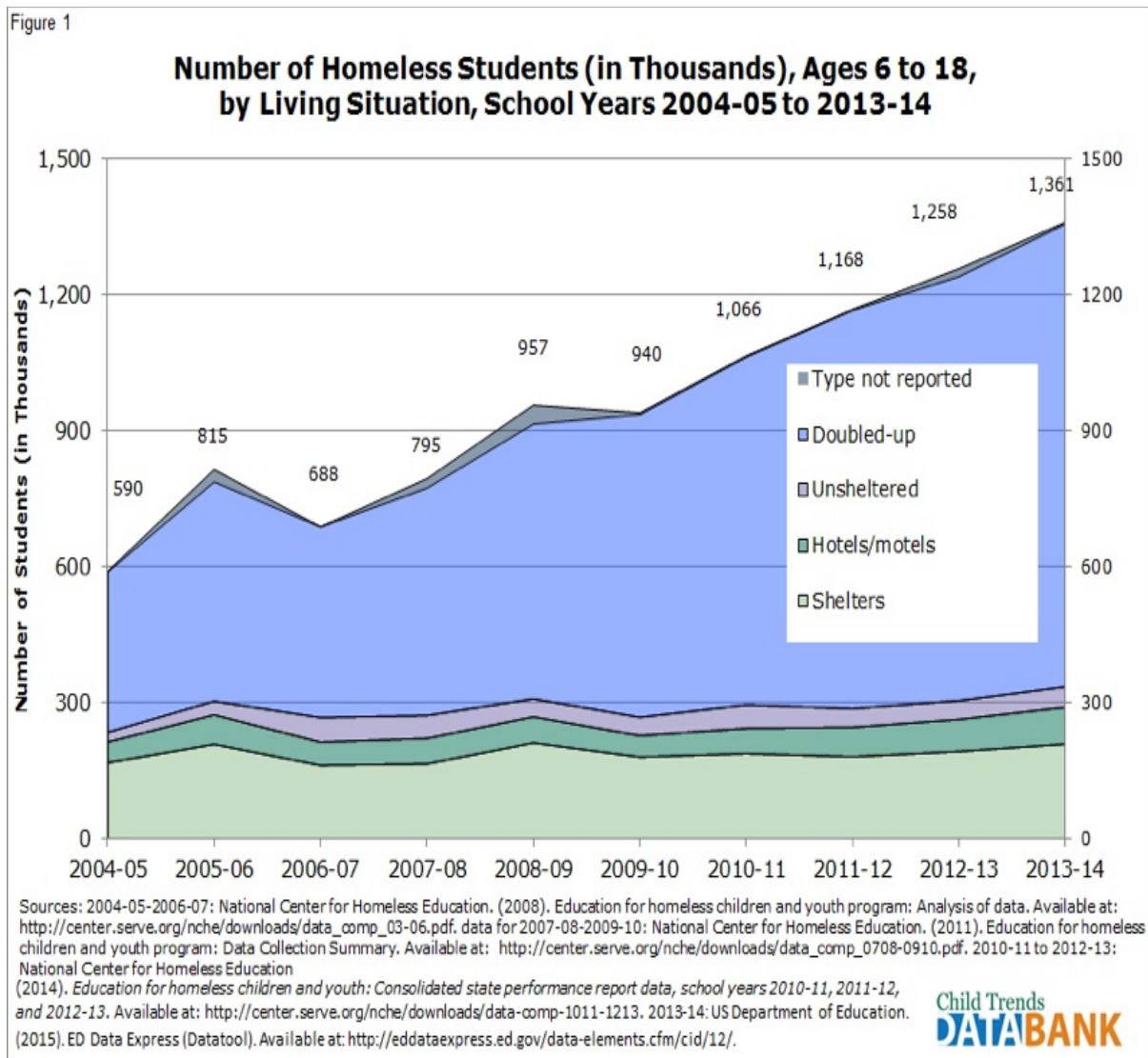
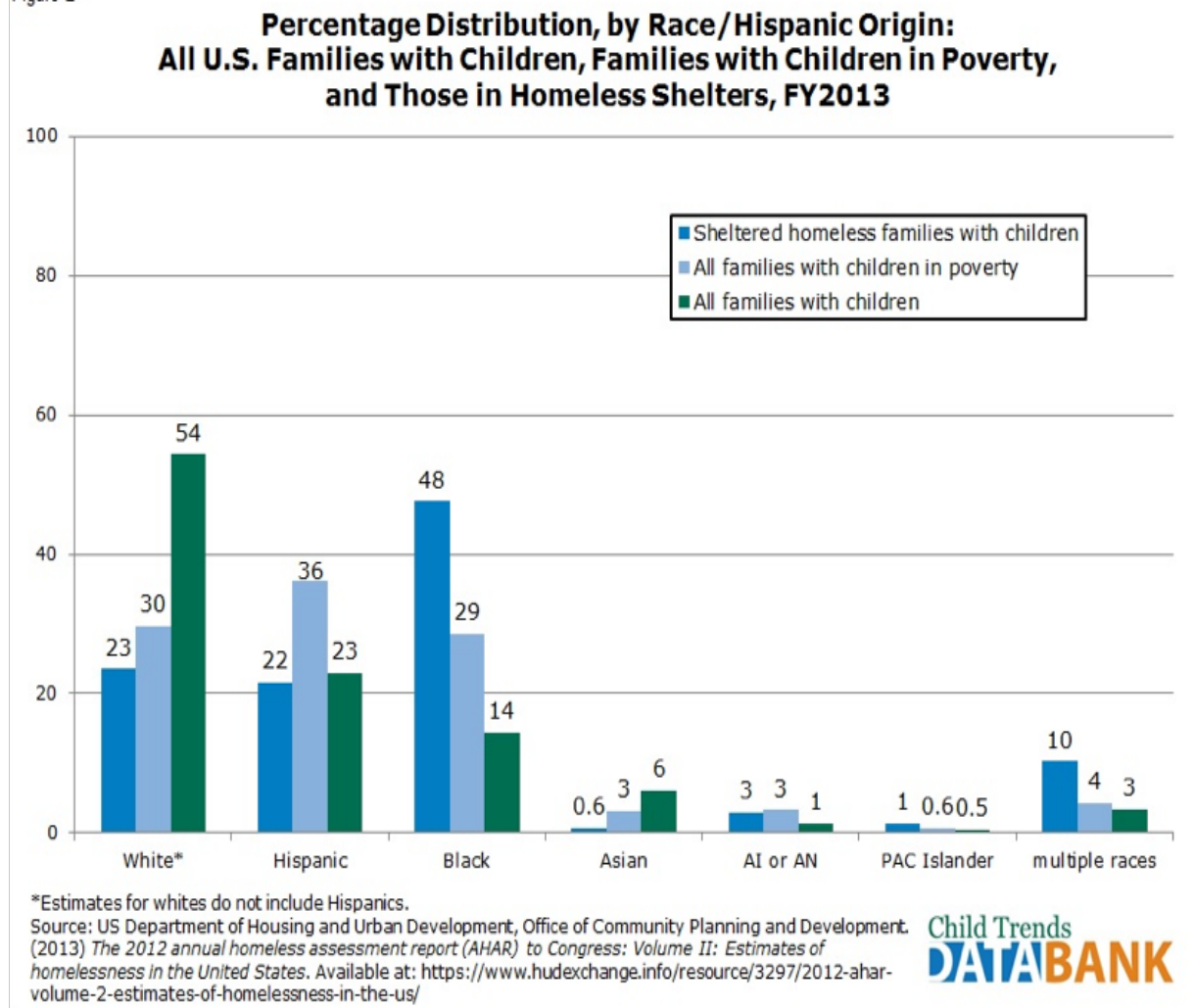


Figure 2



The numbers of homeless families in DC increased 19.8 percent between 2013 and 2014 (NAEH, 2015). From 2012 to 2013, there were more than 2,450 homeless children in DC public schools, with the percentage of homeless students ranging from 1 to 24 percent (Bhat & Reed, 2014). In decreasing order, the wards with the highest percentages of homeless children were Wards 8, 7, 6, 1, 4, and 5 (Bhat & Reed, 2014). Homelessness places caregivers and children of these families at increased risk of negative social, mental, and health effects that are correlated with homelessness. Studies have shown that newly homeless adults face increases in use of health care services for infectious diseases, chronic diseases, and mental ailments in the year leading up to homelessness (Schanzer et al., 2007). The ailments for which individuals seek health care services include depression, anxiety, diabetes mellitus, and others (Schanzer et al., 2007).

If the effect of homelessness can be detrimental to an adult, how does it affect the children in these families? Since childhood is a formative period of emotional, behavioral, and motor development, child homelessness can create adverse life outcomes (McCoy-Roth et al., 2012). According to McCoy-Roth and colleagues,

turbulence or lack of stability that is associated with homelessness may lead to emotional and behavioral problems in children (McCoy-Roth et al., 2012). For example, studies have shown that children in this population are more likely to lack attention-focusing skills, exhibit depression, and have conduct disorders (McCoy-Roth et al., 2012). As these traits affect development, homeless children are more likely to score lower on academic testing and drop out of school (McCoy-Roth et al., 2012). In addition, homeless children may experience limited access to educational institutions due to a lack of transportation or inability to meet institutional requirements such as vaccinations (McCoy-Roth et al., 2012).

The combined effect of these factors is a high risk of struggles in adulthood with attaining a decent quality of life and social mobility. This makes family homelessness a societal problem and homeless families a major focus of government and community aid. For example, DC Mayor Muriel Bowser is promoting Homeward DC, a 2015 to 2020 program that aims to provide homeless families with short-term housing units in every ward. In this plan, the primary family housing facility, DC General, would be replaced by family-friendly housing shelters in every ward (District of Columbia Interagency Council on Homelessness, 2015). Other methods to help families focus on cost-effective and rapid re-housing coupled with access to social service resources (NAEH, 2012; McCoy-Roth et al., 2012). Together, these solutions aim to help families regain stability and recover from homelessness.

In addition, the growth of shared equity homeownership, funded by non-profits, private entities, and government agencies, has helped residents stay in communities with rising housing costs (Davis, 2006). In shared equity homeownership, also called resale-restricted housing, a cap is placed on the resale cost of the home to ensure affordability for future residents and community stability (Davis, 2006). In one model of shared equity homeownership, community land trusts, the resident owns the home but leases the land from a separate entity (Zonta, 2016). For the residents who elect to stay in DC, the shared equity homeownership market, such as Beecher Cooperative in Glover Park, is a viable option (Davis, 2006). If municipalities could ensure the availability of a wide range of both short-term and long-term affordable housing options, this could help low-income residents of changing cities including DC.

Accessibility and the Built Environment

Access to transportation is an important social determinant of health that is greatly affected by urban renewal (Healthy People 2020, 2016). Redevelopment alters the social and spatial distribution of accessibility benefits throughout a city, which influences how urban land is used and by whom (Rérat & Lees, 2011). When neighborhoods experience an influx of new residents, usually of a higher income bracket, new transit infrastructure may be created or existing infrastructure revitalized. The existing members of the community may face difficulties with housing affordability and may become displaced. Those who are displaced also lose out on mobility benefits of the new transportation infrastructure (Revington, 2015). Access to transportation can also affect other social determinants of health including access to health care services,

availability of community-based resources in support of community living, opportunities for recreation, and public safety, especially in terms of walkability (Healthy People 2020, 2016).

Lack of access to reliable transportation can negatively affect access to health care, as it may lead to rescheduled or missed appointments, delayed care, and missed or delayed medication use. Lack of access to transportation particularly affects those with chronic diseases (Syed et al., 2013). To receive evidence-based care, patients need to visit their clinician regularly, have access to their prescriptions, and have enough flexibility if any changes come up in their treatment plans. Without reliable transportation, however, delays in clinical interventions may result. These delays may exacerbate the patient's chronic disease and result in negative health outcomes (Syed et al., 2013).

Missed clinic appointments are closely linked to transportation barriers. In a study of 200 children with a history of missed appointments, 51 percent of parents identified transportation barriers as the primary reason for missing clinic appointments. In another study, 50 percent of caregivers of urban children in Texas who had a 26 percent no-show rate at their health care appointment cited transportation problems (Yang et al., 2006). Major factors associated with missed appointments included not owning a vehicle and not having access to a vehicle (Syed et al., 2013).

