Supporting Adult Involvement in Adolescent Health and Education

DC Regional Public Health Case Challenge

2014 EDITION

GEORGETOWN UNIVERSITY

INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES

Advising the nation • Improving health

Contents

Acknowledgements

Disclaimer

All characters, organizations, and plots described within the case are fictional and do not reflect the view of existing organizations or individuals presented. The case scenario is complex and does not necessarily have a single correct or perfect solution, thus encouraging teams to develop a judicious balance of creative, interdisciplinary, and evidence-based approaches.

The authors of this case study have provided facts and figures within the case as well as appendices with resources and references to help teams create their solutions. The data provided are derived from independent sources, may have been adapted for use in this case, and are clearly cited such that teams can verify or contest the findings within their recommendations whenever pertinent. Teams are responsible for justifying the accuracy and validity of all data and calculations that are used in their presentations, as well as defending their assertions in front of a panel of subject matter experts who will be serving as judges representing different stakeholders.

I. Funding Announcement

Improving Outcomes for Early Adolescents by Supporting Adult Involvement in Their Health and Education

Introduction

The VCM Brygood (VCMB) Foundation[1] of the District of Columbia is pleased to announce a grant funding opportunity for any non-profit organizations working with the local DC community on topics relevant to health and education[2]. Specifically, the goal of this solicitation is to change adult behavior[3] by increasing the time, quality, and effectiveness of **adult**[4] involvement in **early adolescent** education for children aged 10-14.

Numerous studies have pointed to the beneficial impacts of adult involvement in a child's education. It is also known[5] that education is a strong predictor of health. Therefore, changing adult Knowledge, Attitudes, and Behavior (KAB) to facilitate increased involvement supporting early adolescent education has the dual benefit of improving both adolescent **education** and **health**. It is the Foundation's hope that this grant opportunity will not only produce short-term gains in adolescent health and education, but will also have meaningful, long-term impacts[6]. Epidemiologic research suggests that increasing adult involvement in supporting early adolescent education now better prepares adolescents to go on to lead healthy, productive lives in which they can achieve—and contribute to—their maximum societal potentials in the future (Low and Low, 2006).

The VCMB Foundation will award one four-year grant in the amount of $1 million dollars ($250,000 annually) to the non-profit organization that develops the most comprehensive, interdisciplinary, innovative, and evidence-based solution(s) targeted at adults with the outcome of improving the health and education of adolescents aged 10-14 living in DC. The successful solution will also provide feasible interventions that the applicant organization can readily implement in partnership with relevant DC government or community agencies. Proposed plans should prioritize the issues, justify the choice of intervention(s), specify the implementation and evaluation strategy, and provide budget estimates for the use of funds within the time frame specified.

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[1] The VCM Brygood Foundation is a private, non-profit, funding organization located in Washington, DC. For the past 50 years, the VCMB Foundation has been committed to funding innovative strategies to improve adolescent health and education in the local community.

[2] The VCMB Foundation defines health as a state of complete physical, mental, and social well-being. Education is defined to include a form of learning in which the knowledge, skills, attitudes, and behaviors of a group of people are passed from one generation to the next through teaching, training, or research.

[3] Successful outcomes of educational interventions involve more than just knowledge gains. For example, outcomes that adopt a multi-pronged approach targeting attitudes and behavior in addition to knowledge gains (KAB) are most successful. (See Schrader and Lawless, 2004).

[4] The VCMB Foundation defines "adult" as any individual ≥18 years old.

[5] For example, ensuring students are awarded a high school diploma four years after starting 9th grade has been identified as a leading health indicator for the future (Healthy People 2020).

[6] The Foundation would ultimately like to create a positive feedback loop in which behavior change in adults leads to improved adolescent health and education which in turn contributes to reinforcing positive behavior change in adults (and adolescents as they enter adulthood) and the cycle continues.

This grant elicits submissions through an open, competitive process to eligible non-profit organizations working on health and education issues in DC. Teams will present their proposals to The VCMB Foundation's board of advisors on October 31, 2014. For more detailed judging criteria, please see Appendix D.

The Challenge

You work for a small, non-profit organization that specializes in issues of health and education. The director of your organization has tasked your team to apply for this funding opportunity. Therefore, your goal, as a team, is to develop and propose an interdisciplinary, innovative, equitable, justifiable, and financially sound plan that will be supported by: the DC Government; your target audience of adults; adolescents aged 10-14; and the broader population of DC residents. When writing your proposal, your Director has approved your team to hire more skilled personnel within the funding allotted above, and whose salaries must be accounted for in your budget estimations, to help you implement your proposed solution(s) and meet this challenge.

Good luck!

Background

The following five scenarios, adapted from real life situations, portray the diverse range of issues faced by adults, who directly and/or indirectly, interact with adolescents aged 10-14.[7] You are not limited to directing your solution(s) to the types of adults or issues presented in these examples. Rather, these examples are intended to provide your team with different ideas of adult populations and issues, for which you may choose to design your intervention(s).

Scenario One: High Level Official in District of Columbia Public Schools (DCPS)
A high level official within the DCPS is becoming increasingly concerned about the rising childhood obesity rates among 10-14 year old DCPS students. Though this official recognizes that the causes of increasing childhood obesity are multifactorial and complex, she feels that DCPS can play a larger role in educating students on the importance of good nutrition for health and education. This official also recognizes that adults outside of the school environment also play a huge role in supporting good nutritional habits. Thus, she has proposed a two-pronged approach to addressing the problem. First, she wants to introduce a school garden program to integrate nutrition education and nutritional sciences in all DCPS middle schools' curricula. This new program would emphasize different aspects of good nutrition. The hope is that better nutrition will ultimately improve the academic achievement of these adolescents. Second, she would like to see this new curriculum involve the students' families to increase the impact, and build support for this new curriculum among families and communities. However, when she initially proposed the idea at a meeting with one group of DC middle school science teachers, the teachers were not enthusiastic about the ideas,

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[7] The Foundation recognizes that there is not one "correct" solution to address this public health issue. Rather, a number of different solution(s) could be proposed that target adult involvement in early adolescent education for children aged 10-14 living in DC. This solicitation does not necessarily have to directly impact all adolescents aged 10-14 living in DC. For example, for this funding announcement, you may choose to address a solution that targets adults of adolescents who work within the DC Public School (DCPS) and/or DC Public Charter School (PCS) educational system, or you may choose to target adults who work outside of a school based system.

having just invested a huge amount of time and resources on developing a new curriculum focused on advancing technology in the classroom by including the use of more computerized applications to scientific instruction. This left the official unsure how best to proceed.

Scenario Two: DCPS School Teacher

Ms. Smith, an 8th grade DCPS Middle School Teacher in Ward 8 SE, DC, feels like she is losing control over her classroom and her ability to teach. Her concerns emerged at the beginning of the school year and have worsened as the year continues. She believes many of her students have undiagnosed physical and/or mental health issues, such as vision problems and Attention Deficit Hyperactivity Disorder (ADHD), and these factors are making it difficult not only for her students to learn the material necessary for them to graduate to 9th grade, but also for her to teach them. She has also noticed that the student absenteeism rates in her classroom have been rising over the past month. She suspects the sharp increase in violent crime in the neighborhood surrounding the school may be to blame. Her fears were confirmed when she overheard one student, who regularly has good attendance, report to another, "[he] was afraid of coming to school this morning as, the neighborhood 'gang' was hanging around the parking lot bullying kids on their way into school ... some of them had guns." Ms. Smith wants to ensure her students have a safe and healthy environment to learn by involving the parents of her students.

Scenario Three: Parent of an adolescent

The Jones' were a financially stable family who lived in Northwest DC. A stay-at-home mom, Mrs. Jones was always involved in her son's school and assisted with his homework, helping him perform academically at or above the level of his other 6th grade classmates. Mr. Jones worked long hours to ensure the family maintained health insurance to cover the maintenance and treatment of his son's asthma, a condition his son had been diagnosed with since the age of one. Although the family was doing fine, their situation recently took a turn for the worse. Mr. Jones suffered a massive heart attack and suddenly passed away leaving Mrs. Jones and their 12-year-old son without a steady income or health insurance. Issues such as financial stability, health insurance coverage, and employment, never worries to Mrs. Jones in the past, quickly became pressing matters. In addition, Mrs. Jones was unable to attend a school performance she had always volunteered at in the past, finding herself overwhelmed by her new set of competing responsibilities. She also began receiving notes from one of her son's teachers stating concerns about the child as his academic performance was slipping—uncharacteristic behavior for a formerly straight "A" student. Mrs. Jones knows neither where to go to receive support, nor does she know how she is going to balance work and parenting. She also wants to continue to play a role in her son's education and remain involved with his school, but she is unsure how to do so given the dramatic shift in her life.

Scenario Four: Faith Based Leader

Mr. Rogers, the leader of an after-school faith group in Northeast DC, has noticed a change in one of the 14-year-old girls who regularly attends his class. He has detected that this particular girl has not only begun changing her style of dress, but has also been exhibiting certain behavior changes. For example, she has become more withdrawn during group activities—preferring to stay alone in the corner rather than interacting with the others. He also recently learned from the girl's mother that the teen's academic performance had been suffering over the past month (around the same

time he had noticed the subtle behavior changes). Mr. Rogers suspects the teen is struggling with some issues that may be contributing to both her recent behavioral changes, and the changes in her educational performance. Mr. Rogers wants to intervene now to support this student recognizing the importance of establishing support early to ensure the teen is successful both in and after high school—a period he has heard is an especially important transitional time in a teen's education. However, he feels limited by his lack of knowledge or training in issues relating to health and education.

