

2026 DC Public Health Case Challenge

Sustaining the Mind and Body: Preventing Multimorbidity of Mental and Physical Chronic Disease Development Among DC Residents

NATIONAL ACADEMY OF MEDICINE

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Acknowledgments

The authors express their appreciation to Patricia Cuff (National Academies of Sciences, Engineering, and Medicine [National Academies]), Mac McCullough (Boise State University), and Nilay Shah (Northwestern University Feinberg School of Medicine and National Academy of Medicine [NAM] Fellow) for reviewing the case and providing valuable feedback. In addition, the authors thank the National Academies staff from the Center for Health, People, and Places for their guidance during case development: Amy Geller (Senior Program Officer) and Alina Baciu (Senior Program Officer).

Disclaimer

All characters and organizations 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 devise a variety of creative, interdisciplinary, and evidence-based approaches across the Social Ecological Model (SEM). The authors of this case study have provided essential data and information in the text and appendices with additional resources and references to help teams develop their proposed solutions. The data provided are drawn from independent sources and clearly cited so teams can verify and use the information as appropriate and relevant to their approach to the case. Teams are responsible for justifying the accuracy and validity of all data and calculations in their presentations and supporting their assertions in front of a panel of subject matter experts who will serve as judges representing different stakeholders.

AI Disclosure

AI was used to aid in the construction of parts of this document as detailed in this disclosure. OpenAI ChatGPT-5, Google Gemini, and Grammerly AI were used to check grammar, sentence structure, syntax, and flow as well as to reword a small minority of sentences in this document. OpenAI ChatGPT-5 was also used to aid in comparing sources for Appendix D. All material generated by an AI platform used in this document was reviewed, proofread, and fact-checked to ensure accuracy of the presented information.

Instructions

Task: Based on details provided in the funding announcement, develop a feasible and innovative proposed solution using a public health approach to address multimorbidity among DC residents across the life course. For this case, multimorbidity refers to the co-occurrence of two or more chronic conditions in the same individual, including physical, mental health, and long-duration infectious conditions (Valderas et al., 2009). Unlike a comorbidity framework, which often centers on one primary disease, a multimorbidity framework recognizes that two or more conditions can coincide and interact (Academy of Medical Sciences, 2018). To address the intersection of mental and physical health through a life course perspective, interventions

should focus on the primary and secondary prevention[1] of multimorbidity among underserved DC subpopulations. Present your proposed solution(s) to address the problem at the Case Challenge competition to be held on October 16, 2026.

Scope: The proposed solution is limited to a budget of $3 million USD to be used over a 4-year period. Your proposed solution and presentation should specify which ward(s), target population (i.e., groups of people including life course stage(s)), chronic diseases (at least 2, with 1 being mental health-related and the other(s) related to physical health or long-term infection), prevention level(s), and organizations your intervention(s) will engage, and provide a justification for these selections. Staff salaries for the intervention should be covered in the allowed budget ($3 million total). All preparatory and intervention activities should happen within the 4-year funding period.

Outside resources: Teams should consider engaging outside resources for a deeper understanding of the problem and to develop a stronger proposed solution. However, team members must generate the proposed solution independently. Faculty advisors and other individuals who serve as a resource should not generate ideas for the proposed solutions, but may provide relevant supportive information, guide students to resources, and offer feedback on students' ideas/proposed solutions and recommendations on draft slides/practice presentations.

Use of artificial intelligence (AI) tools: Please refer to Appendix D for the full AI policy including detailed rules and guidelines for its use. In summary, if you choose to use AI (generative or otherwise), it should be used only as an assistant, not a teammate—it should aid in your team's work, not replace it.

- You may not feed the case (this document) into an AI to develop the solution. The solution needs to be developed by the team of humans. Furthermore, feeding the case into AI is strictly prohibited as this document is not public information.
- AI should be used solely as a tool to identify support for and to prepare the presentation of the solution. Team members should fact check and verify the accuracy of AI-generated items.
- At the end of your presentation, disclose the nature and extent of AI use in preparing the solution. You are responsible for the accuracy (and appropriate attribution/citation) of everything presented in your case.

Judging: Refer to the judging rubric (see Appendix F) for the criteria on which you will be assessed. Judges are drawn from organizations working with Washington, DC residents, academic and clinical medicine, and other nonprofit organizations.

If you have questions about the case, please e-mail National Academies staff at DCCaseChallenge@nas.edu before 9:00 am on Thursday, October 15, 2026. Staff will forward your question and the answer to all participating teams.

On the day of the presentation, October 16, please remember the following:

[1] See page 10 for definitions of primordial, primary, secondary, tertiary, and quaternary prevention.

- Arrive at the National Academy of Sciences building (2101 Constitution Avenue, NW, Washington, DC; entrance on C Street) between 8:00 am and 8:30 am.
- The security guard will ask to see your ID and direct you Room 125 to check in.
- Bring a copy of your presentation in PowerPoint format on a flash drive and give it to the Case Challenge organizers in Room 125 by 8:30 am (you may also email it to DCCaseChallenge@nas.edu by 8:30, but bring a backup on a flash drive and check in in Room 125).
- 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. Team members may identify their field of study if desired.

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

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

Case

Sustaining the Mind and Body: Preventing Multimorbidity of Mental and Physical Chronic Disease Development Among DC Residents

Funding Announcement and Specific Case Challenge

The DC Institute for Chronic Disease Prevention (ICDP) announces a Request for Proposals (RFP) for a 4-year, $3 million grant to fund innovative, evidence-based initiatives addressing mental and physical chronic multimorbidity among DC residents across the life course.

Proposed solutions using data-driven strategies to identify settings and underserved DC subgroups across the life course (e.g., perinatal, pediatric, adolescent, young adult, midlife, and older adults) will be prioritized. Proposed solutions must focus on primordial, primary, or secondary prevention[1] of mental or physical chronic conditions. Tertiary and quaternary prevention[1] strategies and novel genetic therapies are excluded. Proposed solutions addressing two or more levels of the Social Ecological Model (SEM) (Appendix A) and collaboration across multiple DC wards will be prioritized.

The Challenge

How can ICDP prevent or delay mental and physical multimorbidity in a specific DC population? As a Washington, DC-based team focused on health disparities, you will design a sustainable, feasible public health proposed solution targeting the intersection of mental and physical multimorbidity focused on primordial, primary, or secondary prevention[1], across multiple levels of the Social Ecological Model (Appendix A). Backed by your organization's leadership, your team has two weeks to apply for this competitive grant.

Constructing your case: Use the following table to aid in the construction of your proposed solution which should include at least one element from each aspect row listed. With the exception of prevention levels, these lists are NOT exhaustive. ***You may choose other populations or conditions not listed.*** Please ensure that your choices are supported by evidence and biological plausibility. An example of how to use this table would be a proposed solution focusing on primordial prevention of cardiometabolic disease and depression among veterans in midlife.

Aspect	**Example elements**
Prevention level	Primordial, primary, secondary[1]
Population	Veterans, pregnant women, men, low-income, families, children, racial and ethnic group(s), one DC ward, specific workers (e.g., construction workers)

Life Course Stage	Life course-specific stage or transition (e.g., pediatric, adolescent, young adult, midlife, older adult), sex-specific stage or transitions (e.g., perinatal period, menopause)
Mental Health Conditions and Substance Use Disorders(s)	Depression, anxiety, bipolar disorder, adjustment disorders, eating disorders, suicidal ideation/self-harm, gambling disorder, substance use disorders (e.g., alcohol use disorder)
Physical Health Condition(s)	Cardiometabolic disease (e.g., hypertension, diabetes, obesity), cardiovascular disease (e.g., stroke, atrial fibrillation, coronary artery disease, heart failure), musculoskeletal disorders (e.g., chronic pain, gout, osteoarthritis), respiratory disease (e.g., asthma, COPD), autoimmune disease (e.g., lupus, rheumatoid arthritis), cancer (colorectal, breast, uterine (endometrial), pancreatic, kidney, and thyroid), neurodegenerative disease (e.g., Alzheimer's, Parkinson's, Huntington's)

Illustrative Case Scenarios

The scenarios are meant to illustrate some types of life circumstances and health conditions that communities within Washington, DC are likely to experience. These scenarios are not representative of all populations in the region.

Scenario 1: Leo is a 10-year-old boy living in a DC neighborhood in Ward 3 with limited safe outdoor recreational spaces. He spends most of his free time sedentary, playing video games. Recently, routine pediatric screenings identified Leo as having early signs of hypertension and prediabetes, suggesting early cardiometabolic risk. At school, he is irritable, struggles to focus, and has declining grades. His family is struggling to coordinate his medical appointments while managing his behavioral changes. One of Leo's teachers suggested he be evaluated for Attention Deficit Hyperactivity Disorder (ADHD), but his family is nervous about how stigma related to this diagnosis may impact his education.

Scenario 2: Sarah is a 21-year-old college student living in Ward 1 who was diagnosed with lupus last year. Frequent flares and medication management have made it difficult to keep up with school. As she prepares for graduate school and begins a summer internship, she experiences symptoms of depression and has withdrawn from friends and campus activities. The stress and decrease in social support are endangering her mental health.

Scenario 3: Paul is a 35-year-old male police officer in Ward 6 struggling with severe occupational burnout and depression. He has increasingly relied on heavy alcohol use and

chain-smoking to numb his daily work-related stress leading him to develop a persistent, infectious form of bronchitis. The respiratory infection is constantly aggravated by his frequent patrols in poor air quality, exacerbated by heavy traffic, ongoing construction, and the intense DC summer heat. Limited time off and difficulty accessing care have kept him from seeing a healthcare provider.