Pharmacy and medication access is another important factor to examine. A study found that following hospital discharge, patients reporting difficulty visiting the pharmacy had lower prescription fill rates than those not reporting difficulty, 20 versus 55 percent, respectively (Kripalani et al., 2008). Another study found that 45 percent of its respondents who could not drive said they would miss fewer doses of their medications if transportation was not a problem (Welty et al., 2010). In another study, patients who were not able to afford medications also cited transportation as a significant barrier (Syed et al., 2013).

Examining transportation barriers in relation to different demographic groups is essential. Nationwide, about 3.6 million people do not receive medical care due to transportation issues (Syed et al., 2013). These individuals were more likely to be older, poorer, less educated, female, and from an ethnic minority group. Individuals carrying the highest burden of disease also faced the greatest transportation barriers (Syed et al., 2013). A study conducted by the U.S. Department of Transportation (DOT) that researched the ethnic differences in burden of travel for health care found that African Americans had greater burdens of travel compared to whites even after controlling for mode of travel and socioeconomic status (Probst et al., 2007). The barriers that affected these populations the most were distance to treatment center, access to a vehicle, and finding someone to drive them to appointments. Overall, health care access and transportation barriers were worse for racial and ethnic minorities than for whites (Syed et al., 2013).

Certain populations such as children, the elderly, and veterans face unique circumstances with transportation barriers to health care access. For children living in urban areas, 18 to 21 percent of respondents of a study cited transportation barriers as the reason for not bringing a child in for needed health care (Syed et al., 2013). Elderly populations face a unique combination of access barriers due to disability, illness, and likely a greater need for frequent visits to their clinician. Among the elderly reporting any barrier to health care access, 3 to 21 percent reported having transportation barriers (Fitzpatrick et al., 2004). Veterans also face barriers to health care access despite being a group that often has access to the federal health care system and may receive federally supported transportation assistance (Syed et al., 2013).

Access to transportation also greatly affects community living and opportunities for recreation and public safety, specifically in terms of walkability (Kischinsky & Talen, 2015). One key issue that city residents face is that even though their neighborhoods may be walkable in terms of block size and land use diversity, these same neighborhoods may not be the ones that offer high-paying job opportunities, have low crime rates, or have good schools. Often the same indicators of walkability that are desired in higher income neighborhoods do not have the same value in neighborhoods where crime is prevalent. The positive effects of a built environment may be negated by social disadvantages that plague those living in that particular area (Kischinsky & Talen, 2015).

Figure 5: Rail Access Among Workers Living in Washington, DC, Who Recently Moved: 2011-2013

Previous residence location of recent movers	Rail accessibility	Number of workers	Percent of workers	Margin of error
All workers who recently moved	No Rail Access	28,925	40.4	2.1
	Rail Access	42,677	59.6	2.1
Previously lived outside of Washington, DC Metro Area	No Rail Access	8,988	36.9	3.2
	Rail Access	15,352	63.1	3.2
Previously lived within Washington, DC Metro Area, but outside of Washington, DC	No Rail Access	4,890	44.1	4.6
	Rail Access	6,203	55.9	4.6
Lived within Washington, DC	No Rail Access	15,047	41.6	3.0
	Rail Access	21,122	58.4	3.0

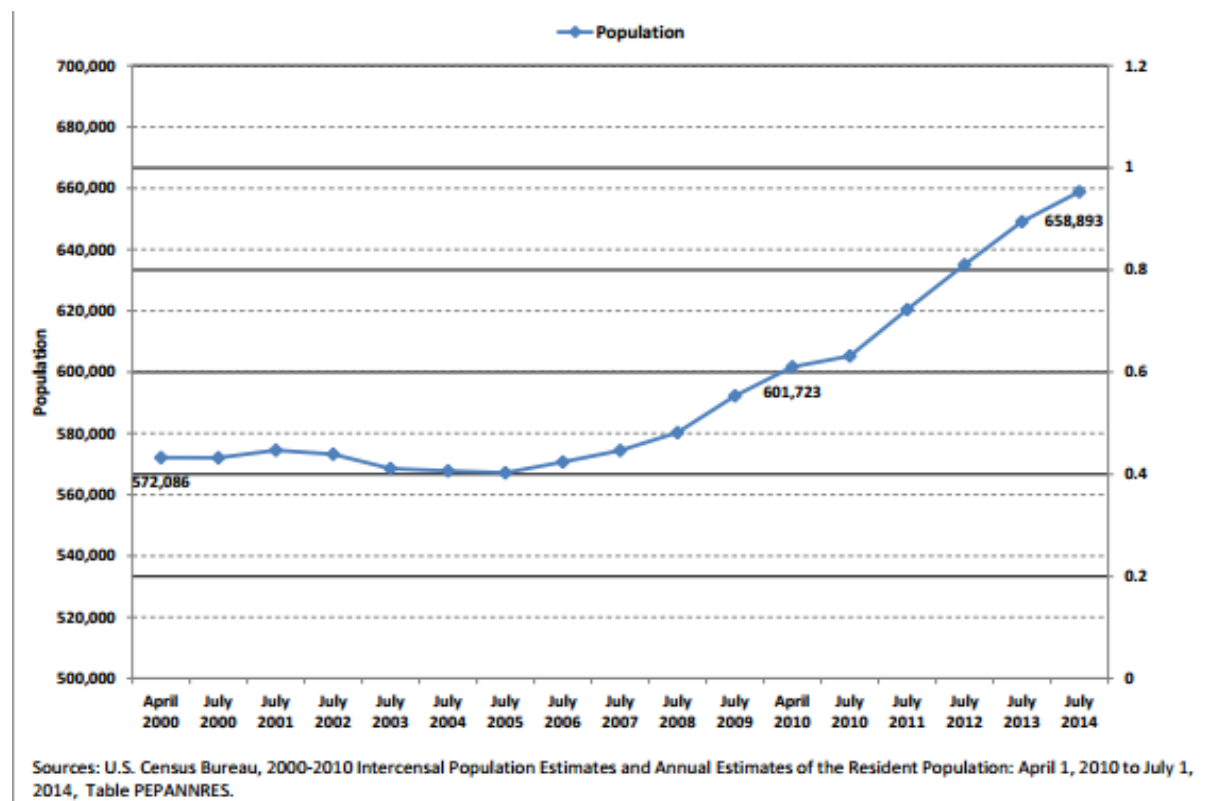
Source: U.S. Census Bureau, American Community Survey 2011-2013.

Universe: Workers 16 years and over who lived in Washington, DC and moved to a different residence during reference year.

Another issue for those living in walkable neighborhoods is that they are seeing an influx of new residents move in. This influx generally causes housing pressures to increase and finding affordable housing in walkable neighborhoods to become more difficult. Many walkable mixed-use developments and neighborhoods are typically diverse in terms of housing types, incomes, and socioeconomic demographics, but often demand drives up the housing values and affordability declines (Kischinsky & Talen, 2015).

Transit-oriented development (TOD) is theoretically designed to improve the determinants mentioned above. Considering that low-income households frequently do not have access to a vehicle, greater access to transit stations should give them more opportunities to find jobs and participate in urban activities (Dawkins & Moeckel, 2016).

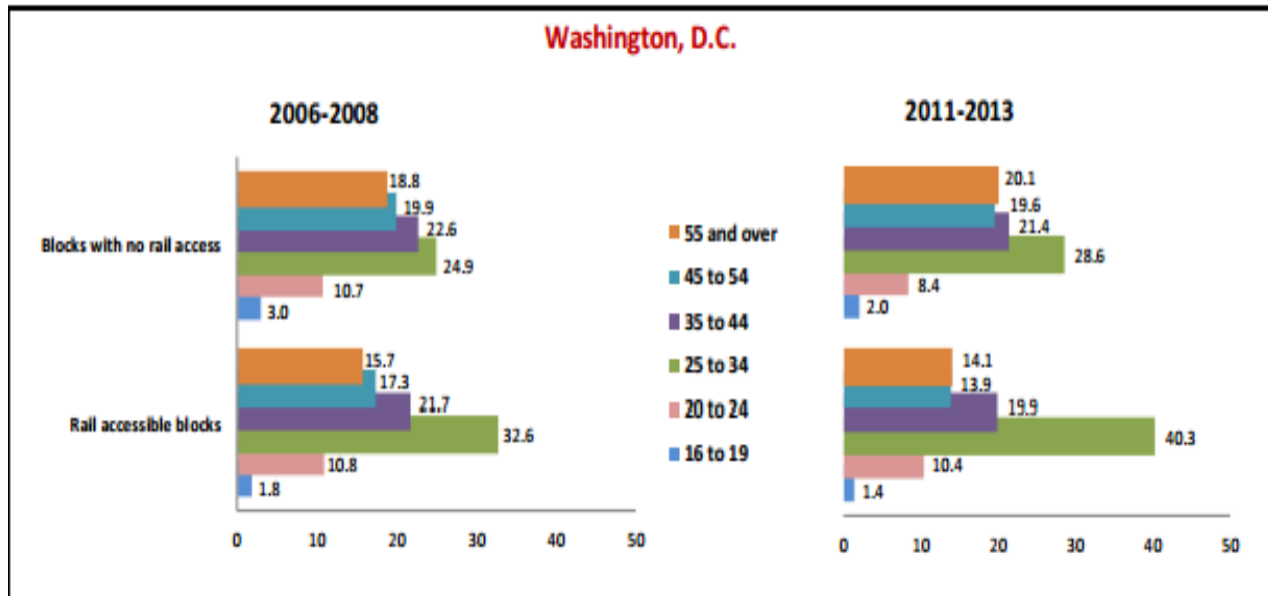
Figure 6: Population of Washington, DC: April 200 to July 2014



The Sustainable Communities Partnership involving HUD, the Environmental Protection Agency (EPA), and the DOT aimed to use TOD-based land-use strategies to advance more sustainable and equitable development patterns (DOT & HUD, 2008). The investments made by these agencies could potentially result in the displacement of the low-income populations who should have benefited most from increased transit access (Diaz et al., 2013). Changing demographics in households and businesses can increase land and housing prices as they compete for transit proximity. Due to this, many low-income households dependent on reliable access to public transit face displacement in

transit-accessible areas (Dawkins & Moeckel, 2016). TOD can negatively affect health outcomes for these low-income households, especially since lack of transportation is cited as a critical barrier to health care access (Metzler, 2007).

