

**SCHOOL-BASED HEALTH CENTERS: A CONDUIT FOR  
ADDRESSING PEDIATRIC PUBLIC HEALTH ISSUES IN URBAN  
COMMUNITIES**

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## **ABSTRACT**

Children in low-income, urban communities face significant barriers to leading a healthy lifestyle. Public health issues, such as adverse childhood experiences, food insecurity, and a lack of mental health resources consistently place toxic stress on a growing child's mental and physical health. Making matters worse, these children and adolescents are less likely to make their pediatric primary care appointments through no fault of their own. A literature review revealed that school-based health centers provide an economically efficient model to delivering pediatric primary care. By eliminating common barriers to healthcare, like transportation issues and family work requirements, school-based health centers successfully combat public health issues and improve health outcomes, successfully establishing equity in delivering pediatric primary care.

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# CHAPTER 1

## INTRODUCTION

As a medical student, future pediatrician, and budding bioethicist at Temple University, I have spent the last 4 years witnessing first-hand the unique challenges that the youth population in urban communities face in growing into healthy, happy adults. Growing up in a suburban bubble, I was protected from physical and psychological traumas that stem from public health issues like community violence, neglect, and food insecurity. While I grew up dreading medical and dental appointments, I now realize my fortune in having adequate medical care throughout childhood: Care that contributed to my growth and development in all facets of life and has allowed me to achieve an ultimate dream of becoming a doctor. Unfortunately, children in low-income, urban communities are not always afforded such opportunities. Instead, these children consistently face significant barriers to a healthy life, and through no fault of their own, are left without adequate access to primary care services throughout childhood and adolescence. School-Based Health Centers are an underutilized resource for addressing this urban issue and establishing equity in pediatrics.

The most crucial role of the general pediatrician is to identify patients' cognitive, physical, emotional, and behavioral developmental delays that exist in patients, so they can intervene and set the child up for the best possible success long term. Well child visits exist for this very reason as they provide an opportunity every year to check in, evaluate, and screen patients for any number of conditions from autism to asthma to depression. Children in lower income communities can especially benefit from these

appointments as they grow to commonly face higher levels of community health disparities. In young urban populations, children who participate in a developmental screening via primary care are more likely to be identified with delays, referred to early intervention, and deemed eligible for early intervention services. These children also incur a shorter time to identification, evaluation, and action leading to improved outcomes from earlier intervention (Guevara 2013) While early intervention screening studies apply to an age group under 5, well child checks extend through a child's grade school and adolescent years offering the same opportunities to screen and combat common urban public health concerns that greatly affect healthy development such as adverse childhood experiences and food insecurity.

Crime and community violence in low-income urban settings leave children susceptible to significant adverse childhood experiences that significantly increase the risk for long-term mental and physical health issues. As a medical student in North Philadelphia, we were frequently advised to stay within a block or two of the medical campus for fear of community violence. During our first year, students were informed that we had 24/7 access to security escort to public transportation or parking.

Administration acknowledged that it could feel unsafe for us-as grown adults-to complete solo walks in the blocks around Temple's medical campus—some of the safest streets of North Philadelphia. However, consistently making these walks to schools or activities in much more dangerous areas is accepted as the norm for thousands of grade school children every day of the year. It should come as no surprise that these children are far more susceptible to trauma, violence, and abuse than more privileged populations.

Community violence is one of the most prevalent traumas that youth in low-income urban settings face on a regular basis. The gun violence statistics have consistently worsened in many cities across the country and Philadelphia is one of the leading examples. In total, 2273 people were shot and 514 were killed in the city in 2022. Young people were no exception as 217 people under the age of 18 with an average age of 15 were shot (Petrillo 2023) . In one instance, 5 teenage boys were ambushed with gunfire leaving a football scrimmage in broad daylight in Philadelphia's urban Roxborough neighborhood with numerous children of all ages in attendance. Growing up in areas with such substantial violence leaves children especially susceptible to continuous adverse childhood experiences which shape their mental and physical health.