Scenario 4: Frankie is a 38-year-old new mother living in Ward 7, with generalized anxiety disorder (GAD) and persistent hypertension. Following a high-risk pregnancy complicated by gestational hypertension and postpartum anxiety, she is now navigating early postpartum while managing both her mental health and ongoing blood pressure issues. Frankie often feels overwhelmed by the dual burden of monitoring her blood pressure at home while caring for her infant. Her anxiety has intensified due to fears about her health, her child's well-being, and the challenges of balancing motherhood with her job. Though she has a prescription for a Selective Serotonin Reuptake Inhibitor (SSRI), and therapy referral, she is finding it increasingly difficult to keep her follow-up appointments. Frankie is worried about her blood pressure leading to long-term heart disease or stroke, but feels trapped by the financial and logistical (e.g., unreliable public transportation, lack of childcare) barriers to accessing consistent, integrated care for her conditions.

Scenario 5: Anna is a 53-year-old woman living in Ward 8. She has been navigating menopause-related quality of life and health impacts, including weight gain, insomnia, hot flashes, mood changes, and brain fog. At her last wellness check, Anna's physician assistant noted an increase in her blood pressure and cholesterol levels. The provider discussed lifestyle changes (e.g., nutrition, exercise, and sleep) and medications to help reduce her risk for later cardiometabolic disease, musculoskeletal problems, cognitive decline, and depression. However, Anna is concerned that her health insurance will not cover the medications, her neighborhood lacks safe spaces to exercise, and she lives a 55-minute bus ride away from the nearest grocery store with affordable, healthy food options.

Scenario 6: Thomas, a 71-year-old Ward 5 veteran, struggles with severe depression driven by post-retirement social isolation. He also has Type II diabetes and chronic service-related lower back pain. Although he receives VA benefits, he still struggles with out-of-pocket costs (including diabetes supplies and healthy groceries), transportation, coverage uncertainty, and specialized back physical therapy. Long transit routes with multiple bus transfers to his distant VA clinic cause him to miss appointments, worsening his glycemic control and pain. Feeling that VA mental health care ignores his physical pain, Thomas hesitates to try community care due to out-of-pocket costs and uncertain VA coverage.

Problem Statement

Multimorbidity is a growing global public health threat, affecting an estimated 42% of American adults (Schiltz, 2022; Skou et al., 2023). A meta-analysis of data from 2000 to 2021 places global prevalence at 37.2%, with North America reporting significantly higher rates at 43.1% (Chowdhury et al., 2023). This burden is substantial in Washington, DC, where nearly half of

adults aged 18–64 reported at least one chronic condition in 2023 (KFF, 2023). Multimorbidity is linked to poorer quality of life, disability, premature mortality, and affects individuals, communities, and the health system (Skou et al., 2023).

The impact of multimorbidity is made more severe by the complex, bidirectional relationship between mental and physical health. Depression is two to three times more common in populations with multimorbidity and the link is cyclical (Read et al., 2017). Metabolic diseases elevate cardiovascular risk, which in turn fuels further psychological distress (Zhou et al., 2024). This compounding burden is exacerbated by disability, which is associated with higher rates of chronic disease and reduced access to healthcare (NASEM, 2017; Zhou et al., 2024).

Systemic inequities influence health outcomes and contribute to the development and progression of multimorbidity. The burden of multimorbidity in Washington, DC, is shaped by persistent inequities across race, geography, and income. Black adults experience multimorbidity-related aging five to ten years earlier than other racial groups (Caraballo et al., 2022). Geographic disparities further exacerbate these trends, exemplified by a 15-year life expectancy gap between residents of Ward 8 and Ward 3, which correlates with higher rates of conditions like diabetes among African American and Latino populations (King & Cloonan, 2023). Furthermore, immigrant communities may also experience increasing mental illness, and chronic disease morbidity increases with residence in the US (Zheng & Yu, 2025).

Preventing multimorbidity requires intervening before multiple chronic conditions become established. Because some risk factors originate in early development, addressing multimorbidity requires shifting toward a life-course perspective that integrates systems to provide early, sustainable interventions to prevent chronic disease before it starts (Ferro, 2023; Halstead, 2024). Addressing these disparities is essential to achieving global health targets, including United Nations Sustainable Development Goal 3.4, which seeks to reduce premature mortality from non-communicable diseases (WHO, n.d.).

Systemic inequities contribute to the unequal distribution of multimorbidity and indicate the need for approaches that extend beyond individual-level clinical care. Differences across race, geography, income, disability, and immigration status demonstrate how the conditions in which people live can shape chronic disease risk and progression. A coordinated life course approach that addresses shared risk factors and centers underserved DC populations is needed to prevent multimorbidity before it develops or worsens.

Defining Multimorbidity and Its Impact in DC Communities

Differing understandings of multimorbidity

Currently, no agreed-upon criteria or measurement for multimorbidity exists, and there are inconsistencies in the literature in describing the coexistence of multiple conditions. Thus, defining multimorbidity remains a challenge. Historically, “comorbidity” was proposed in 1970 to describe the co-occurrence of an additional condition with a primary or index condition

(Feinstein, 1970). It was not until 2015 that “multimorbidity” was proposed as a term to differentially describe several conditions that co-exist, without a single focus of attention to one condition above the others (Skou et al., 2023). More recently, The Lancet has highlighted the term *syndemics*, a conceptual framework that focuses on the interaction of multiple health problems and the impact of the social, economic, environmental, and political context (The Lancet, 2017).

In 2018, a Medical Subject Heading (MeSH) term was dedicated to multimorbidity, defining multimorbidity as “the complex interactions of several coexisting diseases” (Fortin, 2018). The Academy of Medical Sciences suggested a working definition of “the coexistence of two or more chronic conditions”, each one of which is either:

- A physical, non-communicable disease of long duration, such as cardiovascular disease or cancer.
- A mental health condition of long duration, such as a mood disorder or dementia.
- An infectious disease of long duration, such as HIV or hepatitis C (Academy of Medical Sciences, 2018).

This definition is consistent with the World Health Organization (WHO) definition of multimorbidity as “being affected by two or more chronic health conditions in the same individual” and reflects the most frequently used definition by researchers. Chronic diseases are defined by the CDC as “conditions that last one year or more and require ongoing medical attention or limit activities of daily living, or both” (CDC, 2026b). One nationally representative cross-sectional study of U.S. households found that the most prevalent combination of conditions was hyperlipidemia and hypertension, which also represented the highest cost burden (Appendix B, Figures B1 & B2) (Schiltz, 2022).

Because multimorbidity does not center a “main” or index condition, it goes beyond single-disease prevention models to look at the whole individual. This framework requires consideration of how mental health, physical health, long-duration infectious conditions, and social conditions continuously interact and influence one another over time. Rather than treating conditions in silos, managing multimorbidity means recognizing how these different domains trigger and exacerbate one another, a dynamic most evident in the relationship between mental and physical health.

Intersection between mental and physical health

Mental and physical health are inextricably linked components of overall well-being. The biopsychosocial model shows that illness is not isolated to the body; it is heavily influenced by such factors as social environments, emotional tone, and coping skills (Halstead et al., 2024). Addressing this requires a multimorbidity framework that treats coexisting physical and mental health conditions with equal importance rather than viewing mental health as secondary to physical health.

The bidirectional nexus between mental and physical health

Prolonged physical illnesses frequently lead to profound psychological distress. Patients dealing with coronary heart disease, kidney disease, asthma, and cholesterol disease suffer from significantly extended periods of compromised mental health (Huang et al., 2023). In reverse, declining mental health accelerates cellular aging and drives cortisol production, elevating susceptibility to cardiovascular ailments and other age-associated diseases. A comprehensive 14-year analysis of nationwide primary-care records revealed that an initial psychiatric diagnosis substantially raises the risk of 16 distinct physical ailments, with the reverse holding true as well (Hanna et al., 2024). The measured impact of multimorbidity escalates notably once mental health disorders are included in the assessment (Chowdhury et al., 2023).

The costs of postponing action

Patients diagnosed with severe psychiatric conditions manifest physical multimorbidity with greater frequency and at a much earlier stage in life relative to the broader population (Halstead et al., 2024). This cumulative strain contributes straight to shortened lifespans, extreme functional limitations, and extensive health-economic deficits. Notably, those diagnosed with schizophrenia suffer a life expectancy reduction ranging from 10 to 20 years compared to the general public. This example is one instance of how delayed action contributes to negative psychiatric health outcomes.

Community-level and structural interventions

Higher-order interventions at the community or structural level shape how and when DC residents access healthcare. Consider organizations such as public health agencies, housing authorities, and religious congregations that shape both health risks and prevention. Potential approaches for working with them may include integrating behavioral health into primary care, improving referral pathways, reducing stigma, strengthening community-based supports, or addressing social barriers that prevent consistent preventive care. A few examples are provided here.

Dismantling Societal Obstacles: Psychiatric health is frequently sidelined because of cultural stigmas and the less visible nature of symptoms compared to bodily diseases. Public anti-stigma campaigns and educational programs are crucial to encourage individuals to seek help.

Comprehensive Care Models: Healthcare frameworks should explicitly embed mental health services into routine primary care while scaling up available telehealth pathways.

Localized Strategies: The Department of Behavioral Health in Washington, DC, reinforces these coordinated strategies by providing localized access points, such as a continuous 24/7 crisis service and the Assessment and Referral Center located on P Street NE, helping community

members address their mental, emotional, and behavioral well-being as a core requirement for physical health.

