



2018 DC Public Health Case Challenge

Reducing Disparities in Cancer and Chronic Disease: Preventing Tobacco Use in African American Adolescents



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Disclaimer

All characters, organizations, and illustrative vignettes described in the case are fictional and do not reflect the views of actual organizations 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 serve as judges representing different stakeholders. Parts of this case have been directly adapted from previous DC Public Health Case Challenge cases.

Instructions

Task: Develop a feasible and creative proposal of an intervention or interventions that will address the disparities in cancer from tobacco use in African American adolescents (defined as ages 10 to 19) in Washington, DC. Present your proposed solution(s) to address the challenge at the Case Challenge competition to be held on October 14, 2018.

Scope: The proposal is limited to a budget of \$2.5 million USD to be used during a five-year span. Your proposal and presentation should specify which sector(s), groups of people, and/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 serve as a resource should not generate ideas for the case solutions, but can provide relevant supportive 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 E) to see the criteria on which you will be assessed. Judges are drawn from organizations working with DC residents, academic and clinical medicine, and other non-profit organizations.

If you have questions about the case, please email Sophie Yang (syang@gmail.com) prior to 9:00am on Thursday, October 12. She will forward your question and the 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 8:00 a.m. and 8:30 a.m.** on October 14, 2018. The security guard can direct you to the auditorium 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 8:30 a.m.**
- Your presentation should be no longer than 15 minutes and will be followed by 10 minutes of Q&A from the judges.
- 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 guide in Appendix G for student teams and faculty advisors. If you have questions about the event, please email Sophie Yang (syang@nas.edu).

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

Case

Reducing Disparities in Cancer and Chronic Disease: Preventing Tobacco Use in African American Adolescents

Problem Statement¹

African American residents of DC are twice as likely as their white, Asian/Pacific Islander, and Hispanic counterparts to develop and die from lung cancer.² Although lung cancer can be attributed to a number of factors, such as genetics and occupational exposure, 80 percent of all lung cancer cases are caused by tobacco use.³ The harmful effects of tobacco extend beyond lung cancer and include various other cancers (stomach and pancreatic, for example) as well as conditions such as chronic obstructive pulmonary disease (COPD) and cardiovascular problems. These conditions are largely preventable but are present at disparate rates among racial groups due to factors such as health care access, education levels, behavioral risks, tobacco control policies and marketing tactics, and environmental risks. A subgroup that is most affected by the issue of smoking and tobacco use is adolescent (defined in this case as those ages 10 to 19 years old)⁴ residents of District of Columbia Wards 7 and 8. This population is particularly at risk due to a multitude of factors that contribute to higher rates of tobacco use at a young age, and disparities in the above factors increase susceptibility to smoking and development of these conditions. Interventions with this specific group may span multiple levels of the ecological model and offer many potential points of intervention.

Funding Announcement

The Foundation for Improving Health and Wellbeing is excited to announce a grant funding opportunity for nonprofit organizations working to address the root causes of disparities in cancer rates and outcomes for African American residents of the District of Columbia. This grant focuses on African American adolescents, ages 10 to 19, in Wards 7 and 8 to address disparities in tobacco use, associated behaviors such as nicotine use, as well as resulting health conditions. The Foundation is specifically looking for a new and innovative approach that recognizes the variety of underlying factors that contribute to these disparities and offers a fresh approach in the field, i.e., going beyond screening or early diagnosis/secondary prevention.

Smoking leads to numerous negative health effects, including lung cancer, COPD, and other cardiovascular problems. Many people who smoke begin during adolescence, and combined with additional issues including lack of health care access, lack of access to high-quality education, and broad marketing systems, African American adolescents in the District of Columbia are at higher risk for tobacco use and its associated health effects. Intervening at a

¹ Throughout the case citations are provided as footnotes. For a complete list of these citations please see Appendix C.

² Rebecca Anhang Price et al., "Monitoring Cancer Outcomes Across the Continuum: Data Synthesis and Analysis for the District of Columbia," (2012).

³ Centers for Disease Control and Prevention, "What Are the Risk Factors for Lung Cancer?," https://www.cdc.gov/cancer/lung/basic_info/risk_factors.htm.

⁴ "Age limits and adolescents," *Paediatrics & Child Health* 8, no. 9 (2003).

young and critical age has the potential to prevent countless deaths and impaired quality of life from tobacco-related morbidities.

This grant will last 5 years and has a total budget of \$2.5 million. The award will go to the organization that develops a multifaceted, interdisciplinary, innovative, and evidence-based solution targeted at disparities in tobacco use and the resultant later life health effects for African American adolescents in Wards 7 and 8. A successful application will provide a feasible and sustainable intervention that the organization can implement readily or with minimal additional capacity and has the potential for long-lasting population health effects. Proposals should prioritize the specific health effects and causal factors to be addressed, justify the choice of intervention(s), specify the implementation and evaluation strategy, and provide budget estimates for the use of funds within the timeframe specified in the request for proposal (RFP). Specific attention should be paid to structural and historical factors that influence these issues.

An example of a previously funded grant from a different division of the Foundation focused on reducing rates of diabetes and obesity in youth. Obesity has been linked to numerous neurological and psychological problems and is a significant health burden for youth in the District of Columbia. The successful grant application gave three primary intervention points. First, from birth through 3 months, the children's mothers were targeted for promotion and support for breastfeeding as a strategy for setting a good foundation for healthy weight. At about 6 months the program then shifted to reinforce healthful options as infants transitioned to solid foods. Finally, when the children were age 3, the program screened for building blocks of healthful eating and physical activity and intervened as needed. **Further, the Foundation is looking for new and innovative ideas that differ from currently funded projects and common interventions. Presently, the Foundation invests significantly in mobile and web applications and mobile clinics and welcomes proposals that employ other, more novel approaches.**

The Foundation solicits submissions through an open, competitive process to eligible nonprofit organizations working on issues relevant to the health and development and/or social and environmental factors that affect the health and wellbeing of African American adolescents in the District of Columbia. Applicants will present their proposals to the foundation's panel of reviewers on October 14, 2018. For more detailed judging criteria, please see Appendix E.

The Challenge

You work for a nonprofit organization in the District of Columbia that focuses on preventing cancer and other chronic diseases for adolescents in the area, and the director of your organization has tasked you with applying for this grant. This grant calls for a multifaceted solution focused on reducing tobacco and nicotine use and targeting the multitude of risk factors faced by African American adolescents that contribute to later development of lung cancer and other diseases. The proposed solution will also need to pay special attention to underlying historical and structural factors that continue to contribute to widening disparities in tobacco use.

Your goal as a team is to develop and propose an interdisciplinary, innovative, equitable, justifiable, and financially sound and sustainable plan that would be supported by relevant DC government agencies, local policymakers (if appropriate), potential partner organizations, your target population, and the community more broadly. When writing your proposal, note that your director has given approval for your team to hire trained 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!

Case Scenarios

The following scenarios provide examples of individuals who are affected by the above mentioned problem and could benefit from an intervention developed by your team. Although the scenarios are fictional, they draw from circumstances faced by DC residents, with an emphasis on DC's most vulnerable groups. 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 issues this population faces.

Scenario 1

Joseph Weber is a 17-year-old African American male who lives in Ward 8 and suffers from asthma. Living in Ward 8 means Joseph's family has very limited access to grocery stores, and the most common place his family shops is at small convenience/corner and liquor stores. These stores have significant marketing for cigarettes and other tobacco products, and many of Joseph's friends regularly smoke. Since he is in high school, Joseph still has a required health exam each year, but he has very irregular interactions with health care providers otherwise. Entering his senior year of high school, Joseph begins smoking despite his asthma and knowing the potential risks.

Scenario 2

Austin Wheeler is a 14-year-old high school freshman in the District of Columbia. Despite the legal age for e-cigarette use being 18 years old, many of Austin's friends use the JUUL e-cigarette frequently. In addition, Austin is often exposed to secondhand smoke from relatives who smoke cigarettes. While Austin has tried JUUL, he presently does not own one. However, many of his friends do and he is saving money to buy himself one. The evidence of potential harms and benefits is evolving, but initial evidence points to increased cough, wheeze, and asthma activity. Further, the long-term harms and the effect of using JUUL on combustible tobacco use are still unknown.

Scenario 3

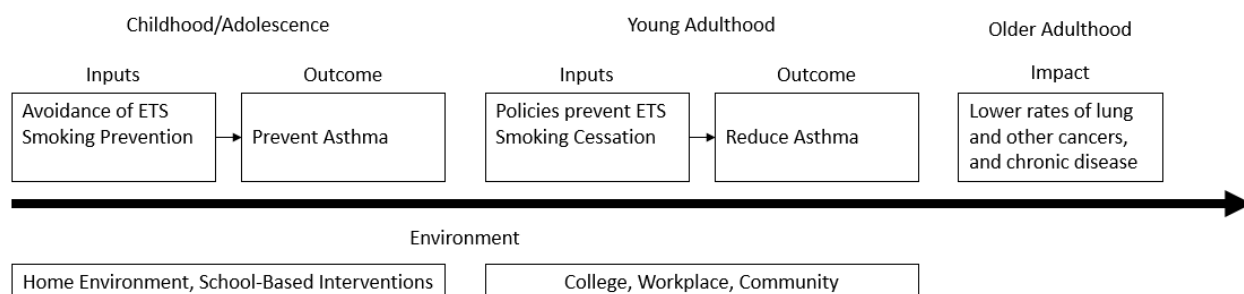
When Amanda Jones, a lifelong resident of Ward 7, was 16 years old, she began smoking and had limited access to preventive health services. Now at 65 years old, Amanda is still a heavy smoker. She has tried multiple times to quit with no success. She has previously been diagnosed with chronic obstructive pulmonary disorder (COPD) and high blood pressure, both thought to be related to her smoking. In addition to her smoking, she grew up in housing with indoor smoking, increasing her secondhand smoke exposure, and most recently she was

diagnosed with lung cancer. Having to travel a significant distance each way for her doctor's appointments has caused her to miss several appointments and thus her treatment has been delayed. Further, her grandchildren live with her and are now exposed to her cigarette smoke.

Logic Model

The logic model in Figure 1 provides an example of how consequences of tobacco use can start in adolescence and early adulthood but often do not manifest as cancer until later in life.

Further, there are numerous environments that both contribute to this risk-taking behavior as well as provide opportunities for intervention.



ETS: Environmental Tobacco Smoke

Figure 1: Logic model depicting how tobacco exposures in adolescence and early adulthood can manifest as cancer and/or chronic disease later in life. Adapted from: *Toward Quality Measures for Population Health and the Leading Health Indicators* (IOM, 2013) and *For the Public's Health: The Role of Measurement in Action and Accountability* (IOM, 2011).

Background

Social Ecological Model

The social ecological model is a systems model representing the different levels of influence on health. At the core of the social ecological model is the individual, surrounded by levels of influence representing the interpersonal, organizational, community, and policy levels. The Centers for Disease Control and Prevention (CDC) state that effective implementation of public health activities at these levels of influence will enable interventions to maximize impact through collaborative application.⁵ The levels of influence are described below:

- 1) **Individual level:** The core of the social ecological model represents the individual who may benefit from the effectiveness of the intervention put in place. The emphasis of influence at this level should focus on ways to increase the individual's knowledge, as well as address a person's mindset towards the risks and benefits of interventions. In addition to influencing individual attitudes and beliefs, efforts at this level should focus on facilitating access to affordable health care, including screenings and tobacco cessation, and initiating timely treatment for those who are diagnosed with cancer.
- 2) **Interpersonal level:** At the interpersonal level of influence, interventions should aim to facilitate behavior change by focusing on shifting cultural and social norms. This could

⁵ Centers for Disease Control and Prevention, "Social Ecological Model," <https://www.cdc.gov/cancer/crcp/sem.htm>.

include encouraging family members and friends to be a source of support to the individual, as well as timely reminders about prevention, screenings, and tobacco cessation from health care providers.

- 3) **Organizational level:** Organizational level influence should incorporate various institutions, such as health care systems, community clinics, local health departments, schools, and faith-based organizations, to support health interventions. These organizations could offer support by providing assessment of screening efforts, expanding access to screening, and supporting policies that promote preventive care including tobacco cessation programs.
- 4) **Community level:** Community level interventions involve those that leverage community organizations as a means to encourage and facilitate behavior change. Interventions at this level could include cancer control coalitions, community advocacy groups, and media campaigns, which may increase public awareness through educational campaigns along with collaborative efforts to encourage cancer screening expansion and programs aimed at expanding tobacco cessation.
- 5) **Policy level:** Policy level influence involves actions by federal, state, and local governments to support and enact policies to advance health. Efforts at this level could focus on implementing existing policies that intend to promote healthy behavior. Examples of policy level influence include imposing additional tobacco taxation and purchase restrictions that limit the amount of tobacco products sold per transaction. Other examples include age restrictions for purchasing tobacco products as well as expanding smoke-free environments to include a wide range of public areas in addition to workplaces and restaurants. Integrating directives dictating coverage for tobacco cessation therapies could also be an effective policy level intervention.



*Some groups may fit within multiple levels of this model.

Figure 2: Social Ecological Model. Source: <https://www.cdc.gov/cancer/crcp/sem.htm>

District of Columbia Demographics

Many factors related to poverty and education contribute to cigarette smoking and tobacco use. As such, interventions that aim to address tobacco use among adolescents must take into consideration the environments in which adolescents live and go to school and/or work. Factors including income, education, employment, housing, and crime determine many of the influences and resources that shape the lives of adolescents. Therefore, it is critical to understand these factors in the context of the District of Columbia.

Neighborhoods in the District of Columbia are divided into eight wards with distinctive histories, cultures, architectures, demographics, and geography, each briefly highlighted below.⁶

- 1) **Ward 1** is in the central part of the city and has the highest population density of any of the wards in the District. Neighborhoods in Ward 1 have historical significance for local Latino and African American communities and include Adams Morgan, Columbia Heights, and Mount Pleasant.
- 2) **Ward 2** contains various landmarks, including the White House and the National Mall, and is also home to what is the downtown of the District. It is an approximately 138-block area of 520 residential and commercial properties.
- 3) **Ward 3** is one of the largest residential areas in the District in Northwest DC and contains large areas of Rock Creek Park as well as neighborhoods such as Van Ness, Tenleytown, Cleveland Park, and Woodley Park among others.
- 4) **Ward 4** is a residential neighborhood that includes areas such as Petworth, Takoma, and Sixteenth Street Heights. It is the northernmost neighborhood in the District and is dominated by single-family detached homes.

⁶ District of Columbia, "Neighborhood Planning," <https://planning.dc.gov/page/neighborhood-planning-01>.

