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Asthma-Related Hospitalization and Emergency Room Visits in Oakland

Cover Page Footnote

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Alondra Varela

Major:
Public Health

Dr. Jennifer Hartle

Asthma-Related Hospitalization
and Emergency Room Visits in
Oakland

Biography

Alondra's interest in health began when her grandfather was diagnosed with metastatic melanoma. Sadly, he was not well informed in the ways he could have lowered his risk of cancer and passed away without having the proper counseling for his condition. His situation inspired her to learn more about the science behind these diseases and how to prevent them. She will be attaining her bachelor's degree in Public Health at San José State University. Her goal is to become a college professor and a public health epidemiologist. Most of all, she wants to be in a career that makes health resources and education more available to everyone in the United States. She is committed to researching health inequalities in the Latino community and additional marginalized communities because she lives in Oakland, which is a city affected by health disparities. Thus, she has first-hand experience with environmental stressors. She hopes that through her graduate studies she will be able to identify distinctive stressful environments and health behaviors that contribute to different mental and physical outcomes in marginalized groups.

Asthma-Related Hospitalization and Emergency Room visits in Oakland

Abstract

The City of Oakland has seen diminished childhood asthma rates. During the last few years more children have been able to qualify for Medi-Cal and other health insurance plans under the Affordable Care Act (ACA). Local programs work together with Medi-Cal and ACA to reduce the number of symptoms related to asthma by making sure children from low-income communities have access to primary care, medicine, and treatment. Unfortunately, the asthma-related hospitalizations and emergency room visits among children have continued to increase. These rates are even higher in low-income communities located near highly trafficked areas. To investigate this phenomenon, this study is an in-depth literature review of the current journal articles detailing the preventative measures taken to decrease the risk of a child having to go to the emergency room or be hospitalized. The literature review included information on environmental and social factors that may contribute to increased risk of severe symptoms that required hospitalization.

This study found that more research is needed on how children interact with their health systems and their environment. Without follow-up after a child is discharged from the hospital, there is no guarantee that families will seek primary care, which leads to hospital readmission. Both the West Oakland zip code 94601 and the East Oakland zip code 94621 have higher hospitalization rates and emergency room visit rates compared to the county and other parts within Oakland. These residents are exposed to higher amounts of pollution because of the environment they live in. Pollution is a known trigger that worsens asthma symptoms. Many of the people living in these areas do not have the resources to move out to other neighborhoods because of their socioeconomic status.

Introduction

As of today, health-protective services that limit the amount of vehicle, industry, and power plant emissions and other sources of pollution

released near residential and school environments are lacking in low-income areas of Oakland. Some of these communities are located near the Port of Oakland, the Union Pacific Rail yard, and several major freeways. In Alameda County, 7 of the 10 schools in the Oakland Unified School District are located 500 feet away from a major freeway (Green, Smorodinsky, Kim, McLaughlin, & Ostro, 2004). From the Bay Area Census for the City of Oakland (2010), I found that 28% of Oakland's population identifies as African American. The same census conducted in the year 2000 showed that 35.7% of Oakland's population had identified as African American (Bay Area Census, 2010). It is evident that there has been a decrease in the number of African American residents living in Oakland. Additionally, 18% of the residents in Oakland live in poverty while countywide only 11.2% of residents live in poverty.

As of 2008, 25% of Oakland's population was younger than 18 years of age. Of these children who live in Oakland, 28.6% are living in poverty compared to the United States value of 21.7% (U.S Census Bureau, 2015). For the purpose of this research I will focus on children who identify as African American who live in Oakland. Children of African American decent had the highest rates because their rates of asthma hospitalization are four to six times higher compared to other race/ethnicity (Community Assessment, Planning, and Education (CAPE), 2014).

This topic is important if there is a disproportionate risk of asthma in low-income communities in comparison to more affluent neighborhoods. As of 2015, 18.6% of children in Oakland have asthma. This statistic suggests that there has been a decrease from 2014 when 20% of children living in Oakland had asthma, but hospitalizations in East and West Oakland have increased in this same time period, so my hypothesis is that asthma rates are higher in these areas. Unfortunately, none of the websites provide asthma rates among children 5–17 years old by zip code. Therefore, on the basis of the data, one can hypothesize that there is a health disparity in the East Oakland and West Oakland areas in asthma-related hospitalization rates.