Figure 7: Age of Workers: Rail-Accessible Neighborhoods vs. Other Neighborhoods

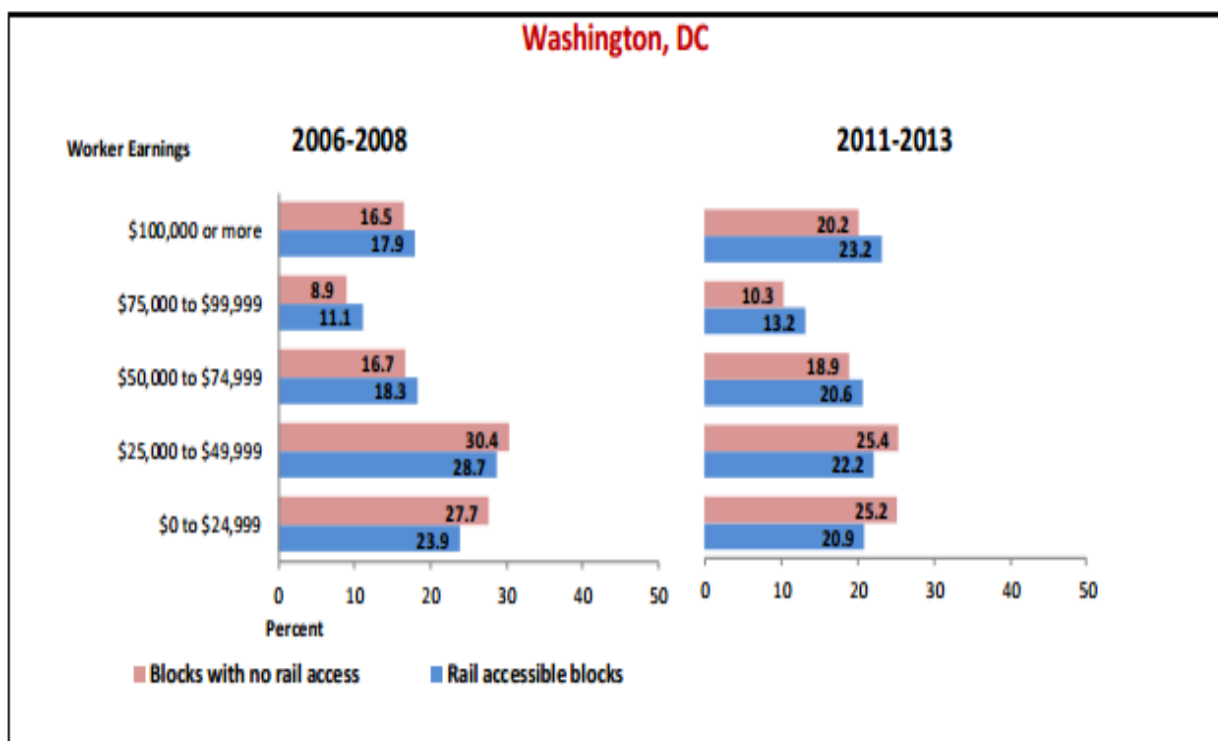


As Washington, DC sees its population increase and its demographics change, gentrification caused by TOD is likely to worsen. From 2006 to 2014, the city saw an increase in its population by about 90,000 people (McKenzie, 2015). There was also a significant increase of residents who were 25 and older with a Bachelor's degree or higher, 39.1 to 55.1 percent between 2000 and 2013 (McKenzie, 2015). As more residents attained higher levels of education, the median annual household income increased from \$40,000 in 2000 to about \$68,000 in 2013. More young people also started to move to DC, contributing to the decline in the median age from 34.6 years in 2000 to 33.8 years in 2013. The African American population declined dramatically between the years 2000 and 2013 from 60 to 48.8 percent (McKenzie, 2015). The white population increased from 30.8 to 40.9 percent. All of these demographics have caused rail-accessible neighborhoods to have higher rates of recent movers (McKenzie, 2015).

DC has also seen a significant increase in its population of younger workers as people seek to live near a rail stop. About 40 percent of DC workers living in a rail-accessible neighborhood are between the ages of 25 and 34 (McKenzie, 2015). From 2006 to 2008 and 2011 to 2013, the proportion of workers in this age group increased at similar rates for DC and the surrounding counties at about 8 percent. The number of older workers aged 45 to 54 in DC neighborhoods without rail access was about 10 percent higher than their rail-accessible counterparts from 2011 to 2013 (McKenzie, 2015).

The past decade's changes in DC's racial and ethnic makeup are also reflected in the racial and ethnic composition of neighborhoods in Metrorail-accessible areas. From 2006 to 2008 and 2011 to 2013, the proportion of African American workers living in the DC area declined from 32.9 percent to 24.1 percent within Metrorail-accessible blocks (McKenzie, 2015). All other racial or ethnic groups either saw an increase or did not experience a statistically significant change. During the same time periods, white workers in Metrorail-accessible neighborhoods in DC increased by about 6 percent from 50.3 to 56 percent. This trend is consistent with findings from a recent study showing white population growth in large cities between 2010 and 2014 after decades of white population loss (McKenzie, 2015).

Figure 8: Worker Earnings: Workers Living in Rail-Accessible Blocks vs. Workers Living in Other Neighborhoods



The DC region has seen a large influx of highly educated workers, with a 10 percent increase in highly educated workers living near Metrorail stops from 2006 to 2008 and 2011 to 2013—from 63.9 to 74.2 percent (McKenzie, 2015). Similarly, the city experienced an approximately 5 percent increase in workers who earn at least \$100,000 per year living within Metrorail-accessible neighborhoods from 17.9 to 23.2 percent. The percentage of DC workers earning between \$25,000 and \$49,999 who lived near a Metrorail stop declined from about 29 percent to 22 percent from 2006 to 2008 and 2011 to 2013 (McKenzie, 2015).

The Washington, DC metro area has seen substantial population growth and economic development between 2006 to 2008 and 2011 to 2013 (McKenzie, 2015). This growth

has highlighted many important issues such as housing affordability, displacement of low-income populations, and the strain on transportation systems. Factors such as demographic shifts, distribution of wealth, and the built environment have changed the outlook on urban and suburban divide in the DC area (McKenzie, 2015).

Walkability and chronic disease. Urban planning contributes not only to access to health care such as clinics, providers, medications, and other services such as needle exchanges, it can also affect other determinants of health such as neighborhood walkability, which can in turn have dramatic effects on chronic disease rates.

A study performed in Portland, Oregon analyzed the effect of the built environment on blood pressure in middle-aged and older adults. The results showed a statistically significant decrease in both systolic and diastolic blood pressures for individuals living in highly walkable neighborhoods ($P < 0.001$). In addition, neighborhoods that were associated with both a low level of walkability and an increased availability of fast food restaurants had residents who were significantly associated with increased blood pressure over time (Li et al., 2009). Another study performed in Chicago in 2007 echoed similar results but instead of measuring level of walkability, the social indicator was neighborhood affluence; there was a significantly negative association between hypertension and neighborhood affluence (Morenoff et al., 2007). Further studies using national data from the Black Women's Health Study (BWHS) confirmed that for African American women, housing value was inversely related with hypertension. The study commented that neighborhood social and environmental stressors, including level of crime and level of unemployment, most likely contributed to the public health consequences for African American women living in areas with low housing value (Cozier et al., 2007).

As neighborhoods evolve and increasingly affluent populations migrate to neighborhoods of lower socioeconomic status, will these neighborhoods have increased walkability and decreased levels of crime, or will displaced populations face worsening conditions? The Moving to Opportunity study observed the long-term effects and analyzed the health impact of moving low-income families to wealthier neighborhoods. An extreme reduction in obesity and diabetes of approximately 40 to 50 percent was observed and hypothesized to have been caused by an increase in physical health due to improved neighborhood safety and improved mental health, including less psychological distress (Ludwig et al., 2013). The findings of this study suggest that increased urban revitalization and improved neighborhood safety will benefit the physical status of low-income individuals who maintain their residence. However, the conclusion from this article may be controversial because the article does not always apply to populations displaced due to increasing housing markets, which is viewed as a negative consequence of urban transformation (Ludwig et al., 2013).

Although this section does not include a discussion of mobility for individuals with physical and intellectual disabilities, it should be noted that those with disabilities represent vulnerable populations. Additionally, it should be noted that research on the efficacy of interventions that improve the social connections of individuals with physical

and intellectual disabilities has been promising despite limited initial investment in such programs.

Health and Education

Education plays an important role in a society's ability to improve health and well-being. According to a study released by the National Poverty Center, "the better educated are more likely to exercise and to obtain preventive care such as flu shots, vaccines, mammograms, pap smears, and colonoscopies" (Cutler & Lleras-Muney, 2006). When people have a high level of education, meaning a high school diploma and beyond, they are more likely to be able to provide for themselves and their families than those who do not. Additionally, according to the programs listed by the DC Department of Education and the DC Department of Health (DOH), public schools in Washington, DC recognize their role in promoting health education and supplying health care resources to their students and have since implemented several programs and opportunities to improve district-wide health care and status.

In Washington, DC, public education is provided by the District of Columbia Public Schools (DCPS) and by the District of Columbia Public Charter School Board (DCPCSB).

Figure 9: Demographics of Washington, DC, Public Schools

Demographics

Category	SY 11-12	SY 12-13	SY 13-14	SY 14-15	SY 15-16
% Student Population Black	71%	69%	68%	67%	64%
% Student Population Hispanic	15%	16%	16%	17%	18%
% Student Population Other Ethnicity	4%	4%	4%	4%	4%
% Student Population White	10%	11%	12%	12%	13%
% Student Population in Special Education *	18%	17%	15%	16%	15%
% Student ELL	10%	10%	10%	10%	11%
% Student Population with Free/Red. Lunch	70%	77% **	76%	76%	TBD

*This number includes non-public students.

**Change in students eligible for Free/Red. Lunch is a result of the Community Eligibility Option. All students at eligible schools receive lunch meals at no charge.

Source: DCPS, 2016.

DCPS-organized actions for promoting health. All public schools in DC follow the guidelines of the District of Columbia School Health Nursing Program. According to the DOH, the School Health Nursing Program provides nurses who perform services that include assessment and triage; emergency care; health assessments; care for

medically fragile and special health care need students; counseling; and vision, hearing, and BMI screening (DOH, 2016b). In addition to school nurses, DC has enacted the DC Healthy Schools Act (HSA), which provides universal access to free breakfast (approximately 8 percent of students use this service), and brings local produce to public school lunches and encourages gardening on campus (DC Hunger Solutions, 2010a). DOH has implemented an Asthma Action Plan in public schools. The plan includes providing trained and certified educators to deliver and administer anaphylaxis medication.³

Truancy and early dropout effects on health. The influence of education on health and health behavior is well established (IOM, 2015). High school completion is widely recognized as the minimum entry requirement for higher education and well-paid employment. School dropout may result from “substance use; pregnancy; and psychological, emotional, and behavioral problems” (Freudenberg & Ruglis, 2007). Additionally, according to Bell and colleagues, “adults who were frequently truant as teenagers are much more likely than those who were not to have poorer health and mental health, lower paying jobs, an increased chance of living in poverty, more reliance on welfare support, children who exhibit problem behaviors, and an increased likelihood of incarceration” (Bell et al., 1994).

Studies show that those who have obtained a Bachelor’s degree are in overall better physical and mental health than those who have dropped out of high school (NCHS, 2009). Data from CDC’s National Health Interview Survey comparing those with less than a high school diploma to those with a Bachelor’s degree show that adults without a high school diploma report being bed-bound with illness or injury more often than their college graduate peers (NCHS, 2009). They are also more likely to report feelings of sadness, hopelessness, and worthlessness (NCHS, 2009).

Food and Nutrition

Food deserts. A food desert is generally defined as a geographic area in which there is limited access to nutritious, affordable foods such as fruits and vegetables. Food deserts frequently result from a lack of grocery stores, farmers’ markets, or healthy food providers in a particular area. The scarcity of healthy and affordable food items often forces low-income individuals who live in those areas to rely on available foods that are usually highly processed and packaged items found in fast food chain restaurants, quickie marts, gas stations, and convenience stores. These items are typically high in both sugar and fat and are known contributors to the diabetes and obesity epidemics in the United States. Food deserts are thought to contribute to chronic disease by negatively influencing dietary choices (Gallaher, 2011). In addition to being a public health challenge, food deserts are also considered to be an issue of environmental justice, which focuses on “equitable distribution of environmental burdens” (Hilmers et al., 2012).

³ Student Access to Treatment Act of 2007 (DC Law 17-107), Pub. L. No. 17-134 (2007).

The definition of food deserts established by the U.S. Department of Agriculture (USDA) is “parts of the country vapid of fresh fruit, vegetables, and other healthful whole foods, usually found in impoverished areas” (Gallaher, 2011). While this definition is useful for identifying potential food deserts, it provides an incomplete picture of all of the contributing factors that influence an individual’s access to nutritious and affordable foods. Characteristics of the built environment may also play a role, such as access to transportation. Walkability and neighborhood safety are other determinants of access to nutritious and affordable food. Individual factors, including age, access to childcare, and personal mobility, may also play a role in access to healthy and affordable food.

