

Childhood trauma, poverty, and race: Exploring community health and community-based participatory research in Aliquippa, PA

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University of Pittsburgh, 2023

Abstract

Aliquippa is a small city in Western PA. Located in the Rust Belt, Aliquippa experienced the rise and fall of the steel industry through the late 1900s and early 2000s. Aliquippa still experiences the socioeconomic effects of the Rust Belt, and street violence is on the rise. Specifically, the children of Aliquippa are being affected by systemic racism, poverty, and trauma, which puts them at risk for adverse adult health outcomes and threatens community health. These conditions have public health relevance, and community-based participatory research would be an excellent tool to explore the interplay of the social determinants of health and health outcomes in Aliquippa. Even though Aliquippa would greatly benefit from public health research and intervention, there is a literature gap surrounding Aliquippa and small cities in rural states in the Rust Belt. In this essay, Aliquippa will serve as a case study, identifying the historic elements and social determinants of health that contribute to community challenges and adverse health outcomes for small cities in rural states in the Rust Belt. Furthermore, this essay will explore several CBPR methods that may mobilize community members, enable sustainable community development, and decrease adverse health outcomes.

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1.0 Introduction

Across the United States, children from all types of backgrounds experience trauma. Where a child lives may influence how much trauma and the types of traumas they experience, which may lead to differing health outcomes. Community-based participatory research (CBPR) and community programming are excellent initiatives to address childhood trauma and related adverse health outcomes. However, it is crucial that CBPR and programs are tailored to the unique characteristics and history of the target community to ensure ethical research methods and to maximize their benefits.

In this essay, Aliquippa, PA will be used as a case study to describe the importance and ethical necessity of thoroughly studying a community's history before beginning CBPR. Aliquippa is a small city in a rural state on the Rust Belt, so the interplay between historic and modern poverty, racism, environmental crises, and community health will be explored. This essay will also detail the challenges presented when attempting CBPR and childhood trauma research in an urban cluster in a rural state. Furthermore, this essay will explore research methodologies and community engagement strategies that can inform effective programs and interventions to reduce traumatic childhood events and improve community health in Aliquippa.

1.1 Aliquippa, PA Demographics

Aliquippa is the largest city located in Beaver County, Pennsylvania, with a population of 9,126 as of 2021 (USCB, 2021). Beaver County is a county in Western Pennsylvania, and it

touches the Ohio border. Aliquippa is located on the Ohio River in the western portion of the Greater Pittsburgh Region. In Beaver County, Aliquippa is both a zip code (15001) and a city. The zip code contains seven cities and townships, including the City of Aliquippa. In this essay, “Aliquippa” will always refer to the City of Aliquippa.

Compared to the typical Beaver County sprawling farmlands and suburbs, Aliquippa has a denser and more diverse population. Specifically, Aliquippa is home to many of the Black residents of Beaver County. Beaver County is 6.6% Black, has nearly 11,000 Black residents, and has a 9.1% poverty rate (USCB, 2022). Aliquippa is 33.1% Black, has nearly 3,000 Black residents, and has a 25.56% poverty rate. Specifically, in Aliquippa, White residents have a 13.76% poverty rate, while Black residents have a 43.58% poverty rate (World Population Review, 2022). Its diversity, poverty rate, and city-like qualities make Aliquippa a unique community that requires childhood trauma and community health exploration separate from the rest of Beaver County.

1.2 Adverse Childhood Events (ACEs) and Trauma

This essay will reference adverse childhood experience (ACE) data to explore childhood trauma and adult health outcomes. ACE research consistently correlates higher numbers of ACEs (more trauma) to adulthood risk of adverse health outcomes and premature mortality (Brown et al., 2009; Felitti et al., 1998; Petruccelli et al., 2019). According to the CDC, an ACE is a potentially traumatic event or a stressful environmental living condition that is experienced by a person 0-17 years of age. Potentially traumatic events and conditions include experiencing abuse or neglect, experiencing violence, witnessing violence in the home or community, having a family

member attempt or die from suicide, having parental separation, having an incarcerated family member, having a family member who uses drugs, and having a family member who has mental illness (CDC, n.d.). ACE questionnaires are taken by adults and include questions about their childhood and their current health status. There are different ACE questionnaires for males and females. The full questionnaire includes separate sections for family health history and health appraisal.

It is important to note that the ACE measures do not include all types of traumas. The ACE questionnaire does not consider natural disasters, poverty, racism and other forms of discrimination, community violence, housing insecurity, and other social determinants of health (Cronholm et al., 2015). ACE questionnaires are divided by sex. Gender non-conforming individuals may be hesitant to participate in ACE research, and social trauma related to binary gender deviance is not studied using ACE measures (Munro et al., 2019).

Additionally, ACE questionnaires do not consider protective factors, such as access to health services and supportive relationships, and cannot consider individual differences in resilience or sensitivity to ACEs. For these reasons, this essay will explore both ACE research and other childhood trauma research that includes social determinants of health. Racism and its effect on health outcomes will specifically be explored because of Aliquippa's high proportion of Black residents as compared to the rest of Beaver County.

1.3 Neighborhood-Based Trauma

Where a child lives, learns, and plays may dictate the number of ACEs and types of traumas they experience. According to Healthy People 2030, "neighborhood and built environment" was

classified as one of the five domains of the social determinants of health (CDC, 2018). This domain includes environmental health, community violence, local health policy, housing and homes, injury, disability access, physical activity, respiratory disease, sensory or communication disorders, tobacco use, and transportation. Across the U.S., Black, Indigenous, and other Persons of Color (BIPOC) individuals and people with low incomes are more likely to live in areas with neighborhood and environmental health risks (Diez Roux & Mair, 2010; Rice et al., 2015). Again, because of its disproportionate number of Black residents compared to the rest of Beaver County, it is important to focus on the neighborhood and built environment as risk factors for adverse health outcomes in Aliquippa.