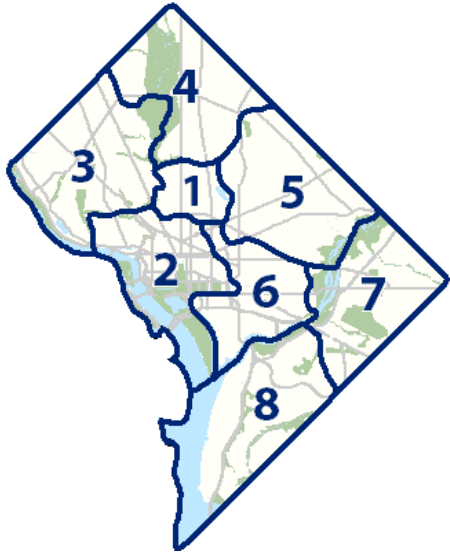


Figure 3: District of Columbia Ward Map.
Retrieved from:
<https://planning.dc.gov/page/neighborhood-planning-01>

5) **Ward 5** is the most diverse ward in the District and contains residential streets and shopping areas as well as high-rise condominiums and industrial parks. The Bloomingdale neighborhood is in this ward.

6) **Ward 6** is in the heart of the District and is the only ward to include portions of each of the four quadrants of the city. It has a highly diverse population and housing stock with a myriad of neighborhood characteristics.

7) **Ward 7** is east of the Anacostia River and is home to several residential neighborhoods that have a distinct sense of pride and culture within the District. Ward 7 is also home to green spaces such as Kenilworth Aquatic Gardens, Watts Branch Park, Anacostia River Park, and Kingman Island.

8) **Ward 8** is also east of the Anacostia River. It contains neighborhood such as Anacostia, Cedar Hill, and Congress Heights. It also contains the Blue Plains Wastewater Treatment Plant.

As Wards 7 and 8 are the focus of this grant, it is important to take a closer look not just at their neighborhoods but also at their demographic breakdown. Ward 7 is estimated to be about 92.6 percent African American, and Ward 8 is estimated at 92.1 percent.⁷ These statistics are in comparison to a DC-wide estimate of 45.7 percent (see Figures 4 and 5). Wards 7 and 8 contain some of the poorest areas in all of DC.⁸

The racial demographics of the District's population, as a whole, show an approximately equal presence of white and African American residents (see Figure 4). However, when looking at this information by ward, it is evident that some wards have a greater African American populations than others. For example, as previously mentioned, in both Wards 7 and 8 more than 92 percent of the population is African American (see Figures 4 and 5). In addition, 11.37 percent of the District of Columbia is Hispanic/Latino, with 3.59 percent of Ward 7 and 2.69 percent of Ward 8. Beyond race, there are also differences in age composition among wards. While 17.9 percent of the District's population is less than 18 years old, 23.8 percent and 30.2 percent of Wards 7 and 8 residents, respectively, are younger than 18 years old.⁹

⁷ DC Health Matters, "2018 Demographics,"

<http://www.dchealthmatters.org/?module=demographicdata&controller=index&action=index&id=130951§ionId=940>.

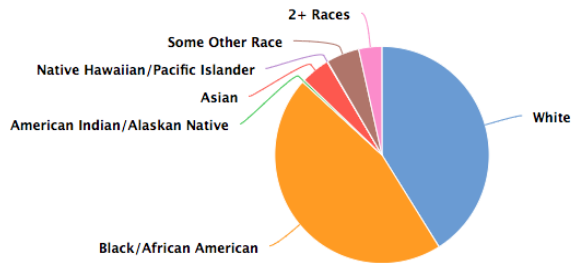
⁸ District of Columbia, "Neighborhood Planning".

⁹ United States Census Bureau, "U.S. Census Bureau QuickFacts,"

<https://www.census.gov/quickfacts/fact/table/US/PST045217>; District of Columbia, "Neighborhood Planning".

Population by Race

City: District of Columbia



Population by Race	City: District of Columbia	
	Persons	% of Population
White	286,861	41.08%
Black/African American	319,013	45.68%
American Indian/Alaskan Native	2,589	0.37%
Asian	30,133	4.31%
Native Hawaiian/Pacific Islander	549	0.08%
Some Other Race	34,885	5.00%
2+ Races	24,345	3.49%

Figure 4: District of Columbia Population by Race. Source: DC Health Matters: Demographics. (2018). Retrieved from <http://www.dchealthmatters.org/?module=demographicdata&controller=index&action=index&id=130951§ionId=940>

Wards 7 and 8 Population by Race

Population by Race	Ward: Ward 7		Ward: Ward 8	
	Persons	% of Population	Persons	% of Population
White	2,161	2.68%	3,275	4.10%
Black/African American	74,709	92.64%	73,606	92.18%
American Indian/Alaskan Native	245	0.30%	212	0.27%
Asian	251	0.31%	353	0.44%
Native Hawaiian/Pacific Islander	26	0.03%	39	0.05%
Some Other Race	1,353	1.68%	561	0.70%
2+ Races	1,898	2.35%	1,801	2.26%

Figure 5: Wards 7 and 8 Population by Race. Source: DC Health Matters: Demographics. (2018). Retrieved from <http://www.dchealthmatters.org/?module=demographicdata&controller=index&action=index&id=130951§ionId=940>

Poverty and Socioeconomic Status

Poverty is associated with several factors that affect health status, such as food insecurity, exposure to crime and violence, and unsafe or unhealthful housing.¹⁰ Within the District, the percentage of African American families at or below the federal poverty level is higher at 22 percent than the rate for all other racial and ethnic groups.¹¹ Furthermore, the African

¹⁰ Maurice Jackson, "The Health of the African American Community in the District of Columbia: Disparities and Recommendations," (Washington, D.C.: Georgetown University, 2016).

¹¹ Ibid.

American population residing within Wards 7 and 8 is reported to have the lowest median household income of any racial or ethnic group within those wards and across DC (see Figure 6).¹² Additionally, African Americans experience a higher rate of unemployment across the nation at 7.9 percent when compared to the overall rate of 4.5 percent for the national population in 2016.¹³

Median Household Income by Race/Ethnicity

Median Household Income by Race/Ethnicity	City: District of Columbia	Ward: Ward 7	Ward: Ward 8
	Value	Value	Value
All	\$82,192	\$40,475	\$37,023
White	\$130,783	\$105,680	\$85,135
Black/African American	\$44,700	\$38,107	\$35,025
American Indian/Alaskan Native	\$64,321	\$73,899	\$56,660
Asian	\$94,752	\$66,917	\$55,024
Native Hawaiian/Pacific Islander	\$77,344	\$54,808	\$170,113
Some Other Race	\$53,627	\$43,768	\$70,605
2+ Races	\$89,595	\$52,969	\$64,151
Hispanic/Latino	\$70,970	\$50,708	\$43,803
Non-Hispanic/Latino	\$83,478	\$40,124	\$36,868

Figure 6: Median Household Income by Race. Source: DC Health Matters: Demographics. (2018). Retrieved from <http://www.dchealthmatters.org/?module=demographicdata&controller=index&action=index&id=130951§ionId=940>

In addition to facing the highest poverty rates in the District, residents in Wards 7 and 8 also experience a scarcity of full-service grocery stores.¹⁴ A DC Hunger Solutions review of the grocery store landscape conducted in 2016 revealed that of the 49 full-service grocery stores in the District, only two were located in Ward 7 and just one in Ward 8.¹⁵ The report describes a decline in the number of full-service grocery stores since 2010, when four were located in Ward 7 and three in Ward 8 (see Figure 7).¹⁶

¹² District of Columbia, "Neighborhood Planning".

¹³ Maurice Jackson, "An Analysis: African American Employment, Population & Housing Trends in Washington, DC," (Washington, D.C.2017).

¹⁴ DC Hunger Solutions, "Closing the Grocery Store Gap in the Nation's Capital," <http://www.dchunger.org/pdf/dchs-closing-grocery-store-gap-report.pdf>.

¹⁵ Ibid.

¹⁶ Ibid.

Changes in the Number of Confirmed and Planned Full-Service Grocery Stores in D.C., from 2010 to 2016, Compared to D.C.'s 2014 Median Household Incomes and Racial and Ethnic Demographics							
Wards	# of Full-Service Grocery Stores, 2010	# of Full-Service Grocery Stores, 2016	# of Full-Service Grocery Stores in Pipeline,* 2016	Median Household Income, 2014	% Non-Hispanic Black, 2014	% Non-Hispanic White, 2014	% Hispanic, Any Race, 2014
Ward 1	6	8	1	\$80,794	31.4	54.7	20.8
Ward 2	8	7	0	\$99,422	9.0	74.7	9.8
Ward 3	11	9	0	\$109,909	6.0	82.2	9.4
Ward 4	2	5	1	\$71,545	58.6	26.1	19.3
Ward 5	3	7	1	\$55,063	72.8	18.3	8.3
Ward 6	4	10	3	\$90,903	36.7	54.1	6.0
Ward 7	4	2	0	\$39,828	94.4	2.5	2.8
Ward 8	3	1	0	\$31,642	93.7	4.3	1.4
DC Overall	43 (avg. 5.4 per ward)*	49 (avg. 6.1 per ward)*	6 (avg. 0.75 per ward)	\$69,235	49.6	40.2	9.9

Note: A precise comparison between 2010 and 2016 data is challenging due to ward boundary changes in 2012 and a modest change in the application of full-service grocery store definition between D.C. Hunger Solutions' 2010 report and this report.

Figure 7: Changes in the Number of Confirmed and Planned Full-Service Grocery Stores in D.C., from 2010 to 2016: (2016). Retrieved from <http://www.dchunger.org/pdf/dchs-closing-grocery-store-gap-report.pdf>

Education

Historical reports of education achievement within the District have shown that Wards 7 and 8 struggle with disparities in educational attainment. In 2011, Ward 8 had the lowest percentage of residents with a high school diploma and the lowest with a bachelor's degree, with Ward 7 tied for second lowest for residents with a high school diploma (see Figure 8).¹⁷

As of January 2018, 89.9 percent of the overall District's population aged 25 years and older had graduated from high school and 56.2 percent had obtained a bachelor's degree or higher.¹⁸ In comparison, although 83.4 percent of Ward 7 residents aged 25 years or older have graduated from high school, only 16.6 percent of the ward's residents have obtained a bachelor's degree or higher.¹⁹ Similarly, 84.4 percent of Ward 8 residents aged 25 years or older have completed high school while only 17.0 percent have obtained a bachelor's degree or higher.²⁰

In March 2018, DC Public Schools published a report highlighting that fewer high school seniors in the District are expected to receive diplomas in June 2018 than in the previous year.²¹ According to a Washington Post investigation, the predicted drop in the graduation rate is

¹⁷ Paul Ashton, "The Education of DC: How Washington D.C.'s investments in education can help increase public safety," (Washington, D.C.).

¹⁸ DC Health Matters, "2018 Demographics."

¹⁹ Ibid.

²⁰ Ibid.

²¹ Perry Stein, "D.C. Public Schools graduation rate on track to decline this year," *The Washington Post*, 3/1/2018 2018.

related to questions about the validity of diplomas awarded in 2017 by high schools in the District.²² The investigation revealed that as many as one in three graduates received their diplomas in violation of city policy mandating attendance and class make-up rules.²³

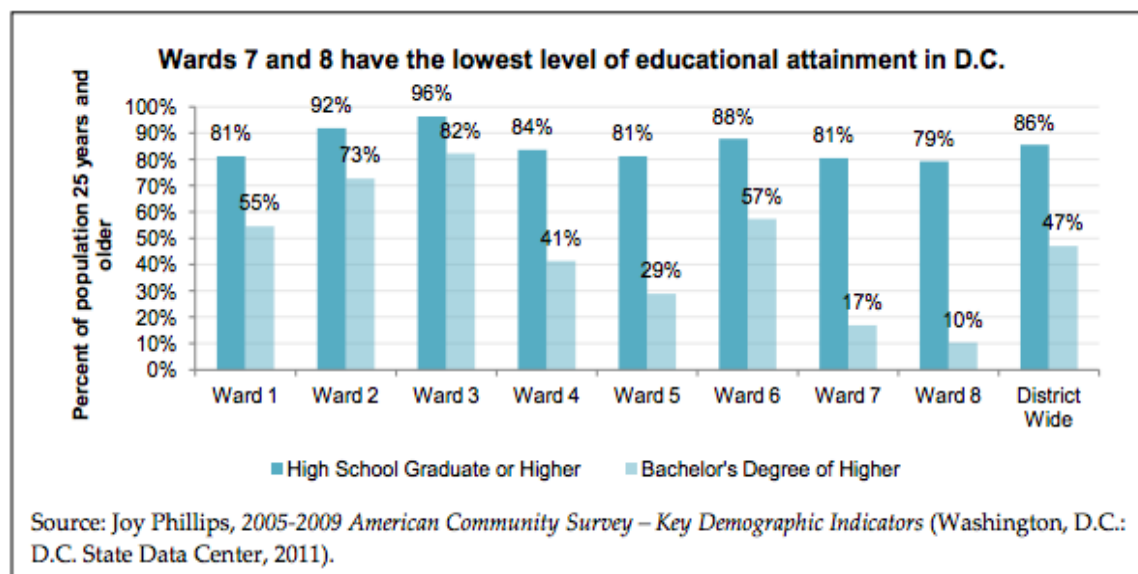


Figure 8: Educational Attainment.

Employment

Unemployment is associated with a number of factors that affect health, including poor nutrition, unhealthy living conditions, and chronic stress.²⁴ Unemployment affects both African American youth and older workers in the District. In December 2017, the unemployment rate was 10 percent in Ward 7 and 12.9 percent in Ward 8, while Ward 3 reported a rate of 3.3 percent.²⁵ In addition, rates of unemployment for African Americans in these wards were more than twice the overall unemployment rates for each ward as a whole.²⁶

Housing

Throughout the District, longtime African American residents have been disproportionately affected by gentrification. Over the past thirty years, the District's African American population has dropped nearly 20 percent due to constant relocation to neighboring counties or more affordable areas.²⁷ A 2016 report published by Georgetown University outlines the close relationship between housing, health, and quality of life, namely how destabilized housing and financial burden can have long-term effects on health through homelessness, food insecurity,

²² Ibid.

²³ Ibid.

²⁴ Jackson, "The Health of the African American Community in the District of Columbia: Disparities and Recommendations."

²⁵ District of Columbia, "Ward Labor Force Report," (Washington, D.C.2017).

²⁶ Jackson, "An Analysis: African American Employment, Population & Housing Trends in Washington, DC."

²⁷ Jackson, "The Health of the African American Community in the District of Columbia: Disparities and Recommendations."

job loss, and social disconnection.²⁸ Additionally, housing disparities can lead to unsafe living environments where direct or secondhand exposure to tobacco is likely to take place.