Food deserts in DC. A 2010 report by DC Hunger Solutions and Social Compact found that the 43 full-service grocery stores across DC are unevenly distributed across the area (DC Hunger Solutions, 2010b). Furthermore, the report suggests that Wards 4, 5, 6, 7, and 8 are underserved compared to other wards, with individuals living in these wards needing to travel a great distance for affordable food. Although Wards 3, 7, and 8 have similar population size, Ward 3 has 11 full-service grocery stores while Wards 7 and 8 contain only 4 and 3 grocery stores, respectively. Wards 7 and 8 are located in the Southeast quadrant of DC, which experiences high rates of crime and poverty and added barriers to food access. The report found that lack of access to full-service grocery stores correlates with a higher number of individuals who are overweight or obese. The percentage of those who are overweight or obese in Wards 7 and 8 is 72.9 and 71.8 percent, respectively, while it is only 42.2 percent in Ward 3, which contains many affluent, high income neighborhoods (DC Hunger Solutions, 2010b).

Figure 10: Map of Food Deserts in the DC Area

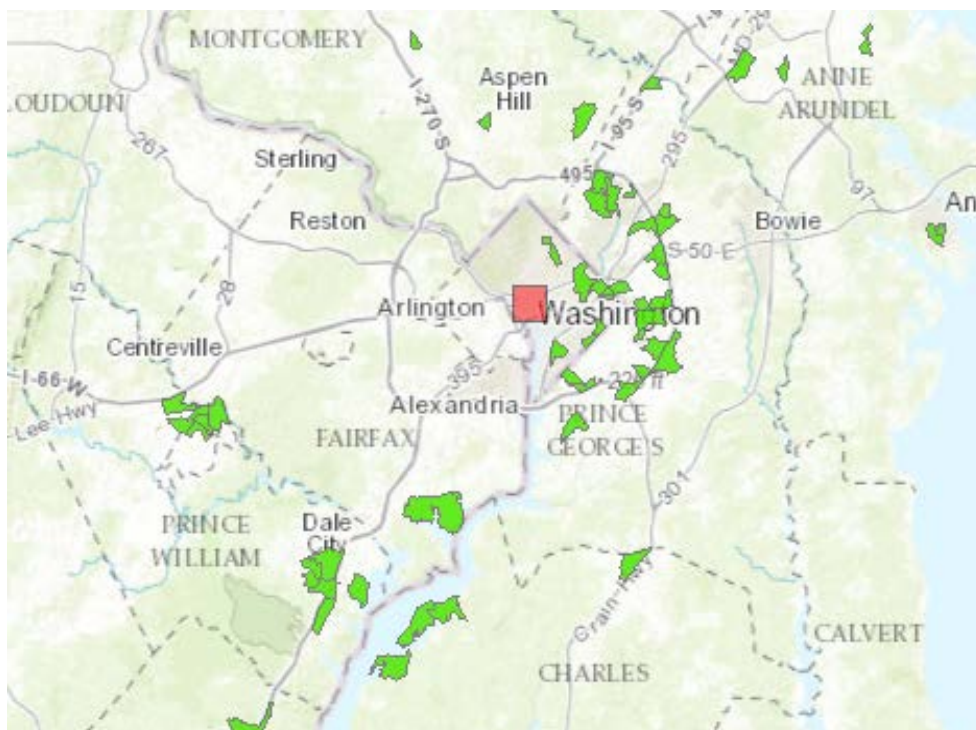


Figure 10 illustrates the prevalence of food deserts (represented in green) in the DC area as identified by USDA. The map echoes some of the findings outlined above and illustrates that many of the food deserts are clustered in the Southeast quadrant, which contains both Wards 7 and 8, and spill into neighboring Prince George's County in Maryland. Despite having some of the most affluent African American communities in the nation, Prince George's County contains pockets of deep poverty and several food deserts (Wilkins & Mimica, 2013). The public health consequences of food deserts were at the forefront of the DC metropolitan local news recently as Seat Pleasant, located in Prince George's County, lost its only major grocery store (Wilkins, 2016). In Prince George's County, many grocery stores were forced out of the area because they were not as profitable as they would like to be. Unfortunately, there are many vulnerable populations living in the area, including elderly and low-income earners, who were reliant on these grocery stores. Thus, economic factors are important contributors to the development of food deserts.

Food deserts and their effect on health outcomes. Food deserts have been widely hypothesized to contribute to adverse health outcomes by negatively affecting diet, with one study finding that living a greater distance from a grocery store correlated with a higher rate of obesity as well as lower rates of fruit and vegetable consumption (USDA, 2009). Obesity and type 2 diabetes are of public health and economic concern. With 30 percent of adults suffering from obesity, it is unsurprising that obesity-related comorbidities, such as heart disease, are some of the leading causes of death in the United States. Similarly, type 2 diabetes increases the risk for adverse health outcomes including kidney failure, stroke, blindness, and lower-limb amputation. The CDC reported that 1.7 million cases of type 2 diabetes were diagnosed in the United States in 2012 and that one in three people were pre-diabetic and would develop diabetes in their lifetime (CDC, 2014).

Much of the research supporting the link between food deserts and poor health outcomes is indirect. Furthermore, the idea that food deserts contribute to negative health outcomes remains controversial. For example, some studies suggest that "distance to a grocery store" might not be the most important factor that contributes to health outcomes. Factors that may be more important in influencing health outcomes include household and neighborhood resources, education, and taste preferences (Ver Ploeg & Rahkovsky, 2016). Thus, eliminating food deserts may not fully address the real issue of epidemic levels of obesity and type 2 diabetes or be the most impactful intervention strategy for combating these diseases. However, there is also a question of equity in access to healthy, affordable food options.

Initiatives to increase access to food in DC. In recent years, DC has put forth several initiatives to increase access to food in low-income neighborhoods. One example is the DC Healthy Corner store program, which equips small corner stores with the means to sell fresh produce (Ver Ploeg & Rahkovsky, 2016). Through the program, a small corner store may be provided with a refrigerator for the specific purpose of selling discounted fruits and vegetables. In fiscal year 2015, Healthy Corners sold 184,878 units of fresh produce and snacks (DC Central Kitchen, 2016). Another initiative is the DC Free

Summer Meals Program. During the school year, DCPS provides free lunches to qualifying students at certain schools. Through the Free Summer Meals Program initiative, free lunches are made available to school-age children in DC at a variety of community locations to help alleviate the financial burden associated with school closure during the summer that is imposed on families who rely on the school lunch program (DC Hunger Solutions, 2010a).

In addition to local initiatives, several national efforts seek to eradicate food deserts. As part of Michelle Obama's "Let's Move!" initiative to end childhood obesity, the USDA Food Desert Locator was constructed to identify vulnerable geographic areas. The Food Desert Locator takes into account the location of grocery stores as well as median household income. Another part of the "Let's Move!" initiative is the Healthy Food Financing Initiative (HFFI).⁴ The purpose of HFFI is to increase accessibility to nutritious foods by equipping local retailers with the necessary resources to sell fresh produce (American Nutrition Association, 2010).

The impact of urban renewal on access to healthy food. Arguments in favor of urban renewal purport that it leads to revitalization of neighborhoods that is mutually beneficial to both high- and low-income individuals. However, researchers have found that urban renewal can limit access to food for low-income residents, as they essentially become "priced out" of grocery stores in their local area (Breyer & Voss-Andreae, 2013). Newly transformed areas, where high rates of poverty continue to exist despite an influx of new businesses, are sometimes termed "food mirages." A food mirage is a geographic area in which a grocery store may be present, but the prices of food in that particular area are too high for low-income residents to afford (Breyer & Voss-Andreae, 2013). Thus, it may appear that there is access to healthy foods in a particular neighborhood, when in fact there is not. In theory, food mirages essentially function as food deserts, but are more difficult to detect. Thus, the current metric to determine if an area is a "food desert," which is based on the median income of a geographic region and number of grocery stores, may be insufficient in identifying at-risk areas. The presence of food mirages could also be a confounding factor in understanding the direct impact of food deserts on health outcomes. A more complete analysis of the impact of accessibility of healthy foods and the built environment might include the impact of grocery store prices, acceptance of federal nutrition benefits, and transportation to healthful food options.

Health Care and Social Services in Changing Neighborhoods

For areas that are undergoing change, evaluation of the number and location of health care providers in revitalized communities provides evidence that the influx of higher income residents has dramatically changed the health care landscape and is visible in rapidly evolving DC neighborhoods such as Adams Morgan.

⁴ For more information, see <http://www.acf.hhs.gov/ocs/programs/community-economic-development/healthy-food-financing>.

The influx of wealthier residents, along with rising property values and costs, may attract health care providers who cater to those of a higher socioeconomic background, thereby displacing health centers that serve a more vulnerable clientele and potentially reducing access to affordable care. An article by Sage Growth Partners provides a visual map of the health care clinics available in Adams Morgan. While three federally qualified health centers (FQHCs) have traditionally operated in the area, MedStar Health, a private primary and urgent care center, opened within a 0.7 mile radius of the three other pre-existing FQHCs and reported \$4.62 billion in net operating revenue in 2014 (DeMarco and D'Orazio, 2015).

Figure 11: The Private Community Health Center: Private Centers Are Opening Their Doors Close to Existing FQHCs



A *Washington Post* article similarly outlined the rise of mainstream private providers such as MedStar in Adams Morgan due to changes facilitated by the ACA enacted in 2010. These large scale providers set up similar services offered by community health centers in order to attract more of the newly insured individuals in Adams Morgan, potentially leaving the original FQHCs with fewer patients and less monetary income (Sun, 2014).

From these two articles, it is clear that in the neighborhood of Adams Morgan the influx of higher income residents has increased the presence of private providers, altering the health care landscape. With the potential closure of FQHCs, individuals who are still uninsured will experience reduced access to affordable care. While the outcome of the changing landscape is not yet measurable in DC, an article about the Mission District in San Francisco, which is undergoing a similar landscape change, explains that “rents escalated so rapidly in the past few years that non-profit health clinics, Latino cultural

arts organizations, and the ubiquitous auto repair shops have been forced to close” (Rose, 2016). More specifically to DC, a study performed by the DC Bar Pro Bono Center found that several non-profits are being driven out because the housing market has increased and their clients have relocated to other communities due to the increasing housing market (DC Bar, 2016).

Although the landscape of health care services may be changing in communities such as Adams Morgan due to changes in zoning and real estate costs, the lower socioeconomic population that is leaving the area is also potentially losing their access to health care. An article about the changing community in Chicago in 2011 speculates that “health care access may become more restricted if relocated residents are unable to find nearby providers who accept them or their children as patients. More affordable sources of care, such as [FQHCs], are likely to have a reduced presence in their new neighborhoods” (Keene & Geronimus, 2011).

In order to better understand the effects of the ACA, it is important to understand the context of the DC area prior to the ACA’s implementation in 2010. According to the Urban Institute, a majority of DC residents in 2005 were considered “medically vulnerable,” with many neighborhood areas deprived of necessary primary care providers. These areas were named Health Professional Shortage Areas (HPSA) and typically housed more racial and ethnic minorities as well as residents with lower incomes and who were more impoverished. It was found that Latino residents of DC were three times less likely to be insured than non-Latino individuals, partially due to language barriers identified in finding, receiving, and following up with medical care (NeighborhoodInfo DC, 2005).

The influence of the ACA on health care for low-income populations. According to the U.S. Department of Health and Human Services (HHS), 16.4 million uninsured individuals have enrolled in health insurance since the expansion of the ACA. Populations who have made the “greatest coverage gains” include racial and ethnic minorities, young adults, and those with low incomes (Blumenthal et al., 2014). In a study that looked at the effects of ACA expansion of Medicaid in 28 states and Washington, DC compared to 22 non-expansion states, there was a 7.9 percent decrease in the number of uninsured individuals, a 2.4 percent decrease in the number of individuals unable to afford health care, and a 3.5 percent decrease in the number of individuals who lacked access to health care. Furthermore, a study conducted after the first two open enrollment periods found that un-insurance rates of low-income adults dropped 5.2 percent, the number lacking a personal physician dropped 1.8 percent, and difficulty accessing medicine dropped 2.2 percent (Sommers et al., 2014). Specifically in DC, HHS has shown that individuals with Medicare saved \$9,765,032 in prescription drug spending. In addition, approximately 49,624 people in DC have used one or more free preventive services in 2014 alone (HHS, 2015).

Although there has been a vast increase in the number of insured individuals in DC as a result of the ACA and Medicaid expansion, the question remains, will this expansion

lead to increased access and beneficial clinical outcomes for the most vulnerable populations?