Scenario Five: Nurse Practitioner in Primary Care Clinic
Mrs. Brown has been practicing as a nurse practitioner (NP) in a primary care clinic (PCC) located in SW, DC. Recently, Mrs. Brown received a referral from a NP who works in a local middle school for a 13-year-old girl who had come into the student health center complaining of abdominal pain, nausea, and vomiting. The girl also reported to the school's NP that "she was late." The school NP received confirmation from the student that she was sexually active, and referred her to Mrs. Brown at the local PCC for follow up.   At her first meeting with the student, Mrs. Brown ordered a pregnancy test—the results confirmed that the student was in fact pregnant. The girl began to cry to Mrs. Brown reporting, "[she] was really trying to do well in school and eventually get into a good college away from her old crowd...." She also tells Mrs. Brown that she does not have a strong support system at home and is fearful that her mom may "throw her out" over the news.

II. DC at a Glance

Demographics[8]

- Population: 632,323
- Male: 299,041 (47.3%)
- Female: 333,282 (52.7%)
- B Total number of individuals under the age of 18: 109,480 (17.3%)
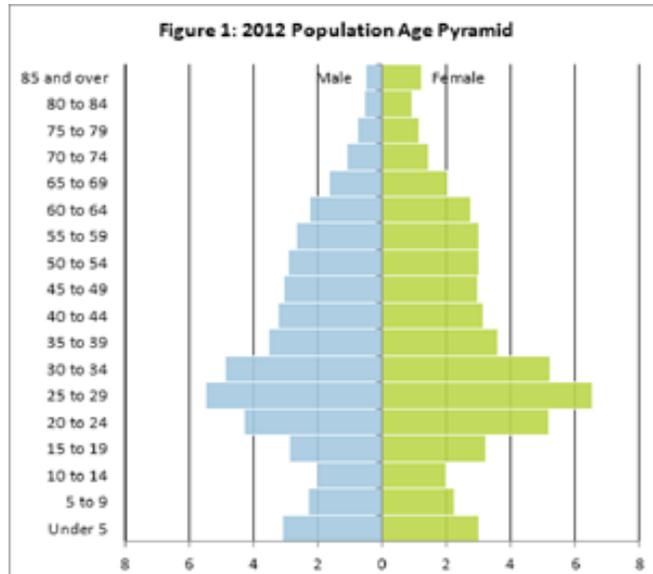- 10-14 year olds: 25,688 (4.1%)

Figure 1: U.S. Census Bureau, Population Division, 2012

Geography[9]

Washington, D.C., is administratively divided into four geographical quadrants of unequal size, each delineated by their ordinal directions from the medallion located in the Crypt under the Rotunda of the Capitol.

- **"Northwest" (NW)** is located north of the National Mall and west of North Capitol Street.It is the largest of the four quadrants of the city.
- **"Northeast" (NE)** is located north of East Capitol Street and east of North Capitol Street.
- **"Southwest" (SW)** is located south of the National Mall and west of South Capitol Street and is the smallest quadrant of the city.
- **"Southeast" (SE)** is located south of East Capitol Street and east of South Capitol Street. Southeast DC is noted for its high crime rate, the highest in the District.

Wards[9]

Neighborhoods in Washington, DC are divided into 8 wards with unique histories, cultures, architectures, demographics, and geography as briefly highlighted below:

- **Ward 1** is centrally located in the city and has the highest population density of any of the wards in DC. Additionally, many of the neighborhoods in Ward 1 have historical significance

for local Latino and African-American communities such as the Adams Morgan, Columbia Heights, and Mount Pleasant neighborhoods. Howard University is located in Ward 1.

• **Ward 2** contains landmarks including the White House and the National Mall, and is also home to what is considered to be "Downtown DC"-- a 138-block area of approximately 520 residential and commercial properties from Massachusetts Avenue on the north to Constitution Avenue on the south, and from Louisiana Avenue on the east to 16th Street on the west. Ward 2 also contains both Georgetown University and The George Washington University.

• **Ward 3** is one of the largest residential areas in DC. According to the DC Ward Profile, Ward 3 is home to 78% of residents who identify as white (non-Hispanic) compared to an overall population average of 35% white (non-Hispanic). American University is in Ward 3.

• **Ward 4** is a residential neighborhood including neighborhoods such as Petworth, Takoma, and Sixteenth Street Heights. Ward 4 represents the northernmost neighborhood in DC and is dominated by single-family detached homes.

• **Ward 5** is perhaps the most diverse ward in DC in terms of use, containing residential streets and shopping areas, as well as high-rise condominiums and industrial parks. The Bloomingdale neighborhood is located in this Ward.

• **Ward 6** contains the Capitol Building complex and is home to Navy Yard, the site of the 2013 mass killings, as well as many of the developing areas near Navy Yard.

Figure 2: DC Wards[10]

• **Ward 7** is located east of the Anacostia River. It is home to a number of residential neighborhoods that have a distinct sense of pride and culture in DC such as the Deanwood neighborhood. Ward 7 is also home to green spaces such as Kenilworth Aquatic Gardens, Watts Branch Park, Anacostia River Park and Kingman Island.

• **Ward 8** is also located east of the Anacostia River. Its 2010 population was composed of 94% black, non-Hispanic residents as compared to an overall median of 51% of black, non-Hispanic DC residents in the rest of the wards combined. Wards 7 and 8 contain some of the poorest areas in all of DC.
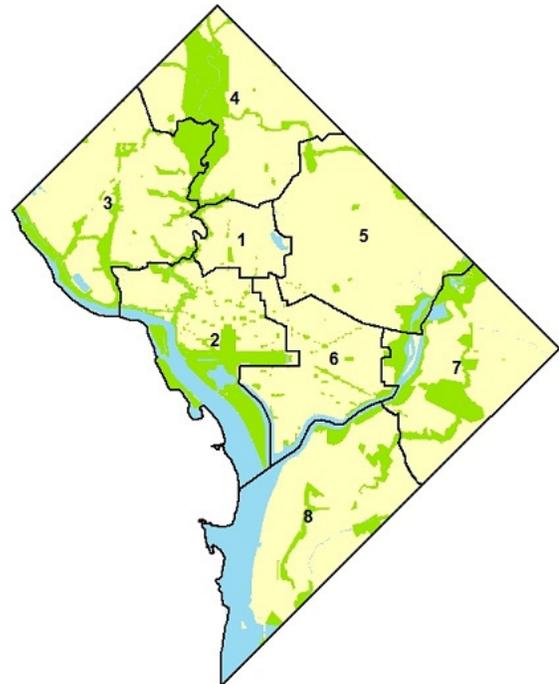
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[10] DC Ward Map, 2012. Available at: http://www.neighborhoodinfodc.org/wards/wards.html.

Community Adolescent Programs

DC has a number of community based programs outside of the education and health systems that focus on issues relevant to health and education. Examples are presented here. For more resources relevant to health and/or education, see Appendix B.

- Youth Villages: Serves families in DC through intensive in-home services;

- Healthy Babies Project, Teen Parent Empowerment Program (TPEP): Equips teen parents to be responsible parents, prevent repeat pregnancies, complete their education, establish careers, and move out of the cycle of poverty;

- Covenant House Washington: Responds to needs of young people who are affected by homelessness, abuse, and neglect by offering services and programs including education classes and childcare for infants and toddlers of young people;

- Sasha Bruce Youthwork: Provides comprehensive youth development services as well as providing a safe and interesting environment to spend their out-of-school time; and

- Boys and Girls Club of Greater Washington: Offers holistic programming to provide youth support and guidance to deal with a number of challenges such as graduation rates, teen pregnancy, crime, obesity, gang violence, etc.

Relationship Between Health and Education

Numerous national education organizations, such as the Council of Chief State School Officers, the National School Boards Association, and the American Association of School Administrators, have acknowledged the close relationship between health and education (Council of Chief State School Officers, 2004; National School Boards Association, 2009; American Association of School Administrators, 2007; Association for Supervision and Curriculum Development, 2011; Centers for Disease Control and Prevention [CDC], 2014).

The synergistic relationship between health and education can best be described through three interacting pathways (See Figure 3) (The Center on Society and Health, 2014):

1. **Education**;
2. **Health**; and
3. **Contextual factors**.
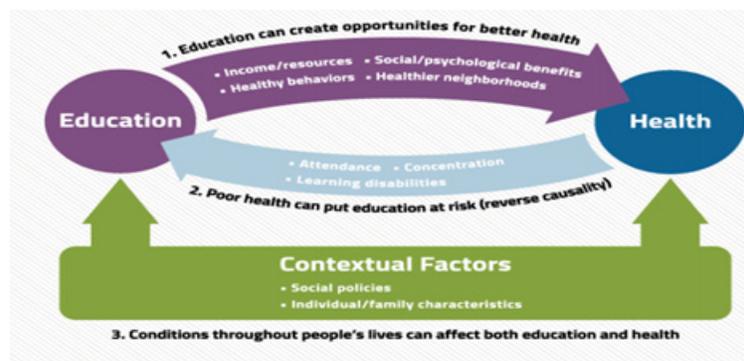
Figure 3: Why Education Matters to Health: Exploring the Causes[11]

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[11] The Center on Society and Health, 2014

Education Creates Opportunities for Better Health

Academic success and educational achievement are strong predictors of overall health outcomes (Department of Health and Human Services [DHHS], 2014). Education is an important "social determinant of health." It promotes and sustains healthy lifestyles and positive choices, supports and nurtures human development, human relationships, and personal, family, and community well-being (Measuring the Effects of Education on Health and Civic Engagement, 2006). Additionally, more years of schooling/education tends to lead to better health and well-being by promoting healthier behaviors (Measuring the Effects of Education on Health and Civic Engagement, 2006).
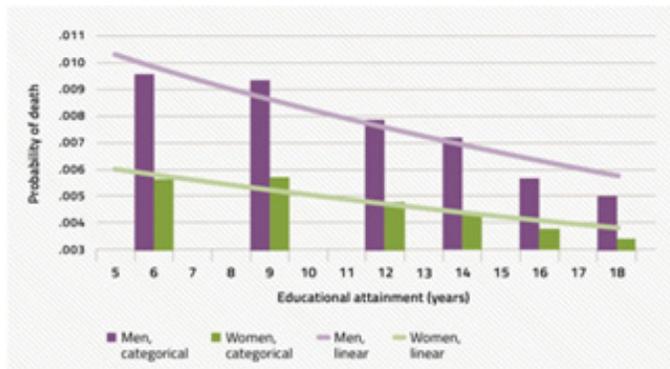

Figure 4: All-cause Mortality Risk for Men and Women by Years of Education[12]

There are noted health benefits in terms of decreased mortality and increased longevity of life related to education. While death rates are declining among the most educated individuals, they are increasing among the least educated (Zimmerman and Woolf, 2014; Jemal et al., 2008). Epidemiologic research also suggests that more educational attainment (measured in years of schooling completed) is associated with a lower probability of death in men and women (Ross et al., 2012) (See Figure 4). Addi-

tionally, people with more education are likely to live longer (National Longitudinal Mortality Study, 1988-1998).