Rising housing costs are a major contributor of stress in low-income communities within the District. Between 2010 and 2014, the median gross monthly rent in the District was reported at \$1,302, compared to a national average of \$920.²⁹ In addition, many African Americans within the District have been priced out of the housing and job markets due to the lack of available jobs and skills training as well as lack of access to high-quality education.³⁰

Crime

There are numerous other factors that affect the lives of adolescents living in Wards 7 and 8. Crime has an impact not only on the individual victim but on the community as a whole, resulting in behavior changes such as families spending less time outside and restricted activities before and after school. The rates of crime in Wards 7 and 8 are the highest in the city, and Ward 8 saw an increase in the rate of property crime from 2000 to 2010 (see Figure 9).³¹

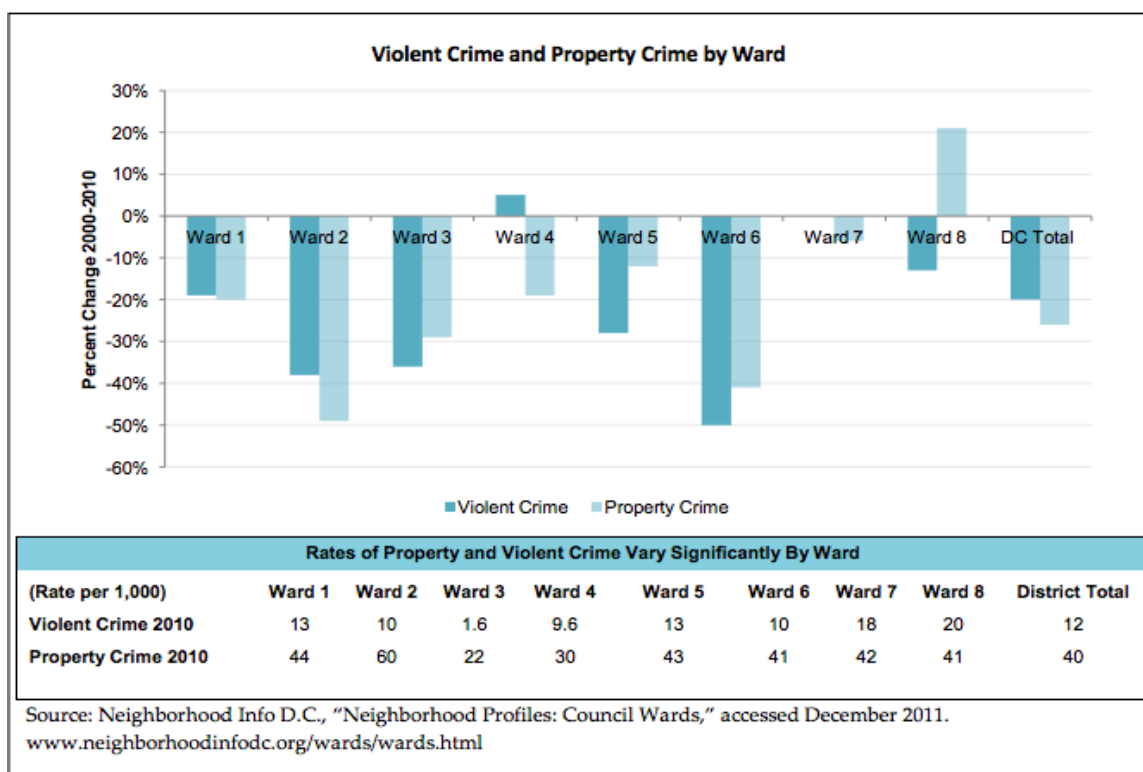


Figure 9: District of Columbia Crime Rates. Source: *The Education of D.C.: How Washington D.C.'s investments in education can help increase public safety.* (2012). Retrieved from http://www.justicepolicy.org/uploads/justicepolicy/documents/education_of_dc_-_final

²⁸ Ibid.

²⁹ Ibid.

³⁰ Jackson, "An Analysis: African American Employment, Population & Housing Trends in Washington, DC."

³¹ Ashton, "The Education of DC: How Washington D.C.'s investments in education can help increase public safety."

These demographic statistics represent the environment in which the target population for this grant, adolescents, live and attend school and/or work. As demonstrated by the social ecological model (see Figure 1), the community plays a key role in health and should be strongly considered for interventions that aim to help African American adolescents thrive.

District of Columbia Health

Recent data from CDC indicate smoking rates in DC for adults to be about 14.7 percent (rates for adolescents are not available), which is well below the national state average.³² Regarding lung cancer incidence, DC is reported to rank 17 out of 51 states (50 plus DC), with an incidence of 59.6 per 1,000. Only 16.8 percent of cases were diagnosed at an early stage when cancer is most curable. Further, DC ranks 25 out of 51 with accredited lung cancer screening centers at a rate of 4.5 per one million people.³³ Additional data show that in DC lung cancer has the highest mortality rate of all cancers at 31.9 per 100,000.³⁴

The 2017 Youth Risk Behavior Survey found significant association between grades and tobacco use in high school students in the District of Columbia (see Figure 10), with the proportion of students reporting tobacco use increasing as type of grades decreases.³⁵

Health Risk Behavior	Percentage of students who engaged in each risk behavior, by type of grades mostly earned in school				Significant Association*
	A's	B's	C's	D's/F's	
	% 95% CI ^a	% 95% CI	% 95% CI	% 95% CI	
QN31: Percentage of students who first tried cigarette smoking before age 13 years (even one or two puffs)	8.4 (7.1-9.9)	10.4 (9.2-11.7)	14.7 (13.0-16.5)	22.1 (18.1-26.7)	Yes
QN34: Percentage of students who ever used an electronic vapor product (including e-cigarettes, e-cigars, e-pipes, vape pipes, vaping pens, e-hookahs, and hookah pens [such as blu, NJOY, Vuse, MarkTen, Logic, Vapin Plus, eGo, and Halo])	25.6 (23.5-27.8)	28.4 (26.6-30.2)	33.1 (30.8-35.5)	34.9 (30.1-40.0)	Yes
QN35: Percentage of students who currently used an electronic vapor product (including e-cigarettes, e-cigars, e-pipes, vape pipes, vaping pens, e-hookahs, and hookah pens [such as blu, NJOY, Vuse, MarkTen, Logic, Vapin Plus, eGo, and Halo], on at least 1 day during the 30 days before the survey)	8.1 (6.8-9.6)	9.0 (7.9-10.2)	13.2 (11.6-15.0)	16.2 (12.8-20.3)	Yes
QN38: Percentage of students who currently smoked cigars (cigars, cigarillos, or little cigars, on at least 1 day during the 30 days before the survey)	8.3 (7.0-9.7)	8.5 (7.4-9.7)	12.2 (10.6-13.9)	19.2 (15.7-23.3)	Yes

Figure 10: Tobacco Use by Type of Grades. From 2017 Youth Risk Behavior Survey. Source: "2017 Youth Risk Behavior Survey Results: District of Columbia (Including Charter Schools) High School Survey Risk Behaviors and Academic Achievement Report," (District of Columbia Office of the State Superintendent 2017).

³² Centers for Disease Control and Prevention, "Map of Current Cigarette Use Among Adults (2016)," <https://www.cdc.gov/statesystem/cigaretteuseadult.html>.

³³ Ewa Dworakowski, "American Lung Association Finds That the District of Columbia Can do More to Reduce the Toll of Lung Cancer – the # 1 Cancer Killer of Women and Men," (Washington, D.C.2018).

³⁴ Centers for Disease Control and Prevention, "United States Cancer Statistics: Data Visualizations: Leading Cancer Cases and Deaths, Male and Female, 2015," <https://gis.cdc.gov/Cancer/USCS/DataViz.html>.

³⁵ "2017 Youth Risk Behavior Survey Results: District of Columbia (Including Charter Schools) High School Survey Risk Behaviors and Academic Achievement Report," (District of Columbia Office of the State Superintendent, 2017).

In addition to lung cancer, other important health indicators in DC include chronic obstructive pulmonary disease (COPD), cardiovascular disease, and diabetes—all conditions that may be exacerbated by tobacco use as discussed below. Approximately 4.6 percent of DC residents have been diagnosed with COPD, while approximately 6.7 percent of African American residents have been diagnosed with COPD. Further, it was found that DC residents were more likely to report having COPD if they were African American, not working, a member of a household with income less than \$25,000, had a history of smoking, and/or had a history of asthma. A number of these risk factors are prevalent in Wards 7 and 8, such as those related to income and race.³⁶ Heart disease is the leading cause of death in DC, causing approximately 25 percent of deaths. Further, the fourth leading cause of death in DC is stroke. Across the risk factors for both heart disease and stroke, DC frequently has higher rates than the national average.³⁷ Finally, diabetes is also a significant issue in the District of Columbia, with the highest rates of emergency department visits due to diabetes among the African American population as well as in Ward 7.³⁸

Clinical Background

Lung Cancer

Lung cancer is the leading cause of cancer mortality in the District of Columbia (31.9 per 100,000). Lung cancer also has an incidence of 42.5 per 100,000 in DC, the second highest incidence of cancer in both men and women (prostate and breast cancer incidence are the highest, with incidences of 103.2 and 121.1 per 100,000, respectively).³⁹

Symptoms of lung cancer tend to be nonspecific and vary by individual but generally include persistent cough, chest pain, shortness of breath, wheezing, coughing up blood, fatigue, and weight loss. Most lung cancer patients do not show signs or symptoms until the cancer has progressed to later stages.⁴⁰

When lung cancer is detected at early stages (stage I or II, in which the cancer has not spread to other sites in the body), the 5-year survival rate ranges from 92 to 53 percent.⁴¹ However, because symptoms generally do not appear until later stages, only 16 percent of lung cancer cases are detected early. Because most lung cancers are detected later, lung cancer has a poorer prognosis compared to other cancers and has an overall 5-year survival rate of 17.7

³⁶ Centers for Disease Control and Prevention, "COPD among Adults in the District of Columbia," https://www.cdc.gov/copd/maps/docs/pdf/DC_COPDFactSheet.pdf.

³⁷ American Heart Association, "DC State Fact Sheet," (Washington, D.C.2017).

³⁸ Angelica Journaigan, "Community Health Needs Assessment," (Washington, DC2016).

³⁹ Centers for Disease Control and Prevention, "United States Cancer Statistics: Data Visualizations: Leading Cancer Cases and Deaths, Male and Female, 2015."

⁴⁰ Centers for Disease Control and Prevention, "What are the symptoms of lung cancer?," https://www.cdc.gov/cancer/lung/basic_info/symptoms.htm.

⁴¹ American Cancer Society, "Non-Small Cell Lung Cancer Survival Rates, by Stage," <https://www.cancer.org/cancer/stomach-cancer/detection-diagnosis-staging/survival-rates.html>.

percent (versus colon cancer at 64.4 percent, breast cancer at 89.7 percent, and prostate cancer at 98.9 percent).⁴²

The only validated screening test for lung cancer is low-dose computed tomography, which involves the use of X-rays. This is only recommended for patients who are considered high risk. High risk is defined as 1) being in the age range of 55-74 and 2) having a smoking history equivalent to one pack a day for 30 years. Screening is generally limited to high-risk patients and not recommended to non-high-risk populations because unnecessary radiation from X-rays can cause a small increase in the risk of various cancers.⁴³

Lung cancer has many environmental risk factors, most notably smoking. Tobacco use is associated with 80-90 percent of all lung cancers because of chronic exposure of inhaled carcinogens.⁴⁴ Other causes of lung cancer include pollutants such as secondhand smoke and exposures to radon, asbestos, silica, and arsenic.⁴⁵ Radon and asbestos can be found in homes and workplaces and is a greater risk in areas that are poorly regulated, such as low-income neighborhoods.⁴⁶ Exposure to silica is most often due to occupational conditions involving silica dust, such as sandblasting. Arsenic is found in a variety of sources including contaminated water and cigarettes. Studies have shown that there are disparities in air pollution (including the aforementioned contaminants) causing greater levels of harmful exposure for minority racial groups and members of low-income households.⁴⁷ These disparities are reflected in health outcomes of respiratory disease, with three times as many African Americans dying from asthma compared to whites and five times as many African American adolescents dying from asthma compared to their white counterparts.⁴⁸ The high association of lung cancer with exposure to environmental factors makes this type of cancer one of the leading causes of preventable death in the United States for all races.

Other Cancers

While tobacco is most often associated with lung cancer, it also plays a role in many other cancers. About 40 percent of all diagnosed cancers in the United States may be associated with

⁴² American Lung Association, "Lung Cancer Fact Sheet," <http://www.lung.org/lung-health-and-diseases/lung-disease-lookup/lung-cancer/resource-library/lung-cancer-fact-sheet.html>.

⁴³ American Cancer Society, "Who should be screened for lung cancer?," <https://www.cancer.org/latest-news/who-should-be-screened-for-lung-cancer.html>; National Cancer Institute, "Risk Factors: Radiation," <https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation>.

⁴⁴ Department of Health and Human Services, "How Tobacco Smoke Causes Disease: The Biology and Behavioral Basis for Smoking-Attributable Disease," (2010).

⁴⁵ Centers for Disease Control and Prevention, "What Are the Risk Factors for Lung Cancer?"; S. Simon, "World Health Organization: Outdoor Air Pollution Causes Cancer," <https://www.cancer.org/latest-news/world-health-organization-outdoor-air-pollution-causes-cancer.html>.

⁴⁶ Thea Evans, "Radon: A public health issue that hurts the poor the most," <http://www.incontext.indiana.edu/2016/july-aug/article2.asp>.

⁴⁷ American Lung Association, "Disparities in the Impact of Air Pollution," (2013).

⁴⁸ Arthur L. Frank, "Environmental Justice and Air Pollution : The Right to a Safe and Healthy Environment," <https://www.medscape.org/viewarticle/589135>.

tobacco use, including cancers of the mouth and throat, voice box, lung, esophagus, stomach, kidney, pancreas, liver, bladder, cervix, colorectal, and a type of leukemia.⁴⁹

Racial disparities for incidence and mortality of several cancers exist throughout the DC region (as well as the rest of the United States). Two cancers associated with tobacco use, lung and colorectal, have more than twice the incidence in African Americans (72.0 and 53.9 per 100,000, respectively) than in whites (31.6 and 24.3 per 100,000, respectively) (see Table 1). Similarly, mortality rates of lung and colorectal cancers are approximately twice as high in African Americans (60.7 and 22.2 per 100,000, respectively) than in whites (32.8 and 9.7 per 100,000, respectively) (see Table 2).⁵⁰

Table 1: Age-Adjusted Incidence Rates Per 100,000 Adults for the Most Common Cancers in the District, 2009

Cancer Site	White	Black
Breast (female)†	136.0	123.2
Colorectal	24.3*	53.9
Lung and Bronchus	31.6*	72.0
Prostate	81.9*	198.2

SOURCE: CDC WONDER, 2009.⁵¹

NOTE: Incidence of cervical cancer suppressed because of small numbers.