Aliquippa is an urban cluster (population 9,126) in a rural state. Because Aliquippa is not a large metropolitan city (population of 50,000 or more) or a rural town (population of 5,000 or less), it would be insufficient to generalize existing urban or rural community health research to the city. To fully understand how Aliquippa as a neighborhood and community affects childhood trauma and community health, it is necessary to explore the city's history.

2.0 History of Aliquippa

Originally, the land Aliquippa sits on was a large Native American territory home to the Delawares, Iroquois, and Shawnees. Sitting on the Ohio River, upriver from Pittsburgh, the land was an ideal trading hub for early inhabitants. After the French and Indian War (1754-1763), the native peoples lost the title of the land to the British. The land was deserted, and Aliquippa experienced its first depression. British colonizers settled in the area in 1770. They introduced saw and grist milling to the area and industrialized Aliquippa (Casebeer, 1995).

In the late 1800s, Aliquippa's steel industry began to thrive. European immigrants flocked to Aliquippa for jobs in the mills. In the early 1900s, Jones and Laughlin Steel Corporation (J&L) expanded from Pittsburgh's South Side to Aliquippa. Eventually, the Aliquippa mills stretched seven miles along the river, making it the largest integrated steel mill in the world (Casebeer, 1995).

Through the Great Depression, the Aliquippa mills continued to thrive and avoided wholesale layoffs by reducing work hours and provided vegetable gardens on company property for their workers and their families to farm. The economy recovered as the demand for steel (for ships, armor, and weapons) increased through World War II. At its peak during the War, J&L employed nearly 9,000 of the 27,000 Aliquippa residents. Through the 1900s, middle- and upper-class housing developed in Aliquippa. Franklin Avenue, the main street, flourished with successful shops and housing (Casebeer, 1995). During the last few years of the War and as the Great Migration surged, there was another immigration wave of Black families from the South seeking jobs at the mill. Nearly 12,000 Black workers traveled to Western PA during this time. At the

Aliquippa mills, “bunkhouses” were established, housing 4-8 workers per room, and the Aliquippa Plan System was eventually developed to house the J&L workers (Price, 2016).

Despite the influx of workers, the global demand for steel decreased and foreign competitors were more productive and cheaper than the steel companies in Western PA. Like other Beaver County and Pittsburgh Big Steel towns, most of Aliquippa’s large steel companies closed in the 1980s. J&L collapsed in 1984. Over 8,000 employees were laid off. Downtown Aliquippa felt the effects immediately—the Franklin Avenue shops closed, and real estate values declined, resulting in a negative feedback loop of unemployment and diminishing local tax revenues. The financial strife was so severe at one point that the town could not pay for its electricity, and Duquesne Light Company threatened to shut off streetlights because of payment delinquency (Casebeer, 1995).

In the late 1980s, unemployed steelworkers protested their frustrations outside of the railroad tunnel leading to the J&L mill entrance. This group was called the “Tunnel Rats,” and they were eventually arrested by local police for disorderly conduct. The Aliquippa Borough Council re-chartered Aliquippa as a city in 1987 for tax benefits, but there was no organizational or community change in response to the Tunnel Rats. Aliquippa experienced severe economic distress over the following decade, and the population drastically declined from around 27,000 in the early-1980s to 11,734 in 2000. The collapsed steel industries and declining populations in Aliquippa, Western PA, and other northeastern and midwestern towns became known as the “Rust Belt” (Casebeer, 1995).

Despite attempts for revitalization, socioeconomic distress persists in Aliquippa today. Poverty and crime still challenge the town, and gangs are present (Pioneer Press, 2008). Staff at local schools confirm that children are active in gangs (C. McCabe, personal communication,

January 12, 2023). Therefore, community health, childhood trauma, and childhood health outcomes are urgent matters that deserve attention and targeted intervention. To develop ethical and effective interventions and programming for children in Aliquippa, it is necessary to understand Aliquippa's history.

3.0 Community Health Implications

Many of the health risks in Aliquippa are direct and indirect results of immigration patterns, the financial hardship that followed the collapse of the steel mills, and the industry's impact on the environment. When exploring community health and childhood trauma in Aliquippa, it is vital to consider poverty, racism, environmental biohazards, generational cycles of trauma, and community resilience.

3.1 Poverty and Health

There is a lack of literature surrounding health outcomes in Aliquippa after the collapse of the steel industry. However, many sources describe cities in the Rust Belt to have had consistent patterns of socioeconomic and health deterioration (Alder et al., 2014; Hacksworth, 2019; Hartley, 2013). Unemployment rates skyrocketed. Many unemployed families were dislocated, forced to seek employment in other areas, and predominantly Black populations remained in urban centers. As the populations decreased, local tax bases shrunk dramatically. Poverty rates spiked, and urban decay became widespread throughout the Rust Belt. Inner-city communities in Rust Belt cities became notorious for high rates of school dropout, poverty, welfare dependency, and family disorganization (Haller, 2005).

Outside of Rust Belt research, studies consistently show that poverty has detrimental effects on health outcomes and prevents families from gaining socioeconomic capital: poverty breeds adverse health outcomes and adverse health outcomes keep impoverished people in poverty

(Raphael, 2011; Wagstaff, 2002). In impoverished communities, families may not have access to healthcare or quality health services and are likely to experience unsafe living conditions. There is typically a lack of health and income education and a lack of quality K-12 education. Limited healthcare and education affect dietary and sanitary practices, vaccination rates, high-risk lifestyle factors (substance use, sedentary behavior, abnormal sleep, etc.), and contraceptive practices. Engaging in risky health behaviors typically contributes to sickness, malnutrition, and high fertility which, in turn, contribute to loss of wages, costs of healthcare, and greater vulnerability to serious illness and environmental disasters (Wagstaff, 2002). These factors continue the poverty cycle, preventing the gain of socioeconomic capital and making families more likely to remain in poverty.