Adverse childhood events (abuse, neglect, domestic violence, and community violence among others) are a leading public health concern in urban pediatrics as young people are at significantly risk for the development of mental and physical disease following such traumas. One study focused closely on pediatric populations and identified an alarmingly high prevalence of ACEs experienced in urban populations (Burke 2011). Youth exposed to community violence frequently develop stress symptoms, emotional numbing, and hyperarousal which impact cognitive, behavioral, and emotional development. Numerous adult studies have demonstrated relationships between ACE categories and medical and psychological illness. Children in these urban communities with high rates of trauma are an incredibly vulnerable population that need consistent access to adequate healthcare resources throughout their childhood.

Food insecurity is another topic vitally important to address in pediatrics. In the summer after my first year of medical school, I completed Temple University's Center for Urban Bioethics food insecurity internship which allowed me to connect community members with access to nutritious food and taught me the unique sets of barriers that exist in urban settings. One community member referenced how difficult it was to get quality produce in the area and foods extremely high in sodium were the only affordable options for most community members. When parents face mounting bills, transportation issues, and hectic schedules; it becomes easy to settle for the less nutritious but more convenient options available in these grocery deserts. The cardiovascular disease that results from such food scarcity is obvious, but the community member also provided insight that I had not previously considered: The poor dietary options and resulting poor health contributes to a high stress environment that leads to poor decision making and further contributing to violence in the community. It becomes apparent how systemically these issues in urban communities intertwine.

A study in an urban pediatric primary care clinic found that one-third of their households were food insecure—significantly higher than the national average—and confirmed the North Philadelphia community members' narratives that I encountered as an intern (Demartini 2013). In comparison to food secure families, food insecure families were more likely to obtain food from convenience stores because of their higher prevalence in urban neighborhoods than grocery stores. While these stores were more convenient and perhaps cheaper in many circumstances, urban convenience stores do not commonly stock sufficiently nutritious food like healthy fruits and vegetables. Pediatric

screening for food insecurity and where parents acquire food is a necessity and provides an opportunity for community level advocacy.

Unfortunately, screening for these debilitating public health issues is only productive when children actually make it to their appointment—a factor typically out of their control as children. During my time in pediatric clerkships at St. Christopher’s Hospital for Children in Philadelphia’s Kensington neighborhood, I encountered firsthand the high rates of no shows and cancelled appointments. When following up with phone calls, parents often hesitantly rescheduled as they pointed to transportation costs and lack of time off from work as their most common barriers to attendance. Surveys of West Philadelphians confirmed my personal clinical experiences as community members acknowledged urban transportation costs as well as poor parental health, family obligations, and work requirements were the four leading factors in high no show rates (Brown 2020). This problem is not unique to Philadelphia as other studies have also shown that rates of missed appointments among pediatric Medicaid patients are statistically significantly higher than patients’ with private insurance (Lamberth 2002). When the population most at risk for poor health outcomes is incapable of attending appointments because of barriers contributing to their risk in the first place, implementing more in depth screening becomes far less useful.



## **CHAPTER 2**

### **WHY WE SHOULD CARE**

Well-trained, empathic, and compassionate pediatricians providing adequate primary care can serve an incredibly positive influence in a child's life. Without access to this type of care, children exposed to urban public health issues like adverse childhood experiences and food insecurity are at risk for developing a plethora of psychosocial and physical health issues. In a community with as much community violence and trauma as North Philadelphia, children are likely to experience more than one adverse childhood experience, and substantial research suggests that ACEs and the toxic stress that come with them can affect the brain in a dose-dependent manner. While more research is needed on the acute effects of ACEs in childhood, one study found that children with >4 ACEs were 48% more likely to have learning/behavior problems and 14% more likely to obese (Burke 2011). Expanding from the acute to the chronic, one can find overwhelming evidence of the chronic health damage that correlates with the experience of multiple adverse childhood experiences. In one study endorsing 4 or more ACEs were found to be 2.6 times more likely to have COPD, 2.4 times more likely to have hepatitis, 2.5 times more likely to have sexually transmitted diseases, 46 times more likely to use injection drugs, 4.6 times more likely to suffer from depression, and 12.2 times more likely to express suicidality (Fellitti 1999). These studies demonstrate the critical role that the pediatric primary care system plays in universal ACE screening and early identification of children in need of psychological and medical services.