Well-educated people experience better health outcomes as compared to those individuals with less educational attainment (Molla, Madans et al. 2004). Self-reports of "fair" to "poor" health are highest among adults ≥ 18 years with less educational attainment (Schiller et al. 2012). (See Figure 5).

Research also suggests a strong association between increased education and reduced burden of chronic illness. For example, The National Center for Health Statistics reported that by 2011, the prevalence of diabetes had reached 15% for adults without a high school
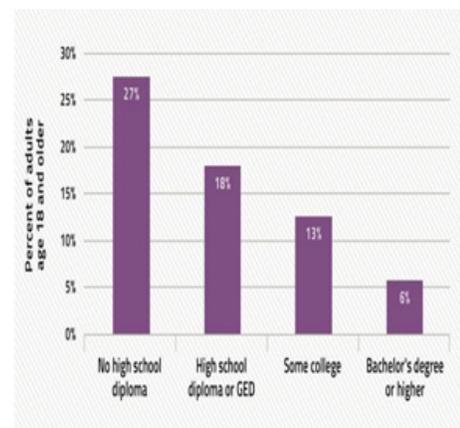

Figure 5: Self-report of fair and poor health[13]

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[12] The Center on Society and Health, 2014
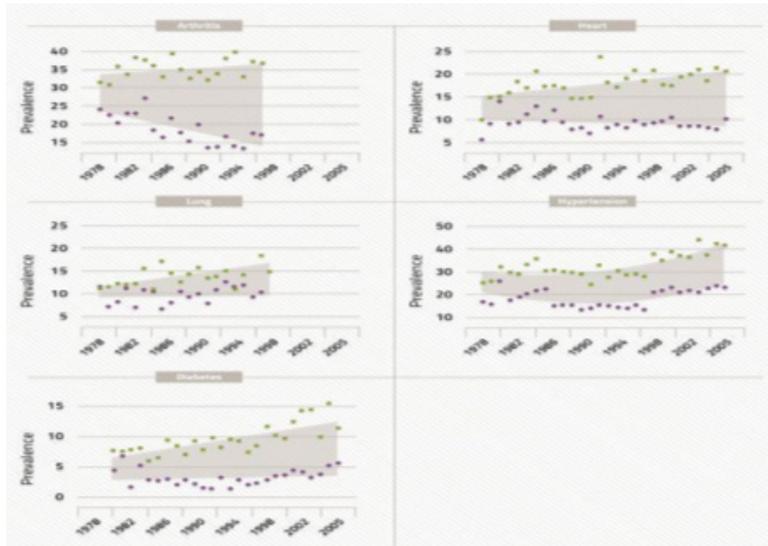[13] Ross et al., 2012

Figure 6: Widening Prevalence of Chronic Conditions by Educational Attainment, 1978-2005[14]

education, compared to 7% for college graduates (NCHS, 2011). This trend in increased prevalence of chronic illness among individuals with fewer years of educational attainment is consistent across other chronic illnesses such as arthritis and heart conditions (See Figure 6).

Individuals with more education are more likely to be employed and have higher median weekly earnings (See Figure 7). Higher income earners, and their families, tend to live in communities with access to resources that are important to health, such as more nutritious foods and health services, and resources important to education, such as better schools and transportation. Additionally, higher income earners and their families, tend to live in communities with lower levels of risk (crime, unemployment, poverty, etc.) as compared to lower income earners (Zimmerman and Woolf, 2014).

Education also has positive impacts on increasing knowledge and behaviors that can lead to better health (Robert Wood Johnson Foundation [RWJF], 2001-2014). For example, education not only offers learners access to health information, but it also facilitates healthier behavior choices and provides individuals with the tools to acquire appropriate health resources (Freudenberg and Ruglis, 2007).
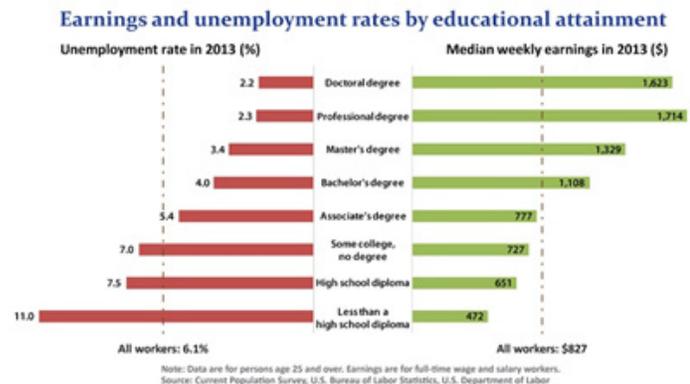
Figure 7: Earnings and Unemployment Rates by Educational Attainment[15]

Similarly, social and psychological factors, such as a sense of control, social standing, and social support, are all positively associated with education (RWJF, 2001-2014). Social networks are strengthened by education, whereas social stressors are mitigated. The 2011 National Health Interview Survey (NHIS) reports that stress is higher among poorly educated Americans (Schiller et al. 2012). People without a high school diploma are at least four times as likely to report being

[14] Schiller et al., 2012
[15] Goldman and Smith, 2011

nervous, and six times as likely to be sad "all or most of the time" as compared to people with a Bachelor's degree. Additionally, education can play a role in providing individuals with a sense of control over their lives (Freudenberg and Ruglis, 2007).

An inverse association between educational attainment and engaging in risky health behaviors has also been documented (Freudenberg and Ruglis, 2007). While higher educational attainment is associated with decreased risky health behaviors, such as smoking or having a low level of physical activity; lower educational attainment is associated with an increase in risky health behaviors (Lantz, House, et. al., 1998; Measuring the Effects of Education on Health and Civic Engagement, 2006).

Poor Health Can Put Educational Attainment at Risk

Poorer health in adolescence is strongly negatively associated with educational attainment (Jackson, 2009). Children with asthma and/or other chronic illnesses, such as ADHD, may experience recurrent absences; be easily distracted, bored, or have difficulty concentrating in a classroom setting; have difficulty processing information or completing assignments; and/or may not listen to, or follow instructions well, as compared to healthy students. Each of these poor health factors can have marked implications for educational attainment (Basch, 2010). Additionally, lack of educational attainment due to poor health may limit the development of cognitive skills, problem solving abilities, learned effectiveness, and personal control (Mirowski and Ross, 2005; Zimmerman and Woolf, 2014).

The health issues most commonly faced by students include vision impairments, asthma, teen pregnancy, poor nutrition (breakfast/hunger), and inattention and hyperactivity (Basch, 2010). Each is highlighted in more detail below.

Vision
Vision problems have been estimated to affect 20% of youth (Basch 2010). Approximately 80 percent of what a child learns in school, however, is presented visually (Heiting, 2014), which may place children with visual problems at a learning disadvantage compared to their peers without visual impairments.

Asthma
Asthma is one of the most common chronic health conditions affecting children—it affects an estimated 7.1 million children under 18 years old (American Lung Association 2012). Young people miss a total of nearly 13 million school days annually in the U.S. due to asthma or complications from asthma (CDC, 2011) making the condition one of the leading causes of school absenteeism. In 2003, visits to the Emergency Department (ED) of Children's National Medical Center in Washington, DC totaled approximately 73,000 of which 6.1% (~4,500) included a primary discharge diagnosis of asthma among patients aged 12 months – 17 years (Teach et al., 2006).

Teen Pregnancy
Teen pregnancy is pregnancy that occurs prior to the age of 20. Approximately 3 in 10 teen girls, or

greater than 700,000 teen pregnancies, occur in the U.S. annually (The National Campaign to Prevent Teen and Unplanned Pregnancy, 2014). For many years, DC had the highest teen pregnancy rate in the nation. While the rate of teen pregnancy in DC has dropped in recent years, it is still higher than the national teen pregnancy rate. The DC Office of Adolescent Health reports the rate of teen pregnancy in DC for 15-19 year olds to be at 42.8 percent as compared to 31.3 percent in the United States nationally (Office of Adolescent Health [OAH], 2014). Geographic disparities in the number of teen births among 15-19 year olds exist by Ward—Wards 7 and 8 had the highest number of teen births among all the Wards in 2008 (CDC, 2008). Teen pregnancy considerably reduces the chance that a teenage mother will finish her education. For example, only 50% of teen moms complete high school and less than two percent of teen mothers attain a college degree by age 30 (CDC, 2008).

Nutrition

Healthy eating in childhood and adolescence is important for proper growth and development, including cognitive development. Balanced diets rich in vitamins and nutrients can contribute to greater chances for well-being. For example, studies have shown that eating a healthy breakfast is associated with improved mood and memory, enhanced cognitive function, and reduced absenteeism. On the other hand, poor diets can contribute to chronic diseases, obesity, and low self-esteem. Moreover, nutrient intake deficiencies have been linked to physical and mental health problems, both of which can have detrimental impacts on educational attainment (Alaimo, Olsen, and Frongillo, 2001; Cook et al., 2004; Weinreb et. al., 2001). Food insecurity, or the inability to consistently access enough nutritious food necessary to maintain good health, is one cause of poor health. Its effects can also be seen in education. Many students often come to school hungry and distracted (Nord, Andrews & Carlson, 2007). Students experiencing hunger tend to have a higher prevalence of behavioral, emotional, and academic problems as compared to children who are well-nourished (Food Research and Action Center [FRAC], 2014). In 2012, 20% or more of the child population in DC lived in food-insecure households (Feeding America, 2014).