Poverty has unique effects on adverse health outcomes at each period of the life span. Poverty during motherhood has effects on infant health outcomes. Mothers in poverty are more likely to face stressful life events than mothers with financial stability. Stressful life events may include single parent and teenage pregnancies, intimate partner violence, substance use, unemployment, exposure to pollutants and unhealthy environments, limited access to maternal healthcare and pregnancy services, and more (Aizer, 2011; Braveman et al., 2010; Nagahawatte & Goldenberg, 2008; Weck et al., 2008). Infants born into poverty are at risk preterm birth, intrauterine growth restriction, and neonatal and infant mortality. Through early childhood, children born into poverty are at risk for delayed cognitive development, nutritional deprivation, poor school performance, and behavioral problems (Braveman et al., 2010; Hamad & Rehkopf, 2015; Larson, 2007; Savitz et al., 2004).

Children that live in poverty during early and middle childhood also may experience adverse health outcomes related to stressful life events. Research consistently correlates poverty to ACEs, where children living in impoverished neighborhoods is a factor associated with an

increased risk for experiencing four or more ACEs (Maguire-Jack et al., 2021). ACEs and other trauma in childhood may affect developmental psychopathology where emotional and sensor regulation, gross and fine motor skills, hypothalamic-pituitary-adrenal function, and general brain development can be hindered. Children living in poverty are at risk for ongoing elicitation of cortisol and adrenaline (hormones in the stress reaction pathway) which may contribute to endocrine, metabolic, and immune system problems in adulthood (Raphael, 2011). Longitudinal ACE and trauma studies suggest that childhood trauma related to poverty increases the risk for adverse health outcomes in adulthood despite later adult socioeconomic status (Lee et al., 2021; Steele et al., 2016).

Many studies suggest that adolescents who live in impoverished neighborhoods are more likely to engage in risky health behaviors than teenagers living in financially stable neighborhoods. Teenage risky health behaviors include smoking tobacco and marijuana, alcohol use, substance use, suicide attempts, violence with weapons, teenage dating violence, sexual activity without contraceptives, and other risky sexual behaviors (Blum et al., 2000; Green et al., 2017; Rodgers & McGuire, 2012). These risky behaviors may lead to unplanned pregnancies, substance use disorders, sexually transmitted infections, injury, and early death. One study links living in poverty and experiencing multiple ACEs as a teenager with psychological distress and mental health in adolescence (Heflin et al., 2019).

It is important to recognize the overlap between impoverished communities and Black communities in the Rust Belt. Because of the influx of Black workers during the Great Migration and the loss of White workers due to post-industrial displacement, many inner cities were left with predominantly Black populations after the steel industry collapsed (Hacksworth, 2019). When studying poverty, trauma, and health in Rust Belt cities, a racial lens must be used.

3.2 Racism As a Public Health Crisis

3.2.1 Racism in the Rust Belt

Aliquippa deserves community health attention apart from the rest of Beaver County because of its disproportionate Black population and its history with the steel industry. There is a lack of literature that identifies modern racism in Aliquippa. However, racism is a public health crisis that is widespread across the nation (Beech et al., 2021). Despite individual efforts to be anti-racist and avoid racist biases, behaviors, and language, structural racism and microaggressions saturate society in every neighborhood (Pearson et al., 2009; Roberts & Rizzo, 2021).

Since the 1980s, countless studies have shown that racism is not a spatially homogeneous phenomenon—racism on the community level is specific to a community’s ethnic and racial demographics, history of inter-ethnic and inter-racial relationships, connection to educational institutions, and other social determinants of health (Kobayashi & Peake, 2000; Nelson & Dunn, 2016; Robinson, 1987; Troyna & Williams, 1986).

To begin studying racism and its effect on childhood trauma and community health in Aliquippa, the historic use of segregation and racism in the steel mills must be examined. In Aliquippa and across the Rust Belt, Black workers were given the most unfavorable and dangerous jobs. Many Black employees did not have adequate housing, so they were supplied a shared bed in bunkhouses. When they saved enough money to purchase a home, J&L sent them to Plan 11. Plan 11 was one plan in the Aliquippa Plan System which was developed to house J&L workers in close proximity to the plant. Of the many theories surrounding Plan 11, one suggests that J&L intentionally segregated their employees into Plans by racial or ethnic identity. However, J&L claimed that employees were encouraged to buy a home in a Plan they felt comfortable in which

inevitably divided the plans by race and ethnicity (Snedden, 2015). Regardless of its origin, the Plan System swiftly transitioned to redlined neighborhoods once the mills collapsed (Price, 2016). Plan 11 currently has the highest number of blighted and abandoned structures and is still densely populated with Black families (AEDC, n.d.).

On a national scale, there are several theories connecting racism to the urban decay of the Rust Belt. Hackworth (2019) theorizes that organized anti-Black racism and urban decline (coined “organized deprivation”) directly contributed to the impoverishment of Black communities in the Rust Belt after the steel industry collapsed and continues to prevent Rust Belt cities from developing. He identifies five “modalities” of organized deprivation: legal discrimination, White avoidance of Black individuals and communities (which continuously weakens housing demand and development in Black communities), racial hostility toward Black municipalities at local and state levels, targeted policing and revenue collection aimed at Black households, and discrimination by private firms.