From 2012–2014, the emergency-department-visit rate for asthma was 1,101.2 cases per 100,000 people, compared to the Alameda county value of 649 cases per 100,000 people. There is an apparent rise of asthma-related emergency department cases in Oakland. In the West Oakland zip

code 94601, the rate is 981.2 per 100,000, and in the East Oakland zip code 94621 it is 1,713.5 per 100,000 (healthyalameda.org). Both of these areas are closest to the Port of Oakland, large freeways, and warehouse companies. Consequently, these areas would have a higher volume of vehicle traffic. What is triggering the number of asthma-related emergency department visits and hospitalizations if the number of children with asthma is decreasing in Oakland? In previous years, the number of children 5–17 years of age who were hospitalized for asthma was 229.3 per 100,000; this was 67% higher than the Alameda County rate. Over half of the asthma hospitalizations among the children 5 to 17 years of age in Alameda County were paid for by Medi-Cal. This is an indicator that there is a disproportionate rate of severe asthma symptoms that require hospitalization in the low-income communities. Additionally, African American and Latino children were more likely to be hospitalized for asthma than were non-Hispanic whites (Green et al., 2004). According to the report released by the Alameda public health department African American and Latino children make up more than 60% of the hospitalizations rates by race/ethnicity (Community Assessment, Planning, and Education (CAPE), 2014).. This also shows that there is a health disparity amongst African American and Latino children in terms of the amount of pollutants they are exposed to that trigger their asthma symptoms.

Methods

This research addresses the question, “Do policies and practices such as placement of companies and highways in low-income communities relate to the increased number of asthma-related hospitalizations in East Oakland & West Oakland?” I thought the best way to determine this would be to provide an overview of existing evidence pertinent to this health issue. The search terms (Asthma AND West Oakland*), (Asthma and Hospital*) were applied to three bibliographic databases (CINAHL complete, Pubmed, and Google Scholar), and only English-language articles published between 2005 and October 2015 were included. In total, six articles matched the search terms and were reviewed based on their titles, index terms, and abstracts. I considered the matching articles for inclusion or exclusion based on their abstract, study type, and intervention objectives with respect to the full set of inclusion and exclusion criteria.

In order to have a fair comparison of asthma-related hospitalization rates, this research concentrates on the asthma rates of Oakland altogether against the zip code rates of West Oakland (94601) and East Oakland (94621). I collected statistics for Oakland asthma rates, air quality measurements, and demographic by zip code at healthyalamedacountry.org. This data portal contains statistics that are up to date with comparisons of health statistics countywide and statewide. This data helped me determine if there was a health disparity between different areas in Oakland.

Asthma-Related Hospitalizations and Emergency Room Visits in Oakland

There is an immediate need for public health education and promotion in East and West Oakland. In 2015, for East Oakland children aged 0–4, the rate of asthma-related visits to emergency departments (ED) was 1168.2 per 100,000 compared to the Alameda County rate of 929.0 per 100,000. For West Oakland children aged 0–4, the asthma-related ED rate was 1224.3 per 100,000 compared to the Alameda County rate of 929.0 per 100,000. East Oakland’s hospitalization rate for 0–4 year-olds was 889.4 per 100,000 compared to the Alameda County rate of 421.9 per 100,000. West Oakland’s hospitalization rate for 0–4 year-olds is 752.3 per 100,000 compared to the Alameda County rate of 421.9 per 100,000 (Alameda County Public Health Department, 2015). Alameda County Public health has reported the rate of asthma related hospitalizations was 3 times higher for children under the age of five than any other age group.

Influencing Environmental and Social Factors

According to Yap, Gilbreath, Garcia, Jareen, and Goodrich (2013), children with a lower socioeconomic status had a higher mortality rate than more advantaged persons. Even though this study was conducted in the Los Angeles region, the findings are relevant because the Bay area is the fourth most traffic-congested area in the United States. These researchers found that in areas where lower socioeconomic-status groups lived, there was a stronger correlation between the amount of pollution and hospital admissions for respiratory conditions. Additionally, these families are more likely to live near high traffic areas that have higher amounts of air pollution and toxins (Yap et al., 2013).

The median household income from 2010–2014 in Oakland was \$52,962. In comparison, the total income during those years in East Oakland (94621) was \$30,528, and in West Oakland (94601) it was \$39,601. In 2014–2015, 35.8% of people living in East Oakland (94621) were living below the poverty level compared to 12.9% of people living below the poverty level in Alameda County. In West Oakland (94601), 28.6% of people were living under the poverty level compared to 12.9% of people living below the poverty level in Alameda County. On the other hand, more people in Oakland are insured than were last year since the uninsured rate decreased from 24% to 19.7% while the population living in the zip codes I studied remained the same. The lack of insurance may not be a priority factor affecting the higher asthma-related hospitalization and emergency visits in East and West Oakland.