Inattention and Hyperactivity

Approximately 22% of individuals aged 13-18 years old experience mental health disorders that can lead to further impairments and deficits throughout life (CDC, 2011). Attention Deficit Disorder or Attention Deficit Hyperactivity Disorder (ADD/ADHD) is one of the most common mental health disorders of childhood and early adolescence. Hyperactivity and inattentive behavior can affect a child's ability to learn; ADD/ADHD diagnosed children have difficulty with sustained attention, are easily distracted, and are often disruptive (Basch, 2010). According to data reported by the US Centers for Disease Control and Prevention (CDC), DC ranked 37th highest[16] among all U.S. states for current ADHD or ADD diagnosis in 2011 (CDC, 2011). The rates of ADD/ADHD diagnosis in the District increased in the same period. The percentage of children, between 4-17 years of age, currently diagnosed with ADD/ADHD increased from 5.8% in 2007 to 7.9% in 2011, and 4.2% of the 7.9% diagnosed children in DC were taking medication for ADHD (CDC, 2011). In addition to ADD/ADHD, approximately 22% of individuals aged 13-18 years old experience mental health disorders that can lead to further impairments and deficits throughout life (CDC, 2011).

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[16] This ranking represents a decrease from the 2007 DC rankings. See CDC, 2011.

Contextual Factors Linked to Health and Education

Contextual factors[17] such as characteristics at the individual, family, community, or societal level can affect both health and education. For example, contextual factors can create stress and/or cause illness that can impact both a student's success in school both can also impact a student's ability to maintain a healthy lifestyle. Although several factors contribute to what are considered the contextual factors impacting health and education, some salient factors are outlined below:

Social and Psychological Factors

Education in school and other learning opportunities outside of the classroom build skills and foster traits that are important to living a healthy life (Campbell, et. al 2014). Interpersonal connections and social networks may bring access to financial, psychological, and emotional resources that may help reduce hardship and stress in the home environment (Campbell et al., 2014). Social skills that are developed through close relationships with family or friends can range from personal control and flexibility to the capacity for negotiation and the ability to form relationships with others—all of which are also relevant factors in determining positive educational outcomes. Additionally, adolescents who perceive they have good communication and are bonded with an adult are less likely to engage in risky health behaviors (DHHS, 2014; Resnick et al., 1997).

Conversely, stress or other adverse childhood events (ACE), such as growing up in an economically unstable home, can not only cause lasting biological harms, but can also cause youth to take up unhealthy or risky behaviors, such as smoking or violence (Campbell, et. al, 2014).

Parental Educational Attainment

Educational attainment refers to the highest level of education that an individual has completed. Children's health, social, and economic advantages, as well as opportunities for educational attainment, are impacted by parental educational attainment (RWJF, 2011; Matthews and MacDorman, 2007). Studies suggest a positive association between parents' and their children's educational attainments (measured by years of schooling completed). For example, models predict that a parent's educational level when a child is as young as 8 years old, can have a significant impact on educational and occupational successes for the child 40 years later (Dubow et al., 2009). Additionally, the amount of formal education completed by parents is associated with greater educational attainment by children (Haveman et al., 2004; Melby et al., 2008). The impact of familial educational attainment on the synergistic relationship between health and education is evident, not only at the individual level, but also at the generational level. Just as high educational attainment and good health can be perpetuated across generations, so too can low educational attainment and poor health (RWJF, 2011).

Income

Income is a leading predictor of health status (Zimmerman and Woolf, 2014; Braveman et al., 2010). Economic vulnerability can affect health by limiting one's ability to acquire resources neces-

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[17] Contextual factors refer to factors found at the social and economic environment, the physical environment, and the person's individual characteristics and behaviors that may affect the health of an individual or community. See http://www.who.int/hia/evidence/doh/en/.

sary for good health (Zimmerman and Woolf, 2014; Braveman et al., 2010). Additionally, children of families living in poverty are more likely to have chronic health conditions and poorer health status, as well as less access to, and utilization of health care services (DHHS, 2014; Resnick et al., 1997). Poverty during early adolescence is also an important factor in predicting adolescent educational achievement (Zimmerman and Woolf, 2014; Guo, 1998). Individuals with lower levels of educational attainment and income are at greater risk for exposures to financial and occupational stresses, such as chronic under- or unemployment (Zimmerman and Woolf, 2014).

Environmental Factors
Geographic location and the neighborhood or community where a student resides each factors that can either positively or negatively affect health and education. Lower income neighborhoods are often economically marginalized, segregated, and have more risk factors for poor health, such as less access to supermarkets, less green space for physical activity, higher levels of toxins, and a shortage of primary care physicians (The Center on Society and Health, 2014). Additionally, lower-income neighborhoods often contain fewer high-quality schools, provide fewer opportunities for employment, and have marginal political power (The Center on Society and Health, 2014). Additionally, adolescents that grow up in economically "distressed" neighborhoods, characterized by high rates of poverty, are at risk for a variety of negative health outcomes, such as poor physical and mental health, which in turn can have a negative impact on education (HHS, 2014). Additionally, lower income communities tend to have higher risks for crime and violence, and are less resilient in the face of natural or manmade disasters, than higher income communities (Zimmerman and Woolf, 2014). These factors can lead to stress that in turn can be detrimental to health and education.

Social Policies
Social policies consist of legislation, regulations, and actions that are put in place to affect change in the systems, practices, and behaviors of society. Social policies that have been established at the federal level and enacted at the state or local levels, by the DC Government for example, can ultimately affect health and education outcomes. Social assistance programs, such as Medicaid[18] and the Children's Health Insurance Program[19], ensure that those who cannot afford private health insurance do not have to go without medical care. Education is likewise impacted by social educational policies[20], the Early and Secondary Education Act (ESEA), or No Child Left Behind Act of 2001 (NCLB), or Race to the Top, which serve to set standards and provide support for American education systems.

The American Recovery and Reinvestment Act (ARRA) of 2009[21] provided financial and structural support for both the health care and education sectors following the U.S. financial crisis of 2007-

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[18] For more information on Medicaid see http://www.medicaid.gov/

[19] For more information on the Children's Health Insurance Program see http://www.medicaid.gov/medicaid-chip-program-information/by-topics/childrens-health-insurance-program-chip/childrens-health-insurance-program-chip.html.

[20] For more information on NCLB or Race to the Top policies, please see the section on education that follows.

[21] ARRA is also referred to as the Stimulus or The Recovery Act.

2008. Health care funding has been appropriated for purposes including Medicaid supplementation, health research, and prevention and wellness, while education funding has been appropriated for a variety of uses that include providing aid to public school districts to prevent layoffs and cutbacks, assisting low-income children, and increasing teacher salaries (ARRA, 2009). The ARRA awarded DC $182,068,262 and $301,816,079 towards enacting health and education reforms respectively (Recovery.org, 2014).

Early Adolescence

Adolescence can be defined in two stages: early, between the ages 10-14, and late, between the ages of 15-19[22]. Early adolescence is a time of transition. Adolescents not only experience rapid physical transformations, typically occurring before the age of 14 years old, that include changes in growth and sexual development, but they also experience significant brain and cognitive development, such as the ability to make more refined and calculated decisions, during this time period. Early brain development has been shown to be crucial for later cognitive development and learning (Rice and Barone, 2000; Thompson and Nelson, 2001).

Health Risks in Early Adolescence
Experimentation during early adolescence can lead to unhealthy risk-taking behaviors. According to national statistics, examples of risky health behaviors that adolescents engage in include:

- **Smoking:** Approximately 1 in 5 high school students in the U.S. is a current smoker;
- **Poor nutrition**: 78% of U.S. high school students do not eat the recommended 5 daily servings of fruits and vegetables;
- **Inadequate physical activity and obesity**: Only 1 in 3 children in the U.S. participates in daily physical education classes and 1 in 3 children and adolescents in the U.S. is overweight or obese;
- **Unsafe sexual behavior**: Approximately 18% of new HIV diagnoses in the U.S. are among adolescents and young people aged 13-24 and 3 in 10 women become pregnant before the age of 20;

In DC, examples of the levels of health risk behaviors reported by adolescents according to the 2013 Youth Risk Behavior Survey (YRBS)[23] conducted in DC public (DCPS) or DC public charter middle schools (PCS) include:

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[22] Late adolescence will not be discussed further as it is not the subject of this funding opportunity.
[23] The Youth Risk Behavior Survey (YRBS), administered by the US Centers for Disease Control and Prevention (CDC), monitors six types of health-risk behaviors which contributed to the leading causes of death and disability in the US. These include: unintentional injuries and violence; sexual behaviors; alcohol and other drug use; tobacco use; unhealthy dietary behaviors; and inadequate physical activity. For more information, see http://www.cdc.gov/HealthyYouth/yrbs/index.htm.

- Nearly **70%** of respondents were involved in a physical fight;

- Approximately **30%** were bullied at school;

- Approximately **14% (8,941 youth**) reported that they drank alcohol for the first time before age 11;

- Among youth under the age of 11, **less than 5%** reported having tried marijuana or a cigarette; however, **10%** reported having used inhalants (sniffing glue, breathing contents out of spray cans, inhaling paints, etc.) in order to get high; and

- **More than 18%** (~8000 youth) of youth reported having ever had sexual intercourse, with **9%** of these reporting that their first sexual intercourse occurred before the age of 11 years (YRBS, 2013).