Examples of integrated community-level and structural interventions for multimorbidity are visualized in Appendix B, Figures B4 and B5. The need for integrated, structural approaches becomes immediately clear when examining local DC health outcomes and mortality data. Thus, proposals should address the interplay of these larger systems within their intervention.

Impact on DC Communities

According to the CDC's National Vital Statistics System, the top 10 causes of mortality in Washington, DC in 2024 demonstrate a significant burden of long-term health conditions (CDC, 2026a). These causes can be grouped into three main categories, with one focused on acute and external causes (accidents, homicide, and septicemia) and the other two focused on chronic diseases:

- Cardiometabolic & Vascular Diseases: Heart disease, stroke, diabetes, and hypertension. This cluster represents a primary target for the Case Challenge, as these conditions are highly interconnected and often preventable through early life course interventions.
- Other Chronic & Degenerative Diseases: Cancer, chronic lower respiratory disease, and Alzheimer's disease.

Table A: Median self-reported chronic health indicators among U.S. residents overall and D.C residents in 2025.

Chronic Disease Indicator	Prevalence in U.S (All States, DC, and Territories)	Prevalence in DC
Adults who have ever been told they have coronary heart disease or myocardial infarction	6.5%	3.4%
Adults who have been told by a doctor that they have diabetes	12.3%	9.1%
Adults who have been told by a doctor that they have had a stroke	3.5%	2.5%
Adults who have been told by a doctor that they have high blood pressure	34.2%	29.6%
Adults who have had their blood cholesterol checked and have been told it was high	37.8%	35.1%
Self-reported as Obese (BMI 30.0-99.8)	33.9%	24.2%

Adults who have been told they have a form of depression	22.3%	21.5%
Adults who currently have asthma	10.8%	12.4%
Adults who have been told they have arthritis	26.4%	18.6%
Adults ever told by a health professional that they had cancer other than non-melanoma skin cancer	8.9%	5.7%
Self- reported 14+ days when mental health status not good	15.7%	15.8%
Self- reported 14+ days when physical health status not good	13.1%	8.8%
Adults reporting fair or poor general health*	19.4%	12.7%
Average number of poor mental health days during the previous 30 days*	4.9 days	4.8 days

Source: https://www.cdc.gov/brfss/brfssprevalence/index.html unless otherwise indicated (CDC, n.d.).
**Source: KFF analyses of the Centers for Disease Control and Prevention's 2024 Behavioral Risk Factor Surveillance System for fair or poor health and poor mental health days (KFF, 2024a; KFF 2024b). Estimates represent weighted data for noninstitutionalized adults aged 18 years and older and include both male and female respondents. The table presents median point estimates and differences should be interpreted descriptively unless confidence intervals are also evaluated.*

Although DC's adult health estimates compare favorably with U.S. estimates on several measures, these aggregate figures should not be interpreted as evidence that chronic disease burden is low or evenly distributed across the District (see Table A). In 2025, DC had lower point estimates than the U.S. for fair or poor general health, diagnosed diabetes, obesity, and a history of cancer other than nonmelanoma skin cancer. Current asthma was somewhat higher in DC, whereas the average number of poor mental health days was nearly identical in DC and the U.S.

Importantly, citywide averages can mask substantial inequities within the District across wards. DC Health reported that improvements in health had not occurred at the same rate for all residents and that differences in health opportunities and outcomes were patterned by race, income, and geography (DC Health, 2018). The agency's Health Equity Report for the District of Columbia 2018 documented a 21-year difference in life expectancy across DC neighborhoods illustrating how a comparatively favorable citywide estimate can coexist with markedly different health risks and outcomes across communities. These differences reflect unequal social and

structural conditions, including access to economic opportunity, housing, healthy food, transportation, and medical care.

Citywide chronic-disease estimates should therefore be interpreted as broad benchmarks and it should not be assumed disease burden is uniformly low across DC. In 2024, 6.6% of adults in DC had three or more of eight selected chronic conditions, compared with 11.3% of the U.S. adults overall. This measure includes arthritis, asthma, chronic kidney disease, chronic obstructive pulmonary disease, cardiovascular disease (heart disease, heart attack or stroke), cancer (excluding non-melanoma skin cancer), depression or diabetes (AHR, 2024).

Timely access to primary, specialist, and behavioral care, along with medication and lab monitoring, is key to preventing and managing chronic conditions before complications arise (Engström et al., 2025). Barriers like insurance gaps, transportation issues, administrative burdens, and limited provider availability have compounding risks. Delayed screenings or disrupted treatment can worsen disease control, leading to severe complications like stroke, kidney disease, depression, or preventable emergency visits.

Managing multiple chronic conditions requires frequent healthcare visits, making reliable transportation essential (Chen et al., 2025). In Washington, DC, residents face challenges such as indirect transit routes, unreliable service, transfers, inaccessible stations, mobility limitations, and transit costs. These obstacles particularly impact older adults, people with disabilities, hourly workers, and caregivers coordinating work and family needs.

DC has been a national leader with a unique historical commitment to affordable health insurance that has led to only 2.7% of the population being uninsured (Coventry, 2026 Apr 2). A large contributor to this success has been the DC Health Care Alliance (Alliance), which is a locally funded initiative to support individuals without access to Medicaid, especially considering DC's young adult and immigrant populations (Coventry, 2026 Apr 2; Coventry, 2026 Feb 12). In FY 2024 alone, the Alliance served 23,000 individuals per month (Coventry, 2026 Apr 2). However, the Alliance is facing cuts to reduce eligibility and program costs, including no new enrollments for adults over age 25 from October 2026 and ending eligibility for all adults over age 21 from October 2027 (Coventry, 2026 Apr 2; Egitto, 2025). Without alternatives, these changes will lead to insurance gaps that impede health care access, which can worsen health outcomes for individuals with multiple chronic health conditions (Coventry, 2026 Feb 12).

For specific health outcomes data across the life course in the District, refer to the DC Community Health Needs Assessment (Our Healthy DC, n.d.-a).

Chronic disease prevention

Chronic disease prevention can occur at various levels. ***Primordial prevention*** aims to prevent the onset of risk factors that affect an entire population and targets the underlying stage of natural disease by focusing on the underlying social and environmental conditions that promote disease onset (Keyes et al., 2025). For instance, improving access in an urban neighborhood to

safe sidewalks to promote physical activity would be an example of primordial prevention. ***Primary prevention*** measures aim at a susceptible population or individual who have disease risk factors, to prevent a disease from ever occurring. An example of this is tobacco cessation programs. ***Secondary prevention*** emphasizes early disease detection, with a target of healthy-appearing individuals with subclinical forms of the disease. Examples include blood pressure screening. The primordial, primary, and secondary levels of prevention are the focus of this case challenge.

Tertiary prevention targets both the clinical manifestation and results of the different stages of disease. It focuses on reducing the impacts of the disease once established (Kisling & Das, 2023). One can think of cardiac rehabilitation in patients who suffered from a heart attack and are trying to recover. ***Quaternary prevention*** protects individuals from medical intervention that may cause more harm than good (Martins et al., 2018). For instance, the use of antiarrhythmic drugs after a myocardial infarction, which reduced actual arrhythmias but resulted in higher mortality rates. Tertiary and quaternary prevention will not be the focus of this brief.

Primary prevention for multimorbidity has been defined as aiming to prevent people with one or no diseases transitioning to having two diseases (Makovski et al., 2025). Secondary prevention has been defined as minimizing further accumulation of conditions in those with two conditions.

DC has multiple programs focused on chronic disease prevention including the Asthma, Diabetes Control and Prevention, and Cardiovascular Health Programs, as well as the Brain Health Initiative (DC Health, n.d.-a; DC Health, n.d.-c; DC Health, n.d.-d; DC Health, 2023). The DC Department of Health has a Chronic Disease State Plan for the District where more information on prevention programs can be found (DC DOH, n.d.)

Preventing Multimorbidity

Previous work in prevention of multimorbidity has focused on tertiary or quaternary prevention—reducing or avoiding further deterioration in people with multimorbidity (Makovski et al., 2025). The evidence base for primary and secondary preventive interventions for multimorbidity is lacking. However, there is adequate evidence for protective factors and interventions at different levels that can help prevent specific chronic conditions, and some that can lead to improved health outcomes more broadly. Examples include social policies that reduce poverty or mitigate its effects or that help people move to better housing in opportunity neighborhoods, and health care policies that expand access and remove cost barriers to preventive services, or that provide comprehensive and timely screening and follow-up, such as the Early Periodic Screening, Diagnosis and Treatment that is a required Medicaid benefit for children (CHA, 2026).

Risk factors

Many risk factors for multimorbidity have been identified in the literature (Tazzeo et al., 2023). Biological sex, age, health behaviors (e.g., physical activity level, nutrition, substance use), social determinants of health (e.g., income level, education, employment, early childhood development and experiences, built environment, social connections/network), and baseline health conditions (e.g., obesity or high BMI, mental health and depression, diabetes, hypertension) were all found to impact multimorbidity risk (Álvarez-Gálvez et al., 2023; Carr et al., 2025; Skou et al., 2023; Tazzeo et al., 2023). Two large electronic health record (EHR) studies of millions of patients across the U.S. and a longitudinal study of National Health Insurance Survey (NHIS) data found that those identifying as African American had the highest prevalence of multimorbidity whereas those identifying as Asian American/Pacific Islander or Hispanic had the lowest risk (Alshakhs et al., 2022; Caraballo et al., 2022; Kalgotra et al., 2020). The study of NHID data also highlighted that across the study time period of 1999-2018, there was no significant progress in decreasing the racial disparity in multimorbidity disproportionately affecting people identifying as Black/African American (Caraballo et al., 2022).