* Statistically significant difference between whites and blacks, with 95 percent confidence.

† In situ breast cancers not included in the breast or all sites categories.

Table 2: Age-Adjusted Cancer Mortality per 100,000 in the District by Race, 2008

Cancer Site	White	Black
Breast (female)	15.8*	33.3
Colorectal	9.7*	22.2
Lung and Bronchus	32.8*	60.7
Prostate	--	41.1

SOURCE: CDC WONDER, 2008.⁵²

NOTE: Mortality from cervical cancer for both races, and from prostate cancer for whites, is suppressed due to small numbers.

* Statistically significant difference between blacks and whites, with 95 percent confidence.

⁴⁹ Centers for Disease Control and Prevention, "Cancers Linked to Tobacco Use Make Up 40% of All Cancers Diagnosed in the United States," <https://www.cdc.gov/media/releases/2016/p1110-vital-signs-cancer-tobacco.html>.

⁵⁰ Price et al., "Monitoring Cancer Outcomes Across the Continuum: Data Synthesis and Analysis for the District of Columbia."

⁵¹ Ibid.

⁵² Ibid.

Other Diseases and Conditions Associated with Tobacco Use

As mentioned, in addition to cancer, tobacco has been implicated in a number of other diseases such as cardiovascular disease, diabetes, and chronic obstructive pulmonary disease.

Cardiovascular disease is the leading cause of death in the United States and is often caused by blockage of vessels of the heart (or other organs) that leads to organ damage, heart attacks, and other life-threatening complications. Tobacco use is a major risk factor in cardiovascular disease and contributes to up to one third of all deaths from cardiovascular disease. Smoking contributes to respiratory disease, atherosclerosis, coronary heart disease, stroke, and peripheral heart disease.⁵³

Chronic obstructive pulmonary disease (COPD) refers to a group of chronic diseases that cause obstruction of air in the lungs, making it difficult to breathe. COPD includes chronic bronchitis, emphysema, and some cases of asthma. COPD is a major cause of preventable disability and death in the United States. Symptoms include difficulty breathing, easy fatigability, and chest tightness. Tobacco use is associated with at least 8 out of 10 COPD-related deaths. Smoking during childhood and the teenage years can slow how lungs grow and develop, and this can increase the risk of developing COPD and heart disease in adulthood.^{54,55}

Diabetes mellitus is a disease in which there are very high levels of sugar in the blood. Normally after a meal, high levels of sugar enter the blood but are then removed from the blood by the hormone insulin, which is produced by the pancreas. For individuals with diabetes, insulin is either absent or does not work as well, causing high levels of sugar to remain in the blood. Over time, this can cause damage to the small vessels of the body including vessels of the eyes and kidneys. Smokers are 30 to 40 percent more likely to develop diabetes. Tobacco use also makes diabetes more difficult to control, leading to earlier and more severe complications such as kidney damage leading to the need for dialysis, retinal damage leading to blindness and glaucoma, and nerve damage eventually leading to amputation.⁵⁶

Adolescents are at risk for developing lung damage from exposure to secondhand smoke. Adolescents tend to have more frequent respiratory and ear infections, as well as worse asthma outcomes.⁵⁷ Considering disparities associated with air pollution, adolescents in low-income households are more vulnerable to these complications.⁵⁸

⁵³ Centers for Disease Control and Prevention, "Smoking and Cardiovascular Disease," https://www.cdc.gov/tobacco/data_statistics/sgr/50th-anniversary/pdfs/fs_smoking_CVD_508.pdf.

⁵⁴ Centers for Disease Control and Prevention, "Smoking and COPD," <https://www.cdc.gov/tobacco/campaign/tips/diseases/copd.html>.

⁵⁵ Ibid.

⁵⁶ Centers for Disease Control and Prevention, "Smoking and Diabetes," <https://www.cdc.gov/tobacco/campaign/tips/diseases/diabetes.html>.

⁵⁷ Asthma and Allergy Foundation of America, "Tobacco Smoke and Asthma," <http://www.aafa.org/page/secondhand-smoke-environmental-tobacco-asthma.aspx>.

⁵⁸ C. E. Ciaccio et al., "Secondhand tobacco smoke exposure in low-income children and its association with asthma," *Allergy Asthma Proc* 35, no. 6 (2014).

Causes of Health Care Disparities

Insurance

Partially as a result of the early implementation of the Affordable Care Act, Washington, DC, has made substantial strides in health care insurance coverage, with over 90 percent of its residents having insurance in 2014.⁵⁹ Overall, Washington, DC, is ranked as the 8th state in the country in “access and affordability” by the 2018 *Commonwealth Fund Scorecard on State Health System Performance*. However, DC ranks in the bottom half of states in all other measures including “prevention and treatment,” “avoidable hospital use and cost,” and “healthy lives,” indicating that although health coverage is good, DC lacks in other measures to prevent and treat disease, keep health care costs low, and promote health and wellbeing.⁶⁰ Additionally, minorities remain the most likely groups to not have health insurance, and income also has a substantial impact on health in DC. Lower-income individuals in DC were 13 percent more likely to smoke, 26 percent more likely to be obese, and 24 percent more likely to report “poor” health.⁶¹ Wards 6, 7, and 8 have the highest proportion of both low-income and minority individuals in DC, and these are also the areas where these health disparities are most apparent.⁶²

In addition to lower rates of health insurance coverage in Wards 7 and 8, the *type* of health insurance coverage is also important in determining whether individuals are able to receive treatment. Medicaid covers 24 percent of DC’s population, and individuals with Medicaid are less likely to have their insurance accepted by health care providers than individuals with other types of insurance.⁶³ Additionally, how patients are treated for their conditions can vary depending on the type of health insurance they have. In a national study, Medicaid patients were 12 percent less likely to be treated with radiation treatment for lymphoma.⁶⁴ This presents a large issue for many DC residents. Although many of them are covered under medical insurance, it is possible that many physicians in the city will not care for them due to their Medicaid coverage status. However, it is important to note that since the enactment of the Affordable Care Act (ACA), these issues may not be as relevant, due in part to the preventive services and prevention provisions covered in the ACA.⁶⁵ Although Congress has made changes to the ACA, resulting in losses of coverage across the nation, the DC city council has endeavored to preserve provisions such as the individual mandate, with the intention of protecting coverage for DC residents.

⁵⁹ George Washington University, “Oncology Care Access in the District of Columbia: An Overview and Needs Assessment,” (Washington, D.C.2015).

⁶⁰ David Radley, Douglas McCarthy, and Susan L. Hayes, “Scorecard on State Health System Performance,” (Washington, DC2018).

⁶¹ Ibid.

⁶² George Washington University, “Oncology Care Access in the District of Columbia: An Overview and Needs Assessment.”

⁶³ The Henry J. Kaiser Family Foundation, “Health Insurance Coverage of the Total Population,” *The Henry J. Kaiser Family Foundation* (2015); Julia Paradise and Rachel Garfield, “What is Medicaid’s Impact on Access to Care, Health Outcomes, and Quality of Care? Setting the Record Straight on the Evidence,” no. August (2013).

⁶⁴ George Yaghmour et al., “Insurance and outcomes for classical Hodgkin lymphoma,” (2018).

⁶⁵ Gail Shearer, “Prevention Provisions in the Affordable Care Act,” (American Public Health Association, 2010).

Additionally, health insurance coverage does not guarantee good health outcomes nor the most effective treatment. A 2015 study revealed that insured minorities with breast cancer took, on average, more than two times longer to reach their diagnostic resolution than insured non-Hispanic whites.⁶⁶ Therefore, insurance is not the only factor involved in the barriers to cancer prevention, diagnosis, and treatment in minority populations. Other factors that cause these disparities include underlying psychological issues such as stereotypes and location of health care services.⁶⁷ However, resources such as patient navigators have been found to improve time to diagnostic resolution in minority populations.⁶⁸

Access to Health Care Services

Location and availability of cancer care and screening for minority populations in Wards 7 and 8 is a barrier to receiving these health care services. Although DC has the highest number of oncologists per capita (15.3 per 100,000) among U.S. states, the number of oncologists that accept Medicaid is much smaller, and the number of screening centers outpace the number of cancer treatment centers.⁶⁹ In Wards 7 and 8, distance to hospitals can range from 3 to 5 miles, often requiring multiple bus trips.⁷⁰ Wards 2 and 3 have nearly 70 percent of all urgent care or retail clinics, leaving Wards 4, 5, 6, 7, and 8 with few. Additionally, Wards 7 and 8 have the fewest pharmacies of any ward, with a total of 18 pharmacies, and the fewest vaccination locations, which could be used to receive vaccines, such as the HPV vaccine, that prevent certain types of cancer.⁷¹ Additionally, ambulance response times are the longest east of the Anacostia River in Wards 7 and 8.⁷² The distance from clinics to residencies not only prohibits those from commuting to receive medical care due to the additional time-related burden, but also inhibits those with accessibility constraints, such as those who are disabled, from obtaining the health care and services they need. Affordability is also an important component of access to health care and services. Washington, DC, is ranked as having the highest cost for hospital care (per capita) among all states.⁷³

⁶⁶ H. J. Hoffman et al., "Having health insurance does not eliminate race/ethnicity-associated delays in breast cancer diagnosis in the District of Columbia," *Cancer* 117, no. 16 (2011).

⁶⁷ L. A. Penner et al., "Racial Healthcare Disparities: A Social Psychological Analysis," *Eur Rev Soc Psychol* 24, no. 1 (2013).

⁶⁸ P. C. Raich et al., "Patient navigation improves cancer diagnostic resolution: an individually randomized clinical trial in an underserved population," *Cancer Epidemiol Biomarkers Prev* 21, no. 10 (2012); J. H. Lee et al., "Patient navigation and time to diagnostic resolution: results for a cluster randomized trial evaluating the efficacy of patient navigation among patients with breast cancer screening abnormalities, Tampa, FL," *PLoS One* 8, no. 9 (2013).

⁶⁹ George Washington University, "Oncology Care Access in the District of Columbia: An Overview and Needs Assessment."

⁷⁰ District of Columbia, "District of Columbia Health Systems Plan," (2017).

⁷¹ Kate Rabinowitz, "In DC, access to medical care really depends on where you live," *Greater Greater Washington*, 10// 2016.

⁷² Daniel Henebery, "Ambulances take longer to reach you if you live east of the Anacostia River," *Greater Greater Washington*, 9/2/16 2016.

⁷³ The Henry J. Kaiser Family Foundation, "Health Care Expenditures per Capita by State of Residence," <https://www.kff.org/other/state-indicator/health-spending-per-capita-by-service/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Hospital Care%22,%22sort%22:%22desc%22%7D>.

In addition to burdens related to time to and location of health care services, lack of health care insurance coverage may discourage individuals from seeking routine care. Adolescents in particular may fail to receive general check-ups that are meant to screen for and counsel them about tobacco use and risk of cancer later in life. As a result, underserved communities may have rates of cancer diagnoses that could have been prevented or treated more effectively with earlier identification. Certain health behaviors, such as physical inactivity, failure to follow the established guidelines for cancer screening and prevention, and lack of adequate monitoring of one's health, may lead to a higher risk for lung cancer.⁷⁴

Health Education and Literacy

Preventive care is also important in developing adolescents, as awareness of the dangers of alcohol and drug use can encourage change, reducing certain risk-taking behaviors and exposures. For example, childhood obesity is a known risk factor for many cancers and is a significant issue in Wards 7 and 8, where overall obesity rates are 34 and 37 percent, respectively (overall, 41 percent of African American children in DC are obese).⁷⁵ The public education system can help to prevent obesity in childhood and later in life through interventions such as healthy meals, food logs, and nutrition education.⁷⁶

Education regarding the use of tobacco and other drugs is crucial in cancer prevention as well. Tobacco use substantially increases the risk of developing lung cancer. DC has enacted or is attempting to enact several prevention measures to curb the use of tobacco. For example, from February to April 2012, a DC media campaign focused on increasing the use among African Americans of the DC Quit Line, a phone line available 24 hours a day for residents to call to receive counseling about quitting smoking.

Implicit Bias Among Health Care Workers

Implicit bias in health care settings is another factor that leads to a delay in seeking care among African Americans. In contrast to explicit forms of bias, which refer to attitudes and beliefs on a conscious level, implicit bias can be defined as unconscious attitudes and feelings, such as racial, gender, and cultural biases, that lead to changes in behavior towards others.⁷⁷ Such bias among medical providers affects the quality of care for racial minorities in the United States, particularly for African Americans.

Many of these biases remain “hidden” and need more research and programs to bring awareness to the health care community at large. A study from the American Journal of Public

⁷⁴ P. S. Advani et al., "Financial strain and cancer risk behaviors among African Americans," *Cancer Epidemiol Biomarkers Prev* 23, no. 6 (2014).

⁷⁵ N. A. Berger, "Young Adult Cancer: Influence of the Obesity Pandemic," *Obesity (Silver Spring)* 26, no. 4 (2018); District of Columbia, "Neighborhood Planning"; Data Resource Center for Child & Adolescent Health, "Washington, DC State Fact Sheet," <http://www.childhealthdata.org/docs/nsch-docs/district-of-columbia-pdf.pdf>.

⁷⁶ DC Department of Health, "Obesity in the District of Columbia," (2014).

⁷⁷ W. J. Hall et al., "Implicit Racial/Ethnic Bias Among Health Care Professionals and Its Influence on Health Care Outcomes: A Systematic Review," *Am J Public Health* 105, no. 12 (2015).