The behavioral patterns established during this developmental period helps determine both current health status as well as future health risks (DHHS, 2014). Research has demonstrated that establishing and maintaining healthy behaviors during early adolescence is more effective than trying to change established patterns of unhealthy behaviors during adulthood (CDC, 2011).

Other
During this transitional time, early adolescents may experience and are particularly sensitive to psychological changes that can either positively or negatively impact their health and education outcomes. Young people begin to develop a better-formed sense of self and start to view their own priorities independently of their families.' This shift is complicated by the emerging importance of sexuality and peer relationships (Eccles, 1999). As youth mature, they need space and time to establish an individual adult identity. Self-esteem can suffer as youth often have a difficult time adjusting to new responsibilities (Wigfield, 1999).

The Educational System and Early Adolescence
Academic engagement—defined as "youth's positive attitude toward school, confidence in own ability to do well in school, and perception of and actual success in school"—during early adolescence is associated with educational attainment in young adulthood (Melby et al., 2008). The educational system has recognized the importance of early adolescence. During the 1980s, schools shifted from a junior high educational system that included grades 7 to either grades 8 or 9, to a middle school educational system that included students falling between grades 6-8. This change was intended to separate students undergoing the transitions of early adolescence into a semi-structured environment that also emphasizes responsibility. In the middle school educational system, students learn to move between classes and subjects; however, they are often kept with a core group of classmates in order to facilitate their social development. Unlike in high school, grades are not as heavily emphasized in the middle school educational system, thus leaving room for youth to develop self-esteem (National Middle School Association, 2003).

However, the middle school environment is not without limitation. For example, both bullying and social alienation are common in middle schools; these may lead to an increased risk of dropping-out of the educational system. Mentoring relationships that develop between students and adults

are often weakened by a lack of time, resources, training, and support. Parental involvement is also less prominent, and often declining, in middle schools as compared to elementary schools (Augustine, 2004).

Education[24]

A brief overview of the DC Public School (DCPS) and Public Charter Schools (PCS)[25] formal education system, measures, and factors of educational success follows.[26]

DCPS, PCS

Overview

The Office of the State Superintendent of Education (OSSE)[27] is the State Education Agency for the District of Columbia responsible for raising the quality of education for DC residents. OSSE works closely with the DCPS and PCS to ensure schools are within compliance of all federal and state mandates, as well as serves as the federal liaison to the U.S. Department of Education (Office of the State Superintendent of Education [OSSE], 2014).

The DCPS and PCS consists of the following components: (Office of the State Superintendent of Education [OSSE], 2014a; 21st Century School Fund, 2014)

- Universal pre-kindergarten, which guarantees early childhood education for residents;

- The District of Columbia Public Schools (DCPS);

- Public Charter Schools (PCS);

- A public library system with various learning resources and programs for children and their parents to use; and

- Over 15 colleges and universities, including one public university, the University of the District of Columbia (UDC).

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[24] Please see Appendix B, Resource List, for additional national, federal, and DC based education resources.

[25] Public charter schools are public schools that are "allowed the freedom to be more innovative while being held accountable for advancing student achievement. Because they are public schools, they are: open to all children; do not charge tuition; and do not have special entrance requirements" (http://www.publiccharters.org/get-the-facts/public-charter-schools/).

[26] Please note that the extent of resources that could count as components of the DC early adolescent system is vast. Many components to the DC education system, outside of the DC public school system, have not been discussed. However, a brief overview of some of the features of the formal education system, measures of formal education, and predictors of educational success at the national and DC levels have been provided. Teams are encouraged to research topics and debates on education further. The VCMB Foundation's Board of Advisors will consider all solutions equally and award the winning team according to criteria established in the beginning of this case.

[27] For more information on OSSE, see http://osse.dc.gov/page/about-osse.

[28] The Deputy Mayor for Education has responsibilities not only for policy and planning in both sectors, but also for ensuring the continuum of education from early childhood to post-secondary and adult education (21st Century School Fund, 2014).

The city's K-12 system is one of 'public school choice' where parents have the right to select either enrolling their children in a DCPS or a PCS.[28] Parents also have the option to decide where to send their children for formal schooling. For example, parents may decline to enroll their child in the "in-boundary" public school, if the school lying within boundaries of the student's residential address and grade level is not preferred, instead choosing to enroll their children in a public school that is "out-of-boundary" (OSSE, 2014a; Özek, 2011).

Demographics
Public school enrollment in DC is more than two-thirds African American and Hispanic. DCPS remain largely racially and socio-economically segregated (21st Century School Fund, 2013). For example, Wards 7 and 8 are almost exclusively African American, whereas Ward 4 is almost exclusively White (See Figure 8) (21st Century School Fund, 2014). Additionally, for many decades, the vast majority of public schools students in DC have been low income, and an average of 80% of all students across DCPS in the 2012-13 school year, were eligible for the Federal Free or Reduced-Price Meal subsidy program (21st Century School Fund, 2014).
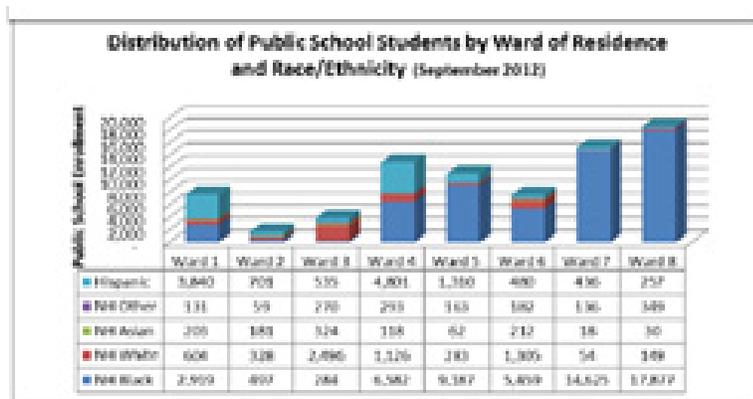

Figure 8: Distribution of DC Public School Students by Geography and Race/Ethnicity (21st Century School Fund, 2014)

Enrollment
There are a total of 228 Public and Public Charter Schools with an audited enrollment of 82,958 across the 8 Wards in DC (See Table 1) (21st Century School Fund, 2014; OSSE, 2014b). Funding for DCPS and PCS systems, and the policies controlling their operation remain subject to the approval of Congress. The amount of funding allotted for each school is dependent on general student enrollment (21st Century School Fund, 2013).

[28] The Deputy Mayor for Education has responsibilities not only for policy and planning in both sectors, but also for ensuring the continuum of education from early childhood to post-secondary and adult education (21st Century School Fund, 2014).

Table 1: Public and Charter Schools in DC by Ward (2013) [29]

Ward	Total Number of Schools			Total Number of Student Enrolled		
	DCPS	PCS	Total	DCPS	PCS	Total
1	11	20	31	5522	6610	12,132
2	8	2	10	2845	657	3502
3	10	0	10	6339	0	6339
4	15	19	34	6812	5476	12,288
5	16	20	36	4590	6611	11,201
6	18	15	33	6727	3993	10,720
7	16	17	33	5484	6274	11,758
8	19	22	41	8074	6944	15,108
Totals (1-8)	113	115	228	46,393	36,565	82,958

Measuring Educational Success

Educational attainment is one way to measure educational success; academic achievement (performance), or a measure of the extent to which a student, teacher, or institution has achieved their educational goals, is another.

Measuring educational success is a multi-factorial, complex process. There is no general agreement on how best to measure academic achievement or which aspects of academic achievement are more important indicators or predictors of success; however federal education policies, such as the No Child Left Behind Act (NCLB)[30] of 2001 and the "Race to the Top" [31] funding contest of 2009, are market-oriented education reform programs that seek to establish high standards and establish measurable goals by which one can assess student educational outcomes (Weiss and Long, 2013).

The performance of all DCPS students is measured using the DC Comprehensive Assessment System (DC CAS)[32] which compares results of DC students against annual performance targets to determine whether the school, local education agency (LEA), or state has made adequate yearly progress (AYP).[33] DC CAS tests are designed to measure the academic proficiency of all DCPS and PCS students according to pre-established standards as set by the DC OSSE in the content areas of reading,[34] mathematics, science and health, and composition (OSSE, 2014). Students are scored at four levels of mastery: advanced, proficient, basic, or below basic.

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[29] Neighborhood Info DC Revised April 29, 2014 http://www.neighborhoodinfodc.org/wards/wards.html

[30] For more information on the NCLB see http://www2.ed.gov/nclb/landing.jhtml

[31] For more information on "Race to the Top" see http://www2.ed.gov/programs/racetothetop/index.html

[32] For more information on DC CAS see http://www.nclb.osse.dc.gov/

[33] AYP is the key measure in determining whether a public school or school district is making "annual progress" towards academic goals established by the state. For specifics about AYP please see http://www.ncpie.org/nclbaction/ayp.html.

[34] Being proficient in reading from an early age increases academic achievement and graduation in later years. A student who can't read on grade level by 3rd grade is four times less likely to graduate by age 19 than a child who does read proficiently by that time (Sparks, 2011).

Reading and math tests are administered annually to all students in grades 2-10. Since 2007, DCPS and PCS students have realized substantial improvements in math, reading, and science DC CAS scores (OSSE, 2014). In 2014, the percent of DCPS and PCS students proficient in math, reading, and science were 54.4, 49.9, and 45.0 percent respectively as compared to 31, 36, and 29 percent in 2007 (OSSE, 2014). Students demonstrated consistent growth annually from 2007 to 2014 as well (OSSE, 2014).

Beginning in 2015, however, new assessments will be aligned to ensure college and career readiness, and, will be available on computer-enhanced and technology- enhanced platforms (OSSE, 2014d). In Spring 2015, the Partnership for Assessment of Readiness for College and Career (PARCC) will replace DC CAS math, reading and composition (OSSEE, 2014e; OSSE, 2014f). PARCC will be able to accurately track a student's academic growth in order to identify progress towards readiness and success in college and their careers, and, give teachers the resources and technological tools they need to ensure this happens by customizing learning to meet the student's direct needs (Partnership for Assessment of Readiness for College and Career [PARCC], 2014). A new health and science test will also be implemented called the Next Generation Science and Health. This test will replace DC CAS Science and Health (OSSE, 2014d). Each of these new assessments are aligned with the more rigorous common core state standards, Next Generation Science Standards, and DC State Standards (OSSEE, 2014f). Performance baselines will be established after program implementation.