The data on community violence and resulting psychological trauma resulting in risk for depression, suicidality, and emotional blocking has become so overwhelming that one would think these urban populations should have more access to mental health services right? Unfortunately, the opposite is true. Over the last 20-30 years, healthcare as a whole has improved in acknowledging the enormous toll that mental health issues place on the quality of life for youth and families. However, this acknowledgement and resource allocation has failed to extend to racial and ethnic minority children who are less likely to receive quality health services as compared to white peers (Alegria 2010). Psychotherapy, for example, is considered an evidence-based treatment for most mental health issues, but in a sample of children enrolled in the child welfare system, counseling access was lower for African American children than for white children. Although antidepressants are more frequently prescribed to children and adolescents in the United States than any other country, there are differences with psychotropic prescription drug use based on race and ethnicity. Disparities include lower use of psychiatric pharmacotherapy as well as higher likelihood of receiving inadequate treatment amongst African-Americans and Latinos—populations more common in urban communities. As adverse childhood experiences continue to cause emotional disturbances and repressions of mental health, an increasing need exists for delivering consistent, culturally aware and competent psychiatric services.

Without effective screening, children growing up within food insecure families in urban food deserts are prone to a wide variety of negative health outcomes. One study analyzed and revealed the deleterious effects of food insecurity on four study categories: General health, chronic health, acute health, and healthcare access (Thomas 2019).

Chronic outcomes showed higher rates of asthma, depressive symptoms, eczema, and other skin allergies. Acutely, food insecurity leads to a 26% increase in emergency room visits while the depressed immune functioning related to stress contributed to more communicable diseases. Lastly, children in food insecure families faced 2-3 times higher likelihood of delayed or forgone healthcare.

In addition to the previously mentioned chronic diseases, childhood obesity is paradoxically of major concern in food insecure families. With obesity firmly entrenched as a global health problem, there exists substantial evidence on factors that increase risk for obesity early in life and cardiovascular disease that results long term. One study found that children with obese mothers, low family incomes, and lower cognitive stimulation have significantly elevated risks of suffering from obesity in childhood. While rates of obesity in black children and children with lower family education also were increased, these parameters may be subject to the confounding effects of low income and lower levels of cognitive stimulation. With obese mothers being the single most significant predictor of childhood obesity, moms living in urban food deserts with little access to nutritious, low-sodium grocery options are at substantial risk for raising obese children (Strauss 1999). During my time as a food insecurity intern at Temple, I learned the vast resources and food banks available to combat these statistics. Identification and action in the pediatric primary care setting can bridge the gap between food insecure families and community resources significantly improving health outcomes for children and families.

Missed well child visits produce numerous negative downstream effects for a child's health and development. During my time on inpatient medical wards at St.

Christopher's Children's Hospital, experienced attending providers encouraged medical students and residents to do substantial chart checks to ensure patients had completed their well child checks. They were aware that the patient population served was at risk for missing check-ups, and inpatient stays were guaranteed medical time with a child and family to pick up on any developmental delays. Unfortunately, as described earlier, children develop brain connections at an alarmingly fast rate through everyday experiences, and for many, catching these delays later during inpatient stays often makes it challenging to remedy damage that has already been done. In addition to developmental screening, well-child checks provide the opportunity to solidify treatment regimens for common pediatric conditions. Affecting 5-7 million children, asthma is the most common pediatric pulmonary condition and requires parental medical literacy on triggers, medication regimens, and action plans. Without proper parental education provided by the general pediatrician at primary care appointments, children are susceptible to more ED visits, hospital stays, and steroid requirements. In one study of 7511 children, 7% of children who missed an appointment had a subsequent asthma-related ED visit within one year: Only 2% of the group who completed their appointments had such requirement (McGovern 2017).

While exploring the shortcomings in the urban pediatric primary care system, I noticed concepts learned throughout my time in the urban bioethics program being consistently violated. In the wake of some horrific racism in medicine and medical research, Thomas Beauchamp and James Childress outlined 4 principles of biomedical ethics with the goal of identifying healthcare's common ethical principles: Autonomy, non-maleficence, beneficence, and justice.