These shared risk factors are important because interventions that address one upstream driver—such as walkable neighborhoods, food access, social connection, preventive care access, or chronic stress—may influence multiple mental and physical health outcomes at once.

Multimorbidity in specific populations

The following examples illustrate populations that may experience distinct multimorbidity risks or prevention opportunities. Teams may select one or more of these populations (including intersectional populations that represent multiple of the below listed, e.g., low-income populations over 60, perinatal health among immigrant populations) or justify another DC population using available evidence.

Sex-based differences between males and females

Sex-based differences are common among people with chronic illnesses. These differences contribute to the male-female health-mortality paradox, where females have lower mortality coupled with higher morbidity than males - living longer but spending more of their life in poorer health (di Lego et al., 2019). Overall, many chronic conditions affect females disproportionately, differently, or uniquely compared to males (Appendix B, Figure B3) (Nandan et al., 2026; Álvarez-Gálvez et al., 2023). A systematic review and meta-analysis of 37 studies across nearly 6 million individuals from 24 countries found that multimorbidity was more prevalent in women (0.45, [95% CI: 0.35-0.56] in women vs. 0.39 [95% CI:0.30-0.50] in men) (Nguyen et al., 2026). Sex differences were found in patterns of multimorbidity, with chronic lung disease and cardiometabolic disease more common in males and musculoskeletal and gastrointestinal diseases more common in females. Women with multimorbidity tend to have a greater risk than men of emergency service use, food insecurity, and physical impairment (Nandan et al., 2026).

Perinatal health population

According to a systematic review and meta-analysis, the odds of pregnancy multimorbidity associated with adverse birth outcomes were 3.38 (CI: 1.18-5.58) in North America (Bestman et al., 2024). Women giving birth in DC experience worse maternal and infant outcomes compared to national rates (March of Dimes, 2025). DC has higher rates of cesarean births among low-risk women (31.6% in DC vs. 26.6% in the US overall), severe maternal morbidity (1,328 in DC vs. 931 in the US per 100,000 hospital deliveries), and maternal mortality (28.2 in DC vs. 23.5 in the US per 100,000 deliveries). Inadequate prenatal care is more common in DC, with 23% receiving inadequate care compared to 16.1% in the US overall. Infant outcomes are also worse in DC, with higher preterm birth rates (11.8% in DC vs. 10.4% in the US) and infant mortality rates (7 in DC vs. 5.6 in the US per 1,000 births). Chronic conditions are key risk factors for adverse maternal health outcomes and intersect with social determinants of health (Our Healthy DC, n.d.). According to CDC, cardiovascular conditions were associated with a third of all pregnancy-related deaths between 2011 and 2015. In DC, the preterm birth rate is worse among Black and Medicaid-insured women as well as those with certain health conditions and risk factors (e.g., smoking, hypertension, overweight or obesity, diabetes, pregnancy-related hypertension) (March of Dimes, 2025). Additionally, 81.4% of maternal deaths in DC were among non-Hispanic Black women 2019-2023 (DC PQC, n.d.) According to DC Health's 2025 Perinatal Health and Infant Mortality Report, Black mothers had a 1.5 to 2 times higher rate of preterm birth and low birthweight (DC Health, 2025). Preterm birth was also higher for mothers with diabetes or hypertension prior to pregnancy (2 to 2.5 times higher) and with gestational eclampsia (3 times higher).

Children, adolescents, and young adults

Younger populations may experience combinations of congenital, developmental, physical and mental health conditions that change as they mature, persist into adulthood, relapse, remit, or are outgrown (van den Akker et. al, 2022). Adult-oriented definitions and indices may therefore overlook outcomes that matter most for younger people (e.g., cognitive and emotional development, school participation, peer relationships, self-efficacy, physical ability, family burden). Physical and mental health conditions also frequently co-exist, with anxiety, mood, and attention disorders occurring alongside asthma, epilepsy, and allergies.

Adults whose chronic conditions began accumulating in their 20s or accumulated rapidly had lower levels of light intensity and moderate to vigorous physical activity in midlife than adults whose conditions developed more slowly or had later onset (Dooley et al., 2025). Although activity intensity declined across time among all groups, the rate of decline did not differ significantly by multimorbidity trajectory, suggesting that the primary disparity was already established by middle age.

Low-income and underserved populations

In a large systematic review and meta-analysis, low education and increasing deprivation were consistently associated with increasing risk of multimorbidity (Nguyen et al., 2026). Low-income and underserved residents may face compounding barriers that increase multimorbidity risk and make prevention more difficult (Pathirana & Jackson, 2018). Limited income, lower educational attainment, unstable employment, caregiving responsibilities, food insecurity, housing instability, and transportation barriers can reduce access to preventive care, screenings, medications, behavioral health services, and follow-up visits (Eder et al., 2021). These barriers are especially relevant in DC, where residents may face long or unreliable transit routes, insurance gaps, and affordability challenges even when services exist.

Populations over 60

Multimorbidity is very common among older adults (60 and older) and most of the death burden of chronic diseases falls on older adults (Zhu et al., 2025, Nandan et al., 2026). Advanced age is one of the most impactful, non-modifiable risk factors for multimorbidity (Zhu et al., 2025). A large systematic review and meta-analysis found that the pooled prevalence of multimorbidity among older adults was 46% globally, with significant variation across included studies. Multimorbidity risk was increased in older adults who were female, 70 years and older, and unmarried, as well as those with a BMI $\geqslant$ 28 kg/m^2, lower education level (below junior high school completion), and lower income level.

Veterans

After age 25, veterans' risk for multimorbidity increased across all age groups (Bloeser et al., 2022). The increased odds of reporting multimorbidity were highest when comparing veterans aged 35–44 to non-veterans of the same age. Veterans aged 35–44 are 50% (adjusted odds ratios (AOR) 1.50, 95% confidence interval (CI) 1.16, 1.94) to 80% (AOR 1.80, 95% CI 1.46, 2.23) more likely to report multimorbidity when compared with same-aged non-veterans.

Immigrants

Immigrant populations are diverse, and their health outcomes are influenced by ethnicity, socioeconomic status, country of origin, citizenship status, and the length of time spent in the United States. A 2015 NASEM review found that the health advantage immigrants have when they first live in the United States decreases with increasing length of residence (NASEM, 2015). Understanding the erosion of protective health benefits creates an opportunity for primary intervention that supports the unique needs of the DC immigrant population. The DC Health Care Alliance provides care for residents who aren't eligible for Medicaid; however, recent policy changes have severely restricted eligibility (Coventry, 2026 Apr 2). Gaps in access to regular, preventive care hinder prevention of multimorbidity.

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Appendix A: Key Frameworks

Life Course Framework: This framework highlights how an individual's functional reserve in later years is directly shaped by the lifelong accumulation of social and biological exposures from early development onward.

Multisolving describes the interconnected nature of health solutions & how you can do one thing to solve multiple health problems. This idea can be used to target multiple chronic diseases or disease at multiple socioecological levels using carefully considered, interconnected solutions (Multisolving Institute, n.d.).

Social Ecological Model (SEM)

The Social Ecological Model (SEM) is a conceptual model that identifies a variety of influences that impact a person's health and well-being. This model consists of five spheres of influence: individual, interpersonal, institutional, community, and public policy. Successful public health interventions consider multiple levels of influence when designing programs and strategies to improve the health and well-being of their target population. See Table A1 and Figure A1 for more information.

Table A1. Social Ecological Model

Level	Description	Interventions
Individual	Individual demographics, personal experiences, knowledge, attitudes, beliefs, and behaviors.	Individual interventions often emphasize educational strategies to improve knowledge, change attitudes, increase self-efficacy.
Interpersonal	Relationships with others, including family members, peer relationships, and social networks.	Interpersonal interventions often aim to influence and facilitate behavior change through a focus on shifting social and cultural norms, with a particular focus on a person's closest social network (e.g., mentoring or peer-to-peer support program).
Institutional	Examples of institutions include local health departments, community organizations, health care systems, law enforcement, and faith-based organizations.	Institutional interventions often aim to influence people who are impacted by a particular institution (e.g., patients of healthcare systems). Efforts often focus on expanding access to resources or programs, improving the quality of services,

		and advocacy efforts.
Community	The role of community organizations, relationships between community organizations and/or the settings in which social relationships occur (e.g., schools, workplaces, neighborhoods).	Community interventions often focus on improving the physical and social environment in these settings (e.g., creating safe places where people can live, learn, work, play, and pray) and by addressing other conditions that give rise to poor health outcomes (e.g., neighborhood poverty, housing inequality). Efforts often focus on motivating a community and its relevant stakeholders to work together and address an issue and/or working to raise awareness and change community norms.
Public Policy	The influence and role of local, state, and federal governments to support and enact policies and laws to improve public health	Policy interventions often involve advocacy and focus on creating supportive conditions (legislative and otherwise) that allow for laws to pass. Impactful changes often address the root causes of and factors that systematically lead to issues (e.g., homelessness, social support).