Factors Affecting Educational Success
Graduation and Drop Out Rates
There are benefits to graduating from High School (HS). For example, not only do HS graduates earn $143 USD more per week than high school dropouts (National Dropout Prevention Center/ Network, 2014), but ensuring students receive a high school diploma four years after starting 9th grade has also been identified as a leading health indicator for the future (Healthy People 2020).

However, HS graduation rates in DC are amongst the lowest in the nation. For the 2011-2012 school year, the national public high school adjusted cohort graduation rate (ACGR) was 80% as compared to 59% in DC (Stetser and Stillwell, 2014). In the 2012-2013 school year, the DC OSSE reported the overall graduation rate for admitted DC Public Schools students rose from 59% to 64% with 62% of these graduates graduating high school within four years of entering 9th grade for the first time in the 2012-2013 academic year (OSSE, 2014c). These rates still fall far behind the national average.

One of the factors contributing to low high school graduation rates in DC is the dropout rate, or rate that a student quits school before he/she graduates. The 2011-12 school year average public HS dropout rate was 5.8 percent in DC compared to 3.3 percent nationally. (Stetser and Stillwell, 2014).

The economic impacts of dropping out can be substantial. For example, students who drop out early tend to earn about half the annual income as those with a HS diploma earn. This can amount to as much as 350 billion US dollars (USD) lost over the course of lifetimes in lost wages, productivity, and taxes. Additionally, dropping out of school early can lead to can have various social, psychological, physical, and cultural impacts (American Graduate, 2011).

Though there may be many reasons (practical, necessity (either medical or financial), disillusionment, or a combination) that can lead a student to drop out of school, some common factors predicting who will drop out include: (What Do We Know about Who Drops Out and Why? 1998.)

- Age: Older students are more likely to drop out than their grade school peers
- Gender: Males are more likely to drop out than females
- SES and Income: Lower socioeconomic (SES) status may contribute to higher drop-out rates
- Ethnicity: Specific ethnicities, such as Black, Native American, and Hispanic students are more likely to drop out than their White counterparts
- Native Language: Students who come from non-English speaking backgrounds are more likely to have higher dropout rates
- Geographic Location: Students from urban districts, as compared to suburban or non-metropolitan areas, are more likely to drop out, as are students from the South and West regions of the United States
- Household Mobility: High levels of household mobility contribute to increased likelihood of dropping out
- Academic Ability: Lower cognitive scores may contribute to a student's choice to drop out
- Disability: Students with disabilities are at greater risk of dropout
- Parental Employment Status: Dropouts are most likely to come from families in which the parents are unemployed
- Family Structure: Students who come from single-parent families are at greater risk of dropout
- School size: Students tend to drop out of larger schools

Truancy

Hundreds of thousands of youth are truant, or regularly absent from school,[35] without an excuse, each day [36] (US Department of Justice [DOJ], 2001). Regular school attendance is critical to providing students an opportunity to learn; truancy is a predictor of lower academic success.

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[35] Absenteeism, or a habitual pattern of absence from a duty or obligation, is a term most commonly referring to the workplace.
[36] Each state has its own definition for the minimum age limits required for free education. In DC any student between 5-18 years old who has an unexcused absence from school is defined as truant (National Center for Education Statistics, 2013).

Each state determines its own state law governing the age range and minimum number of days students are required to attend school. These laws may vary by state and school district; however, in general truancy rates tend to be higher in inner-city school districts with large number of students. (Truancy Prevention Facts and Laws, 2006). Truancy has long been a significant problem in DC; in the 2012-2013 school year, about 15,000 DCPS students—32% of all students Pre-K through HS—missed more than 10 days of class without a valid excuse (Brown and Alexander, 2014).

Truancy is associated with:

- Lower levels of academic achievement, such as low grades in reading and/or mathematics or general proficiency levels
- Delinquent activity in youth, such as substance abuse, gang activity, or involvement in criminal activities
- Negative behavior and attitudes towards schools and teachers
- Social isolation or the inability to make friends with students and/or teachers (DOJ, 2004).

According to a 2012 report by the DC Crime Policy, HS student absenteeism rates are strongly predicted by a student's 8th grade truancy (Liberman & Cahill, 2012).

Factors contributing to truancy are present at the individual, family, and school levels (DOJ, 2004). Examples include:

- Individual: Poor physical health, mental health issues, health risk behaviors, lack of knowledge about attendance laws; and negative attitudes towards education at an individual level can all contribute to truancy
- Familial Factors: A lack of guidance or parental supervision; poverty, parental income and employment status; domestic violence or substance abuse in the home; lack of knowledge about attendance laws; and parental attitudes towards education are some examples of family factors that contribute to truancy
- School factors: School factors contributing to truancy may exist at multiple levels. For example, the number of teachers, the effectiveness and quality of teaching, and educators' years of training and experience are all associated with truancy (Journal of Educational Psychology, 2008). School policies, such as weak or no monitoring of daily attendance, inconsistent attendance policies, lack of parent involvement in the school, and lack of personalized attention to the student are also associated with truancy (Truancy Prevention Fact and Laws, 2006).

Economic factors may also contribute to truancy. For example, student employment or a lack of affordable transportation to school or costs of childcare may each impact truancy rates.

Truancy in childhood has also been identified as a predictor of behavioral and adjustment problems in adulthood (DOJ, 2001). Adults who were more truant as teenagers, are more likely to have poorer health, lower paying jobs, an increased chance of living in poverty in adulthood compared to teenagers who were not truant (DOJ, 2004). Additionally, childhood truancy has been shown to be associated with an increased propensity for violent behavior in adulthood (DOJ, 2001).

Other
Family income[37] is a strong predictor of educational success (Reardon, 2011). Many studies have reported a positive link between high income and high academic achievement. Children from high-income families who attend schools with more affluent student populations tend to have higher academic achievement and graduation rates compared to students from low-income families or those who attend schools with mostly low-income classmates (Duncan and Murnane, 2014). Additionally, the 2013 National Assessment of Educational Progress (NAEP) Trial Urban District Assessment (TUDA) reported that students who were eligible for free/reduced-price school lunch, an indicator of low-family income, had lower average proficiency scores compared to students who were not eligible for this program (NCES, 2014b). This income-related achievement gap[37] between students from high and low-income families and academic achievement is only widening (Reardon, 2013).

In addition to family income, students are more likely to develop academic skills in environments where parents are able and willing, to provide both financial and time-conscious support to their children (American Psychological Association 2010). Children's initial reading competence is correlated with factors found within the home including the literacy environment and number of books owned (Journal of Educational Psychology, 2008).

Adolescent Health System Overall
Adolescents pose unique challenges to health care systems due to their rapidly changing physical, mental, and emotional needs. Such challenges include effectively transitioning patients from pediatric to adolescent care, adolescent-friendly delivery of health services, effective use of eHealth and mHealth technologies, and coordination and integration of health services and programs. State and local public health departments play an active role in supporting the medical care and healthy development of adolescents by providing access to essential services and health promotion through education and community outreach. A wide range of health care delivery platforms exist for adolescents, including school-based clinics, youth centers, mobile clinics, public and private clinics, community health centers, urgent care clinics, trauma centers, hospitals, eHealth services, and more. Although there are areas with excellent coverage and quality, adolescent healthcare services overall are not uniform in conforming to existing guidelines, highly fragmented, and lack coordination (WHO, 2014m; Osius, 2009).

[37] Income is one measure of Socio-Economic Status (SES), which more broadly measures an individuals' or family's economic and social position based on education, income and occupation."

District of Columbia Department of Health
The DC DOH performs health promotion, prevention, and school-based primary care targeted at adolescent residents. There are many programs run by the DC DOH that focus on improving adolescent health, several of which are described below.

Nutrition and Obesity
The Child & Youth Healthy Eating Active Living to Prevent and Reduce Obesity Program aims at reducing obesity among adolescent youth. This program develops and implements programs in educational, community, and health care systems throughout the District that promote healthy eating and active living for adolescents and their families. One such program is the DC Fresh Mobile Cart Pilot Program (FMCPP). The FMCPP focuses on Wards 5, 7, and 8, where obesity rates are the highest in the District, and seeks to increase access to fresh fruits and vegetables (Howard University Hospital, 2014a; DC DOH, 2014b).

Violence and Injury Prevention
The DOH Violence Prevention Program (VPP) has several violence prevention and recovery programs that educate and provide resources for violence related issues to students enrolled in Ward 7 and 8 public schools, which have the highest incidences of sexual violence in the District (DC DOH, 2014d). For example, the Rape Prevention Education program conducts educational sessions that teach students how to recognize risk factors for rape, appropriately respond to incidents of rape, and community resources that are available to assist victims. The Healthy and Unhealthy Relationships program provides educational sessions that teach students how to identify, develop and maintain healthy, resilient relationships, while the Bullying Program provides bullying and violence prevention education on topics such as bullying, cyber bullying, harassment, depression and suicide prevention.

School-Based Health Programs
Adolescents spend considerable time at school. Thus, school-based health care providers play a crucial role in both screening and initial assessment of medical conditions such as mental health disorders and promotion of healthy behaviors. The DC DOH funds and manages School-Based Health Centers (SBHC) throughout the District that provide comprehensive primary care within schools (DC DOH, 2014e). By establishing schools as places where all children, regardless of their insurance status (e.g. Medicaid or SCHIP coverage, private insurance, or uninsured), can be cared for physically and mentally, the health care opportunities created by SBHCs have reached not only the health care sector, but also the education sector.