Several studies in different states demonstrate that the changes have the potential to enable health improvements. In Oregon, a study conducted two years after Oregon's Medicaid expansion in 2008 compared 10,405 individuals randomly selected in a lottery to receive Medicaid coverage to 10,340 randomly selected individuals who did not obtain coverage. Although individuals had a significant increase in their probability of being diagnosed with diabetes and had an increased rate of using diabetes medication, no significant effects were seen in the level of glycated hemoglobin, a measure used to determine poor control of glucose levels. However, individuals with Medicaid were found to have a significant decrease in positive screening for depression, an increase in health prevention and service use, and a strong decrease in medical expenses (Baicker et al., 2013). This short-term study provides uncertain data as to the physical health benefits of Medicaid in a two-year span but highlights mental health and preventive benefits found in Oregon that could relate to changes in ACA implementation in DC. An article published by the Kaiser Commission on Medicaid and the Uninsured reviewed studies of ACA-related changes between January 2014 and March 2016. The authors similarly concluded that while coverage and affordability improved for low-income populations and that there could be a link with increased diagnoses of chronic diseases, further research is needed to validate whether the ACA and Medicaid expansion have had a significant effect on health outcomes (Antonisse et al., 2016).

Another important factor of health care access affected by the ACA is health care workforce capacity. As many as 33 states have reported a need for a larger future physician workforce that will more likely affect to a greater degree the underserved and over 65 adult populations (AAMC, 2012). Interestingly a study analyzing the gaps between needed primary care physicians and available capacity listed DC as one of seven states with the smallest concern for physician shortages as a result of the ACA. However, no evaluation of where primary care availability is located within each state was conducted, and thus the study provides no information about the adequacy of primary care workforce in low-income wards (Ku et al., 2011).

Conclusion

Your goal as a team is to develop and propose to the Quality Communities Foundation an interdisciplinary, innovative, equitable, justifiable, and financially sound plan likely to be endorsed by the DC government and relevant stakeholders (i.e., garnering letters of support). The information in this case study was designed to help you understand issues related to your proposal to the Quality of Communities Foundation. Your solution should aim to mitigate the negative effects of urban change on levels of chronic disease among the DC area's (and especially the District's) most vulnerable and at-risk populations. Vulnerable populations can include but are not limited to the low-income, displaced, homeless, and/or segregated populations.

Appendix A: Acronyms List

ACA- Affordable Care Act
BMI- Body Mass Index
CDC- Centers for Disease Control and Prevention
CHD- Cardiovascular and Chronic Lung Diseases
CI- Confidence Interval
CVD- Cardiovascular Disease(s)
DCPS- District of Columbia Public Schools
DCPCSB- District of Columbia Public Charter School Board
DOH- District of Columbia Department of Health
DOT- U.S. Department of Transportation
EPA- U.S. Environmental Protection Agency
HFFI- Healthy Food Financing Initiative
HHS- U.S. Department of Health and Human Services
HSA- Healthy Schools Act
HUD- U.S. Department of Housing and Urban Development
TOD- Transit-Oriented Development
WHO- World Health Organization

Appendix B: Resource List, stratified by national, regional, and DC-specific

National

- Centers for Disease Control and Prevention
- Environmental Protection Agency—Brownfields Cleanup and Redevelopment
- National Institute of Environment Health Sciences (NIEHS)—Health Disparities and Environmental Justice
- National Institute of Chronic Disease Directors
- National Institute of Mental Health
- National Institute of Minority Health and Health Disparities
- U.S. Department of Housing and Urban Development (HUD)—Economic Development
- U.S. Environmental Protection Agency

DC Maryland and Virginia (DMV)

- Community Preservation and Development
- Community of Hope
- DC Health Matters
- Developing Families Center
- District of Columbia Primary Care Association
- District of Columbia Department of Health
- District of Columbia Department of Housing and Community Development
- District of Columbia Department of Human Services
- Fairfax County Department of Health
- Healthy Babies
- Health Works for Northern Virginia
- House of Ruth
- La Clinica Del Pueblo
- Mary's Center
- Metro Health
- Perry Family Health Center
- SOME (So Others Might Eat)
- Spanish Catholic Center
- Temporary Cash for Needy Families (TANF)
- The Fairfax County Community Health Care Network (CHCN)
- The Mid Atlantic Association of Community Health Centers
- Unity Health Care
- Virginia Community Healthcare Association
- Whitman-Walker Health

Appendix C: References

- Adler, B. 2013. *Pushing poor people to the suburbs is bad for the environment*. <http://grist.org/cities/pushing-poor-people-to-the-suburbs-is-bad-for-the-environment/>.
- American Nutrition Association. *USDA defines food deserts*. <http://americannutritionassociation.org/newsletter/usda-defines-food-deserts>.
- APA (American Psychological Association). *Effects of poverty, hunger and homelessness on children and youth*. <http://www.apa.org/pi/families/poverty.aspx>.
- Andrews, D., and A. Leigh. 2009. More inequality, less social mobility. *Applied Economics Letters* 16(15):1489-1492.
- Antonisse, L., R. Garfield, R. Rudowitz, and S. Artiga. 2016. *The effects of Medicaid expansion under the ACA: Findings from a literature review*. The Henry J. Kaiser Family Foundation. <http://kff.org/medicaid/issue-brief/the-effects-of-medicaid-expansion-under-the-aca-findings-from-a-literature-review/>.
- AAMC (Association of American Medical Colleges). 2012. *Recent studies and reports on physician shortages in the US*. Center for Workforce Studies. <https://www.aamc.org/download/100598/data/>.
- Atkinson, R., and G. Bridge. 2005. *Gentrification in a global context: The new urban colonialism*. London; New York: Routledge.
- Baicker, K., S. L. Taubman, H. L. Allen, M. Bernstein, J. H. Gruber, J. P. Newhouse, E. C. Schneider, B. J. Wright, A. M. Zaslavsky, and A. N. Finkelstein. 2013. The Oregon experiment — Effects of Medicaid on clinical outcomes. *New England Journal of Medicine* 368(18):1713-1722.
- Bell, A., L. A. Rosen, and D. Dynlacht. 1994. Truancy intervention. *Journal of Research and Development in Education* 27(3):203-211.
- Bhat, S., and J. Reed. 2014. *Unlocking opportunities: Services that help poor children succeed in the classroom*. DC Fiscal Policy Institute. <http://www.dcfpi.org/wp-content/uploads/2014/05/Part-I-Poverty-and-Childrens-Learning-Final.pdf>.
- Black, S. A. 2002. Diabetes, diversity, and disparity: What do we do with the evidence?. *American Journal of Public Health* 92(4):543-548.
- Blessett, B. 2015. African Americans and gentrification in Washington, DC: Race, class and social justice in the nation's capital. *Ethnic and Racial Studies* 38(13):2402-2404.
- Blumenthal, D., and S. R. Collins. 2014. Health care coverage under the Affordable Care Act—a progress report. *The New England Journal of Medicine* 371(3):275–281.
- Breyer, B., and A. Voss-Andreae. 2013. Food mirages: Geographic and economic barriers to healthful food access in Portland, Oregon. *Health & Place* 24:131-139.
- CDC (Centers for Disease Control and Prevention). 2009. *Health effects of gentrification*. <https://www.cdc.gov/healthypplaces/healthtopics/gentrification.htm>.
- CDC. 2013. *Asthma facts: CDC's National Asthma Control Program grantees*. http://www.cdc.gov/asthma/pdfs/asthma_facts_program_grantees.pdf.
- CDC. 2014. *2014 national diabetes statistics report*. <http://www.cdc.gov/diabetes/data/statistics/2014statisticsreport.html>.
- Child Trends Data Bank. 2015. *Homeless children and youth: Indicators on children and youth*. <http://www.childtrends.org/indicators/homeless-children-and-youth/>.
- Cozier, Y. C., J. R. Palmer, N. J. Horton, L. Fredman, L. A. Wise, and L. Rosenberg. 2007. Relation between neighborhood median housing value and hypertension risk among black women in the United States. *American Journal of Public Health* 97(4):718-724.
- Cutler, D., and A. Lleras-Muney. 2006. *Education and health: Evaluating theories and evidence*. National Bureau of Economic Research. <http://www.nber.org/papers/w12352>.
- Dawkins, C., and R. Moeckel, R. 2016. Transit-induced gentrification: Who will stay, and who will go? *Housing Policy Debate* 26(4-5):801-818.
- Davis, J. E. 2006. *Shared equity homeownership: The changing landscape of resale-restricted, owner-occupied housing*. National Housing Institute. <http://www.nhi.org/pdf/SharedEquityHome.pdf>.
- DC Bar. 2016. *Pro bono center*. <https://www.dcbbar.org/pro-bono/>.
- DC Central Kitchen. 2016. <https://dccentralkitchen.org/healthy-corners/>.
- DC Hunger Solutions. 2010a. *DC Healthy Schools Act*. Washington, DC: DC Farm to School Network.
- DC Hunger Solutions. 2010b. *When healthy food is out of reach: An analysis of the grocery gap in the District of Columbia*. <http://www.dchunger.org/pdf/grocerygap.pdf> (accessed September 28, 2016).
- DC Hunger Solutions. http://www.dchunger.org/fedfoodprogs/summer/summer_index.htm.
- DCPS (District of Columbia Public Schools). *About DCPS*. <http://dcps.dc.gov/page/about-dcps>.
- DCPS. 2016. *DCPS at a glance: Enrollment*. <http://dcps.dc.gov/page/dcps-glance-enrollment>.