Hackworth claims that organized deprivation in the Rust Belt exists because of the large proportion of Black residents in Rust Belt cities opposed to the state-wide small proportion of rural Black residents. This Black population pattern is consistent among Aliquippa, Beaver County, and Pennsylvania (Hackworth, 2019). In rural states in the Rust Belt, legislators may be Republican-dominant with different constituencies and understanding of cities. Hackworth claims these legislators are hostile to large cities in their states and promise their voters that they will reduce crime in their states’ cities. There are strong ethnic and racial implications in such promises which further contributes to the discrimination faced by BIPOC communities in Rust Belt cities (Hackworth, 2019).

Black communities in Rust Belt cities are subject to several types of systemic and structural racism. Black communities are commonly affected by an unequal distribution of homeownership, which is fostered through redlining, gentrification, and mass incarceration and was exacerbated by the 2008 Great Recession (Heard-Garris et al., 2021).

The unequal distribution of quality education is another form of structural racism. Public schools' resources and environment are directly affected by their district's socioeconomic status and local taxes. Because the Black communities in Rust Belt cities are typically lower SES, it is common for public city schools in the Rust Belt to have limited funding. Resources that may be affected include educational, athletic, healthcare (nurses and school psychologists), and extracurricular resources. Additionally, with weak federal oversight, many public schools with limited funding have environmental risks such as insufficient air quality, water safety, noise levels, lead exposure, and playground designs (Heard-Garris et al., 2021).

The unequal distribution of recreational and green spaces is another form of systemic racism that affects Rust Belt cities. Geo-spatial mapping shows that national and urban parks are concentrated in areas with primarily White residents. Accessible green spaces are also linked to positive childhood health outcomes. Children without access to parks are less physically active, spend more time using technology, and get worse quality sleep than children with neighborhood parks. Green spaces can also promote emotional and behavioral health in children (Heard-Garris et al., 2021).

Rust Belt cities experience general systems of racism and systems of racism specific to post-industrial socioeconomic challenges. It is crucial to consider all types of racism that may affect the trauma residents experience and community health of Rust Belt cities like Aliquippa.

3.2.2 Racism and Childhood Trauma

Racism is traumatic for Black children. According to Mental Health America (n.d.), racial trauma is “the mental and emotional injury caused by encounters with racial bias and ethnic discrimination, racism, and hate crimes.” Countless studies suggest that children who experience direct racism and witness racism are at risk for several adverse youth health outcomes. These health outcomes typically include physical health, such as body mass index, general illness, and weight-for-age; mental health, such as depressive symptoms, anxiety, substance use, and general well-being; socioemotional health, such as internalized and externalized violent behaviors, socioemotional disturbances, and self-esteem; childhood development; and the utilization of healthcare services (Heard-Garris et al., 2017; Hill, 2023).

3.2.3 Generational Cycles of Race-Related Trauma

As a child grows into adulthood, their childhood ACEs and trauma continue to affect their health and commonly prevent them from gaining socioeconomic capital. If a woman (and/or another caregiver) is still in poverty when she gets pregnant, there is a risk for many adverse birth outcomes, and, when an infant is born into poverty, the cycle of poverty begins again (Choi et al., 2020; Liao, 2021). This cycle of poverty is closely related to generational cycles of racial trauma.

Intergenerational trauma is the transmission of the oppressive or traumatic effects of a historical event. This trauma may be transmitted through behaviors on a societal or familial level (Lee, 2023). For instance, a Black grandmother who experienced severe racism earlier in her life may cope with her trauma by repressing her emotions. Oftentimes, the denial and minimization of trauma causes individuals to cope in unhealthy ways. This behavior has direct effects on her

children's emotional health. A caregiver who never healed or explored their trauma may be unable to provide emotional support. Families may be affected by intergenerational trauma through disconnection, detachment, distance, impaired self-esteem (which may stem from the minimization of a child's experiences as compared to their parents'), trauma bonding, and estrangement. The trauma may spread through generations until a family member addresses it (Anderson & Stevenson, 2019).

Epigenetic studies suggest intergenerational trauma may be passed through generations via several biological mechanisms. According to the CDC, this epigenetic study is "the study of how your behaviors and environment can cause changes that affect the way your genes work." Trauma may be transmitted through genetic modification, in utero, and altered memory (Carter et al., 2021). One study found that babies born to mothers who were severely stressed during pregnancy were born with abnormal stress thresholds depending on which of the mother's stress genes were "switched on or off" (Yehuda & Lehrner, 2018).

There are several therapies that may help families address these concerns. These therapies include psychoanalysis, eye movement desensitization and reprocessing, somatic therapy, internal family systems, and prolonged exposure therapy (Colangeli, 2020; Kolk, 2014). However, it is important to recognize that families that would benefit from intergenerational trauma therapy are more likely to be families that cannot access mental healthcare. The more targeted the therapy-type, the more difficult it is to access.

3.3 Steel Mills and the Environment

Beyond the mass trends of unemployment and socioeconomic strife, the steel industry had monumental environmental effects on Rust Belt cities. There was a lack of environmental policy, allowing the mills to produce mass pollution emissions. These emissions went unchecked for years during the peak steel-production era. The smoke was so thick and dark through Pittsburgh that streetlights had to remain turned on during daylight hours (Mazmanian & Kraft, 1999).

Steel milling uses copious amounts of energy and remains one of the world's largest CO₂-producing industries. To produce steel, iron ore is mined from the Earth. Iron ore mining is high energy intensive, and its byproducts include nitrous oxide, carbon dioxide, carbon monoxide, and sulfur dioxide, which combine as potent air pollution. Also, water from iron ore mines drain into community water banks, contaminating water sources with heavy metals and acid. It is possible that acid draining can continue for thousands of years after mining stops (Olmez et al., 2016).

Turning iron ore into steel also uses large amounts of energy and emits large amounts of carbon dioxide. It is estimated that 1.83 tons of carbon dioxide is released for every one ton of steel manufactured (Carpenter, 2012). By 1920, Aliquippa mills were producing 900,000 tons of iron and 900,000 tons of steel (Price, 2016). Currently, it is estimated that the steel industry produces 1.2 gigatons of carbon dioxide emissions each year (IEA, 2020).