In addition to providing medical services to enrolled students and their children during normal business hours at SBHCs, the DOH has school-based programs for preventative oral health through the School Based Oral Health Program (DC DOH, 2014f), reproductive health and sexuality education through the Health and Sexuality Education Program (DC DOH, 2014g), and mental health services. The DC DOH also provides on-site school nurses at DCPS and PCS who perform triage, emergency care, health counseling, care for children with disabilities, health assessments and screenings. School nurses promote student health and wellness by collaborating with students, family members, school personnel, and community-based organizations.

Mental and Behavioral Health

Adolescents with stable mental health are prepared to develop crucial skills that help build a healthy, productive society; however, it is estimated that as many as one in five children and adolescents may have a mental health disorder that require treatment (DC DBH, 2014). The DC Department of Behavioral Health (DC DBH) provides prevention, intervention, and treatment services and support for children, youth, and adults with mental and/or substance abuse disorders including emergency psychiatric care and community based outpatient and residential services (DC DBH, 2014). For example, the DC DBH operates school based programs in select DCPS and PCS that offer prevention, early intervention, and clinical services to youth and their families as well as offers supportive services for school teachers and staff (DC DBH, 2014). Additionally, DBH, through the Children and Youth Services Division, outlines specific actions and inclusive system of care for children, adolescents, and their families that promotes early identification and prevention of mental and behavioral health care issues. Emergency services are provided through the Children and Adolescent Mobile Psychiatric Service (ChAMPS).

Community Health Centers and Clinics

The largest primary care provider in DC is Unity Health Care (UHC), which has a District-wide network of Federally Qualified Health Centers (FQHC) and mobile clinics. UHC provides comprehensive team-based primary and specialty health care for adolescents. Unity's teen service programs include: family planning, oral health, mental health, HIV/AIDS, and substance abuse.

Mary's Center for Maternal and Child Care is another FQHC in the District. Services at Mary's Center include: general and mental health, nutrition, sexual health, and counseling services, as well as educational, vocational, and community-oriented relationship, education, and career support services. The Center provides for continuity during transition from pediatric to adolescent care, especially among young men, with approximately half of teen patients being male (Mary's Center, 2014h). Mary's Center also reaches out to the community through a school-based peer health educator program, which not only trains students on how to provide health education at local schools, but also offers parents referrals for mental health and other services that support parents in the community. Lastly, Mary's Center runs a Teen Program with a dedicated space and staff, including case managers, to serve the individual needs of its adolescent patients. The program's patients are primarily Hispanic youth ages 13 to 21.

Other community-based health care providers that focus on adolescent DC residents with specific health risks include: Metro TeenAIDS, which provides HIV prevention and counseling; Community of Hope, which cares for low-income residents and provides housing assistance to adolescents; and Whitman-Walker Health, which works closely with members of the LGBT community to provide primary care, HIV/AIDS care and behavioral health. There are also free clinics for the uninsured and underinsured within DC such as Bread for the City, which provides same or next day primary care appointments using a medical home model (Bread for the City, 2014i).

Primary and Urgent Care Clinics

In addition to offering pediatric primary care, urgent care clinics enable adolescent patients to get convenient walk-in appointments in a comfortable outpatient environment for non-life threatening emergent health needs, such as sports injuries, minor traumas and acute illnesses, and routine preventative services. Urgent care providers in DC include: MedStar PromptCare clinics in Adams Morgan and Capitol Hill, Metro Immediate and Primary Care in Capitol Hill, DC Immediate and Primary Care in Cleveland Park, and Medics USA clinics in Dupont Circle and Columbia Heights.

MedStar Health

MedStar Health operates Washington Hospital Center and Georgetown University Hospital. Washington Hospital Center is the largest private hospital in Washington, DC. Washington Hospital Center provides specialized pediatric and adolescent gynecological care, as well as engages in reproductive health community outreach through the Teen Alliance for Prepared Parenting (TAPP). The TAPP program supports pregnant adolescents and expecting fathers under the age of 18 with comprehensive services, including prenatal care, family planning and contraceptive services, and educational workshops. The goals of TAPP are prevention of subsequent teen pregnancy, improvement of parenting skills, and providing parents with assistance to complete their education (MedStar Health, 2014k). In addition to pediatric primary care, Georgetown University Hospital runs the KIDS Mobile Medical Clinic (KMMC) in collaboration with Ronald McDonald House Charities. KMMC offers mobile comprehensive pediatric and adolescent wellness care, mental health, and social services, and annually provides more than 1,750 medical visits to young patients residing in Wards 5, 6, 7, and 8 (MedStar Health, 2014l).

Children's National Medical Center

Children's National Medical Center is the only hospital in the DC area that focuses exclusively on children and teens. Three such specialty programs run by Children's include the Adolescent Health Center, The Goldberg Center for Community Pediatric Health, and The Burgess Clinic.

The Adolescent Health Center (AHC) provides comprehensive health care services for adolescents and young adults in DC at seven locations throughout DC. Physicians at the AHC can serve as sub-specialty care consultants for patients who are referred to the center by community health care providers. The AHC also performs community health education and outreach through the Adolescent Prevention Education Programs (APEP). The Teens Against the Spread of AIDS (TASA), Teen Talk, and Teen Life Clubs (TLC) educational programs teach youth about preventing HIV, unintended pregnancy, and sexually transmitted infections, respectively.

The Goldberg Center for Community Pediatric Health at Children's National has programs that provide access to comprehensive family-centered health care for high-risk adolescents, particularly those living in Wards 5, 6, 7 and 8. Supported by Children's National and the Children's Health Fund (CHF), the Children's Health Project of DC (CHPDC) has primary care clinics located near public housing and schools in Southeastern DC, a Mobile Health Program that provides full dental services, a Referral Management Initiative that facilitates access to specialty care, and the Childhood Asthma Initiative (CAI) to combat the high incidence of asthma among DC youth.

Lastly, the Burgess Clinic, which is home to the Children's Special Immunology Services HIV/AIDS program, treats more than 90% of the HIV positive adolescents 13 to 21 years of age in DC (Burgess Clinic, 2014j). Special Immunology Services combines inpatient and outpatient primary and specialty care, along with social services for affected families in order to provide comprehensive care for adolescent HIV/AIDS patients. The HIV Services Mental Health Program provides psychological counseling for adolescents and families affected by HIV/AIDS. This program specifically assists youth in coping with their medical condition and manages their personal concerns by providing individual and family therapy, parent training, and psychiatric consultation.

Coordinated Care for Adolescents with Disabilities and Chronic Conditions

Poor coordination of care for adolescent patients has been identified as an opportunity to improve adolescent health (National Research Council [NRC] and Institute of Medicine [IOM], 2009), and can present unique challenges to patients with special needs. The Children and Youth with Special Health Care Needs (CYSHCN) Program improves access to coordinated primary and specialty care for adolescents with special health care needs by providing family navigation, district-wide advocacy, assistance with pediatric-to-adult health care transition, and sickle cell transition management. To provide improved coordination of care to low-income young adults in DC with disabilities and chronic illnesses, the Health Services for Children with Special Needs, Inc. (HSCSN) is a Medicaid health plan that coordinates physical, mental, behavioral, and developmental care for Supplemental Security Income (SSI)-eligible adolescent populations.

APPENDIX A: ACROYNM LIST

ACE – Adverse Childhood Events
ACGR- Adjusted Cohort Graduation Rates
AHC - Adolescent Health Center
APEP - Adolescent Prevention Education Programs
ARRA – American Recovery and Reinvestment Act of 2009
ADD- Attention Deficit Disorder
ADHD - Attention Deficit Hyperactivity Disorder
AHC- Adolescent Health Center
ALA - American Lung Association
APEP- Adolescent Prevention Education Programs
ARRA- American Recovery and Reinvestment Act
AYP - Adequate Yearly Progress
CAI - Childhood Asthma Initiative
CAS- The DC Comprehensive Assessment System
CDC- U.S Centers for Disease Control and Prevention
ChAMPS – The Children and Adolescent Mobile Psychiatric Service
CHF - Children's Health Fund
CHPDC - Children's Health Project of DC
DC DBH- District of Columbia Department of Behavioral Health
DC CAS - District of Columbia Comprehensive Assessment System
DC - District of Columbia
DCPCS – District of Columbia Public Charter Schools
DCPS - District of Columbia Public Schools
DOH - Department of Health
DHHS- Department of Health and Human Services
DMPED - Office of the Deputy Mayor for Planning and Economic Development
ED- Emergency Department
ESEA – Elementary and Secondary Education Act
FMCPP- DC Fresh Mobile Cart Pilot Program
FQHC - Federally Qualified Health Centers
FPL – Federal Poverty Level
FRAC- Food Research and Action Center
FQHC- Federally Qualified Health Centers
HSCSN - Health Services for Children with Special Needs, Inc.
HS - High School
IOM- Institute of Medicine
KMMC - KIDS Mobile Medical Clinic
MS - Middle School
NAEP - The National Assessment of Educational Progress
NCES - National Center for Education and Statistics
NCHS- National Center for Health Statistics
NCLB – No Child Left Behind Act of 2001

NHIS- National Health Interview Survey
NRC- National Research Council
LEA- Local Education Agency
OAH- Office of Adolescent Health
OSSE - Office of the State Superintendent of Education
PARCC- Partnership for Assessment of Readiness for College and Career
PPACA – Patient Protection and Affordable Care Act
PCC – Primary Care Center
PCS- Public Charter Schools
RWJF- Robert Wood Johnson Foundation
SBHCs – School Based Health Centers
SCHIP – State Children's Health Insurance Program
SBOHP - School Based Oral Health Program
SBHC - School-Based Health Centers
SES – Socio-economic status
SSI -Supplemental Security Income
TLC - Teen Life Clubs
TAPP - Teen Alliance for Prepared Parenting
TASA - Teens Against the Spread of AIDS
TPEP- Teen Parent Empowerment Program
TUDA -Trial Urban District Assessment
UDC- University of the District of Columbia
UHC- Unity Health Care
VPP - Violence Prevention Program
WHO- World Health Organization
YRBS- Youth Risk Behavior Survey

APPENDIX B: RESOURCE LIST

National:

The American Association of School Administrators

America's Edge

American Graduate

Association for Supervision and Curriculum Development

The Center for Health and Health Care in Schools at the George Washington University School of Public Health and Health Services

Champions for America's Future

Council of Chief State School Officers

Diplomas Now

Educational Testing Service

Everyone Graduates Center Johns Hopkins University

Fight Crime: Invest in Kids

Health Services for Children with Special Needs, Inc.

