

Asthma in Greater New Haven: Local context and the role of walkability, bikeability, parks, and safety

A report on asthma and the environment for
the New Haven Green Fund



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This project solely represents the views of the author, and should not be interpreted to represent the official views of any of the organizations involved.

Introduction

Purpose of this report

This report will highlight the burden of asthma in Connecticut with a special focus on four communities in Greater New Haven, specifically: **East Haven, Hamden, New Haven, and Woodbridge**. There are many factors that affect asthma, however, the scope of this report includes environmental factors such as, walkability, bikeability, parks access, and neighborhood safety.

General asthma facts

In the United States, about 8.4 percent of children and 7.7 percent of adults have asthma.¹ These rates have been on the rise in recent years.² Asthma is a chronic respiratory disease that presents in various forms when triggered, including coughing, wheezing, and difficulty breathing.³ These symptoms can escalate and even be life-threatening, if not properly managed. There are plenty of factors that trigger asthma symptoms.⁴ Many of these triggers are environmental and they include dust mites, tobacco smoke, pet dander, chemicals, and pests.⁵ Extreme heat and other effects of climate change also correlate with exacerbated asthma outcomes and increased hospitalizations.⁶

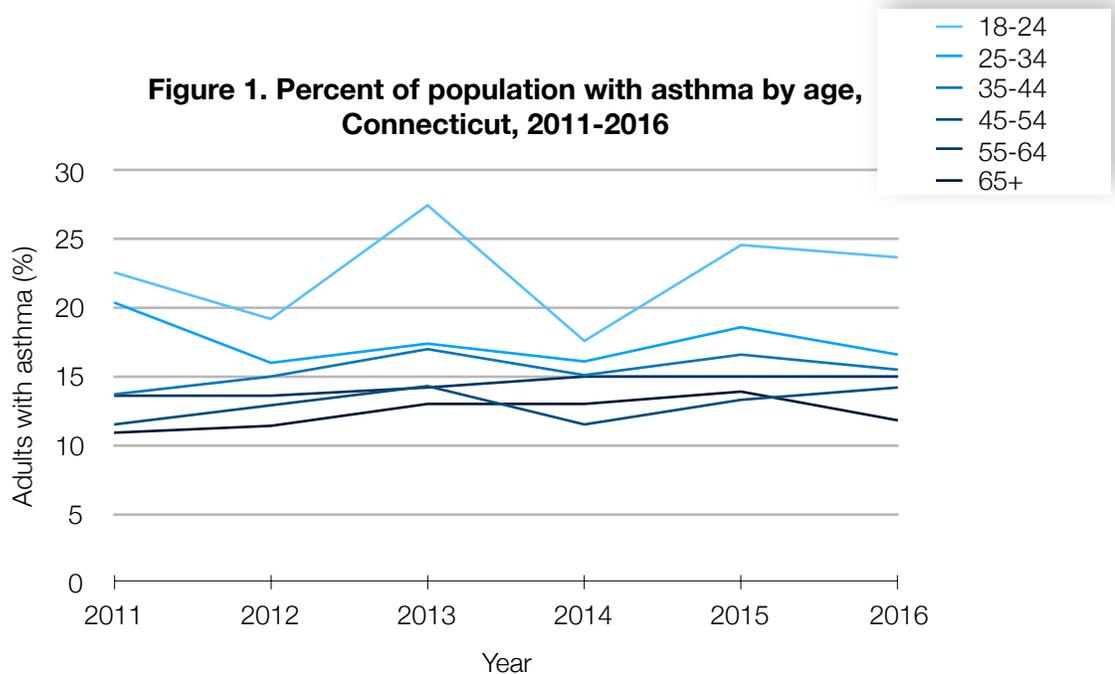


Photo credit: Amber Collett; Faces of Cycling

Scope of asthma in Connecticut

Asthma is the most common childhood chronic disease among children in Connecticut. Statewide prevalence decreases with age—meaning as people get older they are less likely to have asthma. Among adults, those between the ages of 18 and 24 have the highest prevalence (Fig.1). According to the Connecticut Department of Public Health, statewide asthma rates have been higher than nationwide rates since 2000.⁷

In Connecticut, certain people are affected by asthma more than others. Women, people of color, those with low income and educational attainment tend to be more heavily affected compared to members of the population that are not in those groups. As illustrated in Figures 2-5, the asthma rates between demographic groups seem relatively consistent from 2011-2016 for all groups.