Furthermore, steel mining requires burning coal. Coke is a specific form of coal that is used in steel milling. Coke ovens emit air pollutants, such as naphthalene, which is an extremely toxic carcinogen. Wastewater from coke processing contains cyanide, sulfides, ammonium, and ammonia (Olmez et al., 2016; Tarr, 2003). Currently, 75% of the steel industry's energy demand is fulfilled by coal (IEA, 2020).

During the peak of the Western PA steel industry, thousands of employees worked directly in the steel mills and communities were affected by contaminated air and water. The steel workers were regularly exposed to particle metallic compounds in the mills. Long-term exposure to these inhalants can impair pulmonary surfactant—a biological material needed for healthy lung function—resulting in chronic respiratory diseases, such as asthma and chronic obstructive disease (Hamzah et al., 2016). Long-term exposure to fine particulate matter also may overstimulate the body's innate immune response, contributing to an increased risk for inflammatory disease (Tripathy et al., 2021).

Outside of the factories, steel town communities were also vulnerable to environmental health effects. Air pollution has detrimental effects on lung health, putting people at risk for bronchitis, pulmonary emphysema, lung cancer, pneumoconiosis, cough, respiratory irritation, and chest pain. Research shows that long-term air pollution exposure can increase the prevalence of bronchitis, cough, and impaired lung function in areas with high pollution levels. Studies also link air pollution to adverse reproductive, cardiovascular, bladder, and liver health outcomes (Pope & Dockery, 2006; WHO, 2004).

Furthermore, children are specifically vulnerable to air pollution. It is suspected that carcinogens in air pollution are associated with pregnancy and birth complications, gestational hypertension, preterm births, and childhood leukemia (PADH, 2015; Lancet, 2017). A study reviewing bronchial asthma cases at the Children's Hospital of Pittsburgh from 1935 to 1968 found that the number of children hospitalized with acute severe asthmas doubled and asthma patients accounted for 5% of child hospitalizations during the timespan (Palm et al., 1970). A follow-up Pittsburgh study showed that CHP admissions for asthma increased to 10% of total admissions by 1985 (Friday & Fireman, 2009).

Additionally, asthma in children can impact sleep, make children sensitive to allergies, contribute to breathing trouble, and compromise the immune system. These symptoms may interfere with physical exercise, like every day play and sports, and school (Reiter et al., 2021; Tzivian, 2011). Today, asthma is the leading chronic disease in children in the U.S., affecting nearly 6.2 million children. Approximately 14 million school days are missed each year (Gentile et al., 2020).

Despite the environmental reform that swept the nation in the 1970s (including the Clean Air Act), the detrimental environmental effects of the steel industry persist in Western PA. According to the Environmental Protection Agency (EPA), Allegheny County is currently in the top two percent of U.S. counties for cancer risk from air pollutants (Graham et al., 2021). Pittsburgh is ranked the 6th worst city for exposure to high levels of air pollutants (Gentile, 2020). The Pittsburgh region has top rates of asthma, chronic obstructive pulmonary disease, and cardiovascular disease in the country.

Furthermore, environmental inequities exist among Black neighborhoods across the U.S., specifically in areas with prominent environmental health concerns. A 2014 study used spatial pollution mapping techniques to identify that nitrogen dioxide concentrations are 38% higher in BIPOC neighborhoods than White neighborhoods in the U.S. This disparity has enormous implications: the results of this study suggest that reducing the nitrogen dioxide levels in BIPOC neighborhoods to those of White neighborhoods would reduce heart disease mortality by nearly 7,000 annual deaths (Clark et al., 2014). Furthermore, federal environmental policy commonly fails Black communities. Evidence shows these failures come from delayed environmental emergency responses, misinformation, weak enforcement of regulations, and inadequate solutions provided by environmental health and public health officials (Henderson & Wells, 2021).

Because Black communities and children experience disproportionate effects of environmental health risks, Black children are specifically vulnerable (Rosser et al., 2022). This claim has been thoroughly studied in Pittsburgh. A 2020 study found that out of 1,200 students in Pittsburgh, over half of whom were black, 22.5% of students were diagnosed with asthma resulting from air pollution exposure. The rate of children with asthma in Clairton, Woodland Hills, and Allegheny Valley—predominantly Black Pittsburgh neighborhoods that are located near smokestacks—is nearly 1 in 4 (Gentile et al., 2020).

There is no data exploring the connection between environmental health risks, childhood and adult health outcomes, and racial inequities in Aliquippa. However, it is likely the impact of air pollution in Pittsburgh and other Rust Belt cities reflects environmental conditions and environmental health outcomes in Aliquippa. Specifically, using an equity lens will better inform environmental justice efforts and promote community health in Aliquippa.

3.4 Community Resilience

Throughout Aliquippa's history, the town displayed several forms of collective resistance which helped foster a healthy sense of community. When the Great Depression hit the U.S., the Aliquippa steel workforce improvised with work hour distribution and community gardens. The families relying on the mills were able to survive the Depression without losing jobs or experiencing food insecurity because of their equal commitment and compromise with their neighbors.

When the steel mills closed, the Tunnel Rats banded together to make a protesting statement. Even though their protest went unanswered, their efforts reflect a greater system of

community network in Aliquippa. Reports state that the police involved in the Tunnel Rats arrests were hesitant and visibility upset. This shows that the community felt a collective pain and experienced this traumatic event together. While collective pain can affect social capital and hurt community morale, many studies show that collective trauma may ultimately stimulate collective healing in situations where individuals may not be able to heal alone (Cowan et al., 2022; Hirschberger, 2018; Saul, 2022).