Figure A2. Social Ecological Model



The Social Determinants of Health (SDOH)

The social determinants of health (SDOH) are the non-medical factors and conditions that influence health outcomes (CDC, 2024b). SDOH are the conditions in the environment where people are born, live, learn, work, play, worship, and age that affect a wide range of health and well-being outcomes and quality of life (CDC, 2024b). The SDOH are categorized into five broad domains (ODPHP, n.d.-a):

1. Economic Stability
2. Education Access and Quality
3. Health Care Access and Quality
4. Neighborhood and Built Environment
5. Social and Community Context

Examples of SDOH include things like access to transportation, safe housing, safe neighborhoods, educational attainment and income level, job opportunities, language and literacy skills, access to affordable nutrient-dense foods, access to affordable and quality physical and mental health care, and racism, discrimination, and violence (CDC, 2023). The uneven access to the SDOHs contributes to a wide range of health disparities and inequities, which make them critical to address.

The Public Health Approach

The public health approach utilizes a science-based, multi-disciplinary model to maximize benefits for the largest number of people. This model draws on knowledge from several disciplines, including epidemiology, psychology, sociology, medicine, criminology, education, and economics to guide several public health interventions, including those that address homelessness (CDC, 2024a). The following four steps make up the public health approach, accompanied by guiding questions (see Table A2).

Table A2. Guiding Questions for using the Public Health Approach

The Public Health Approach	
Steps	**Guiding Questions**
1. Define and monitor the problem	● What problem do I want to prevent? ● What data is available to describe the scope and burden of the problem? ● How many people are affected by the identified problem? ● Who is experiencing the problem? ● When and where is the problem occurring?

2. Identify risk and protective factors	● What are risk factors for the problem? ● What are protective factors for the problem?
3. Develop and test prevention strategies	● Are there existing, effective strategies based on the best available evidence? ● If none exist, what resources are needed to develop a new strategy based on what was learned in the previous steps? ● What potential research partners can help evaluate the selected strategy? ● Is the strategy effective? Did it do what it was intended to do?
4. Assure widespread adoption	● Who would benefit from this strategy (e.g., parents, educators, policy makers, etc.)? ● What strategies can be used to assure it reaches the people who need it? ● What resources exist to support the implementation and evaluation of this strategy?

SOURCE: Table created using content from CDC, 2024a.

Appendix B: Figures Illustrating Multimorbidity Burden and Applied Prevention

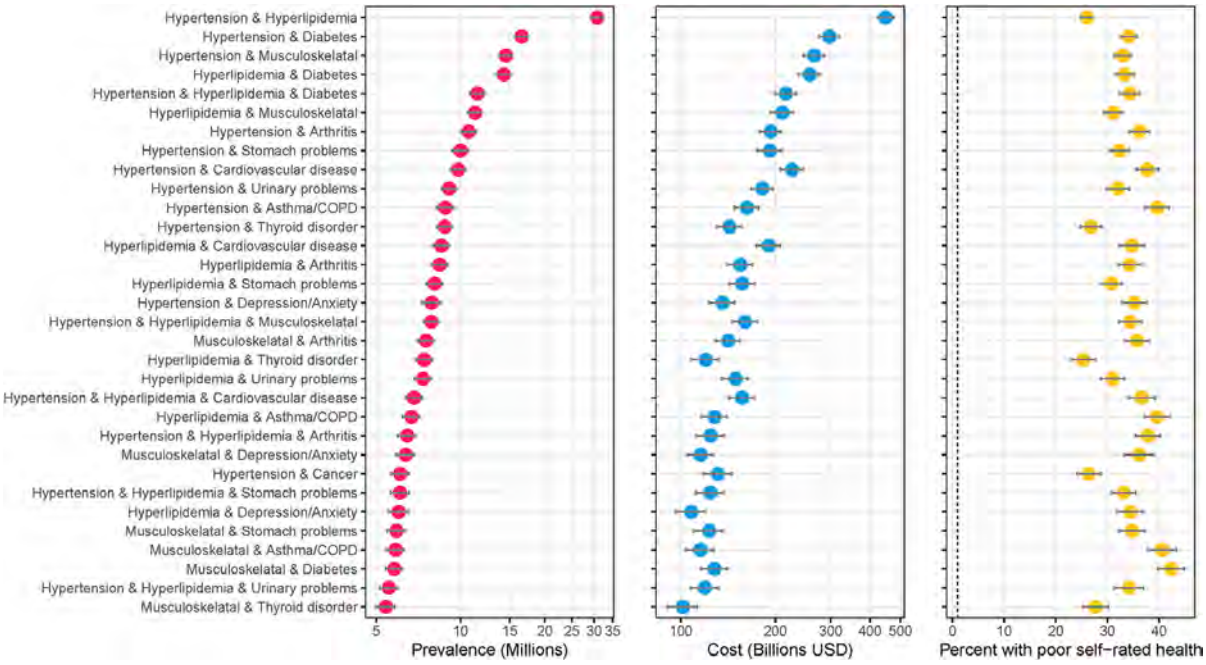


Figure B1. Highly prevalent specific combinations of multimorbidity and associated cost and perceived poor health. Reproduced from Schiltz, 2022. The figure shows combinations of conditions with an estimated prevalence of 5 million or more adults in the United States. Data source: the 2016–2019 Medical Expenditure Panel Survey (MEPS). Weighted estimates and 95% confidence intervals were calculated by applying population weights using Taylor-series methods (i.e., complex survey methods) to account for the complex sampling design of the MEPS. Weighted estimates have been annualized by taking the average over the 4-year study period. X-axes for prevalence and cost are on the logarithmic scale. Results are sorted by prevalence. Cost is measured as total annual medical expenditures in 2019 US Dollars, and perceived health is an answer of “fair” or “poor” on a 5-point question asking respondents to rank their overall health.

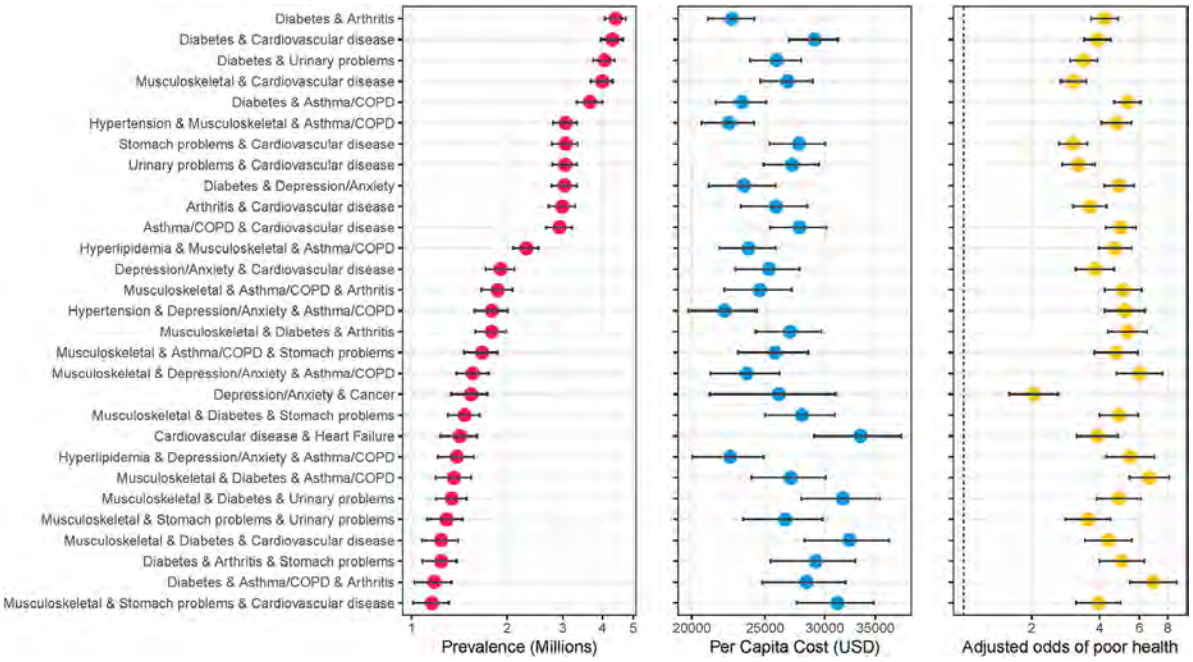


Figure B2. Specific combinations of multimorbidity ranked highest in terms of average cost or perceived poor health. Reproduced from Schiltz, 2022. The figure shows the specific combinations of multimorbidity that ranked in the top 20 in terms of the highest average cost per person or top 20 highest percentage with self-reported poor health. A total of 28 conditions met either criterion, with 12 meeting both. Data source: 2016–2019 Medical Expenditure Panel Survey (MEPS). Weighted estimates and 95% confidence intervals were calculated by applying population weights using Taylor-series methods (i.e., complex survey methods) to account for the complex sampling design of the MEPS. Weighted estimates have been annualized by taking the average over the 4-year study period. Adjusted odds ratios were calculated using log-binomial models adjusting for age, race, and sex, and Taylor-series methods for standard errors. X-axes are on a logarithmic scale, and results are sorted by prevalence.