Additional statewide trends

Figure 2. Lifetime asthma prevalence by sex

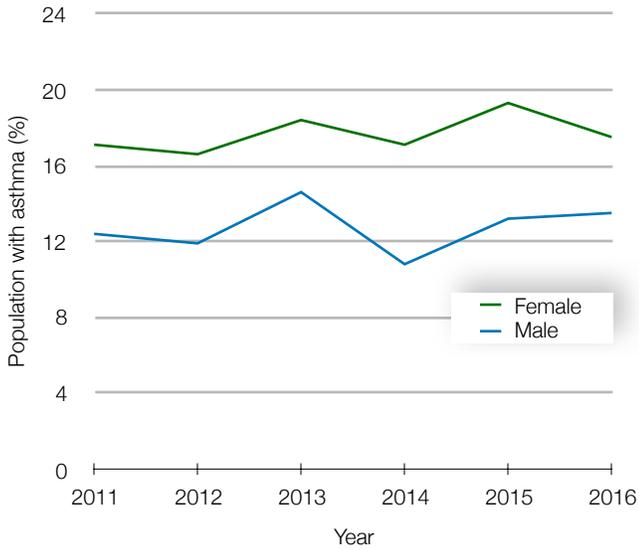


Figure 3. Population with asthma by education level

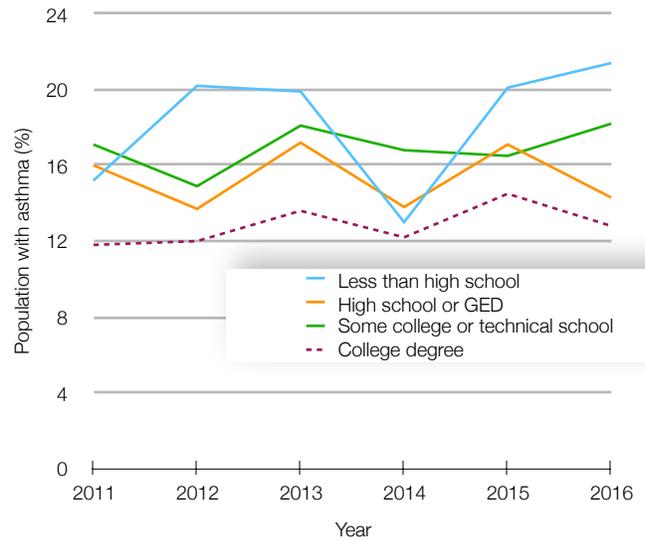


Figure 4. Population with asthma by race/ethnicity

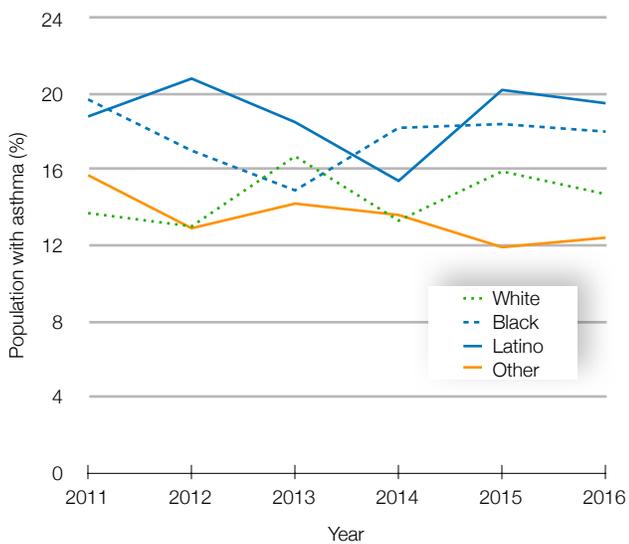
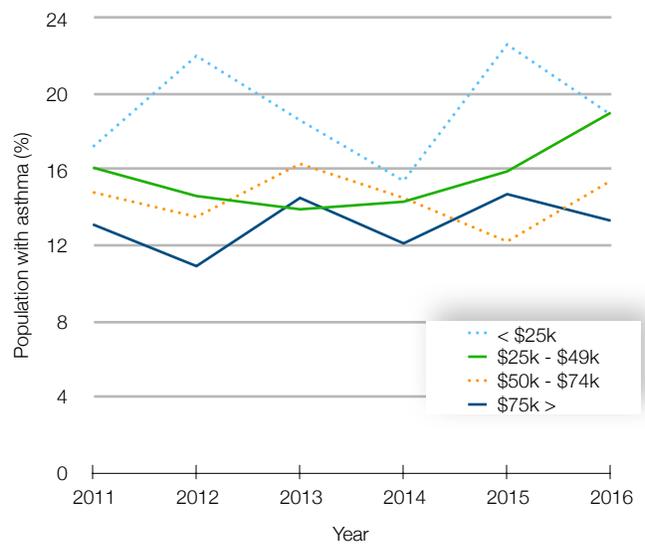


Figure 5. Population with asthma by household income



Disparities also exist in terms of who is hospitalized for asthma. This suggests that there are differences in how various groups are able to manage the condition, or the quality of care and resources that are available and accessible. Unintended consequences from systemic health and housing policies also play a role in the vast disparities illustrated in Figure 6.