Health discovered that two-thirds of health care providers maintained an implicit bias towards African American and Latino patients.⁷⁸ Some physicians may perform actions differently in front of minority patients, unaware that they are harboring a bias or making their patients feel uncomfortable. Minority groups may in turn perceive these behaviors as unequal and stereotypical treatment, leading to higher rates of distrust and ineffective communication within the physician-patient relationship.⁷⁹ A study by JAMA pertaining to lung cancer reported that African Americans are less likely to choose surgical intervention to treat early stage lung cancer, citing their physician's communication style as influencing their decision.⁸⁰

The social distance hypothesis in health care explains that physicians seeing patients who are similar in terms of class, culture, and social status offer more attention to them. Hence, race concordant physician-patient interactions exhibit greater levels of patient trust and physical attention.⁸¹ Studies on racial concordance in medical settings have shown that African Americans are more likely to trust physicians of the same race and gender, highlighting a need for more minority providers and culturally competent physicians. These findings add to evidence of the stress African Americans experience associated with low socioeconomic status, residential segregation, and health care inequities. A combination of these factors may explain the high mortality rate among African Americans with lung cancer.⁸²

Behavioral Factors

Substance Use Behaviors and Media Influence

Research shows that substance abuse, including use of tobacco, among adolescents is correlated with an increased risk for lung cancer and should be a target for prevention efforts. Studies show that African American adolescents experience unique risk factors for substance use and abuse related to their race, ethnicity, and culture. This population is disproportionately exposed to culturally targeted media in the form of increased cigarette ads, especially menthol cigarette promotions. These strategies included using specific aspects of language and urban culture, distributing free menthol cigarette samples for lower-income African Americans, and sending menthol cigarette promotions via direct mail, a practice that is no longer legal.⁸³ In part as a result of this marketing, 88.5 percent of African Americans aged 12 years and older who

⁷⁸ I. V. Blair et al., "Assessment of biases against Latinos and African Americans among primary care providers and community members," *Am J Public Health* 103, no. 1 (2013).

⁷⁹ Hall et al., "Implicit Racial/Ethnic Bias Among Health Care Professionals and Its Influence on Health Care Outcomes: A Systematic Review."

⁸⁰ S. Cykert et al., "Factors associated with decisions to undergo surgery among patients with newly diagnosed early-stage lung cancer," *JAMA* 303, no. 23 (2010).

⁸¹ Jason Schnittker, "Social Distance in the Clinical Encounter: Interactional and Sociodemographic Foundations for Mistrust in Physicians," *Social Psychology Quarterly* 67, no. 3 (2016).

⁸² E. B. O'Keefe, J. P. Meltzer, and T. N. Bethea, "Health disparities and cancer: racial disparities in cancer mortality in the United States, 2000-2010," *Front Public Health* 3, no. April (2015).

⁸³ Phillip S. Gardiner, "The African Americanization of menthol cigarette use in the United States," *Nicotine Tob Res* 6 Suppl 1, no. SUPPL. 1 (2004).

smoke prefer menthol cigarettes to regular cigarettes.⁸⁴ While studies show that menthol cigarettes can cause lung cancer at a similar rate as non-menthol cigarettes, menthol creates chemicals that are more easily absorbed through body tissue. The ease of inhalation with menthol cigarettes also makes them a more popular choice among youth, leading to greater addictive potential.⁸⁵ A 2017 meta-analysis provides strong evidence that by prohibiting menthol cigarettes, there will be a reduction in youth smoking, improved cessation in adults, and subsequent public health benefits.⁸⁶

In many predominantly African American communities, menthol cigarettes are widely available in retail markets and have greater shelf space in minority neighborhood stores. Tobacco companies also offer greater discounts and coupons to minority groups, women, and youth, as these communities tend to be of lower socioeconomic status and have limited disposable income compared to their white counterparts. Hence, they are more prone to enticement by discounts.⁸⁷

Psychological stress poses a risk for increased smoking behaviors and can manifest in different ways. Psychological stress can result from the burdens of low socioeconomic status, unhealthy environments (such as the conditions seen in Wards 7 and 8), community violence, harmful family dynamics, and lack of access to education.⁸⁸ African American adolescents faced with these stressors are more likely to turn to smoking as a coping behavior.⁸⁹ This may further perpetuate the risk of lung cancer in adulthood.

In addition, African American youth frequently use marijuana before transitioning to cigarette smoking.⁹⁰ Marijuana use during adolescence can have significant effects on health in later life, with a possibility of subsequent lung cancer complications.⁹¹ Further research aims to explore this issue in greater depth to establish a definitive relationship.⁹² Early onset of alcohol abuse, particularly overconsumption of beer, is another risk factor for lung cancer. There is a possibility of suffering a dose-response relationship across an individual's lifetime with higher alcohol

⁸⁴ Gary A. Giovino et al., "Differential trends in cigarette smoking in the USA: is menthol slowing progress?," *Tobacco Control* 24, no. 1 (2015).

⁸⁵ Daniel R. Brooks et al., "Methol Cigarettes and Risk of Lung Cancer," *American Journal of Epidemiology* 158, no. 7 (2003).

⁸⁶ Ibid.

⁸⁷ Stephanie Andersen et al., "Program Infrastructure in Tobacco Prevention and Control."

⁸⁸ P. S. Romano, J. Bloom, and S. L. Syme, "Smoking, social support, and hassles in an urban African-American community," *Am J Public Health* 81, no. 11 (1991).

⁸⁹ Ibid.

⁹⁰ R. Mehra et al., "The association between marijuana smoking and lung cancer: a systematic review," *Arch Intern Med* 166, no. 13 (2006).

⁹¹ J. Bechtold et al., "Chronic adolescent marijuana use as a risk factor for physical and mental health problems in young adult men," *Psychol Addict Behav* 29, no. 3 (2015).

⁹² Mehra et al., "The association between marijuana smoking and lung cancer: a systematic review."

intake leading to higher risk of cancer.⁹³ Hence, adolescents that begin abusing alcohol early in their lives may be more likely to develop cancer as adults.

Passive smoking, such as frequent exposure to the smoke of others or environments where tobacco use is prevalent, can increase the risk for lung cancer.⁹⁴ It is likely that the under resourced environments in Wards 7 and 8 pose a risk for increased secondhand smoke exposure, with some estimates putting the effect of secondhand smoke as being responsible for 260,000 deaths between 1965 and 2014.⁹⁵ In addition, CDC notes that African Americans are at greatest risk for secondhand smoke compared to other racial groups. More than 50 percent of African American adolescents aged 12 to 19 years nationwide are exposed to far greater amounts of secondhand smoke compared to their white or Asian peers.⁹⁶

School-based Interventions

For adolescents, one of the most common areas of intervention are schools and the academic environment. This setting is a logical point for interventions because of its ability to capture most school-aged children and provide a readily available platform for intervention. Previous programs that were thought to be effective at the time have since had their effectiveness questioned. One example of this is the Drug Abuse Resistance Education (D.A.R.E.) program. D.A.R.E at its peak spent an average of \$750,000,000 annually on its programming, yet meta-analysis of its outcome evaluations has found small and statistically nonsignificant effect sizes.⁹⁷

Since such a large and widely accepted program has been proven to be ineffective, it is important to consider what is most likely to be effective for school-based interventions. Studies have explored what elements could make programs more effective, with one study recommending a longer (defined as 15 or more sessions) and more interactive approach that uses peer leaders.⁹⁸ Funding has also been discussed as an important element of success. Programs that are not well-funded exhibit higher attrition rates, poorly defined goals, performance bias, reduced interactive activities, less individualized support, and shorter program durations.⁹⁹ These factors contribute to a program that is less effective than it could be and that lacks long-lasting effects on its participants.

⁹³ Elisa V. Bandera, Jo L. Freudenheim, and John E. Vena, "Alcohol Consumption and Lung Cancer: A Review of the Epidemiologic Evidence," *Cancer Epidemiol Biomarkers Prev* 10, no. August (2001).

⁹⁴ David M. Homa et al., "Vital Signs : Disparities in Nonsmokers ' Exposure to Secondhand Smoke — United States , 1999 – 2012," *Morbidity and Mortality Weekly Report* 64(2015).

⁹⁵ American Association for Cancer Research, "Cancer Progress Report," (Philadelphia, PA: American Association for Cancer Research, 2017).

⁹⁶ Homa et al., "Vital Signs : Disparities in Nonsmokers ' Exposure to Secondhand Smoke — United States , 1999 – 2012."

⁹⁷ S. L. West and K. K. O'Neal, "Project D.A.R.E. outcome effectiveness revisited," *Am J Public Health* 94, no. 6 (2004).

⁹⁸ B. R. Flay, "School-based smoking prevention programs with the promise of long-term effects," *Tob Induc Dis* 5, no. 1 (2009).

⁹⁹ Ibid.

A 2016 study described the effectiveness of a reward system for students participating in a school-based smoking prevention program. This “Smoke-Free Class Competition” motivated students to decrease their cigarette use.¹⁰⁰ Another study emphasized the importance of preventing early-stage substance use, a related yet similarly complex issue, by specifically targeting middle and high school students to accomplish this goal. The researchers found that long-lasting school interventions addressed risk factors pertaining not only to the individual but also to their family and overall community.¹⁰¹ The study emphasizes the importance of using a theoretical and evidence-based approach to reducing adolescent substance abuse rather than simply lecturing students and repeating the dangers of substance abuse. In addition, the study showed that the biopsychosocial factors and etiology of substance abuse should be discussed and explained to students in a creative manner in order to facilitate change. This study highlights a modern approach to school-based substance abuse prevention that incorporates social resistance skills, normative training, and increasing students’ competency skills. Normative training aims to correct unsupported beliefs about substance abuse through educating students about abuse statistics, risks and social expectations surrounding substance abuse, and social resistance. Competence training is employed to teach sound decision-making skills, problem-solving skills, coping strategies, and general social skills.¹⁰²

The challenges with school-based programs are important considerations, especially when targeting areas or schools that may be struggling with the resources and supports necessary for core services. In addition, programs should critically consider the additional burdens they may place on educators who may already be under resourced.

Technology Access and Impact

The rise of modern technology, digital media, and social networking has brought with it changes in youth ideology and behavior. For example, African Americans engage in increased cell phone usage compared to other racial and ethnic groups, with studies showing that African American adolescents use cell phones more for calling and texting rather than excessive Internet use.¹⁰³ In addition, according to a report by the Pew Research Center, underserved African American teenagers are also more likely to pay for prepaid cell phone plans themselves.¹⁰⁴ Further, it has been estimated that 92 percent of African Americans own a cell phone, but only 56 percent have a smartphone.¹⁰⁵ Culture may influence these findings, as

¹⁰⁰ J. K. Das et al., "Interventions for Adolescent Substance Abuse: An Overview of Systematic Reviews," *J Adolesc Health* 59, no. 4S (2016).

¹⁰¹ Bechtold et al., "Chronic adolescent marijuana use as a risk factor for physical and mental health problems in young adult men."

¹⁰² Kenneth W. Griffin and Gilbert J. Botvin, "Evidence-Based Interventions for Preventing Substance Use Disorders in Adolescents," *Child Adolesc Psychiatr Clin* (2010).

¹⁰³ Roderick Graham and Kyungsub Stephen Choi, "Explaining African-American Cell Phone Usage Through the Social Shaping of Technology Approach," *Journal of African American Studies* 20, no. 1 (2015).

¹⁰⁴ Amanda Lenhart, "Teens, social media and technology overview 2015: Smartphones facilitate shifts in communication landscape for teens," *Pew Research Center*, no. April (2015).

¹⁰⁵ Aaron Smith, "African Americans and Technology Use," *Pew Research Center* (2014).

African American households tend to involve extended family networks, necessitating the need for frequent communication.¹⁰⁶ However, higher income and well-educated African American adolescents engage in similar rates of Internet usage as their white counterparts. African American youth are also more likely to use the Internet for Twitter compared to other racial and ethnic groups.¹⁰⁷

Considering the prevalence of cell phone usage, studies have attempted to use this technology as a medium through which to help combat cancer. A 2017 study describes the use of smartphones in distributing a free risk assessment survey for lung cancer, which helped facilitate faster recruitment of individuals for lung cancer screening.¹⁰⁸

Policy and Marketing

Many adult tobacco users start using tobacco products as adolescents.¹⁰⁹ This makes adolescents a unique population for early intervention, but it also means that tobacco companies have a disproportionate interest in marketing tobacco to youth. CDC cites media perceptions, advertising, availability, and accessibility as contributing factors to adolescent tobacco use.¹¹⁰ Similarly, the National Cancer Institute's monograph on the role of media in tobacco use concludes that media communications play an important role in shaping beliefs, knowledge, opinions, and behaviors related to tobacco.¹¹¹

In the past, tobacco companies have used a broad range of marketing techniques—from pricing cuts to distribution to advertising—to target the adolescent market.¹¹² Over the past few decades, Congress has passed laws to restrict advertising by tobacco companies. Namely, these bans restrict broadcast advertising, billboard advertising, and transit advertising. The 1998 Master Settlement Agreement also prohibits brand name sponsorship by tobacco companies of various artistic, cultural, and athletic events. Most recently the issue of marketing has taken a new form as tobacco companies are being accused of using “social media influences” to market their products. While these companies claim that they do not market their products in the United States, concern has been raised on how these marketing tools could spillover to American youth.¹¹³

¹⁰⁶ Graham and Choi, "Explaining African-American Cell Phone Usage Through the Social Shaping of Technology Approach."

¹⁰⁷ Smith, "African Americans and Technology Use."

¹⁰⁸ Z. Szanto et al., "The use of a smartphone application for fast lung cancer risk assessment," *Eur J Cardiothorac Surg* 51, no. 6 (2017).

¹⁰⁹ Centers for Disease Control and Prevention, "Youth and Tobacco Use," https://www.cdc.gov/tobacco/data_statistics/fact_sheets/youth_data/tobacco_use/index.htm.

¹¹⁰ Ibid.

¹¹¹ Ronald M. Davis et al., "The Role of the Media in Promoting and Reducing Tobacco Use," (2008).

¹¹² Regina Benjamin, "Preventing Tobacco Use Among Youth and Young Adults. A report from the Surgeon General," *U.S. Department of Health & Human Services* (2012).

¹¹³ Salynn Boyles, "Big Tobacco Accused of Using Social Media 'Influencers' to Target Youth," *MedPage Today*, https://www.medpagetoday.com/pulmonology/smoking/74883?xid=nl_mpt_DHE_2018-09-

However, these traditional methods of tobacco advertising comprise a small portion of tobacco companies' marketing budgets. The largest expenditure for tobacco companies comes from promotional offers and price discounts.¹¹⁴ Whether through direct consumer discounts or through wholesale retailer discounts, the ultimate goal of these policies is to reduce the price of tobacco products for the consumer. The price of cigarettes and other tobacco products has been shown to affect adolescent cigarette use. In general, adolescents are more responsive to pricing changes than are adults when it comes to tobacco use.¹¹⁵

National Legislation

Note: Below is a short highlight of a small number of tobacco-related policies. This is not a comprehensive list, but rather serves to highlight various policy mechanisms that have been used.