The principle of autonomy recognized a basic freedom at the heart of humanity in stating that we as humans are responsible for what we do and any action we take is the product of our own choice. In healthcare, this usually translate to people having the right to determine what happens to their own bodies. Autonomy in pediatrics is a challenging ethical principle to address as—until a certain age—a child’s autonomy is an extension of a parent’s. Younger children are incapable of making their own choices when it comes to a majority of their medical care and must rely on their parents to take responsibility for their health. However, children quickly grow into adolescents capable of acknowledging their own needs and choosing what medical and psychological care to pursue. Teenagers in urban settings frequently have their autonomy violated when factors out of their control—transportation, financial resources, parental decision-making—still prevent them from receiving adequate medical care at standard healthcare facilities.

The second bioethics principle is non-maleficence or “do no harm”. Beauchamp and Childress expanded upon the Hippocratic Oath in suggesting that this principle should be expanded to avoiding anything which is unnecessarily or unjustifiably harmful. Closely coupled with non-maleficence is the principle of beneficence: Act in a way that promotes the good of the patient. This principle refers to acts that go above and beyond in medicine. An example is having excellent bedside manner with a focus on compassion, empathy, and understanding of a patient’s needs that goes beyond acute illness. To do as much good and prevent as much harm as possible, urban pediatric primary care must be altered so that the children consistently suffering from issues like adverse childhood experiences and food insecurity can receive adequate access to preventative care.

Lastly, Beauchamp and Childress described justice as the principle that emphasized the distribution of healthcare resources fairly. John Rawls, another prominent American philosopher, took it one step further in suggesting that healthcare resources should be allocated in a manner of who needs treatment the most similarly to how emergency rooms triage patients in waiting rooms to ensure the best outcomes for as many people as possible. Children in urban communities commonly have poor physical and psychosocial outcomes that result from public health concerns like community violence and food deserts and yet they frequently receive less medical and psychological care than suburban counterparts. To ensure justice is to establish a system that moves this incredibly vulnerable population to the front of the line for pediatric primary care.

## CHAPTER 3

### SCHOOL-BASED HEALTH CENTERS AS A POTENTIAL SOLUTION

Having established the fact that children growing up in urban communities are an extremely vulnerable population without adequate access to preventative care through no fault of their own, one may wonder what can be done to improve long term quality of life. Instead of placing the onus on parents—who themselves are also burdened by community, financial, and medical stressors—we must enact a system that eliminates common barriers like transportation, finances, and parental health literacy. One commonly proposed but seldom enacted system is school-based health centers (SBHC).

In the late 1960s, the American Academy of Pediatrics developed the first School-Based Health Center as a branch of its Community Access to Child Health (CATCH) program. The AAP acknowledged that children experiencing illness or emotional trauma cannot learn to their full potential: The organization viewed SBHCs as a way to link health and education by providing access to medical and mental health services to children in need. With the goal of combatting common illness, family disruption, and emotional distress experienced by children, local pediatrician Dr. Philip J. Porter oversaw the organization of the first SBHC in Cambridge, Massachusetts. Other early initiatives in Dallas and Minneapolis quickly followed and together formed the foundation for this new faction of pediatric primary care (Gustafson 2005).

Backed by investment from the Robert Wood Johnson Foundation—one of the nation's leading health philanthropies—and increasing funding from federal and state governments, SBHCs underwent a rapid 2-decade expansion. From 1985 to 1999, SBHC

numbers saw a 35 fold increase, from 31 to 1135, an expansion that now includes 45 states and both rural and suburban communities. By the 2016-17 school year, SBHCs provided healthcare access to 6,344,907 students in 10,629 public schools equating to 13% of school-aged youth across America (Love 2019). The growth over these years can be attributed to many factors including supporting evidence on positive impacts, state investments, federal expansion of the primary care safety net, and community level advocacy. Despite the substantial growth in the past half century, there remains considerable room for expansion to provide for urban communities in need.

SBHCs have been described as powerful tools “for achieving health equity among children and adolescents who unjustly experience disparities in outcomes simple because of their race, ethnicity, or family income”. The School-Based Health Alliance describes their mission as a commonsense idea to gain currency across the country by placing vital services—medical, behavioral, dental, and vision care—directly in schools so that all young people have equal opportunity to grow in spite of barriers present in the communities in which they reside. Though SBHCs come in many shapes and sizes to deliver care, all have fundamental primary care services delivered by a team of medical professionals including physicians, physician assistants, nurse practitioners, licensed registered nurses, social workers, nutritionists and patient care technicians. Most frequently, schools provide the setting to operate while local healthcare organizations provide the multidisciplinary team targeted at delivering primary and mental health care, nutritional consult, vision services, reproductive health, oral health care, and health promotion services. Care is tailored to an individual student’s needs and is provided during or after school hours and often during the summer. Providing all of these different



types of medical care in a setting convenient to families eliminates barriers and provides justice in the distribution of healthcare resources in lower-income communities. The shared commitment between schools and local healthcare organizations supports child and adolescent health and well-being..