- DeLilly, C. R., and J. H. Flaskerud. 2012. Discrimination and health outcomes. *Issues in Mental Health Nursing* 33(11):801–804.
- DeMarco, C., and D. D'Orazio. 2015. *No safe harbor: Why the dynamic healthcare market threatens to leave some FQHCs lost at sea*. Sage Growth Partners. <http://sage-growth.com/wp-content/uploads/2015/11/FQHC-White-Paper-Lost-at-Sea-Final.pdf> (accessed August 25, 2016).
- Diaz, R., J. Behr, M. Ng, A. Jeng, and B. Giles. 2013. The effects of transit corridor developments on the healthcare access of medically fragile vulnerable populations: *International Journal of Privacy and Health Information Management* 1(2):57-75.
- District of Columbia Interagency Council on Homelessness. 2015. *Homeward DC, 2015-2020*. District of Columbia Interagency Council on Homelessness Strategic Plan 2015-2020. http://ich.dc.gov/sites/default/files/dc/sites/ich/page_content/attachments/ICH-StratPlan2.7-Web.pdf.
- DOH (District of Columbia Department of Health). 2010. *Working towards a healthy DC: The District of Columbia's overweight and obesity action plan*. <http://doh.dc.gov/sites/default/files/dc/sites/doh/OBESITY%20ACTION%20PLAN.pdf>
- DOH. 2011. *Diabetes in the District of Columbia*. <http://doh.dc.gov/sites/default/files/dc/sites/doh/Diabetes%20in%20the%20District%20of%20Columbia%20Fact%20Sheet%2011052012.pdf>.
- DOH. 2013. *District of Columbia community health needs assessment, Volume 1*. [http://doh.dc.gov/sites/default/files/dc/sites/doh/page_content/attachments/DC%20DOH%20CHNA%20\(Final\)%2004%2030%202014%20-%20Vol%201.pdf](http://doh.dc.gov/sites/default/files/dc/sites/doh/page_content/attachments/DC%20DOH%20CHNA%20(Final)%2004%2030%202014%20-%20Vol%201.pdf)
- DOH. 2014a. *Annual report 2014*. <http://doh.dc.gov/page/annual-report-2014>
- DOH. 2014b. *Chronic disease prevention state plan for the District of Columbia 2014-2019*. [http://doh.dc.gov/sites/default/files/dc/sites/doh/Chronic%20Disease%20State%20Plan%20v%2008%2026%2014%20\(Final\).pdf](http://doh.dc.gov/sites/default/files/dc/sites/doh/Chronic%20Disease%20State%20Plan%20v%2008%2026%2014%20(Final).pdf)
- DOH. 2014c. *Obesity in the District of Columbia, 2014: Striving to reduce and prevent overweight and obesity among D.C. residents*. <http://doh.dc.gov/sites/default/files/dc/sites/doh/publication/attachments/Obesity%20Report%202014.pdf>
- DOH. 2016a. *Diabetes Prevention and Control Program*. <http://doh.dc.gov/service/diabetes-prevention-and-control-program>.
- DOH. 2016b. *Frequently asked questions about the District of Columbia School Health Nursing Program*. Community Health Administration. <http://www.dccpsb.org/sites/default/files/data/files/faqs%20for%20school%20nursing%20program%2008%202013.pdf>
- DOH. 2016c. *Health Schools Act (HSA)*. <http://osse.dc.gov/service/healthy-schools-act-0>.
- DOH. 2016d. *Heart disease and stroke prevention and care*. <http://doh.dc.gov/service/heart-disease-and-stroke-prevention-and-care>
- DOT and HUD. 2008. *Better coordination of transportation and housing programs to promote affordable housing near transit: A report to Congress from the U.S. Department of Transportation Federal Transit Administration and the U.S. Department of Housing and Urban Development*. https://www.huduser.gov/Publications/pdf/better_coordination.pdf.
- Fitzpatrick, A. L., N. R. Powe, L. S. Cooper, D. G. Ives, and J. A. Robbins. 2004. Barriers to health care access among the elderly and who perceives them. *American Journal of Public Health* 94(10):1788-1794.
- Freudenberg, N., and J. Ruglis. 2007. Reframing school dropout as a public health issue. *Preventing Chronic Disease* 4(4).
- Fullilove, M. T., and R. Wallace. 2011. Serial forced displacement in American cities, 1916–2010. *Journal of Urban Health* 88(3):381-389.
- Gallaher, M. 2011. USDA defines food deserts. *Nutrition Digest* 38.
- Gonzalez, G. 2013. Racial and ethnic minorities face more subtle housing discrimination. U.S. Department of Housing and Urban Development. http://portal.hud.gov/hudportal/HUD?src=/press/press_releases_media_advisories/2013/HUDNo.13-091.
- Goodman, R. A., S. F. Posner, E. S. Huang, A. K. Parekh, and H. K. Koh. 2013. Defining and measuring chronic conditions: Imperatives for research, policy, program, and practice. *Preventing Chronic Disease* 10.
- Grant, R., D. Gracy, G. Goldsmith, A. Shapiro, and I. E. Redlener. Twenty-five years of child and family homelessness: Where are we now? *American Journal of Public Health* 103(S2):e1–e10.
- Greer, J. 2012. *Race and mortgage redlining in the United States*. <https://wpsa.research.pdx.edu/meet/2012/greer.pdf>.
- Hamnett, C. 2003. Gentrification and the middle-class remaking of inner London, 1961-2001. *Urban Studies* 40(12):2401-2426.

- Harper, S., R. F. MacLehose, and J. S. Kaufman. 2014. Trends in the black-white life expectancy gap among US states, 1990-2009. *Health Affairs* 33(8):1375–1382.
- Healthy People 2020. 2016. *Social determinants of health*. <https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health>.
- HHS (Department of Health and Human Services). 2015. *5 years later: How the Affordable Care Act is working for District of Columbia*. <http://www.hhs.gov/healthcare/facts-and-features/state-by-state/how-aca-is-working-for-the-district-of-columbia/index.html>.
- Hilmers, A., D. C. Hilmers, and J. Dave. 2012. Neighborhood disparities in access to healthy foods and their effects on environmental justice. *American Journal of Public Health* 102(9):1644–1654.
- Howard University Hospital. 2016. *The obesity epidemic in Washington, D.C.* Center for Wellness and Weight Loss Surgery. <http://www.hubariatrics.com/files/obesityindcfactsheet.pdf>.
- Huang, E. S., and K. Finegold. 2013. Seven million Americans live in areas where demand for primary care may exceed supply by more than 10 percent. *Health Affairs* 32(3):614–621.
- HUD (Department of Housing and Urban Development). *Affordable housing*. http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/affordablehousing/.
- Huynh, M., and A. R. Maroko. 2014. Gentrification and preterm birth in New York City, 2008–2010. *Journal of Urban Health* 91(1):211–220.
- IOM (Institute of Medicine). 2011. *A nationwide framework for surveillance of cardiovascular and chronic lung diseases*. Washington, DC: The National Academies Press.
- Jones, C. 2000. Levels of racism: A theoretic framework and a gardener's tale. *American Journal of Public Health* 90:1212–1215.
- Keene, D. E., and A. T. Geronimus. 2011. “Weathering” HOPE VI: The importance of evaluating the population health impact of public housing demolition and displacement. *Journal of Urban Health* 88(3):417–435.
- Kennedy, M., and P. Leonard. 2001. *Gentrification: Practice and politics*. The LISC Center for Home Ownership and the LISC Knowledge Sharing Initiative. http://programs.lisc.org/files/901_file_asset_upload_file304_540.pdf.
- Kim, S., and E. Cardemil. 2012. Effective psychotherapy with low-income clients: The importance of attending to social class. *Journal of Contemporary Psychotherapy* 42(1):27–35.
- Kischinsky, J., and E. Talen, E. 2015. Affordable housing and walkable neighborhoods: A national urban analysis. *Cityscape* 17(2).
- Kripalani, S., L. E. Henderson, T. A. Jacobson, and V. Vaccarino. 2008. Medication use among inner-city patients after hospital discharge: Patient-reported barriers and solutions. *Mayo Clinic Proceedings* 83(5):529–535.
- Ku, L., K. Jones, P. Shin, B. Bruen, and K. Hayes. 2011. The states' next challenge—Securing primary care for expanded Medicaid populations. *The New England Journal of Medicine* 364(6):493–495.
- Levi, J., L. Segal, J. Rayburn, and A. Martin. 2015. *The state of obesity: Better politics for a healthier America 2015*. Trust for America's Health. <http://healthyamericans.org/report/115/>.
- Li, F., P. Harmer, B. J. Cardinal, and N. Vongjaturapat. 2009. Built environment and changes in blood pressure in middle aged and older adults. *Preventive Medicine* 48(3):237–241.
- Ludwig, J., G. J. Duncan, L. A. Gennetian, L. F. Katz, R. C. Kessler, J. R. Kling, and L. Sanbonmatsu. 2013. *Long-term neighborhood effects on low-income families: Evidence from Moving to Opportunity*. National Bureau of Economic Research. <http://www.nber.org/papers/w18772.pdf>.
- McCoy-Roth, M., B. B. Mackintosh, and D. Murphy, D. 2012. When the bough breaks: The effects of homelessness on young children. *Child Trends: Early Childhood Highlights* (3)1:1–11. <http://www.childtrends.org/publications/when-the-bough-breaks-the-effects-of-homelessness-on-young-children/>.
- McKenzie, B. 2015. *Transit access and population change: The demographic profiles of rail-accessible neighborhoods in the Washington, DC area*. U.S. Census Bureau. <https://www.census.gov/content/dam/Census/library/working-papers/2015/demo/SEHSD-WP2015-23.pdf>.
- McKinnish, T., R. Walsh, and K. White. 2010. Who gentrifies low-income neighborhoods?. *Journal of Urban Economics* 67(2):180–19.
- Metropolitan Washington Council of Governments. 2015. *Clean air milestone: Data indicates D.C. region now meets Clean Air Act standard*. <https://www.mwcog.org/about-us/newsroom/2015/09/29/clean-air-milestone-data-indicates-d-c-region-now-meets-clean-air-act-standard-air-quality-air-quality-data-air-quality-conformity-emissions-greenhouse-gas-ozone/>.
- Metzler, M. 2007. Social determinants of health: what, how, why, and now. *Preventing Chronic Disease* 4(4):A85.

- Morenoff, J. D., J. S. House, B. B. Hansen, D. R. Williams, G. A. Kaplan, and H. E. Hunte. 2007. Understanding social disparities in hypertension prevalence, awareness, treatment, and control: The role of neighborhood context. *Social Science & Medicine* 65(9):1853-1866.
- Murphy, F. G., T. M. Bond, R. C. Warren, and S. D. Maclin Jr. 2008. Twenty-first century globalization: Impact of gentrification on community health. *American Journal of Health Studies* 23(2):66-73.
- NAEH (National Alliance to End Homelessness). 2012. Ending family homelessness: National trends and local system responses. NAEH and Corporation for Supportive Housing. <http://www.endhomelessness.org/library/entry/ending-family-homelessness-national-trends-and-local-system-responses>.
- NAEH. 2015. *The state of homelessness in America, 2015*. National Alliance to End Homelessness and Homelessness Research Institute. <http://www.endhomelessness.org/library/entry/the-state-of-homelessness-in-america-2015>.
- NASEM (National Academies of Sciences, Engineering, and Medicine). 2016. *Framing the dialogue on race and ethnicity to advance health equity: Proceedings of a workshop*. Washington, DC: The National Academies Press.
- National Health Care for the Homeless Council. 2016. *What is the official definition of homelessness?*. <https://www.nhchc.org/faq/official-definition-homelessness/>.
- NeighborhoodInfo DC. 2005. *Health status and health care access*. The Urban Institute and Washington DC Local Initiatives Support Corporation (LISC). <http://www.neighborhoodinfodc.org/pdfs/TargetBrief4-Health.pdf>.
- NeighborhoodInfo DC. 2012. *DC 2012 ward profile – Population*. http://www.neighborhoodinfodc.org/wards/Nbr_prof_wrd7.html.
- NeighborhoodInfo DC. *Neighborhood profiles: Neighborhood clusters*. <http://www.neighborhoodinfodc.org/nclusters/nclusters.html>.
- Nourse, E. S. 1975. The regional workshops on primary care. *Journal of Medical Education* 50(12 pt 2), 201-209.
- Probst, J. C., S. B. Laditka, J. Y. Wang, and A. O. Johnson. 2007. Effects of residence and race on burden of travel for care: Cross sectional analysis of the 2001 US National Household Travel Survey. *BMC Health Services Research* 7(1).
- Rabinowitz, K. 2015. *DC gentrification by the numbers*. DataLensDC. <http://www.datalensdc.com/gentrification-by-numbers.html>.
- Rérat, P., and L. Lees. 2011. Spatial capital, gentrification and mobility: Evidence from Swiss core cities. *Transactions of the Institute of British Geographers* 36(1):126-142.
- Revington, N. 2015. Gentrification, transit, and land use: Moving beyond neoclassical theory. *Geography Compass* 9(3):152-163.
- Rimmerman, C. M. 2013. *Coronary artery disease*. Cleveland Clinic Center for Continuing Education. <http://www.clevelandclinicmeded.com/medicalpubs/diseasemanagement/cardiology/coronary-artery-disease/>.
- Rivers, W. 2015. *Going, going, gone: DC's vanishing affordable housing*. DC Fiscal Policy Institute. <http://www.dcfpi.org/going-going-gone-dcs-vanishing-affordable-housing>.
- RWJF (Robert Wood Johnson Foundation). 2016. *A short distance to large disparities in health*. RWJF Commission to Build a Healthier America. <http://www.commissiononhealth.org/PDF/769f7dcc-46a7-4953-b149-44931d0995e8/CommissionMetroMap.pdf>.
- Rose, K. *Combating gentrification through equitable development*. Reimagine. <http://www.reimagineerpe.org/node/919> (accessed September 27, 2016).
- Schanzer, B., B. Dominguez, P. E. Shrout, and C. L. M. Caton. 2007. Homelessness, health status, and health care use. *American Journal of Public Health* 97(3):464-469.
- Slater, T. 2011. Gentrification of the city. In *The new Blackwell companion to the city*. Wiley-Blackwell. Pp. 571-585.
- Sommers, B. D., T. Musco, K. Finegold, M. Z. Gunja, A. Burke, and A. M. McDowell. 2014. Health reform and changes in health insurance coverage in 2014. *New England Journal of Medicine* 371(9):867-874.
- Story, C. R., H. C. Crethar, and T. Hall. 2014. Privilege, oppression and the Affordable Care Act: Cultural implications for health educators. *American Journal of Health Studies* 29(4):302-308.
- Sturtevant, L. 2013. The new District of Columbia: What population growth and demographic change mean for the city. *Journal of Urban Affairs* 36(2):276-299.
- NCHS (National Center for Health Statistics). 2009. Summary health statistics for U.S. adults: National Health Interview Survey, 2009. *Vital and Health Statistics* 10(249). https://www.cdc.gov/nchs/data/series/sr_10/sr10_249.pdf.