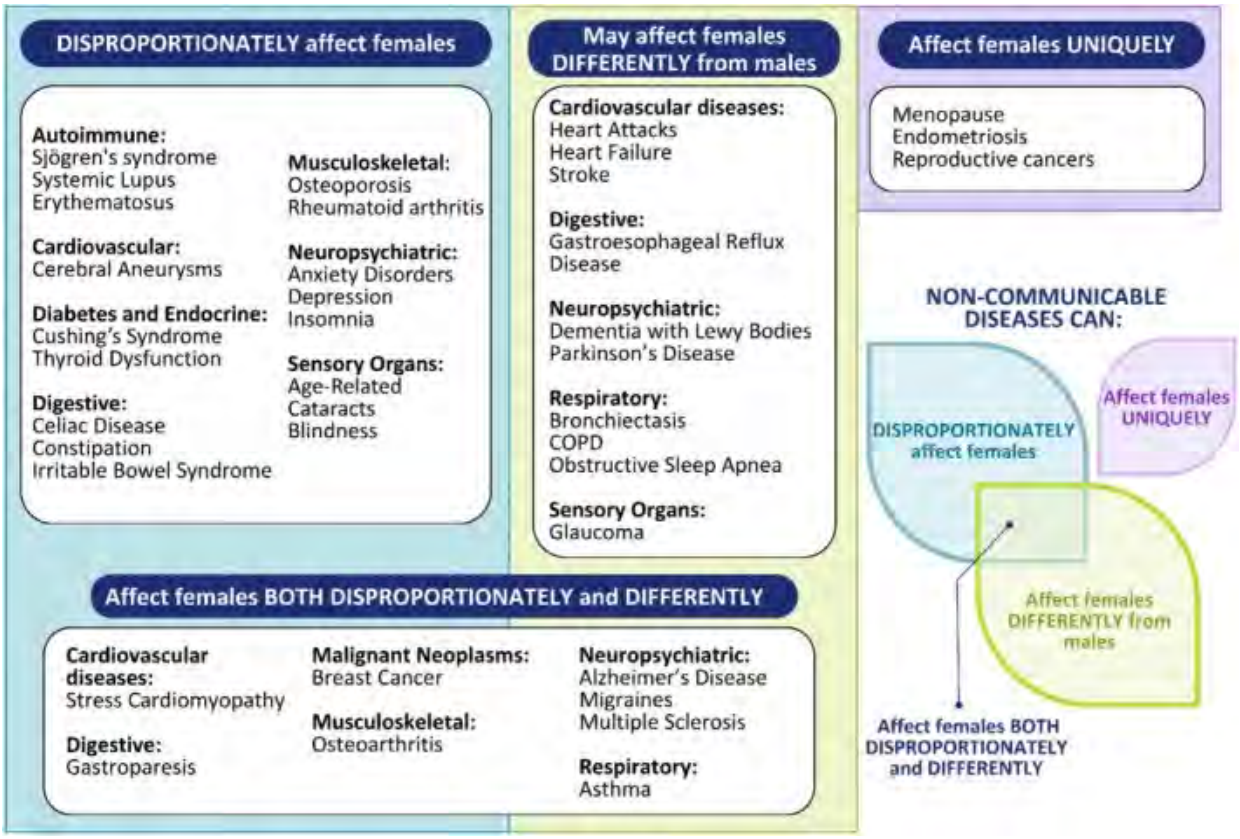


Figure B3. Reproduced from Nandan et al., 2026. Three categories of noncommunicable diseases that impact older females. This figure illustrates non-communicable diseases that impact older females disproportionately, differently than males, and uniquely. Noncommunicable diseases that affect females disproportionately and differently are not mutually exclusive, represented by the overlap.

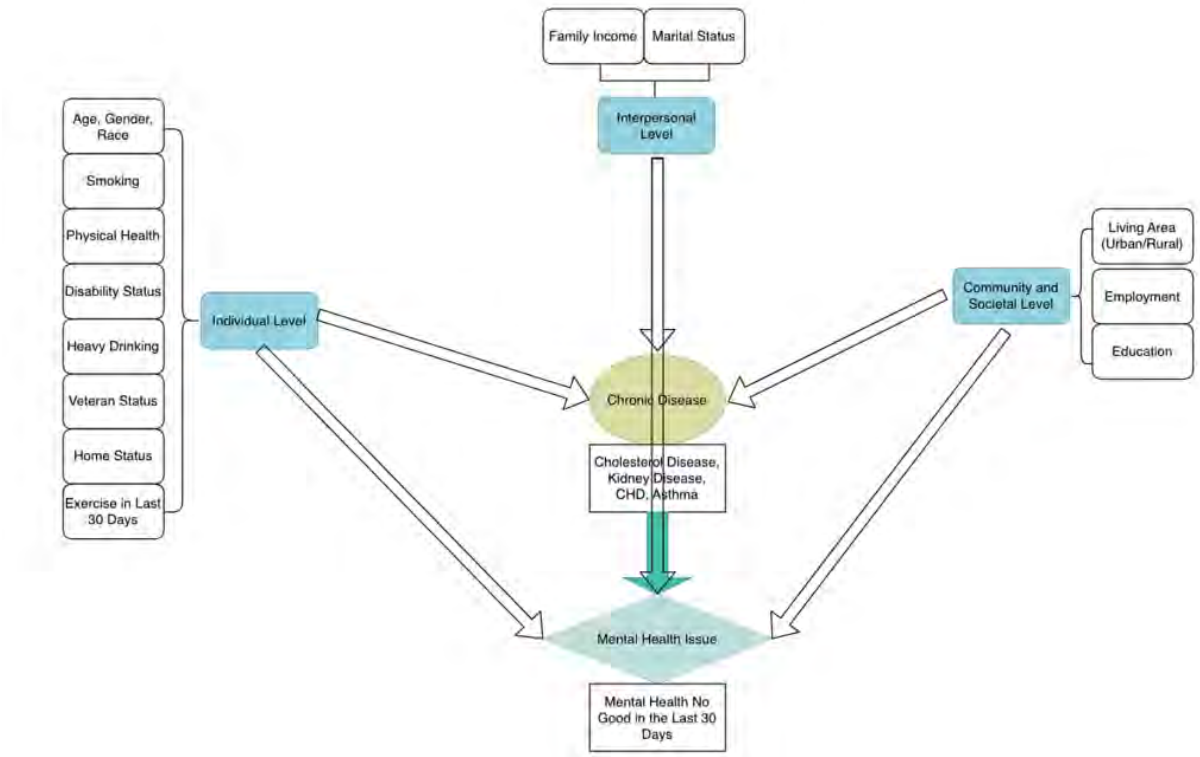


Figure B4. Reproduced from Huang et al., 2023. This figure illustrates an application of the social ecological model (SEM) to multimorbidity, illustrating the interplay between three levels of factors: individual, interpersonal, and community/society levels, in relation to the risk of chronic disease and mental health.

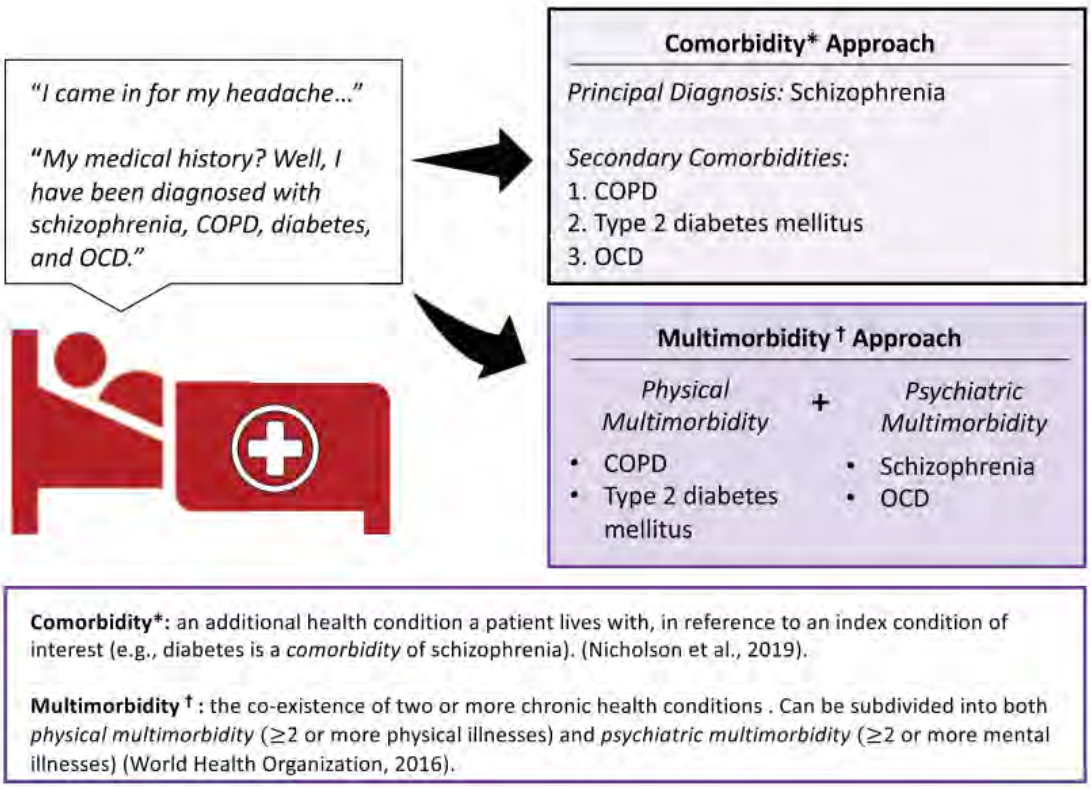


Figure B5. Reproduced from Halstead et al., 2024. This figure illustrates the difference between a comorbidity and multimorbidity approach to care for people living with multiple chronic conditions.