The 2009 Tobacco Control Act is a major piece of legislation that gives the FDA the power to regulate the manufacture, distribution, and marketing of tobacco products. In 2016, the FDA also expanded its domain to all products meeting the definition of a tobacco product, including e-cigarettes.¹¹⁶ One of the key components of the act is that it gives the FDA power to significantly restrict tobacco marketing and sale to adolescents by banning sales to minors, vending machine sales, the sale of packages containing less than 20 cigarettes, tobacco brand sponsorships of events, and giveaways of free cigarettes or brand name non-tobacco items. The act also preserves the right of state and local governments to regulate the sale of tobacco products.¹¹⁷ The FDA Office of Compliance and Enforcement (OCE) enforces that tobacco retailers and the tobacco industry in general are compliant with the restrictions on tobacco sales and advertising to minors by inspecting retailers and monitoring promotional offers and advertisements.

Under the 2009 Tobacco Control Act, tobacco retailers are also required to photographically verify the age of the buyer. Current federal law requires that a person be at least 18 years of age to buy tobacco products. Under the Synar Amendment, states are required to enforce their own state age restrictions as well as conduct random, unannounced inspections of tobacco outlets to guarantee compliance with state youth access laws. These inspections typically involve supervised underage individuals attempting to buy tobacco products without appropriate photo identification. There are a broad range of penalties, from warning letters to fines to revocation of retailers' licenses, imposed on retailers that sell to minors. The FDA also conducts its own inspections but in areas deemed at high risk for violations such as lower

04&eun=g1123415d0r&pos=&utm_source=Sailthru&utm_medium=email&utm_campaign=Daily%20Headlines%202018-09-04&utm_term=Daily%20Headlines%20-%20Active%20User%20-%20180%20days.

¹¹⁴ Benjamin, "Preventing Tobacco Use Among Youth and Young Adults. A report from the Surgeon General."

¹¹⁵ National Cancer Institute, "The Economics of Tobacco and Tobacco Control," (2016).

¹¹⁶ Food and Drug Administration, "Family Smoking Prevention and Tobacco Control Act," <https://www.fda.gov/tobaccoproducts/labeling/rulesregulationsguidance/ucm246129.htm#youth>.

¹¹⁷ Ibid.

socioeconomic areas.¹¹⁸ A 2015 report by the Institute of Medicine found that enforcing minimum legal age restrictions for the sale and purchase of tobacco can reduce the availability of retail-obtained tobacco to minors. Although this may result in an increase in social sources of tobacco, there would still be a net decrease in tobacco usage among adolescents.¹¹⁹

There has also been a push to raise the minimum age to buy tobacco products from 18 to 21 with the reasoning that the minimum age increase would reduce smoking initiation and prevalence among adolescents.¹²⁰ So far, Hawaii, California, Maine, New Jersey, and Oregon have all raised their legal minimum purchasing age to 21. Many other localities have enacted similar legislation, including the District of Columbia in 2016.¹²¹

Another major policy focus has been the price of tobacco. As discussed earlier, adolescents are more sensitive to price changes than adults. The Surgeon General's report on adolescent tobacco use concluded that increases in cigarette prices reduce initiation and prevalence of cigarette smoking in adolescents.

In addition to direct tobacco use, adolescents are also at risk for secondhand smoke exposure in their homes. In 2016, the Department of Housing and Urban Development passed the Smoke Free Public Housing Rule, which took effect on July 31, 2018. However, as discussed later in the "Unintended Consequences of Policy" section, this public health policy is far more complex than it may initially seem.

DC Legislation

In 2007, Washington, DC, passed comprehensive indoor smoke-free legislation prohibiting smoking in public areas, worksites, and indoor areas of restaurants and bars. The DC smoke-free indoor laws also include a ban on e-cigarettes. Other legislation that targets adolescent use of e-cigarettes includes restrictions on e-cigarette sales to minors, retail licensure to sell e-cigarettes over the counter, and an e-cigarette tax.¹²²

In May 2018, the DC City Council voted to raise the tax on cigarettes an additional two dollars, which will (effective October 2018) bring the tax to \$4.50 a pack (\$4.95 after a surtax), making it the highest cigarette tax of any state.¹²³ This tax is higher than those of neighboring Maryland

¹¹⁸ Food and Drug Administration, "Compliance and Enforcement," (Washington, D.C.2013).

¹¹⁹ Institute of Medicine, *Public Health Implications of Raising the Minimum Age of Legal Access to Tobacco Products*, ed. Richard J. Bonnie, Kathleen Stratton, and Leslie Y. Kwan (Washington, DC: The National Academies Press, 2015).

¹²⁰ Engineering National Academies of Sciences and Medicine, *Public Health Consequences of E-Cigarettes*, ed. Kathleen Stratton, Leslie Y. Kwan, and David L. Eaton (Washington, DC: The National Academies Press, 2018).

¹²¹ American Lung Association, "Tobacco 21 Laws: Tracking Progress Toward Raising the Minimum Sales Age for All Tobacco Products to 21," <http://www.lung.org/our-initiatives/tobacco/cessation-and-prevention/tobacco-21-laws.html>.

¹²² Centers for Disease Control and Prevention, "STATE System: E-Cigarette Fact Sheet," no. May (2017).

¹²³ Andrew Giambrone, "D.C. Cigarette Taxes to be Among Nation's Highest Under New Budget," *Washington City Paper* 2018.

and Virginia, who have a \$2 and 30 cent tax, respectively.¹²⁴ The issue of taxation of cigarettes as a policy is one with mixed results. Some research has indicated that when the cigarette tax was increased there was a reduction in youth and adolescent smoking. However, other research shows that while there was a responsive reduction between 1991 and 2005, that effect was weakened as taxes rose after 2007.¹²⁵ Further research has attempted to quantify the amount of tax increase needed to make a meaningful difference, but there is consensus that these increases are an important component of public health efforts to reduce smoking.¹²⁶ Taxation is an important public health policy to consider when discussing tobacco legislation and policy.

Environmental Exposure

Schools

According to DC Code § 7-1701, smoking is prohibited in educational facilities including day care centers, nursery schools, elementary schools, and secondary schools.¹²⁷ Even with smoking prohibited on school grounds and legislation to prevent tobacco retailers from being within 1000 feet of school grounds, adolescents can still be greatly influenced by the behavior of their peers.¹²⁸ Research has demonstrated the relationship between youth smoking behavior and perceptions of peer smoking prevalence. One study found that adolescents who believed that half or more than half of adults or their peers smoked were significantly more likely to try tobacco products.¹²⁹ This study posited that the use of cigarettes by a peer might be a more significant predictor of tobacco use than the use of cigarettes by an adult.¹³⁰

More recent studies have found that adolescents often overestimate the tobacco use of their peers.¹³¹ This is a significant concern, as perceived rates of smoking may be more influential in

¹²⁴ Ibid.

¹²⁵ M. van Hasselt et al., "The relation between tobacco taxes and youth and young adult smoking: what happened following the 2009 U.S. federal tax increase on cigarettes?," *Addict Behav* 45(2015); Benjamin Hansen, Joseph Sabia, and Daniel Rees, "Cigarette Taxes and Youth Smoking: Updated Estimates Using YRBS Data," (National Bureau of Economic Research, 2015).

¹²⁶ Kevin Callison and Robert Kaestner, "Do Higher Tobacco Taxes Reduce Adult Smoking? New Evidence of the Effect of Recent Cigarette Tax Increases on Adult Smoking?," (National Bureau of Economic Research, 2012); Stanton Glantz, "Tobacco taxes are NOT the most effective tobacco control policy (as actually implemented)," UCSF Center for Tobacco Control Research and Education, <https://tobacco.ucsf.edu/tobacco-taxes-are-not-most-effective-tobacco-control-policy-actually-implemented>.

¹²⁷ USLegal.com, "Smoking Regulations In District Of Columbia," <https://smoking.uslegal.com/smoking-regulations-district-of-columbia/>.

¹²⁸ Tracy Garner, Tilahun Kassaye, and Tasha Lewis, "District of Columbia Communities Putting Prevention to Work: Tobacco Use," (Washington, D.C.2013).

¹²⁹ G. J. Botvin et al., "The false consensus effect: predicting adolescents' tobacco use from normative expectations," *Psychol Rep* 70, no. 1 (1992).

¹³⁰ Ibid.

¹³¹ Jennifer B. Unger and Louise Ann Rohrbach, "Why do adolescents overestimate their peers' smoking prevalence? Correlates of prevalence estimates among California 8th-grade students," *Journal of Youth and Adolescence* 31, no. 2 (2002).

predicting adolescent smoking than actual rates of smoking.¹³² According to the findings of a theoretical literature review, one of the most important risk factors for tobacco use among adolescents is the number of the adolescents' friends who smoke.¹³³

While smoking is not banned legislatively on DC college campuses, many local universities have created their own policies regarding smoking. George Washington University prohibits "smoking or inhaling any tobacco or other smoking product by any method including but not limited to, cigarettes, cigars, pipes, e-cigarettes, and hookah."¹³⁴ An unintended consequence that has arisen from banning smoking on college campuses is that people have simply moved off campus to smoke. As such, those who oppose campus smoking bans argue that such bans force smokers to leave campus and go elsewhere to smoke, which could put them in potentially dangerous situations.¹³⁵ In August 2013, American University banned the use of tobacco products on campus, but starting in March 2016 permitted smoking at a designated smoking area on campus.¹³⁶

Workplaces

Studies have shown that when workplaces add restrictions on smoking, increased cessation and reduced cigarette use occurred.¹³⁷ Adolescents whose workplaces had a smoke-free policy were more than 30 percent less likely to smoke as adolescents whose workplaces did not have a smoke-free policy.¹³⁸

In 2017, the Bureau of Labor Statistics reported that the number of employed youth (ages 16 to 24) was 20.9 million, which represented 54.8 percent of young people at the time.¹³⁹ Adolescent workers are most likely to be found working in the leisure and hospitality industry (26 percent), in locations such as fast food restaurants, followed by the retail trade industry (19 percent), and the education and health services industries (12 percent).¹⁴⁰

However, working for pay has been found to be correlated with adolescent tobacco use. Adolescents who worked more than 10 hours a week for pay tended to start using tobacco products earlier than their peers who did not work at all or who worked less than 10 hours a

¹³² J. L. Reid, S. R. Manske, and S. T. Leatherdale, "Factors related to adolescents' estimation of peer smoking prevalence," *Health Educ Res* 23, no. 1 (2008).

¹³³ B. R. Hoffman et al., "Peer influences on adolescent cigarette smoking: a theoretical review of the literature," *Subst Use Misuse* 41, no. 1 (2006).

¹³⁴ George Washington University, "Oncology Care Access in the District of Columbia: An Overview and Needs Assessment."

¹³⁵ "University Policy: Tobacco- and Smoke-Free Policy," ed. American University (2016).

¹³⁶ Jenny Doren, "George Washington University smoking ban opponents stage protest," *WJLA - Washington DC*, 11/13/12 2012.

¹³⁷ Arthur J. Farkas, "Association Between Household and Workplace Smoking Restrictions and Adolescent Smoking," *Journal of the American Medical Association* 284, no. 6 (2000).

¹³⁸ *Ibid.*

¹³⁹ Bureau of Labor Statistics, "Employment and Unemployment Among Youth," (Washington, DC 2017).

¹⁴⁰ *Ibid.*

week.¹⁴¹ This study states that a reason for this could be the “precocious development” theory, which posits that adolescents assume adult roles and behaviors to gain the perceived benefits of adulthood.¹⁴²

When smoking was prohibited at bars in a town in California, people tended to move outside to smoke, which bothered neighborhood residents.¹⁴³ This finding was similar to a study from Scotland that found that when smoking was banned at work, people would move outside to smoke.¹⁴⁴ This study suggests that a ban is only part of a piecemeal approach to addressing smoking-related problems.

Housing

Parental smoking behavior may influence children’s smoking behavior. In one study, adolescents who lived in smoke-free households were more than 25 percent less likely to be smokers as adolescents who lived in a household where smoking was allowed.¹⁴⁵ Similarly, children are more likely to smoke if their parents are smokers.¹⁴⁶ In households with parents who did not smoke, children who were in elementary and middle school were less likely to experiment with smoking compared to children who grew up in households with parents who smoked.¹⁴⁷

CDC defines secondhand smoke as “smoke from burning tobacco products, such as cigarettes, cigars, or pipes,” as well as “smoke that has been exhaled, or breathed out, by the person smoking.”¹⁴⁸ Secondhand smoke can have many health consequences for those who are exposed to it. Research has shown that there is no safe level of secondhand smoke exposure.¹⁴⁹ Research has also shown a causal association between the risk of non-small cell lung cancer and secondhand smoke and that the time of exposure affects rates of lung cancer.¹⁵⁰ Children who are exposed to secondhand smoke for a longer period of time are at a higher risk for developing lung cancer than children who are not exposed to secondhand smoke and children who are

¹⁴¹ Rajeev Ramchand, Nicholas S. Ialongo, and Howard D. Chilcoat, "The Effect of Working for Pay on Adolescent Tobacco Use," *American Journal of Public Health* 97, no. 11 (2007).

¹⁴² Ibid.

¹⁴³ R. S. Moore, R. M. Annechino, and J. P. Lee, "Unintended consequences of smoke-free bar policies for low-SES women in three California counties," *Am J Prev Med* 37, no. 2 Suppl (2009).

¹⁴⁴ Odette Parry, Stephen Platt, and Carolyn Thomson, "Out of sight, out of mind: workplace smoking bans and the relocation of smoking at work," *Health Promotion International* 15, no. 2 (2000).

¹⁴⁵ Farkas, "Association Between Household and Workplace Smoking Restrictions and Adolescent Smoking."

¹⁴⁶ Z. Harakeh et al., "Parental factors and adolescents' smoking behavior: an extension of The theory of planned behavior," *Prev Med* 39, no. 5 (2004).

¹⁴⁷ Farkas, "Association Between Household and Workplace Smoking Restrictions and Adolescent Smoking."

¹⁴⁸ Centers for Disease Control and Prevention, "Secondhand Smoke (SHS) Facts,"

https://www.cdc.gov/tobacco/data_statistics/fact_sheets/secondhand_smoke/general_facts/index.htm.

¹⁴⁹ The American Cancer Society, "Health Risks of Secondhand Smoke," <https://www.cancer.org/cancer/cancer-causes/tobacco-and-cancer/secondhand-smoke.html>.