- Sun, L. H. 2014. MedStar faces tensions with community clinics over primary-care expansion in District. *The Washington Post*, April 7. https://www.washingtonpost.com/national/health-science/medstar-faces-tensions-with-community-clinics-over-primary-care-expansion-in-district/2014/04/07/c0db204e-a0b5-11e3-a050-dc3322a94fa7_story.html.
- Syed, S. T., B. S. Gerber, and L. K. Sharp. 2013. Traveling towards disease: Transportation barriers to health care access. *Journal of Community Health* 38(5):976-993.
- Tatian, P., J. Leopold, E. Oo, G. Joseph, G. MacDonald, A. Nichols, M. Woluchem, S. Zhang, and K. Abazajian. 2015. *Affordable housing needs assessment for the District of Columbia*. The Urban Institute. <http://www.urban.org/sites/default/files/alfresco/publication-pdfs/2000214-Affordable-Housing-Needs-Assessment-for-the-District-of-Columbia.pdf>.
- U.S. Census Bureau. 2011a. *Economic profile 2005-2009 ACS ward 7*.
- U.S. Census Bureau. 2011b. *Economic profile 2005-2009 ACS ward 8*.
- USDA (Department of Agriculture). 2009. *Access to affordable and nutritious food: Measuring and understanding food deserts and their consequences*. USDA Economic Research Service. http://www.ers.usda.gov/media/242675/ap036_1_.pdf.
- Ver Ploeg, M., and I. Rahkovsky. 2016. *Recent evidence on the effects of food store access on food choice and diet quality*. USDA Economic Research Service. <http://www.ers.usda.gov/amber-waves/2016-may/recent-evidence-on-the-effects-of-food-store-access-on-food-choice-and-diet-quality.aspx#.V5KDv-mAZUR>.
- Welty, T. E., S. L. Willis, and E. A. Welty. 2010. Effect of limited transportation on medication adherence in patients with epilepsy. *Journal of the American Pharmacists Association* 50(6):698-703.
- Wilkins, T. 2016. Amid food desert, Seat Pleasant loses grocery store. *NBC Washington News* 4, July 1. <http://www.nbcwashington.com/news/local/Amid-Food-Desert-Seat-Pleasant-Loses-Grocery-Store-385265081.html>.
- Wilkins, T., and M. Mimica. 2013. USDA labels Prince George's County "food desert." *NBC Washington News* 4, July 24. <http://www.nbcwashington.com/news/local/USDA-Labels-Prince-Georges-County-Food-Desert-216843251.html>.
- Wolch, J. R., J. Byrne, and J. P. Newell. 2014. Urban green space, public health, and environmental justice: The challenge of making cities 'just green enough.' *Landscape and Urban Planning* 125:234-244.
- WHO (World Health Organization). 2015. *Noncommunicable diseases*. <http://www.who.int/mediacentre/factsheets/fs355/en/>.
- Yang, S., R. L. Zarr, T. A. Kass-Hout, A. Kourosh, and N. R. Kelly. 2006. Transportation barriers to accessing health care for urban children. *Journal of Health Care for the Poor and Underserved* 17(4):928-943.
- Zonta, M. 2016. *Community land trusts: A promising tool for expanding and protecting affordable housing*. Center for American Progress. <https://www.americanprogress.org/issues/economy/report/2016/06/20/139515/community-land-trusts/>.

Appendix D: Judging Rubric

DC Regional Case Challenge 2016 - Judging Rubric

These criteria will be considered collectively through a facilitated judging discussion to determine the overall grand prize winner and category prizes. The criteria contributing to the three category prizes listed are indicated below.

Category Prizes: *Practicality Prize; ^Creativity/Innovation Prize; #Interprofessional Prize

	Poor	Acceptable	Very Good	Outstanding	Comments
Analysis of Problem/Challenge					
<ul style="list-style-type: none"> Astute synthesis of problem Identification of key issues 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Appropriateness/Justification of solution					
<ul style="list-style-type: none"> Justification of chosen priorities Justification of chosen intervention(s) Evidence to support likely effectiveness Resourcefulness in gathering information 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Acceptability/Uptake of solution *					
<ul style="list-style-type: none"> Acceptability to relevant stakeholders Cultural acceptability Social/behavioral considerations 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Implementation Considerations *					
<ul style="list-style-type: none"> Implementation plan Timeline and budget Feasibility (budget and other resources, time frame, cultural/political constraints, logistical/infrastructure constraints) Monitoring and evaluation plan 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Potential for Sustainability *					
<ul style="list-style-type: none"> Long-term maintenance and growth (feasibility, funding) 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Creativity/Innovation ^					
<ul style="list-style-type: none"> Creativity and innovation in solution implementation and resources Creativity and innovation in resources used for information-gathering 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Interdisciplinary/multi-sectoral #					
<ul style="list-style-type: none"> Use of collaborations/interactions among disciplines and/or sectors 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Teamwork #					
<ul style="list-style-type: none"> Engagement of whole team in preparation and/or presentation Clear team understanding and use of each other's roles and expertise 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Presentation Delivery					
<ul style="list-style-type: none"> Clarity of content and logic of flow Time management Audience engagement Visual aesthetic Professionalism, poise, and polish 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Questions & Answers					
<ul style="list-style-type: none"> Clarity and thoughtfulness of responses Ability to draw from evidence 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Appendix E: Team Biographies



Hannah Risheq, MPH (Case Writing Lead) is a Master's of Science in Social Work (MSSW) student focusing on Social Policy at Columbia University. She received her B.A. in Public Health from American University in 2013 and her M.P.H with a focus on Epidemiology from George Mason University in 2015. Hannah competed in the DC Case Challenge as a member of the George Mason University team in 2014. After competing, Hannah joined the Case Writing team for the 2015 DC case challenge. Hannah has worked on research relating to the expansion of Medicare and Medicaid and the implications of the Affordable Care Act on mental health access. She is an active member of the student body at Columbia University and co-leads the School of Social Work Policy Caucus. Hannah works on the behavioral health team at Health Management Associates in NYC.



Laura-Allison Woods (Case Editor/Advisor) is a Masters of Public Health Candidate at Brown University with an emphasis in Health Research, Policy, and Practice. Additionally, she is a graduate research assistant at the Center for Alcohol and Addiction Studies at Brown. Prior to studying at Brown, Laura received her Bachelors of Science degree in Community Health & Health Education at George Mason University. This is her 4th year with the Institute of Medicine's Case-Writing team; she participated in the Inaugural competition, wrote on the 2014 case-writing team, led the 2015 case-writing team, and was a consultant for this year's (2016) case-writing team. In the future, Laura is interested in Women's Health and Child Health, specifically in regards to mental well-being.



Jumoom Ahmed, currently a senior pursuing a Bachelor's in Health Administration and Policy major with a concentration in Health Informatics at George Mason University. She competed in the DC Case Challenge as a member of the George Mason University team in 2015. Jumoom was a research assistant in the HAP department working on the relationship between the CCC program participants who receive services through the "Elderly or Disabled with Consumer Direction" (EDCD) program. After graduation she will aim to achieve a Master's in Health Informatics.



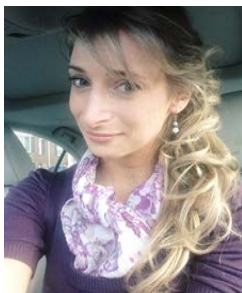
Kaltun Ali is a senior at George Mason University and is studying Health Administration and is concentrating in Assisted Living. She competed in the DC Case Challenge as a member of the George Mason University team in 2015. Kaltun currently works as a Kidney Science Translation Assistant at NIDDK.



Wyatt Bensken is currently a postbaccalaureate fellow at the National Institutes of Health, specifically in the National Institute of Neurological Disorders and Stroke (NINDS). Wyatt graduated from American University in 2016 with a Bachelor of Science in Public Health, and has prior research experience working with the National Coalition for the Homeless, as well as the National Park Service Office of Public Health. Wyatt's current research is in the field of neuroepidemiology, specifically epilepsy and EEG research. Wyatt is also heavily engaged in the development of the medical education program at NINDS.



Shannon Coombs is a graduate of Howard University with a Bachelor of Arts in History. She competed in the DC Case Challenge as a member of the Howard University team in 2015 while a senior at Howard University. After competing, Shannon joined the 2016 Case Challenge Writing team. Shannon has worked as a community advocate for LIFT-DC, a community development organization, and a hospice volunteer for Capital Caring. Shannon also completed a senior thesis relating to the history of the maternal pathology theory. Shannon is currently a 2016-2016 Fulbright South Korea English Teaching Assistant in Mokpo, South Korea.



Daniela Kofman is a Geriatric Nurse Practitioner currently practicing in New Jersey. Previously she was a nursing instructor at Johns Hopkins University. Daniela graduated from University of Maryland in 2012 where in her final semester she participated in the public health case challenge and her team won first place for creativity. She hopes to impart the same positive experience to this year's participants as she had herself.



Laura Kropp, MPH is currently a PhD candidate in Emerging Infectious Diseases at the Uniformed Services University of the Health Sciences. She graduated with a Bachelor's of Sciences in Biochemistry and Molecular Biology at the Pennsylvania State University, and a Master's degree in Public Health from the University of Pittsburgh, while working as a research assistant in immunology and genetics. Her current work focuses on parasitic worms and their ability to modulate the host immune system. Laura was a member of the USUHS team that competed at the 2015 DC Case Challenge, as well as the 2016 International Emory Global Health Case Competition.



Tarah Woodle is a medical student at the Uniformed Services University of the Health Sciences. She received her BA in Biochemistry and French from Vassar College in 2013. She competed in the Emory Case Challenge as a member of the second place USUHS team in 2016. Tarah previously worked as an ORISE fellow at the FDA researching infectious diseases and currently part of the student leadership for the Humanitarian Aid/ Disaster Relief group at USUHS.



Zeinab Safi is a senior at George Mason University obtaining her Bachelors of Science in Neuroscience. Zeinab has been actively involved in shedding light on global health development issues on her university's campus through campus organizations and research work. She has worked on the secretariat for George Mason University Model World Health Organization, the first global health conference hosted by students at her university. Zeinab attended the Clinton Global Initiative University conference in 2016 for a public health initiative is currently working on developing it further to target resource poor areas locally and globally.

Appendix F: Guide for Student Teams and Advisors

DC Regional Public Health Case Challenge 2016 Guide for Student Teams and Faculty Advisors

The National Academies of Sciences, Engineering, and Medicine (NASEM) will host the Fourth Annual DC Regional Public Health Case Challenge in October 2016 to promote interdisciplinary, problem-based learning for the betterment of our DC community. Teams will be asked to approach a realistic public health issue facing the DC community and to develop a multi-faceted plan to address it. A panel of expert judges will watch student presentations and pick a winning solution.

Organizers

NASEM Health and Medicine Division staff

Point of Contact: Sophie Yang (syang@nas.edu)

Amy Geller (ageller@nas.edu)

Alina Baciú (abaciú@nas.edu)

Colin Fink (cfink@nas.edu)

Case Writing Team

Hannah Risheq (George Mason, alumni, case lead)

Jumoom Ahmed (George Mason)

Kaltun Ali (George Mason)

Wyatt Bensken (American, Alumni)

Shannon Coombs (Howard)

Laura Kropp (Uniformed Services)

Daniela Minkin (Maryland, Alumni)

Zeinab Safi (George Mason)

Tarah Woodle (Uniformed Services University)

Laura-Allison Woods (George Mason, Alumni, case editor/advisor)

Theme

This year's case will focus on the changing American city and implications for health and well-being of vulnerable populations in DC.