Appendix C: Existing DC Programs and Partners on Chronic Disease Prevention

Given that chronic disease prevention is a large public health concern, there are existing DC programs and resources working to develop community resilience and preventive interventions. A non-exhaustive list of partnership community support includes:

- **District of Columbia Primary Care Association (DCPCA)** partners with national programs and local health centers to implement evidence-based interventions to improve health outcomes for cardiovascular disease, hypertension, and diabetes. Source

- **Early Childhood Innovation Network (ECIN)** is a local collaborative of health and education providers, community-based organizations, researchers, and advocates who implement and sustain evidence-based, equity-centered early intervention programs to support community health. Source

- **Root Causes Community Dialogue Project** is a community partnership initiative to understand the local perspective of barriers to health and wellbeing through focus groups of DC Wards 7 & 8. Source

- **Center for Community Resilience at Milken Institute School of Public Health** aims to prevent Adverse Childhood Experiences in Adverse Community Environments by providing assistance in policy analysis and guidance to partner organizations. Source

- **FRESHFARM FoodPrints** improve health outcomes of children and families through gardening, cooking, and nutrition education. Source

- **The Villages Model** supports older adults in aging-in-place by maintaining access to social activities, opportunities for volunteering, transportation assistance, and referrals to existing community services. Source

- **DC Children's Law Center** provides legal representation when appointed to DC children's legal cases, working at community health centers to identify root causes of health problems, and providing citywide recommendations on health policy. Source

- **Medical-in Partnerships (MLP)** aim to place lawyers in clinic spaces to provide free legal advice on domestic violence, family law, and immigration to community members to support their health and eliminate structural barriers. Source

- **DC Healthy Start** is a program for residents of Wards 5, 7, & 8 that provides services, referrals, and support for women, parents, and infants up to 18 months by addressing health and social service needs.

- **DC Perinatal Quality Collaborative** is a network of clinical teams, public health experts, and other community stakeholders who come together to participate in data-driven, clinical quality improvement initiatives to improve maternal and infant health outcomes.

Appendix D: Rules and Guidelines for AI Use for DC Case Competition Teams

Overview:
The DC Public Health Case Challenge requires original and authentic research, development, analysis, and creation by each team. Teams may not submit AI-created work as their own original ideas, rely on AI to create their intervention, use AI-generated citations, fabricate information or testimonials using AI, or use it to violate copyright. No part of this case document may be uploaded into an AI tool. Permitted limited use of generative AI includes: modifying text, images, producing code, creating presentations, data analysis, or other generated response as a tool to support activities outlined above.

Disclosure statements:
Each team must include a disclosure related to AI-use within their reference materials that includes

1. Which tools were used
2. The purpose each tool was used for
3. Attestation that all generated material has been verified and is the responsibility of the team

Generating draft text for a National Academies written product:

- Any material generated by a generative AI platform that is incorporated into the presentation and related materials **must be independently verified**, including fact checking all content for accuracy, documenting all material with valid attribution/citations, and assuring that no material has been plagiarized.
- Use of generative AI platforms must be **clearly acknowledged** and noted in the discussion of methodology and production. The user of AI platforms remains the author and is responsible for any content generated by AI platforms, as well as avoiding plagiarism and copyright infringement.
    - Example acknowledgment text: [insert tool name] was used in [insert slide number] to [insert purpose] for this the Case Challenge Presentation and Materials. All material generated by an AI platform used in this document was reviewed, proofread, and fact-checked to ensure accuracy of the presented information.

Uploading an Unpublished National Academies product:

Potential risks exist if National Academies information may be incorporated into the training data used by one or more generative AI Platforms or seen by employees of the generative AI platforms. Therefore, **team members are prohibited from uploading the Case Challenge document (or any portion of it) to any AI tools.**

AI tools may be used for the case challenge to:

- Cleaning up notes and action items from group calls

- Literature review support (Perplexity and ConsensusAI are good examples)
- Summarizing published articles
- Generating citations/bibliographies in the proper format.
- Correcting grammar and editing for tone and clarity.
- Creating figures and logos with team guidance and specifications (must be acknowledged)
- Helping to shorten the verbal presentation script if it is too long
- Formatting presentation slides

AI Tools may <u>not</u> be used in the case challenge to:

- Generate solutions/ideas
- Write first drafts of text for slides or other presentation materials
- Write initial script for presentation
- Create a figure or text with no to little guidance from the team
- Perform any task that is not acknowledged in the AI statement

These principles follow guidance from the National Academies and UNESCO (UNESCO, 2023).

Appendix E: Case-Writing Team Biographies

Each year, students from local universities work together to write this background document for the competing teams, including identifying the specific topic to be addressed.

Case Co-Leads



Remle Scott, PhD, MPH is a NIH/NCCIH Research Fellow in the Epidemiology Program and Adjunct Professor at the Uniformed Services University, Department of Pediatrics. Her dissertation focused on understanding the intersection of infectious and non-communicable diseases and studying multimorbidity among people living with HIV in sub-Saharan Africa. Her current work spans maternal-fetal outcomes in the Military Health System, advancing whole-person health, fostering population resilience, and improving care for individuals navigating multimorbidity and chronic pain. She was a member of the USU grand prize–winning team in the 2021 DC Public Health Case Challenge and placed in the top three at the 2022-23 Emory Morningside Global Health Case competitions. This is the second year she has been a co-case lead with Teresa, and has been on the case writing team since 2023.



Teresa Russell, MS is a PhD candidate in Public Health at the Uniformed Services University of the Health Sciences who works as a Research Associate II at the Henry M. Jackson Foundation for the Advancement of Military Medicine. At work, she currently supports the USUHS Center for Health Services Research's project on Fetal Alcohol Spectrum Disorders, focused on understanding and improving FASD care for children across the Military Health System, and a qualitative interview study investigating administrative research barriers faced by faculty at U.S. academic medical centers. Her dissertation focuses on examining the effect of access to care on severe maternal morbidity in both civilian and military-affiliated pregnant populations. She competed in the DC Public Health Case Challenge in 2023 and 2024, and the Emory Global Health Case Challenge in 2024 and 2025, placing second in her last year at Emory. She was also case writing co-lead for 2025 DC Public Health Case Challenge alongside Remle.

Case Writers



Anisa Amiji, MPH, MSHS, PA-C graduated from The George Washington University's joint degree Physician Assistant/Master of Public Health (PA/MPH) program in May 2025, with an MPH concentration in Maternal and Child Health. She was a member of the George Washington University team that received the Practicality Prize at the 2024 DC Public Health Case Challenge. Anisa served as a case writer for the 2025 DC Public Health Case Challenge. Currently, Anisa is a practicing Physician Assistant at Boston Health Care for the Homeless Program.



Urmi Kumar, MPH is a PhD candidate in Public Health at the Uniformed Services University of the Health Sciences. Her dissertation focuses on understanding infectious determinants that impact Alzheimer's Disease and related dementia diagnoses in the Military Health System. After receiving her MPH from Cornell University, with a concentration in infectious disease epidemiology, she has continued to conduct mixed methods research in a multicenter clinical diagnostic stewardship study at Johns Hopkins Children's Center. She was a member of both the 2024 DC Public Health Case Challenge and the second place awarded 2025 Emory Morningside Global Health Case Competition teams.

Case Contributors



Alexander Diller is a recent graduate of American University, where he studied international relations and earned a certificate in community-based research. He is a Co-Investigator with the Cerebral Palsy Research Network, where his work supports new understanding of parent and child factors impacting trajectory of recovery and mobility improvement for ambulatory children with cerebral palsy who receive Selective Dorsal Rhizotomy. He is also a Research Assistant with the INSPIRE Lab at American University, examining social determinants of perinatal health in Washington, DC and a Consultant at Booz Allen Hamilton. He was a member of the American University DC Public Health Case Challenge team in 2025.



Dakota Douglas, MA is a third-year student at the Howard University College of Medicine and a dedicated advocate for healthcare equity with experience in health policy research, community-led policy advocacy, and medical-legal advocacy. Before medical school, she completed both her undergraduate degrees, and MA in Bioethics and Science Policy at Duke University. Her dissertation and scholarly work draw upon disability rights, reproductive justice, tech ethics and policy, education policy, and clinical care delivery. She is a scholar with the Center of Excellence at the Howard University College of Medicine. She represented Howard University in the 2025 DC Public Health Case Challenge, where her team received the team Practicality Award.

Contributions to the development of this case, defined in accordance to ICMJE guidance:

Case Co-Leads (RS, TR) contributed to conceptualization and design; acquisition, analysis, and interpretation of relevant data; project administration; and supervision. They led writing of the original draft and were primarily responsible for writing, reviewing, and editing in response to reviewer feedback and critically reviewing for important intellectual content, including accountability for the integrity of the final work. They have approved the final version of the work to be published and have agreed to be accountable for all aspects of the work.

Case Writers (AA, UK) contributed to conceptualization, design, and writing of the original draft including data acquisition, analysis, and interpretation, and substantive editing and critical review of intellectual content for subsequent drafts including responses to reviewers, reflecting substantial contributions to content development and revision. They have approved the final version of the work to be published and have agreed to be accountable for all aspects of the work.

Case Contributors (AD, DD) contributed to writing, reviewing, and editing of subsequent drafts. They have approved the final version of the work to be published and have agreed to be accountable for all aspects of the work.