Furthermore, the value of community is evident in Aliquippa's football culture. Aliquippa High School (then, Woodlawn High School) established their football team in 1914. Despite harsh segregation policies in Aliquippa and across the U.S., the Aliquippa High School football team was one of the first teams in the nation to allow "anonymous Black players" on the team. Through the 1920s, segregation was rejected by Aliquippa sports teams that integrated Black and White players.

Over the next century, Aliquippa residents continued to cherish their football team. Through the Great Depression, World War II, the Jim Crow era, and the Civil Rights Movement, the Aliquippa football team united the community. The racial dynamics on the team and among the fans were not problematic, and football was consistently a cause for celebration and town pride. When the steel industry collapsed, the town clung onto their football pride (Price, 2016). Having football games to attend, community members remained connected and shared a sense of belonging.

Through the 1980s and into the present day, Aliquippa still maintains their football culture. In recent decades, Aliquippa produced several collegiate and National Football League players. In turn, community members, and notably children, admire the team. Many periodicals quote

community members describing the importance of Aliquippa football while the town is challenged with socioeconomic strife and violence (Price, 2011; Price, 2016).

When assessing community health, it is important to use a resilience framework. In Aliquippa, instances of community unity occurred repeatedly over the past century and continue today. This intergenerational cycle of town pride and community connectedness may act as a protective factor. Conceptually, protective factors are individual or community characteristics that lower a person's risk of adverse health outcomes (Blum, 1998). Many studies suggest community connectedness and social support are protective factors for community health outcomes (Armstead et al., 2018; Ellis et al., 2015).

Greenfield & Marks (2010) established an association between childhood family violence and psychological distress in adulthood. Then, they found that a stronger sense of community was correlated with lower levels of adult psychological stress. Other studies suggest that membership in a sports fan community may contribute to community unity, act as a protective factor, promote cognitive and behavioral health, and contribute to urban regeneration (Davies, 2016; Mastromartino et al., 2022).

When studying childhood trauma and community health, it is crucial to use a historic lens to explore the origins of community health issues, potential generational cycles of trauma, and protective factors. Aliquippa's history shows that major historical events can affect the community for decades, and even centuries. These effects extend to children and dictate the types of challenges they encounter and trauma they experience. Using a community's history to inform community interventions and programming maximizes their effects on individual healing, instances of childhood trauma, and community health.

4.0 Community Based Participatory Research (CBPR)

For the most effective and ethical interventions, CBPR is necessary. According to the National Institute on Minority Health and Health Disparities (NIMHD), CBPR “supports collaborative interventions that involve scientific researchers and community members to address diseases and conditions disproportionately affecting health disparity populations” (NIMHD, 2018). It is widely recognized that CBPR is particularly important when studying health inequities. CBPR builds bidirectional partnerships between academics and communities, contributes to ethical and culturally appropriate measures, provides quality data on unique communities, and informs targeted community interventions and programming (Hacker, 2013).

In 1974, the National Research Act was passed to uphold ethical principles required for human-subject research. A few years later, the Belmont Report was published by the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research to outline ethical principles and research guidelines. The three principles the Belmont Report identifies are respect of persons, beneficence, and justice (NCPHSBBR, 1978).

CBPR is an excellent method to ensure the principles of the Belmont Report are being upheld. CBPR carefully considers the voices of the community, which contributes to respect of persons. By working toward the community’s goals, CBPR values beneficence and maximizes the benefits of the research. CBPR has a great opportunity to uphold the justice principle by engaging as many community members as possible (Mikesell et al., 2013).

CBPR upholds the principles of the Belmont Report, and it extends beyond the Belmont guidelines. While the Belmont Report was originally written to apply to individual research participants, CBPR applies the Belmont Report principles to whole communities to empower and

mobilize community members. Beyond the principles of the Belmont Report, CBPR contributes to reciprocal justice, where the community is benefiting as much or more than the research team (Maiter et al., 2008; Mikesell et al., 2013).

Thus, using CBPR will contribute to Aliquippa being ethically and effectively engaged in childhood trauma and community health research. There are several research methods that utilize CBPR philosophies. One of the most widely used research methods is the community health needs assessment (CHNA). CHNAs are controversial but are still the most used and legitimized in the field. Many state policies require hospitals and other community institutions to conduct frequent CHNAs (Franz et al., 2021).

An alternative research method to CHNAs is asset mapping. Asset mapping is not incorporated into policy. However, it is gaining popularity as it fosters more recent ethical practices and ideologies (McKnight, 2010). Furthermore, visual voice methods are other CBPR methods used to engage community members. Visual voices may be specifically beneficial for children and family engagement (Yonas et al., 2013). All CBPR methods have strengths and weaknesses, so it is important to evaluate the target community before developing research methods.

4.1 Community Health Needs Assessment (CHNA)

A CHNA is a tool used to closely evaluate community health issues and needs through data collection and data analysis. The Public Health Accreditation Board defines community health assessments as “systematic examination of the health status indicators for a given population that is used to identify key problems and assets in a community.” In practice, CHNAs typically focus

on issues that need urgent attention and identify resources that may be available to address those issues.

The ACA requires non-profit hospitals to conduct CHNAs every three years. These CHNAs include a demographic assessment, survey of perceived healthcare issues, quantitative analysis of healthcare issues, appraisal of existing initiatives to address healthcare issues, and a three-year plan to address the remaining healthcare issues (Hoffman, 2022).

Despite the CHNA's persistent use in the public health sector, CHNAs face criticism. Among CHNAs, the definition of a community varies and is oftentimes vague. Generally, communities are groups of people that share a common interest and social network based on identity or location. Community belonging is not exclusive, and people may belong to multiple communities (Ravaghi et al., 2023).