Overview

- **Universities form a team** of 3-6 graduate and/or undergraduate students representing **at least three disciplines, schools, or majors**. The case will require a comprehensive solution and it is advisable that teams be comprised of students representing a variety of subjects (health, public health, law, business, communications, engineering, IT, gender studies, anthropology, economics, sociology, etc.). Teams are encouraged to have both undergraduate and graduate students.

- **Student teams** are provided with a case that is based on a real-life challenge faced by individuals and organizations in the DC area. Teams are given two weeks to **develop comprehensive recommendations to present to a panel of expert judges**. The presented recommendations will be judged on criteria such as content, creativity, feasibility, interdisciplinary nature, and strength of evidence base. The case will include more detailed information on the judging criteria.
- Information from the **2013-2015 DC Case Challenge events is available at** <http://nam.edu/initiatives/dc-public-health-case-challenge/>

Prizes/Incentives for Student Teams

- Experience working with multiple disciplines to tackle a multi-faceted public health challenge
- Practice for [Emory University's International Global Health Case Competition](#)
- Publication of winning solution through the National Academy of Medicine and the Health and Medicine Division of the Academies
- Publication (by NASEM) summarizing each team's solution written by team members (team members listed as authors). For example, see the [2014 publication](#).
- Lunch and either dinner/reception will be provided.
- FREE entrance to the National Academy of Medicine(NAM) annual meeting on **October 17th** for ALL interested team members and advisors with the opportunity for one team (selected by Case Challenge staff) to present at a the "Future Leaders" luncheon highlighting the work of the 2016 event and other programs on Monday, **October 17th**.
 - Attending the NAM annual meeting is an exciting opportunity to meet and connect with leaders in the fields of health, medicine, and beyond. See <http://nam.edu/event/2016-nam-annual-meeting/> for more information
 - ***A minimum of 3 team members must be available on October 17 from 12:00 – 1:45 as one team will be chosen on October 16 to present at the luncheon on October 17***
 - *Advanced registration for the NAM meeting is required for those interested in attending.*
- **Prize money**
 - Grand Prize: \$2,500
 - 3 "Best in Category" Prizes: \$1,500

Timeline

- **Friday, September 9:** Deadline for universities to confirm participation (please email Sophie Yang at syang@nas.edu).
- **Friday, September 23:** Deadline to submit two lists of names (***use form on the last page of this Guide***):
 - Team member names with area of study and email addresses for final team registration.
 - The names of all team members and advisors attending the NAM annual meeting on October 17.

- **IMPORTANT NOTE:** One team will be chosen at the Case Challenge event on October 16 to present at the “Future Leaders” luncheon at the NAM meeting on October 17. ***At least 3 team members must be available to present from 12:00 – 1:45 in the event your team is chosen;***
- ***Advanced registration is required to attend the NAM annual meeting so all interested in attending must let us know on the status form.***
- **Thursday, September 29:** Organizers will release case to teams by 5:00pm. The case will be provided to the faculty advisor and the student team point of contact, who will be responsible for disseminating it to the other team members.
- **September 29-October 16:** Teams will develop their solution to the case.
- **Sunday, October 16:** Teams will present solutions to a panel of judges. Presentations will be followed by an awards ceremony. The event will take place from 11:30am-7:00pm. Lunch and a heavy reception will be provided.
- **Monday, October 17:** NAM annual meeting where teams will have the opportunity to attend the meeting and participate in a luncheon with NAM members and others (including the opportunity for one team to present their case solution at the luncheon).

Getting to the National Academy of Sciences Building

The National Academy of Sciences (NAS) building is located at **2101 Constitution Avenue NW**, and is accessible by car or metro.

Driving to NAS: LIMITED visitor parking is available within the NAS building’s main parking lot. To park for free, tell the garage attendant that you are participating in this case competition and provide your name and license plate number. Street parking is also available at normal DC rates, as is a ramp at the corner of 23rd Street NW and I Street NW.

Taking the Metro: The closest metro station is Foggy Bottom, located along the blue and orange lines. Upon exiting the metro, head west on I Street NW toward 23rd Street NW. Turn left onto 23rd Street NW and walk for about half of a mile. Turn left onto Constitution Avenue NW, and the NAS Building will be on your left.

Upon entering the building, you will need to present a photo ID to the guard at the front desk. Participants may then proceed to the Auditorium to check in and receive further instructions.

Appendix G: Student Team Guidelines and Rules

Case Challenge Guidelines and Rules

Suggested Team Preparation:

Teams are encouraged to meet several times before they receive the case in order to get to know each other, look at examples from previous case competitions (several are provided in the resources section below), and loosely plan an approach. It may be helpful for team members to agree on communication strategies and time commitments for the two weeks during which they will be developing the case response.

Developing the Case Solution:

- Organizers will deliver the case electronically to competing teams by 5:00pm on Thursday, September 29. The case will be provided to the faculty advisor and team members.
- Designated members of the case writing team will be available to respond via email to questions and requests for clarification during the two weeks while teams prepare their solutions (contact details will be provided with the case). To ensure that all teams have access to all information about the case, all teams will receive a copy of the question and the response within 24 hours of receipt. Questions will NOT be accepted after 9:00am on Friday, October 14.
- Teams should not discuss their case presentations or case content with other teams during the case challenge period (September 29 – October 16) until the judges have completed final scoring.
- The student team can access and use any available resources for information and input, including both written resources (publications, internet, course notes/text, etc) and individuals within and outside of the team's university.
- This is a student competition and should reflect the students' ideas and work. The case solution must be generated by the registered team members. Faculty advisors and other individuals who are used as resources should not generate ideas for case solutions, but are permitted to provide relevant information, guide students to relevant resources, provide feedback on ideas and proposals for case solutions and recommendations generated by the students, and provide feedback on draft/practice presentations.
- Participants may not speak individually with the judges until judging has concluded on Sunday, October 16. Please help the organizers by adhering to this rule during breaks.

Faculty Advisors:

Each team must have at least one faculty advisor. This faculty advisor will serve as a point of contact with the Case Challenge Organizers. The faculty advisor will also ensure that the team is made up of only undergraduate and graduate students of their university and that the team has representatives of at least 3 disciplines. Faculty advisors can also help student teams prepare for the case challenge competition within the following parameters:

- Faculty advisors **CAN**:
 - Assist teams with practice sessions or practice review of sample cases in the weeks preceding the release of the case

- Suggest resources relevant to the case
- Provide feedback on ideas for case solutions and recommendations generated by the students
- Provide feedback on draft/practice presentations
- Communicate with the Case Challenge Organizers about case guidelines and logistics
- Faculty advisors **CANNOT**:
 - Generate ideas for case solutions and recommendations
 - Communicate about the case with faculty advisors and students from other competing teams

Presentations:

- Presentation Time: Each team will have a total of 25 minutes. (Note: there will be 5 minutes of transition time between presentations)
 - 15 minutes are allotted to present analysis and recommendations
 - 10 minutes are allotted for Q&A with judges
 - Timing will be strictly enforced
 - Any leftover time will be utilized at the discretion of the judging panel
 - Teams may not view other teams' presentations until they have delivered their own presentation
 - Handheld wireless microphones and a podium with a microphone will be available.
 - Team members will advance their own slides with a wireless clicker
- Format:
 - Analysis and recommendations should be presented in Microsoft PowerPoint.
 - Presentations will be loaded onto the computer and projection screen for you by a Case Challenge Organizer. Teams will have an opportunity to check the compatibility of their file in advance of the presentation.
 - Judges will receive a printout of each team's slides.
 - Teams are encouraged to build appendix slides to help answer questions that they anticipate from the judges.
 - Judges will not know the university affiliation of teams until after judging is completed. The names of team members can be included in the presentation, but **DO NOT** include the university name or any identifying information in your presentation (e.g. school mascot).
- Presenters:
 - As many team members can participate in the presentation as the team sees fit. All team members should stand at the front of the room during the Q&A session at the end of the presentation.
- Dress code:
 - Competing teams are encouraged to present their case in business attire. The teams will not be identified by university to the judges, so students should not wear or carry any identifying logos, insignias, etc.
- Deadline to turn in completed case:

- To ensure that each team has an equal amount of preparation time, each team's final presentation should be loaded onto the presentation computer **by 12:00PM on Sunday, October 16**. Failure to submit the presentation on time will result in disqualification from the competition. No changes can be made to presentations after that time and teams should not continue to work on their case solution and presentation while they are awaiting their presentation time.

Judging:

- The judges have agreed to participate in this event as volunteers. The judges will be announced when the case is released, and biographical sketches of the judges will be available to student teams in advance of the case challenge event.
- In evaluating the proposed case solutions, judges will consider the following:
 - Rationale/Justification for strategies proposed
 - Specificity and feasibility
 - Interdisciplinary nature of the solution
 - Creativity and innovation
 - Clarity and organization
 - Presentation delivery
 - Team work
 - Ability to respond to questions
- Detailed judging criteria will be provided with the case when it is released on September 29.

Resources

The following links provide information and examples from public health case competitions at other universities. Note that most of these cases focus on an international issue; the DC Case Challenge will address a local public health issue. These are just examples—please use your own knowledge, creativity, and community resources to come up with a unique and compelling presentation!

Presentation on Emory's competition at the Consortium of Universities for Global Health conference: <http://www.cugh.org/sites/default/files/2010-annual/presentations/Monday/Kane-220-mon/Ali.pdf>

Emory University's 2015 case:

http://globalhealth.emory.edu/what/student_programs/case_competitions/2015_international_cc.html

University of Toronto's presentation from Emory's 2013 competition:

<http://www.slideshare.net/TheresaLee5/university-of-toronto-emory-global-health-case-competition>

Vanderbilt's 2015 winning presentation: <http://www.vanderbilt.edu/vigh-sac/case/2015ghcc.pdf>

Triangle global health case competition: <http://triangleghcc2013.wordpress.com/>

Yale Case competition presentations: <http://www.slideshare.net/yaleglobalhealthcc>

Appendix H: Presentation Day Agenda

Agenda: DC Public Health Case Challenge 2016

October 16, 2016

National Academy of Sciences, 2101 Constitution Avenue, NW, Washington, DC
Auditorium & West Court

11:15am-12:00pm	Arrival and Registration <i>(Lunch will be provided, Tent)</i>																		
12:00pm	Deadline to turn in presentation <i>Please take your flash drive to the Case Challenge organizer in the business center. This is when you will draw a card for presentation order.</i> Judges Check-in																		
12:15pm	Logistics <i>Alina Baci, Senior Program Officer, NASEM</i>																		
12:20pm	Welcoming Remarks <i>Dr. Victor J. Dzau, President, National Academy of Medicine</i>																		
12:30-5:00pm	Presentations <i>At this time, all but the first team should leave the room. After you have presented, you may be seated in the audience to watch the remaining presentations. At some point during the day, an organizer will gather each team to take a photo at the Einstein statue in front of the NAS building.</i> <table><tr><td>12:30-1:00</td><td>Team 1</td></tr><tr><td>1:00-1:30</td><td>Team 2</td></tr><tr><td>1:30-2:00</td><td>Team 3</td></tr><tr><td>2:00-2:30</td><td>Break</td></tr><tr><td>2:30-3:00</td><td>Team 4</td></tr><tr><td>3:00-3:30</td><td>Team 5</td></tr><tr><td>3:30-3:45</td><td>Break</td></tr><tr><td>3:45-4:15</td><td>Team 6</td></tr><tr><td>4:15-4:45</td><td>Team 7</td></tr></table>	12:30-1:00	Team 1	1:00-1:30	Team 2	1:30-2:00	Team 3	2:00-2:30	Break	2:30-3:00	Team 4	3:00-3:30	Team 5	3:30-3:45	Break	3:45-4:15	Team 6	4:15-4:45	Team 7
12:30-1:00	Team 1																		
1:00-1:30	Team 2																		
1:30-2:00	Team 3																		
2:00-2:30	Break																		
2:30-3:00	Team 4																		
3:00-3:30	Team 5																		
3:30-3:45	Break																		
3:45-4:15	Team 6																		
4:15-4:45	Team 7																		
5:15-6:15pm	Reception, West Court Judges' Deliberations																		
6:15-7:00pm	Awards Ceremony, West Court																		