¹⁵⁰ Richard Carmona, "The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General," (Department of Health and Human Services, 2006).

exposed to secondhand smoke for a shorter period of time.¹⁵¹ In addition to lung cancer, secondhand smoke has been found to be a risk factor for other types of cancer such as childhood leukemia, lymphoma, and brain tumors.¹⁵² It is also a risk factor for other negative health outcomes such as respiratory infections and asthma.¹⁵³

Electronic Nicotine Delivery Systems

Although cigarette smoking declined among adolescents from 2011 to 2017, the use of electronic nicotine delivery systems (ENDS), commonly called e-cigarettes, has increased.¹⁵⁴ In fact, e-cigarettes are now the most widely used tobacco product among adolescents.¹⁵⁵ Although e-cigarettes may be safer than conventional cigarettes, a 2018 report by the National Academies of Sciences, Engineering, and Medicine (NASEM) states that they still pose risk of nicotine addiction and could prompt adolescents to try cigarettes later in life.¹⁵⁶ Further, the report states that teens are more likely to use e-cigarettes than they are to use tobacco cigarettes, and e-cigarette users are more likely to become regular smokers of tobacco.¹⁵⁷ Notably, a 2016 study on the racial differences of electronic cigarette use found that African Americans planned to continue vaping behaviors to a greater extent than white and Hispanic individuals.¹⁵⁸

Although the 2018 NASEM report on e-cigarettes found that “there is no available evidence whether or not e-cigarette use is associated with intermediate cancer endpoints in humans,” because they lead to combustible cigarette use, they can indirectly lead to cancer and other tobacco-related health conditions.¹⁵⁹ Regardless of emerging evidence on their negative effects, e-cigarettes are popular among adolescents and commonly used during school.¹⁶⁰ The 2018 NASEM report states that “there is moderate evidence that secondhand exposure to nicotine and particulates is lower from e-cigarettes compared with combustible tobacco cigarettes.”¹⁶¹ However, more research is needed to fully understand the effects of e-cigarettes on the individual as well as the effects of secondhand exposure from e-cigarettes.¹⁶²

¹⁵¹ Ibid.

¹⁵² The American Cancer Society, “Health Risks of Secondhand Smoke”.

¹⁵³ Ibid.

¹⁵⁴ Centers for Disease Control and Prevention, “Smoking and Tobacco Use Health Effects: Heart Disease and Stroke,” https://www.cdc.gov/tobacco/basic_information/health_effects/heart_disease/index.htm.

¹⁵⁵ Vivek Murthy, “E-Cigarette Use Among Youth and Young Adults: A Report of the Surgeon General,” (Washington, D.C. 2016).

¹⁵⁶ NASEM. 2018. Public Health Consequences of E-Cigarettes. Washington, DC: The National Academies Press.

¹⁵⁷ National Institute on Drug Abuse, “Teens and E-cigarettes,” <https://www.drugabuse.gov/related-topics/trends-statistics/infographics/teens-e-cigarettes>; National Academies of Sciences and Medicine, *Public Health Consequences of E-Cigarettes*.

¹⁵⁸ Romano, Bloom, and Syme, “Smoking, social support, and hassles in an urban African-American community.”

¹⁵⁹ National Academies of Sciences and Medicine, *Public Health Consequences of E-Cigarettes*.

¹⁶⁰ Ana B. Ibarra, “Juul e-cigarettes and teens: ‘Health problem of the decade’?,” *CNN*, 3/15/18 2018.

¹⁶¹ National Academies of Sciences and Medicine, *Public Health Consequences of E-Cigarettes*.

¹⁶² Ibid.

In addition to the 2018 NASEM report, the Surgeon General's report on e-cigarettes and youth cites the wide availability of fruity and sweet flavors as a point of concern in facilitating nicotine addiction. Most adolescents who use e-cigarettes report using a flavored product, and the tobacco industry has a long history of using appealing flavors to target adolescents. For these reasons, Congress banned flavorings beside menthol in cigarettes. However, this ban does not extend to e-cigarettes. Marketing of e-cigarettes happens through conventional avenues like television and radio as well as newer social media platforms such as Instagram, Twitter, and Facebook.¹⁶³ The rising popularity of e-cigarette companies such as JUUL with adolescents has prompted an ongoing Food and Drug Administration (FDA) investigation into their advertising and marketing tactics.¹⁶⁴ Most recently, the Commissioner of the FDA has referred to the use of e-cigarettes by adolescents as an "epidemic," and the FDA has issued several enforcement actions, including letters and fines, in an effort to curb certain advertising and marketing practices.¹⁶⁵

E-cigarettes are an important consideration when discussing issues of tobacco use among adolescents.

Community and Nonprofit Work

In addition to a number of large national organizations, such as the American Cancer Society and American Lung Association, there are a number of smaller organizations and coalitions focused on the issues of tobacco use and cancer. Highlighted below are just a few.

National Coalitions / Organizations

Campaign for Tobacco-Free Kids

The Campaign for Tobacco-Free Kids is a national organization with a vision of "a future free of the death and disease caused by tobacco."¹⁶⁶ Although they are a large, national organization, they also work at state and local levels in the United States as well as internationally. Their programs span from policy to youth initiatives. They also have an "Industry Watch" where they monitor and discuss recent developments in the tobacco industry in an effort to hold the tobacco industry accountable.¹⁶⁷ Their youth initiatives include a "Kick Butts Day" as a day of activism, a training program for youth to train in advocacy, and a National Youth Ambassadors

¹⁶³ Murthy, "E-Cigarette Use Among Youth and Young Adults: A Report of the Surgeon General."

¹⁶⁴ Food and Drug Administration, "Press Announcements - Statement from FDA Commissioner Scott Gottlieb, M.D., on new enforcement actions and a Youth Tobacco Prevention Plan to stop youth use of, and access to, JUUL and other e-cigarettes," <https://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm605432.htm>.

¹⁶⁵ Laurie McGinley, "FDA chief calls youth use of Juul, other e-cigarettes an 'epidemic'," *The Washington Post*, September 12, 2018.

¹⁶⁶ Campaign for Tobacco-Free Kids, "About Us," <https://www.tobaccofreekids.org/about/>.

¹⁶⁷ Campaign for Tobacco-Free Kids, "Industry Watch," <https://www.tobaccofreekids.org/what-we-do/industry-watch>.

program, among others.¹⁶⁸ With their wide range of activities, they provide national coordination and support for smaller scale activities relating to youth and tobacco.

Prevent Cancer Foundation

The Prevent Cancer Foundation was started in 1985 and is focused on “cancer prevention and early detection.” In addition to providing information about a broad range of cancers, they support research through grants and fellowships, have global outreach programs, advocate on bills and relevant issues, and conduct a number of education and outreach campaigns.¹⁶⁹ These outreach campaigns include community grants for community organizations to support their work in cancer detection and prevention.¹⁷⁰

Truth Initiative

The Truth Initiative is “America’s largest non-profit public health organization dedicated to making tobacco use a thing of the past.”¹⁷¹ truth® is their marketing campaign that provides education on the health and social consequences of tobacco and demonstrates the nefarious marketing techniques of the tobacco industry.¹⁷² Additionally, the Truth Initiative focuses on research and advocacy, community and youth engagement, and creating new digital products that assist with cessation and prevention.

District of Columbia Coalitions / Organizations

Breathe DC

Breathe DC is committed to fighting all forms of lung disease. To achieve this mission, they facilitate “evidence-based community health programs, health education, community partnerships, and public policy advocacy” to “engage local residents and leaders to form a united front against asthma, smoking, lung cancer, COPD, and air pollution.”¹⁷³ Each summer, Breathe DC hosts a summer camp to help children with asthma learn self-management skills.¹⁷⁴ They also have a program that advocates for smoke-free housing in the District of Columbia.¹⁷⁵

DC Tobacco Free Coalition

The DC Tobacco Free Coalition is “a coalition of DC-based faith and community-based organizations and individual partners working together to educate the community about the effects and the harm of tobacco and second-hand smoke.” The DC Tobacco Free Coalition strives to use education, policy, and advocacy to reduce the morbidity and mortality associated

¹⁶⁸ Campaign for Tobacco-Free Kids, “Youth Initiatives,” <https://www.tobaccofreekids.org/what-we-do/youth-programs>.

¹⁶⁹ Prevent Cancer Foundation, 2018.

¹⁷⁰ Prevent Cancer Foundation, “Community Grants,” <https://preventcancer.org/research/grants-fellowships/community-grants/>.

¹⁷¹ Truth Initiative, “About Us: Who We Are And What We Do,” <https://truthinitiative.org/about-us>.

¹⁷² Truth Initiative, “Our Mission,” <http://www.projectsoarmorocco.org/mission-soar/>.

¹⁷³ BreatheDC, “Who We Are,” <https://breathedc.org/about-breathe-dc/>.

¹⁷⁴ BreatheDC, “About Camp Breathe Happy,” <https://breathedc.org/camp/>.

¹⁷⁵ BreatheDC, “Smokefree Housing,” <https://breathedc.org/smokefree-housing/>.

with tobacco use.¹⁷⁶ In addition, the coalition has youth programs that use peers and a youth-to-youth approach to further their mission. They also host an annual “DC Calls It Quits Week” to continue raising awareness of youth tobacco use in the District of Columbia.¹⁷⁷

Trust and Cultural Competency

Note: This section has been adapted from the 2017 DC Public Health Case Challenge case.

Developing interventions for at-risk and marginalized communities requires that those with public health training are aware of underlying issues such as access to care, implicit bias, and types of structural racism that influence the communities they are hoping to work with. Working with established community organizations and networks is vitally important for ensuring cultural competence and appropriate interventions because local organizations are often well informed about the needs of their community’s residents and carry significant influence in their community.

In the area of tobacco cessation, cultural competence has been demonstrated to directly improve outcomes. One study investigated the implementation of a culturally targeted intervention in an effort to demonstrate how cultural targeting affects cessation efforts. Studying the African American community specifically, where lower cessation rates have been previously documented, revealed that a targeted approach “showed high levels of feasibility, acceptability, and better adherence to nicotine replacement therapy, higher quit rates, and better retention and follow-up compared with the ST [standard therapy].”¹⁷⁸ This study provides evidence of the role of cultural competence in smoking cessation and contributes to the importance of culturally targeted approaches.

Additionally, it is important for individuals and organizations who are working to improve the health conditions of a community to consider the various issues that the community has faced historically, those that currently affect the community, and those the community may face in the future in order to better understand and to assist more appropriately and effectively. Furthermore, such organizations need to engage with and include the organizations and community structures in place to more effectively and appropriately implement sustainable solutions.

Unintended Consequences of Policies

Although most public health policies have positive effects on wellbeing, there have been numerous examples of seemingly well-meaning policies have had unintended negative

¹⁷⁶ District of Columbia Tobacco Free Coalition, “About Us,” <http://www.dctfc.org/>.

¹⁷⁷ District of Columbia Tobacco Free Coalition, “DC Calls it Quits!,” <http://www.dctfc.org/dc-calls-it-quits-week-2017/>.

¹⁷⁸ A. K. Matthews, L. Sanchez-Johnsen, and A. King, “Development of a culturally targeted smoking cessation intervention for African American smokers,” *J Community Health* 34, no. 6 (2009).

consequences. Two examples of this situation, zero tolerance and smoke-free public housing, highlight how those negatively affected are frequently African Americans and other minorities.

Zero-tolerance policies have been adopted in many academic settings since the mid-1990s and are documented to have been modeled off of zero-tolerance drug policies. These policies are intended to help create a safe environment for students to learn and play in by having zero tolerance for significant disruptions to the learning environment.¹⁷⁹ While well intentioned, the effectiveness of these policies has frequently been called into question. Beyond the assessment of how well they improve the learning environment, one major issue is how they are documented to result in more suspensions for students of color, specifically African American students.¹⁸⁰ This has been shown to be present when controlling for socio-economic status and with no evidence that African American students are more likely to be disruptive or violent.¹⁸¹

Another policy that has led to negative unintended consequences is the smoking ban in public housing, as mentioned earlier. This rule prohibits tobacco products in living units, indoor common areas, administrative offices, and all outdoor areas within 25 feet of housing and administrative office buildings. This law could have a considerable impact on adolescent smoke exposure, as a significant number of DC youth live in public housing.¹⁸² However, some argue that such residential smoking bans affect only the poorest individuals who need public housing. Critics argue that this policy may create a burden for those who are addicted to smoking and unequally targets vulnerable populations, such as residents who are elderly and/or disabled.¹⁸³ As a public health measure, this policy has sound rationale. By banning smoking in public housing, residents, including the large number of children who live in public housing, are protected from secondhand smoke exposure and guaranteed their right to live in a smoke-free environment.¹⁸⁴ However, the enforcement of this rule can include eviction, and while the health and safety of other residents is important, displacing individuals from their housing is a serious concern.¹⁸⁵ One argument for this is that the policy could serve as motivation to quit smoking, yet the infrastructure and resources for cessation that are available to those living in public housing are often poor or absent. Lastly, recent data indicate that 42 percent of heads of households in public housing are African American, while population estimates for the United States indicate only 13.4 percent of the population as African American.¹⁸⁶ Thus, this policy risks

¹⁷⁹ American Psychological Association Zero Tolerance Task Force, "Are zero tolerance policies effective in the schools?: an evidentiary review and recommendations," *The American Psychologist* 63, no. 9 (2008).

¹⁸⁰ Ibid.

¹⁸¹ Ibid.

¹⁸² Jerry Markon and Lisa Rein, "HUD proposes smoking ban in public housing, citing dangers of secondhand smoke," *The Washington Post*, 11/12/15 2015; Ben Sullivan, "HUD Secretary Castro Announces Public Housing to Be Smoke-Free," <https://archives.hud.gov/news/2016/pr16-184.cfm>.

¹⁸³ Markon and Rein, "HUD proposes smoking ban in public housing, citing dangers of secondhand smoke."

¹⁸⁴ D. E. Levy, I. F. Adams, and G. Adamkiewicz, "Delivering on the Promise of Smoke-Free Public Housing," *Am J Public Health* 107, no. 3 (2017).

¹⁸⁵ Department of Housing and Urban Development, "Questions and Answers on HUDs Smoke Free Public Housing Proposed Rule."

¹⁸⁶ Department of Housing and Urban Development, "Resident Characteristics Report: As of May 31, 2018," <https://pic.hud.gov/pic/RCRPublic/rcrmain.asp>; United States Census Bureau, "U.S. Census Bureau QuickFacts".

further displacement and disruption to already marginalized communities, including African Americans and other people of color.

These two policies present examples of well-intended public health policies with unintended consequences that disproportionately affect minority communities. These policies have targeted minority populations and further disenfranchised groups who are already facing systems that perpetuate structural racism and bias. It is important when developing interventions to carefully consider these potential unintended consequences.

Conclusion

Smoking and tobacco use are complex public health problems with later health consequences (including lung cancer, COPD, diabetes, hypertension, and other cancers) for decisions made during adolescence. These health consequences are largely preventable, but due to a myriad of reasons discussed in this case, there are still a significant number of adolescents who begin smoking. In addition, newer devices such as e-cigarettes and other electronic nicotine delivery systems are changing the landscape of youth tobacco and nicotine use. The health issues associated with these behaviors are amplified across socioeconomic status and race, with confounding issues such as lack of access to care and lack of trust of health care providers. In the District of Columbia, the resulting health disparities are greatest in Wards 7 and 8, where there also exists significant potential for intervention. With interventions that focus on adolescents and cross multiple levels of the social ecological model, these later health consequences can be better mitigated and prevented.