Many times, for the purpose of a CHNA, a community is defined at the county level. However, that definition may not be appropriate. Counties can be large and consist of hundreds of neighborhoods with varying socioeconomic levels and demographics. It may be difficult to use a county-wide CHNA to target the health needs of a specific school district or municipality within the county.

Aliquippa serves as an excellent example demonstrating this criticism. While CHNAs exist for Beaver County, Aliquippa does not have a specific CHNA. Aliquippa has a much higher population density and a larger Black population compared to the rest of the County. It is likely ineffective to use a CHNA of Beaver County to inform community programs in Aliquippa.

Furthermore, CHNAs do not have a universal definition of community "needs." Ravaghi et al. (2023) found that the concept of "need" is multifaceted and varies in CHNAs. They recognized that CHNAs typically differentiate "healthcare needs" from "health needs" where

“healthcare needs” refer to issues in the healthcare system and health education and “health needs” refer to a broader system including the social determinants of health. However, there are no CHNA standards that require the evaluation of social determinants.

Many times, CHNA methods and data are one dimensional, failing to explore the factors and the complex interplay between factors that are creating or exacerbating health issues in the community (Hoffman, 2022). In most communities, social determinants contribute to community health issues and the degree to which underserved communities are affected by health issues.

Social determinants need to be targeted by community interventions to effectively address community health issues and reduce health inequities. Currently, many CHNAs are failing to accurately report the influence of social determinants on community health thus misinforming community interventions (Hoffman, 2022).

CHNAs also receive criticism about their methods of data collection. Public health officials conducting CHNAs commonly use elite stakeholders to collect data rather than lay people in the community (Hoffman, 2022). These methods are problematic as they ignore the voice of the community—the voices of those the data and results reflect.

While needs assessments focus on data collection, data alone cannot decide which issues are more important than others in a community (Duncan, 2012). Data can inform which health issues are the most prevalent, but it does not guarantee that community members are interested in addressing that issue before other issues.

Furthermore, ample data exists detailing endless health issues in the country. There is more data than public health officials can use effectively. It is not the absence of data that prevents community health improvement. Rather, it is a lack of community leadership and engagement that

prevents improvement. CHNAs may not be an ideal tool for community health improvement because they do not promote or create community leadership and engagement (Duncan, 2012).

CHNAs typically heavily rely on surveying to generate data. To holistically explore a community, data collection methods must go beyond polling and include qualitative methods. Quantitative polling has several limitations. It is likely that community polls use convenience sampling, non-representative samples, and small samples. These limitations may compromise the external validity to the entire community (Ravaghi et al., 2023). Additionally, polls commonly focus on community needs and negative elements of the community opposed to community capacities and positive elements of the community (Goldman & Schmalz, 2005).

While CHNAs are intended to support communities in improving their community health, CHNAs can still have direct and indirect negative effects due to their deficit-oriented approach. It is possible that community residents and organizations will internalize the issues identified by community members which may lead to increased hopelessness and the deterioration of social capital (Duncan, 2012).

Furthermore, using a deficit-oriented approach, funding is typically directed toward provisional services that are outsourced instead of community members. This direction of funds prevents investment in community members which is a vital aspect of community development. It also may create the concept that only experts from outside the community can provide help or relief (Hoffman, 2022). This perception may also produce a dependency of community residents and organizations on outside professionals (Goodman & Schmalz, 2005).

4.2 Asset Mapping

Asset mapping is a type of systematic community health assessment that uses a strength-based approach to catalog prominent services and resources (including both tangible and intangible resources) within a community (Mathie & Cunningham, 2003). Unlike CHNAs which use a deficit-based approach, asset mapping specifically focuses on community strengths and the gifts and talents of individuals, organizations, and local institutions (Goldman & Schmalz, 2005).

Some academics theorize that policy makers and American capitalism forged a hierarchical system where few authority figures are responsible for mass production and decision making for everyone else, marginalizing the role of the citizen. This framework can be applied to every institution in the U.S., including research. Therefore, asset mapping gives power back to the citizen and shifts attention to the unique capabilities of the community, a shift necessary when building healthy communities (McKnight, 2010).

Asset mapping is primarily used to inform a new community program or intervention, inform an existing community program or intervention, or mobilize and empower a community (Kramer et al., 2012). When asset mapping, researchers do not enter a community to recruit community members to buy into their philosophies and ideas. Rather, researchers look for community members that share similar philosophies and give them the resources to mobilize their ideas (Duncan, 2012).

Asset mapping is gaining popularity and proving to be an ethical and effective CBPR method, but it still has limitations that need to be addressed. The purpose of asset mapping and the definitions of “community assets” and “health assets” are not consistent throughout the literature. Like many CBPR methods, asset mapping has a high demand for community buy-in and commitment. Asset mapping requires many resources and people, which may affect recruitment

efforts and loss-to-follow-up. Additionally, when individual responses are weighed heavily, there is a chance those responses may be misrepresentative of the community as a whole (Kramer et al., 2012; Luo et al., 2022; Whiting et al., 2012; Williment & Jones-Grant, 2012).

The largest limitation in asset mapping is a lack of standard methodology used among public health professionals. Researchers, community development leaders, local governments, and other public health officials could utilize asset mapping. However, without a standard framework, community partners may be hesitant to use the method, and it may make application of the method difficult. Furthermore, methodology standardization would increase the external validity of asset maps and allow researchers to compare results (Healy et al., 2023; Luo et al., 2022).

Some researchers are attempting to establish and publish a standard asset mapping methodology. Healy et al. (2023) developed the Asset Mapping Score Analysis (AMSA) as a framework to collect data and organize asset maps. If asset map data collection and analysis can become standardized in research, asset mapping will be an even stronger method.