Appendix F: Judging Rubric

These criteria will be considered collectively through a facilitated judging discussion to determine the overall grand prize winner and category prizes. The table presents the criteria contributing to the category prizes listed: **Grand Prize; Practicality Prize; Interprofessional Prize; Wildcard Prize.**

	Poor	Accept-Able	Very Good	Out-standing	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 • Fit to Washington, DC context • Cultural/political/social factors • Resourcefulness in gathering information	☐	☐	☐	☐	
Acceptability/Uptake of Solution					
• Acceptability to relevant DC-area stakeholders • Cultural acceptability • Social/behavioral considerations	☐	☐	☐	☐	
Implementation Considerations					
• Implementation plan • Timeline and budget • Feasibility (budget and other resources, time frame, leverages local partners/resources, logistical/infrastructure constraints) • Monitoring and evaluation plan	☐	☐	☐	☐	
Potential for Sustainability					
• Addresses/considers root causes & structural factors that lead to disparities in health outcomes (institutional racism, social/economic/physical conditions, etc.) • 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 G: Guide for Student Teams and Advisors 2026

The National Academies of Sciences, Engineering, and Medicine (National Academies) will host the thirteenth annual DC Public Health Case Challenge on Friday, October 16, 2026, 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 the winning solutions.

Organizers

National Academies Staff
Point of Contact: DCCaseChallenge@nas.edu
Amy Geller (ageller@nas.edu)
Alina Baciu (abaciu@nas.edu)

Case Writing Team
Remle Scott, co-lead (Uniformed Services University)
Teresa Russell, case co-lead (Uniformed Services University)
Anisa Amiji, Case Writer (George Washington University)
Alexander Diller, Case Contributer (American University)
Dakota Douglas, Case Contributor (Howard University)
Urmi Kumar, Case Writer (Uniformed Services University)

Theme

This year's case will focus on "Transformation and Innovation in Chronic Diseases in Washington, DC" with a more specific topic to be announced when the case is released October 2, 2026.

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 teams should be comprised of students representing a variety of disciplines or subjects (health, nursing, public health, law, business, communications, engineering, IT, gender studies, anthropology, economics, sociology, etc.). Teams are encouraged to include both undergraduate and graduate students.
- An orientation **webinar** will be offered to 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 from 12:00 to 1:00pm ET on Friday, October 2.
- **Student teams** will be provided with a case that is based on a real-life public health challenge faced by communities and organizations in the DC area. Teams will be given approximately 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 the evidence base. The case will include more detailed information on the judging criteria.
    - Information from the 2013-2025 DC Case Challenge events is available at http://nam.edu/initiatives/dc-public-health-case-challenge/

Prizes/Incentives for Student Teams

- Experience working with people from 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 National 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 registration to attend the NAM annual meeting on **Monday, October 19** (in person or virtually) for ALL interested team members and advisors.
    - Attending the NAM annual meeting is an exciting opportunity to meet and connect with leaders in the fields of health, medicine, policy, and beyond. See https://nam.edu/events/ for more information.
    - Please visit and scroll down to view the agenda for the NAM Annual Meeting: https://nam.edu/events/annual-meeting/
    - ***We strongly encourage that at least one team member be available on October 19 to present at a poster session at the meeting (times forthcoming)—contact National Academies staff with any questions.***
    - *Advance registration for the NAM meeting is absolutely required for those interested in attending (to register, use team form at the end of this document).*
        - *Note: Only two advisors from each team participating in the Case Challenge may participate.*
- **Prize money**
    - Grand Prize: $3,000
    - 3 "Best in Category" Prizes: $1,800
        - Interprofessional Prize
        - Practicality Prize
        - Wildcard Prize

*Note that if there are only 5 teams competing in a given year, we will not award a Wildcard Prize.

- **Payment**
    - In order to receive the payment for the cash prize, students must have one of the following: SSN, SSN Type 2, or ITIN (tax ID), or the University must be able to accept the prize on a student's behalf. Upon selection, winners will be required to furnish additional documentation and information to complete payment processing. Prize payments may be subject to tax reporting and/or withholding. By accepting the prize payment, winners are responsible for any related income tax liabilities.

Timeline

Please note that the timelines are firm

- **Wednesday, September 9**: Deadline for universities to confirm participation (please email DCCaseChallenge@nas.edu).
- **Thursday, September 24 (COB)**: Deadline to submit the team roster ***(use the form on the last page of this guide)***:
    - Team member names with areas of study and email addresses for final team registration.
    - IMPORTANT NOTE:
        - **This is a FIRM deadline, and we will NOT accept a roster OR any changes beyond this deadline** (except extreme circumstances; contact the organizers if an issue arises).
- **Friday, October 2 from 12:00 to 1:00pm:** 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.
- **Friday, October 2 at 1:00pm:** Case is released.
- **October 2 – October 16**: Teams develop their solution to the case.
- **Wednesday, October 14**: Teams must submit poster for NAM annual meeting by COB, ***unless*** you plan on printing your own poster.
- **Friday, October 16**: Teams present their 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.
- **Monday, October 19**: NAM annual meeting where all teams will have the opportunity to attend the meeting (if they registered with us in advance) and present their solutions at a poster session.

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.

Taking the Metro: The closest metro station is Foggy Bottom, located along the blue and orange lines. Upon exiting the metro, head South on 23rd Street, NW. Walk for about half a

mile. Turn left onto C Street, NW (before Constitution Avenue, NW) and walk on the side of C Street opposite the State Department. The NAS Building will be the second on your right, after you pass 22nd St NW, which is closed to traffic.

Upon entering the building, you will need to present a photo ID to the guard at the front desk. Proceed to Room 125 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:

- 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 Thursday, October 15.
- Teams should not discuss their case presentations or case content with other teams during the case challenge period (October 2 - October 16) 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 serve as a resource should not generate ideas for case solutions, but are permitted to 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 October 16. 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 in their university and that the team has representatives from 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

* Faculty advisors should contact the Case Challenge organizers if they have any questions or concerns about accessibility issues (for example, people with physical disabilities), we will do everything we can to accommodate. The Keck Center has many accessibility and inclusion features (such as ramps/elevators, assistive hearing devices, lactation room, gender neutral bathrooms, etc.).

<u>Presentations:</u>

- 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.
    - Hardcopies of each team's PPT will be provided to judges by staff. If desired, teams may bring a hard copy of any additional materials to distribute to the judges.
- 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.
  - It is allowable for the team to share their areas of study (but not the specific program/university)
- 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 Friday, October 16**. Failure to submit the presentation on time will result in disqualification from the competition. No changes can be made to presentations after that time and teams should not continue to work on their case solution and presentation while they are awaiting their presentation time.

Judging:

- The judges have agreed to participate in this event as volunteers. The judges will be announced approximately 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
  - Teamwork
  - Ability to respond to questions
- Detailed judging criteria will be provided with the case when it is released on October 2.

Resources

Information on the DC Public Health Case Challenge is available here:
https://nam.edu/initiatives/dc-public-health-case-challenge/

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.

Emory Global Health Case Competition:
http://globalhealth.emory.edu/what/student_programs/case_competitions/index.html

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

Yale Global Health Case Competition presentations:
http://www.slideshare.net/yaleglobalhealthcc

Appendix H: Presentation Day Agenda 2026



Agenda
October 16, 2026

National Academy of Sciences Building | 2101 Constitution Avenue, NW, Washington, DC

8:00–8:30am	**Arrival and Registration** *(outside of Room 125; breakfast available outside of Room 120)*
8:30am	**Deadline to Turn in Presentation** *(Room 125)* *Please take your flash drive to the Case Challenge staff member at the computer. This is when teams draw a number for presentation order.*
	Judges Check In (*Front of Room 125*)
8:45am	**Welcome** *(Room 125)* *Introducer: Alina Baciu, Senior Program Officer, National Academies and Case Challenge Co-lead* *Monica M. Bertagnolli* *President, National Academy of Medicine*
8:55am	**Logistics** *(Room 125)* *Amy Geller, Senior Program Officer, National Academies and Case Challenge Co-lead*
9:00am–1:00pm	**Presentations** *(Room 125)* *All but the first team should leave and go to Room 120 or 114. Return to Room 125 when it is your team's turn to present. After your team has presented, you may remain in Room 125 to watch the remaining presentations. During the morning, an organizer will gather each team to take a photo in the front lobby—see schedule in the section below.*

9:00–9:30	Team 1
9:30–10:00	Team 2
10:00–10:30	Team 3
10:30 – 10:45	**Break**
10:45–11:15	Team 4
11:15–11:45	Team 5
11:45-12:00	**Break**
12:00–12:30	Team 6
12:30–1:00	Team 7

9:00-10:30am **Team Photo Times** *(meet at registration table; bring your numbered folder with you)*

Teams 3-5: **9:05am**
Teams 6-7: **9:40am**
Teams 1-2: **10:05am**

1:00–1:45pm *(students)* **Lunch** (*Food available outside Room 120)*

1:00–3:20pm *(judges)* **Judges' Deliberations** *(pick up lunch from outside Room 120 and reconvene in the Board Room at 1:20)*

1:45pm **Group Photo with Students and Advisors** *(Outside)*

2:00–2:45pm **Team Solutions Recap** *(Room 125)*

Moderator: Patricia Cuff, Senior Program Officer, National Academies

Each team will provide an overview of their solutions (5 min each) so everyone can hear how other teams approached the challenge. Discussion will follow.

2:45-3:40pm **Expert Presentations** *(Room 125)*

Moderator: Angelica Valdes Valderrama, National Academies Mirzayan Science and Technology Policy Fellow and Tufts University doctoral candidate

2:45–3:20pm *LabX and The Science & Entertainment Exchange: "Non-traditional" NAS science communication programs*
Nawar Nemeh, Social Media/Marketing Manager and

Cortney Sloan, Manager, Public Engagement, National Academies

The Public Health Communications Collaborative
Shea Van Horn, Program Officer, de Beaumont Foundation

3:20–3:40pm Discussion & Q&A

3:40–4:00pm **Awards Ceremony** *(Room 125)*

4:00–5:00pm **Reception** *(Room 120)*