Appendix A: List of Acronyms and Initials

ACA.....	Affordable Care Act
CDC.....	Centers for Disease Control and Prevention
COPD	Chronic Obstructive Pulmonary Disorder
DC.....	District of Columbia
ENDS.....	Electronic nicotine delivery systems
FDA.....	Food and Drug Administration
HHS.....	Department of Health and Human Services
HUD	Department of Housing and Urban Development
NASEM	National Academies of Sciences, Engineering, and Medicine
NIH	National Institutes of Health
WHO.....	World Health Organization

Appendix B: Resource List

National

- American Cancer Society
- American Heart Association
- American Lung Association
- Campaign for Tobacco Free Kids
- Centers for Disease Control and Prevention
- Department of Health and Human Services
- Department of Housing and Urban Development
- Food and Drug Administration
- National Cancer Institute
- National Institutes of Health
- Prevent Cancer Foundation
- Truth Initiative

DC, Maryland, Virginia

- Breathe DC
- DC Tobacco Free Coalition
- District of Columbia Office of Planning
- District of Columbia Public Schools
- Government of the District of Columbia

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Appendix E: Judging Rubric

DC Regional Case Challenge 2018—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; #Interprofessional Prize; Wildcard Prize;

	Poor	Acceptable	Very Good	Outstanding	Comments
Analysis of Problem/Challenge					
- Astute synthesis of problem - Identification of key issues	☐	☐	☐	☐	
Appropriateness/Justification of Solution					
- Justification of chosen priorities - Justification of chosen intervention(s) - Evidence to support likely effectiveness - Resourcefulness in gathering information	☐	☐	☐	☐	
Acceptability/Uptake of Solution *					
- Acceptability to relevant stakeholders - Cultural acceptability - Social/behavioral considerations	☐	☐	☐	☐	
Implementation Considerations *					
- Implementation plan - Timeline and budget - Feasibility (budget and other resources, time frame, cultural/political constraints, logistical/infrastructure constraints) - Monitoring and evaluation plan	☐	☐	☐	☐	
Potential for Sustainability *					
Long-term maintenance and growth (feasibility, funding)	☐	☐	☐	☐	
Interdisciplinary/Multisectoral #					
Use of collaborations/interactions among disciplines and/or sectors	☐	☐	☐	☐	
Teamwork #					
- Engagement of whole team in preparation and/or presentation - Clear team understanding and use of each other's roles and expertise	☐	☐	☐	☐	
Presentation Delivery					
- Clarity of content and logic of flow - Time management - Audience engagement - Visual aesthetic - Professionalism, poise, and polish	☐	☐	☐	☐	
Questions and Answers					
- Clarity and thoughtfulness of responses - Ability to draw from evidence	☐	☐	☐	☐	

Appendix F: Case Writing Team Biographies



Wyatt Bensken (Team Lead) is a 2016 graduate of American University's Department of Health Studies. After serving two years as a Fellow at the National Institutes of Health, Wyatt is now pursuing his Ph.D. in Epidemiology and Biostatistics at Case Western Reserve University. In addition to the NIH, Wyatt has prior research experience with the National Coalition for the Homeless, the National Park Service Office of Public Health, and the University of Nairobi School of Public Health. Wyatt was a writer for the 2016 DC Public Health Case Challenge, and was the Team Lead for 2017, now returning for his 3rd year with the Case Challenge.

Joe Brough (Case Writer) graduated from the United States Naval Academy in May of 2018. Originally from McLean, Virginia, Joe was a chemistry major at the Naval Academy, and started medical school at Stanford in August of 2018. He is interested in infectious disease. This is Joe's first year with the Case Challenge.



Divya Gutala (Case Writer) is a graduate of George Mason University, with a bachelors in neuroscience. Her previous research experiences include Johns Hopkins University, and the Food and Drug Administration. Divya is interested in working with diverse groups and implementing ways to better improve their health needs through clinical research and community outreach. She is currently pursuing an MPH at George Washington University, and hopes to attend medical school soon after. She was a 2017 Case participant before writing the 2018 Case.

Mark Lorthe (Case Writer) is a 3rd year medical student at Howard University. Prior to entering medical school, Mark was a Registered Nurse where he worked closely with patients and families of low-income urban communities in the Bronx, New York. Mark is interested in psychiatry, neurology, radiology, public health and health policy with the intent of obtaining an MPH after his MD and to contribute to health and education in both low-income urban communities in the U.S. as well as developing areas in Africa. Mark was part of the team representing Howard in 2016 and 2017 and is a writer for the first time this year.





Poorna Sreekumar (Case Writer) is a 3rd year medical student at the University of Maryland, Baltimore. She graduated with a bachelors in chemistry in 2014 from the University of Maryland, College Park. Poorna is interested in public health as well as health policy. This is her first year with the Case Challenge.

Rediet Woldeselassie (Case Writer) is a 1st year graduate student at George Mason University studying Health Informatics with a concentration in Health Data Analytics. He graduated from George Mason University with a bachelors in health administration and policy in 2018. Rediet is a 10-year veteran of the United States Marine Corps, where he served as a logistics management and supply chain analyst. Previously, Rediet was a research assistant at George Mason University's College of Education and Human Development where he worked on analyzing the impact of education on minority and underrepresented university students. Rediet was on the team representing George Mason University at the 2016 DC Public Health Case Challenge. The following year, he volunteered to be on the case writing team for the 2017 challenge and has since returned to be part of the 2018 Case writing team.



Liliana Zigo (Case Writer) graduated from American University with a bachelors in in Public Health and Psychology and a minor in Statistics. She was a member American University's Honors program and in the College of Arts and Sciences Leadership and Ethical Development program. Previously, Liliana was a Killam Fellow sponsored by Fulbright Canada and attended the University of Toronto. Presently, Liliana works at the Cancer Support Community in Washington, DC, as their Education Coordinator. Liliana has participated in three case competitions, including the 2016 DC Public Health Case Challenge, and authored American University's 2018 Global Health Case Competition.

Appendix G: Guide for Student Teams and Advisors

DC Regional Public Health Case Challenge 2018 Guide for Student Teams and Faculty Advisors

The National Academies of Sciences, Engineering, and Medicine (NASEM) will host the Sixth Annual DC Regional Public Health Case Challenge on October 14, 2018 to promote interdisciplinary, problem-based learning for the betterment of our DC area community. Teams will be asked to approach a realistic public health issue facing the DC area community and to develop a multi-faceted plan to address it. A panel of expert judges will watch student presentations and pick winning solutions.

Organizers

NASEM Health and Medicine Division (HMD) Staff

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Mark Lorthe (Howard University)

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Rediet Woldeleslassie (George Mason University)

Liliana Zigo (American University)

Theme

The broad topic of this year's case is "Cancer in DC: Eliminating Disparities."

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, nursing, public health, law, business, communications, engineering, IT, gender studies, anthropology, economics, sociology, etc.). Teams are encouraged to have both undergraduate and graduate students.
- A **webinar** will take place for all students who will be competing (advisors are also welcome to tune in). The purpose of the webinar is to provide a primer on **upstream, evidence-based policy solutions for public health issues**, an overview of the Case Challenge process, and

Q&A. The webinar will take place before the case is released on Friday, September 28 at 12:00pm.

- **Student teams** will be provided with a case that is based on a real-life challenge faced by individuals and organizations in the DC area. Teams will be 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 2013-2017 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](#).
- Press release announcing the winning solution through the National Academy of Medicine (NAM) and the Health and Medicine Division of the Academies.
- Publication by NAM summarizing each team's solution written by team members (team members listed as authors). Past publications are available at <https://nam.edu/initiatives/dc-public-health-case-challenge/>.
- Breakfast, lunch, and a small reception will be provided.
- FREE entrance to the NAM annual meeting on Monday, **October 15**, for ALL interested team members and advisors. The teams who receive the four awards (Grand Prize and the Practicality, Interprofessional, and Wildcard Prizes) will be invited to attend the "Building Leadership Across Generations for Health and Health Policy" luncheon highlighting the work of the 2018 event and other programs on Monday, **October 15**.
 - Attending the NAM annual meeting is an exciting opportunity to meet and connect with leaders in the fields of health, medicine, and beyond. See <https://nam.edu/events/> for more information.
 - ***A minimum of three team members must be available on October 15 from 12:00 – 1:45, as the winning teams will be invited to share a brief overview of their team solution during roundtable discussions at the Building Leadership Across Generations luncheon on October 15.***
 - *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
 - Interprofessional Prize
 - Practicality Prize
 - Wildcard Prize

Timeline

- **Friday, September 7:** Deadline for universities to confirm participation (please email Sophie Yang at syang@nas.edu).
- **Wednesday, September 19:** Deadline to submit two lists of names (*use the form on the last page of this guide*):
 - 1) Team member names with areas of study and email addresses for final team registration.
 - 2) Names of all team members and advisors attending the NAM annual meeting on October 15.
 - **IMPORTANT NOTE:** Winning teams will be invited to the “Building Leadership Across Generations for Health and Health Policy” luncheon at the NAM meeting on October 15. *At least three team members from each team must be available to provide a 3-minute overview of the team solution from 12:00 to 1:45pm in the event your team is a prize winner.*
 - *Advanced registration is required to attend the NAM annual meeting, so all interested in attending must let us know on the status form.*
- **September 28 at 12:00pm:** A one-hour informational webinar for competing students (and advisors) will take place before the case is released. The webinar will be recorded and posted online, so any students who are not available at this time can view the recording after. Students (and advisors) are welcome to email questions in advance. The purpose of the webinar is to provide a primer on upstream, evidence-based policy solutions for public health issues, an overview of the Case Challenge process, and Q&A.
- **September 28 at 1:00pm:** Case released.
- **September 28—October 14:** Teams will develop their solution to the case.
- **Sunday, October 14:** Teams will present solutions to a panel of judges. Presentations will be followed by an awards ceremony. The event will take place from approximately 8:30am to 5:00pm; we will let you know the exact times once we know the number of participating teams. Breakfast, lunch, and a reception will be provided.
 - o **NEW in 2018!** While the judges are off deliberating after the competition, each team will choose one member to present a 3-minute overview of the team’s solution to all competing teams. This will allow the competitors to learn how other teams approached the challenge. This 3-minute overview will also be used by members of the winning teams at the “Building Leadership Across Generations for Health and Health Policy” luncheon on October 15. A portion of the luncheon format will include roundtable discussions. At each of the tables a member from one of the 4 winning teams will provide the 3 minute overview followed by a roundtable discussion of the team solution.
- **Monday, October 15:** NAM annual meeting where all teams will have the opportunity to attend the meeting and winning teams will participate in a luncheon with NAM members and others (including the opportunity to share the team’s solution at the luncheon roundtable discussions).

Getting to the National Academy of Sciences Building

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

Driving to the NAS building: 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 the Case Challenge 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 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.

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 (available at <https://nam.edu/initiatives/dc-public-health-case-challenge/>), 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 solution.

Developing the Case Solution:

- Organizers will deliver the case electronically to competing teams once the webinar (date TBD) has concluded. The case will be provided to faculty advisors 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 12.
- Teams should not discuss their case presentations or case content with other teams during the case challenge period (September 28—October 14) until the judges have completed final scoring.
- Teams 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. Students are encouraged to ground their solutions in public health theory, particularly the social-ecological model of health.
- 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 about their case solution until judging has concluded on Sunday, October 14. Please help the organizers by adhering to this rule during breaks.

Faculty Advisors:

Each team must have at least one faculty advisor. The faculty advisor(s) 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 three disciplines. Faculty advisors can also help student teams prepare for the competition within the following parameters:

- Faculty advisors **CAN**:
 - Ensure that the case is grounded in public health theory, in particular the social-ecological model of health
 - 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 Challenge 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 black and white 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 solution 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 8:30AM on Sunday, October 14**. 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 one week before the event, and biographical sketches of the judges will be available to student teams at that time.
- 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 28.

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!

Emory Global Health Case Competition:

http://globalhealth.emory.edu/what/student_programs/case_competitions/index.html

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

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

Winning presentation from 2015 Vanderbilt Global Health Case Competition:

<http://www.vanderbilt.edu/vigh-sac/case/2015ghcc.pdf>

Triangle Global Health Case Competition: <http://triangleghcc2013.wordpress.com/>

Yale Global Health Case Competition presentations:

<http://www.slideshare.net/yaleglobalhealthcc>

Appendix H: 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 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 at approximately 12:00pm on Friday, September 29 once the webinar has ended. 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 9:00 a.m. 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).
 - Fifteen minutes are allotted to present analysis and recommendations.
 - Ten minutes are allotted for Q&A with judges.
 - Timing will be strictly enforced.
 - Any leftover time will be used 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 8:30 a.m. on Sunday, October 14**. 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
 - Teamwork
 - 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 I: Presentation Day Agenda

DC Public Health Case Challenge 2018

Agenda

October 14, 2018

National Academy of Sciences Building
2101 Constitution Avenue, NW, Washington, DC
Auditorium, Tent, and West Court

8:00–8:30 a.m. **Arrival and Registration** (*Auditorium; breakfast provided in Great Hall*)

8:30 a.m. **Deadline to Turn in Presentation** (*Auditorium*)
Please take your flash drive to the Case Challenge staff member at the computer. This is when you will draw a number for presentation order.

Judges Check In

8:45 a.m. **Welcoming Remarks**
Victor J. Dzau, M.D., President, National Academy of Medicine

8:55 a.m. **Logistics**

9:00 a.m.–1:00 p.m. **Presentations** (*Auditorium*)
At this time, all but the first team should leave and go to the tent. After your team has presented, you may remain in the room 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.

9:00–9:30	Team 1
9:30–10:00	Team 2
10:00–10:30	Team 3

10:30–10:45	Break
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10:45–11:15	Team 4
11:15–11:45	Team 5

11:45–12:00	Break
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	12:00–12:30	Team 6
	12:30–1:00	Team 7
1:00–1:45 p.m.	Lunch/Break (<i>Students in tent; Judges grab lunch from tent and take to Room 114</i>)	
1:00–2:45 p.m.	Judges’ Deliberations (<i>Room 114</i>)	
2:00–2:40 p.m.	Brief Overviews of Each Team’s Solution , (<i>Auditorium</i>)	
2:45-3:00 p.m.	Group Photo (<i>Einstein statue; judges join if time permits</i>)	
3:00-4:00 p.m.	Awards Ceremony & Reception for Students, Advisors, Judges (<i>West Court</i>)	