Local Initiatives Support Corporation

Mission: Readiness

The National Assessment of Educational Progress

The National Association for the Education of Young Children (NAEYC)

The National Campaign to Prevent Teen and Unplanned Pregnancy

The National Center for Education and Statistics

The National School Boards Association

The National School Lunch Program

The National Dropout Prevention Center/Network

Parents as Teachers

The Robert Wood Johnson Foundation

Ronald McDonald House Charities

Sheparding the Next Generation

Strive Together

Truancy Prevention.org

Trust for America's Health (TFAH)

University of Minnesota, The College of Education & Human Development

Virginia Commonwealth University, Center on Society and Health

Federal:

Centers for Disease Control and Prevention (CDC)

Healthy People 2020

Healthy People.gov

U.S. Office of Special Education Programs

U.S. Department of Education

U.S. Department of Health and Human Services, Office of Adolescent Health

U.S. Department of Justice, Office of Juvenile Justice and Delinquency Prevention

U.S. Department of Agriculture, Food and Nutrition Service

DC:
Adolescent Health Center
Bread for the City
Boys and Girls Club of Greater Washington
The Burgess Clinic
Child & Youth Healthy Eating Active Living to Prevent & Reduce Obesity Program
The Children and Youth with Special Health Care Needs Program
Childhood Asthma Initiative
Children's Health Fund
Children's Health Project of DC
Children's National Medical Center
Community of Hope
Covenant House Washington
District of Columbia Primary Care Association
DC Action for Children
DC Department of Behavioral Health
DC Fresh Mobile Cart Pilot Program
DC Office of the State Superintendent of Education
DC Department of Health
DC Campaign to Prevent Teen Pregnancy
Families First
The Goldberg Center for Community Pediatric Health
Health and Sexuality Program
Healthy Babies Project
Healthy Futures Program
Healthy & Unhealthy Relationships
The HIV Services Mental Health Program
KIDS Mobile Medical Clinic
Mary's Center for Maternal & Child Care
Metro TeenAIDS
Office of the Deputy Mayor for Planning and Economic Development
Rape Prevention Education
Sasha Bruce Youthwork
School Based Health Centers
School Based Oral Health Program
Teen Alliance for Prepared Parenting
Unity Health Care
Violence Prevention Program
Whitman-Walker Health
Youth Villages

APPENDIX C: REFERENCES

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APPENDIX D: JUDGING CRITERIA

DC Regional Case Challenge 2014 - Judging Rubric

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

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

	Poor	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 • 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)	☐	☐	☐	☐	
Creativity/Innovation ^					
• Creativity and innovation in solution implementation and resources • Creativity and innovation in resources used for information-gathering	☐	☐	☐	☐	
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 others' roles and expertise	☐	☐	☐	☐	

Presentation Delivery					
• Clarity of content and logic of flow • Time management • Audience engagement • Visual aesthetic • Professionalism, poise, and polish	⊔	⊔	⊔	⊔	
Questions & Answers					
• Clarity and thoughtfulness of responses • Ability to draw from evidence	⊔	⊔	⊔	⊔	

Appendix E: Team Biographies

Sweta Batni is a 5th year PhD Candidate in the Global Infectious Disease program at Georgetown University. Her doctoral research integrates epidemiology, public health, and molecular approaches in studying the eukaryotic parasite, Giardia lamblia, one of the major causes of diarrheal disease worldwide. Prior to matriculating at Georgetown, Ms. Batni worked from 2005-2010 as an analyst researching issues at the nexus of global health, national security, and policy. During her tenure as a research analyst, she was contracted to support a number of US federal government clients including working on medical countermeasures strategy and policy within the Assistant Secretary for Preparedness and Response office (ASPR) at the US Department of Health and Human Services (DHHS) and supporting the Department of Defense, Defense Threat Reduction Agency, Cooperative Biological Engagement Program. Ms. Batni has dual master's degrees (MHS/MA) in Infectious Disease Epidemiology and International Health Policy from the Johns Hopkins Bloomberg School of Public Health (MHS '05) and the Johns Hopkins Paul H. Nitze School of Advanced International Studies (MA '09). This is her second year leading the case writing team for this competition

ENS Yaroslav Bodnar is a second-year US Public Health Service medical student at the Uniformed Services University of the Health Sciences (USUHS) and is sponsored by the National Institute of Allergy and Infectious Diseases. He graduated from Illinois Wesleyan University with a Bachelor of Science in Chemistry and Physics and the University of Illinois at Urbana-Champaign with a Master of Science in Biophysics and Computational Biology. ENS Bodnar was a member of the USUHS 2013 DC Regional Public Health Case Challenge team. He is Vice-President of the USUHS Global Health Interest Group. ENS Bodnar's research interests include tuberculosis drug discovery, clinical trials of therapies for drug-resistant TB, and public health cyber-infrastructure development.

Desirée Bygrave is a graduate of Voorhees College in Denmark, SC, with a Bachelor's degree in Biology. She obtained her Master's degree in Neuropsychology in 2011 at Howard University in Washington, DC. Miss Bygrave is currently a Doctoral Candidate in Neuropsychology at Howard University with an interest in health factors that contribute to: wellness, cardiovascular disease, obesity and variability in cognitive function. She is a research assistant with The Health Promotion and Risk Reduction Research Center at Howard University, a Fall 2014 intern with Directors of Health Promotion and Education, and, a fellow at Summit Health Institute for Research and Education in Washington, DC.

Christine A. Clarke is a doctoral candidate in the Department of Microbiology, Howard University College of Medicine, with a research focus in Cancer Immunology. She is presently a Fellow with the DC Department of Health's Center for Policy, Planning & Evaluation, where she is engaged in research, the use of geographic information systems in disease surveillance, and serves as primary author for the agency's report, Examining the Public Health Burden of Heart Disease in the District of Columbia. Christine's overarching passion lies in disease surveillance/epidemiology, the development of policy regarding control of diseases, as well as the design, implementation and evaluation of biomedical interventions to prevent, mitigate, or treat diseases of global public health significance. Christine was a member of the Howard University team, which placed third in the Institute of Medicine's Inaugural DC Regional Public Health Case Challenge. She was also the Christine Mirzayan Science & Technology Policy Fellow with the Institute of Medicine's Board on Global Health. During her tenure with the Board on Global Health's Global Forum on Innovation in Health Professional Education, Christine researched and drafted a background paper in preparation for the Forum's workshop on Scaling-up Best Practices in Community-based Health Professional Education. Christine has also co-authored the DC Board of Medicine Physician & Physician Assistant Workforce Capacity Report, and has explored topics and regulatory health policies related to health workforce needs in her capacity as DC Board of Medicine Health Policy Fellow. Her tenure with the Board of Medicine and the Global Forum on Innovation in Health Professional Education has fostered her interest in the health-education dynamic, and in exploring best-practice approaches to integrating disease prevention/control services into primary health systems, as well as aligning disease burden with health and development priorities. Christine intends to pursue a Masters in Public Health—with an emphasis in Disease Epidemiology & Control, and Health Systems and Policy. Her goal is to become a health policy advisor at a national or international health organization.

Victoria Larsen is in her third-year of studying biology at Howard University. She is currently working in partnership with Roswell Park Cancer Institute to design a study on pharmacogenomic factors involved in the treatment of patients with breast cancer. She also works with undergraduate students as a mentor and assistant in phage genomic research. Victoria first gained experience in public health as an intern with Seva Mandir, a non-government organization based in northern India. While working with the organization, she conducted a study evaluating healthcare practices in several rural villages and developed a training module to teach illness prevention strategies to caregivers of newborns. Victoria participated in the inaugural DC Regional Public Health Case Challenge as a member of the Howard University team. Victoria is also a nationally certified Emergency Medical Technician and has worked with a local volunteer fire department in emergency response. She plans to continue her education in medical school after graduation.

Megan Prior is a fourth year medical student at Georgetown University School of Medicine. She graduate from Pomona College with a Bachelor's degree in Anthropology and Neuroscience. Ms. Prior spent the last year away from medical school working in health policy with the National Alliance to Advance Adolescent Health. Her interests include comprehensive health care in under-served communities, physician-patient communication and adolescent medicine. She previously participated on the Georgetown Public Health Case Competition team and competed in the 2013 DC competition as well as the 2014 Global Health Case Competition at Emory. She plans to become a pediatrician.

Laura-Allison Woods studies Public Health and Psychology at George Mason University. She participated last year in the DC Public Health Case Competition as a member of the George Mason University group, which won the "Creativity and Innovation" award. Additionally, she was on the Case-Writing team for the 1st George Mason University Global Health Case Competition last spring, led by the DC Case Competition team faculty advisor. In the past she has been published by the University of Iowa School of Medicine for her work on a Pediatric Immunohematology research project, and is finishing up co-authoring a paper on Psychiatric Crisis Intervention in Schools with the Department of Occupational Health at the University of Iowa School of Public Health. She has recently joined as an intern on a research project with a private wellness studio that examines the causality between interpersonal relationships and well-being, and is authorized to score psychoeducational tests within a local Clinical & Forensic Psychological Examiner Office. Following college, she plans on pursuing her doctorate in Public Health, focusing on Pediatric and Women's Mental Health issues.