School-Based Health Centers are uniquely positioned to address social determinants of health and provide a setting for public health intervention in pediatrics. Because school staff have daily interaction with students, schools are an ideal location for screening, early detection, and intervention. Rather than serving individual patients, SBHCs served children and families united in a common institution creating a unique opportunity to integrate healthcare with primary, secondary, and tertiary prevention targeted at specific community public health issues. One clinic in California identified anemia as a common clinical problem in students and responded with a combination of iron-rich cafeteria options and nutritional education in classroom and on parent-teacher nights (Clayton 2010). Similarly, SBHCs in urban communities like North Philadelphia would address obesity and food insecurity with classroom and parental education on the importance of high-quality nutrition and community resources for access. Some components of preventative care are more efficiently delivered in a setting that is part of a families' daily lives.

Having established earlier the importance of early developmental screening in urban pediatrics, I now examine the effectiveness of screening modalities in school-based health centers. Despite a high prevalence of emotional and behavioral problems in pediatrics, only one-sixth to one-half of children and adolescents with psychosocial dysfunction are identified and even less receive the necessary mental health services

(Gall 2000). One can imagine that this number is even greater in urban communities where children are subject to substantial community traumas and frequently miss the appointments for screening. The Youth Pediatric Symptom Checklist (PSY-C) is a 35-item questionnaire that studies have shown greatly improves medical awareness of psychosocial problems and subsequent needs. Seeking to provide validation of the PSY-C in facilitating recognition and the extent to which subsequent referral and mental health services improved functioning, one study analyzed an SBHC of a public high school in a northeastern city (Gall 2000). PSY-C positive adolescents had significantly higher emotional problems, lower academic functioning and higher rates of absences. The screening tool was accepted and easily used by students and staff who reported improved quality of referral. Two months after screen and referral, PSY-C positive students improved academic function and decreased absences by almost 50%. SBHCs are an effective setting for screening modalities on public health issues common to students of the same urban community.

With adverse childhood experiences increasing the risk for mental health disorders, school failure, anxiety, depression, and suicidality, pediatric primary care plays a crucial role in combatting health disparities in identifying children at risk and providing access to mental health services. One study examined the effect of increased mental health services at SBHCs and revealed an association with significant reductions in depressive episodes and suicide risk among adolescents (Paschall 2018). Another study found that students who experienced psychological services were more likely to access mental health services provided in SBHCs instead of the more traditional healthcare setting. When adolescents had access to both SBHC and community health centers, they

were 21 times more likely to seek mental health services in the SBHC. Students who sought mental health services in one SBHC had visits lasting an average of 47 minutes with an average of 4-10 visits for each of their issues. This average time and duration of visits for mental healthcare is an encouraging indicator of adolescent access as it has been previously noted that this population does not consistently follow through with outpatient mental health services (Bains 2016). Improving adolescent access to mental health services establishes autonomy for these adolescents. School-Based Health Centers would adequately combat the adverse childhood experiences, most notably crime and community violence, that children in communities like North Philadelphia face daily.

Food insecurity screening and intervention is of the utmost importance in urban food deserts. I first became passionate about food insecurity on my first day of Temple's service learning at a local North Philadelphia elementary school. A teacher enlightened me to the fact that many of these children come to school hungry, and as he blatantly put it "How is a child to learn and grow if they show up to school without food?" Years later as a pediatric resident at the Medical University of South Carolina, I have seen firsthand the benefits of combatting hunger in the medical setting. In the emergency room and outpatient clinics, all parents are given a survey providing the opportunity to disclose struggles putting food on the table with the option of asking for help immediately. Those families leave the hospital with a grocery bag of packaged goods and a list of low cost/free food resources in the community. I saw the relief on one mom's face and felt paradoxically disheartened that a child in the emergency room was their path to a nutritious dinner that week. What if-instead-children could simply go to school to receive these grocery "prescription" packages.