4.3 Visual Voices

Visual voices is a CBPR method that utilizes creative writing, drawing, painting, photography, and cinematography to explore a research area in a culturally appropriate and ethical manner. Visual voices art is created and interpreted by community members and displayed and published for larger audiences (Yonas et al., 2013).

Visual voices reclaim power in art. Historically, photos, videos, and pieces of art were created by “the powerful, the established, the male, and the colonizer to portray the less powerful, less established, female, and colonized” (Harper, 1994). Visual voices give creative power back to

those who are oppressed, marginalized, or silenced. Being empowered can help a marginalized individual restore self-esteem and regain a sense of humanity. This researcher and community partner relationship promotes reciprocal learning, the dismantling of uneven power dynamics, and mutual benefits (Singhal & Devi, 2003).

Another strength of visual voices is its ability to engage those who may not be able to communicate effectively with verbal or sign language. These populations include children, immigrants with language barriers, and people with disabilities. Again, this method works to give a voice to the most marginalized groups of people (Luttrell, 2010).

Several studies demonstrate the effectiveness of using visual voices with children. Photography, cinematography, and art are activities that may not be accessible to all children, so children may have more enthusiasm to participate in a visual voices project than a standard survey or focus group. Furthermore, photography and cinema are excellent conversation-starters for children about their perspectives, values, emotions, and memories (Luttrell, 2010).

One of the largest challenges with visual voices is capturing the entire truth. Photographs and video clips only document cross-sectional moments in time and lack context. This makes it impossible to interpret the social and community dynamics that caused the event on camera without commentary from the creator. Art reflects the creator's biases, and the creator's commentary is limited by their knowledge. Like any CBPR method that relies on individual responses, visual voice art may not reflect the entire community's reality (Singhal & Devi, 2003).

5.0 Potential Community Partnership Challenges in Aliquippa

CHNAs, asset mapping, and visual voices would benefit the Aliquippa community in different ways. Because CHNAs are the more standard method, a CHNA would establish preliminary statistics on community health in Aliquippa. These statistics could be used for grants and policymaking. However, asset mapping would be more effective for identifying community strengths and helping community leaders mobilize their ideas. If community development comes from internal investment, the changes will be more sustainable. Finally, to engage children, visual voices may be the most effective method. Because childhood trauma is a major area of focus in Aliquippa, visual voices projects could help to facilitate discussions with children to yield the most accurate community health results.

Beyond the logistical challenges present in all CBPR studies, working with urban clusters in rural states has proven to be difficult. There is a large literature gap surrounding smaller cities in rural states, and major cities tend to receive the most attention and resources. In PA, Pittsburgh and Philadelphia are connected to large academic institutions, funding, and programming. Socioeconomic challenges persist in these cities, but there are ample initiatives and groups advocating for their community health and development.

Aliquippa is only a 45-minute drive outside of Pittsburgh, it is in the Greater Pittsburgh Region, and its historic steel industry was an extension of Pittsburgh's steel industry. Yet, Aliquippa is disconnected from Pittsburgh's resources. The University of Pittsburgh has struggled to engage small cities outside of Allegheny County, including the City of Washington and other towns in Beaver County, for research and programs promoting community health.

One reason it is difficult to collaborate with the Aliquippa community is its distance from Pittsburgh's major academic institutions. To begin an ethical and effective CBPR study, the research team must have several members who have the resources and availability to travel to Aliquippa multiple times a week for a prolonged amount of time. With modern technology, virtual meetings are possible. However, there are several variables that limit virtual engagement, including internet access, WiFi stability, and access to devices that support virtual calls. Furthermore, virtual engagement does not have the same psychosocial effects as in-person engagement, making relationships more difficult to form.

In cities with large Black populations, it is possible that academic and medical mistrust prevents communities from engaging in research. Black communities have historically been exploited at the hands of research officials and biomedical professionals. The Tuskegee Syphilis Study and the story of Henrietta Lacks were traumatic events for the Black community. Research has found that these exploitative events may contribute to the Black community's will to protect themselves from research (Buseh et al., 2013). However, other studies found that community-wide academic and medical mistrust developed long before these events, suggesting there are other factors that contribute to mistrust (Gamble, 1997). Interviews with Black individuals reveal that Black communities may be hesitant to engage with these institutions because of fears about being rejected, embarrassment, misunderstanding professional encounters, and experiencing racism and microaggressions (Gary et al., 2021; Powell et al., 2019).

While it is possible that mistrust in the Aliquippa community has contributed to the ongoing challenge to connect Aliquippa with academic institutions, it is more likely that academic institutions are not offering opportunities for engagement. It is impossible for an academic institution to distribute resources to every local town. However, public health professionals and

researchers should continuously search for local communities with the most pressing public health concerns.

When attempting to overcome these challenges, the most important element is establishing bilateral trust between researchers and community members. Although it may be difficult because of the commute, research teams must regularly attend Aliquippa community events and build relationships with the community (Holkup et al., 2004).

Once community leaders are identified and given the resources to mobilize their goals, some responsibility (such as recruitment and CBPR session facilitation) can be shifted to them. This is a complicated action, though, as the dependency on individuals who do not have the appropriate academic credentials may compromise the study's validity. However, showing community members that they are worthy of responsibility may be empowering and contribute to community investment (Holkup et al., 2004). Because CBPR initiatives are intended to promote sustainable development, community contributions should be prioritized.

6.0 Conclusion

To explore childhood trauma in Aliquippa, Aliquippa's history as a Rust Belt city must be considered. This history includes the rise and fall of the steel industry, an influx of Black immigrants from the South, environmental crises, and decades of socioeconomic distress. These events give rise to a complex relationship between poverty, trauma, race, and health in Aliquippa today. To develop interventions and programming to address childhood trauma and community health in Aliquippa, CBPR would likely benefit by examining Aliquippa's history to develop targeted and culturally sensitive methods.

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