An article by Kim et al. (2008) mentioned that children living near highly trafficked areas are more likely to suffer from adverse asthma symptoms such as reduced oxygen capacity and panic attacks. This study measured the amount of traffic pollutants and recent episodes of asthma and bronchitis. Kim et al. (2008) found a variation of air quality between different areas in the same cities of the Bay Area. California has one of the strictest air quality regulations and vehicle pollution standards in the nation. However, due to the fact that homes are located near areas with higher emission particles and toxins, the highest risk of adverse asthma symptoms was for children living within 75m of a freeway/highway (Kim et al., 2008).

On a scale from 1–4, the American Lung Association ranked the annual particulate pollution of Alameda County a 4 due to its low air quality. They rank this by measuring the amount of particulate matter in the environment. Inhaling small toxic particulate matter can negatively affect people with asthma or other cardiovascular problems. In extreme cases it can lead to premature death (Air Resources Board, 2016). This rank is also determined by the number of days that the particle solution exceeds the U.S. standards of air quality within the given year (healthy alameda county, 2017)

A study done by the California Air Resources Board found that diesel concentrations in West Oakland were three times higher than in the San Francisco Bay area as a whole. West Oakland residents are also exposed to nine times more diesel particles in a given year than others living in

nearby cities (Green et al., 2004). In Alameda County, industrial chemical and fuel release sites in low-income communities are four times higher than in affluent neighborhoods (Alameda County Public Health Department, 2015). Air pollution does contribute to increased asthma hospitalizations and asthma onset in children, and it can ultimately affect the long-term development of lungs. There is a disproportionate burden of chemical and fuel release pollution in this area; therefore, these communities disproportionately suffer from disease complications and deaths (Alameda County Public Health Department, 2015). The residents of these areas are exposed to higher amounts of pollution because of the environment they live in. Many of the people living in these areas do not have the resources to move out to other neighborhoods because of their socioeconomic status.

Medical Coverage, Insurance, and Overall Healthcare Quality

The majority of emergency department (ED) visits for children living in Oakland are related to asthma. In Alameda County, more than half of the children's asthma-related hospital visits were paid for by the federal government (Alameda County Public Health Department, 2015). This is an indicator that there is a disproportionate rate of severe asthma symptoms that require hospitalization and ED visits in the low-income communities.

The Role of Public Health

There are a variety of programs in Oakland focused on decreasing the asthma-related hospitalizations and ED-visit rates and increasing the access to primary care in low-income communities. For instance, The Northern California Breathmobile Program is a community asthma-managing program that focuses on regular preventative care. They provide a specialized action plan, medication, and care at no charge to all of their patients (Bay Area Environmental Health Collaborative, n.d.). They plan on counteracting asthma morbidity rate factors like inadequate control of management and inadequate control of asthma triggers by providing care to children who cannot afford treatment and medication. Their team of specialists visits K–12 schools and community centers every 4–6 weeks to see children with asthma.

Oakland also has a partnership called Bay Area Environmental Health collaborative (BAEHC). They currently have a partnership with six

environmental alliances and more than 30 organizations. Their goal is to reduce the amount of air pollution in all communities, especially those who are more exposed to it (Bay Area Environmental Health Collaborative, n.d.). They are at the forefront of the policy-making process and give a greater voice to residents to participate in governmental decision-making to strengthen air pollution policies at a local and regional level. Lastly, more than half of the asthma-related hospitalization/ED visits are paid for by Medi-Cal. With access to insurance, these children will have the opportunity to visit a primary care doctor, afford medication, and enroll in preventative treatment programs for their condition.

Conclusion

In conclusion, over the years the number of children with asthma living in Oakland has decreased while the number of asthma-related hospitalization and ED visits have increased in East and West Oakland. Studies show that there is a connection between the disproportionate amount of pollutants a child with asthma is exposed to and the increased risk of that child having episodic symptoms. After the Affordable Care Act passed, more children were insured. It seems that many of these families rely on the ED as a substitute for primary care. With the help of the BreathMobile and the BAEHC, Oakland can start finding ways to decrease the amount of pollutants that some groups are exposed to more than others. Additionally, programs like the BreathMobile can partner up with insurance companies and Medi-Cal to make sure their patients are going to a primary care pediatrician to reduce the number of children hospitalized for lack of follow-up and treatment.

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