Attempting to combat the paradoxical correlation between food insecurity and diseases associated with overnutrition (diabetes, hypertension, coronary artery disease); two school based health clinics created a pilot food prescription program granting food insecure participants access to high quality produce in place of energy-dense, nutrient-deficient foods. The SBHC's medical provider issued a "Food Rx" card eligible for redemption at local food pantries every 2 weeks for up to 6 months for a total of 12 redemptions. The \$12 cost to the family included the groceries along with nutritional booklets educating on general nutrition, healthy recipes, food storage, and food safety. The food prescription program demonstrated successful feasibility and acceptability along with a 94% decrease in prevalence of self-reported food insecurity (Aiyer 2019). The significant improvement in nutritional education and decrease in food insecurity is a great example of addressing the principle of beneficence for these families. In place of timely costs and transportation to outpatient clinics, school-based health centers provide the perfect avenue for community-level advocacy in food insecurity screening and intervention.

## CHAPTER 4

### ECONOMIC EVALUATION OF SCHOOL-BASED HEALTH CENTERS

School-Based Health Centers provide quality preventative care and successfully combat major public health issues to underserved populations, so why are they not more common? Pilot data from three sites in Georgia found that a lack of awareness and perceived economic limitations were 2 major barriers to the establishment and utilization of SBHCs in low-income communities (Zarate 2020). Awareness is addressed through more research and advocacy, but economic limitations are more challenging to overcome. As such, it is necessary to explore what kind of financial toll these sites take.

Researchers in Ohio employed a longitudinal study design to compare net social benefit and the financial cost of SBHCs with the goal of determining economic value lost, saved, or created in 4 Ohio school districts (Guo 2010). In addition to reducing health access disparities among African Americans and disabled students, the study revealed that the SBHCs provide a net social benefit of \$1.35 million over 3 years. With Medicaid as the primary payer for students, one might expect Medicaid costs to increase substantially. However, Ohio Medicaid's increased costs of \$1,057,920 were offset by cost savings, like reduced hospitalizations, which totaled to \$1,713,228. The net 3-year Medicaid savings averaged out to \$35.20 per child per year. Researchers concluded that SBHCs not only closed gaps of health care disparities, but were overall a cost beneficial health service delivery model.

Another systematic review included 21 economic studies reporting on costs and/or benefits (Ran 2016). Costs included startup costs and operating costs while

benefits included healthcare costs/productivity averted. Operating costs ranged from \$16,322 to \$659,684 per year, and user cost ranged from \$142.79 to 1,427.40. Societal benefits ranged from \$15,028 to \$912,878 per year while Medicaid savings ranged from \$46 to \$1,166 per user. Not included in the study are the economic benefits associated with the health education, nutrition, and health promotion campaigns adopted by many of the SBHCs. Additionally, researchers acknowledged additional economic benefits from improved academic performance and educational outcomes. The systematic review concluded that despite moderate costs, SBHCs generate considerable economic savings to the Medicaid program and society in general. Urban, low-income communities high in Medicaid coverage would especially benefit from establishment of more SBHCs.

## CHAPTER 5

### CONCLUSION

Experiences as a medical student and bioethicist at Temple's Lewis Katz School of Medicine in North Philadelphia taught me that children in low-income, urban communities face significant barriers to leading a healthy lifestyle. Adverse childhood experiences place toxic stress on a child's emotional development and correlate with downstream physical and psychological health issues. Food insecurity plagues numerous families living in urban food deserts and significantly hinders a child's ability to grow in a healthy manner. Racial and ethnic disparities exist in pediatric mental health and prevent children from receiving the proper psychiatric care. Additionally, through no fault of their own, children in lower-income, urban communities are less likely to make their pediatric primary care appointments missing valuable time for screening and health education. School-based health centers provide an economically efficient conduit for delivering pediatric primary care. By eliminating common barriers to healthcare, like transportation issues and family work requirements, school-based health centers successfully combat adverse childhood experiences, food insecurity, and improve access to mental health resources. Placing clinical and preventative care services directly in schools successfully establishes equity in delivering pediatric primary care.

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