People of color are more likely to be hospitalized for asthma compared to white people. Black children under 18 years old are especially at risk of hospitalization compared to other racial and age groups. In terms of emergency department (ED) visits, children visit the ED because of asthma much more than adults in the state (Fig. 7). Further, children of color have higher ED visit rates for asthma than white children.

Figure 6. Age-adjusted asthma hospitalization rates by age group, Connecticut 2000-2017

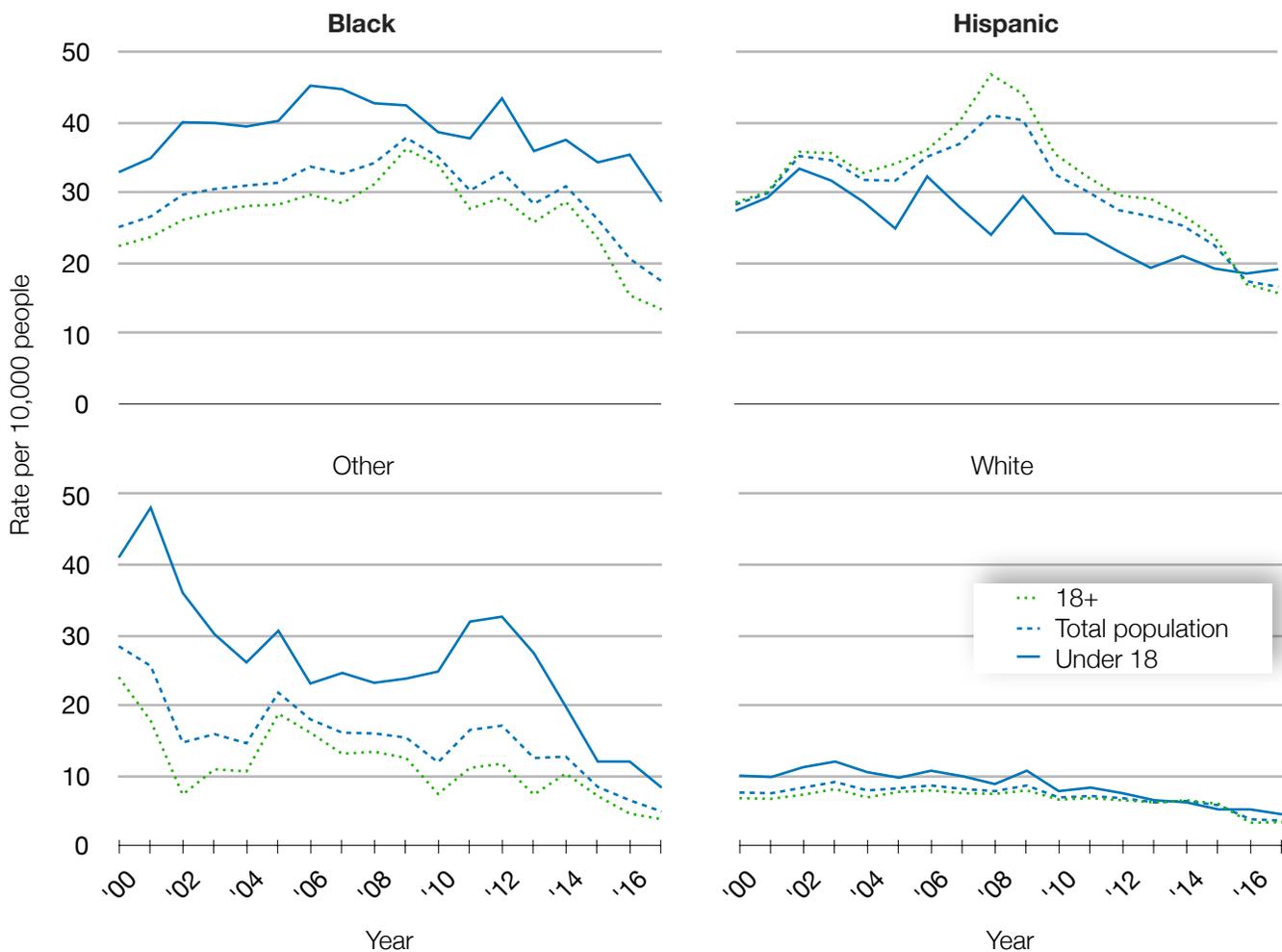
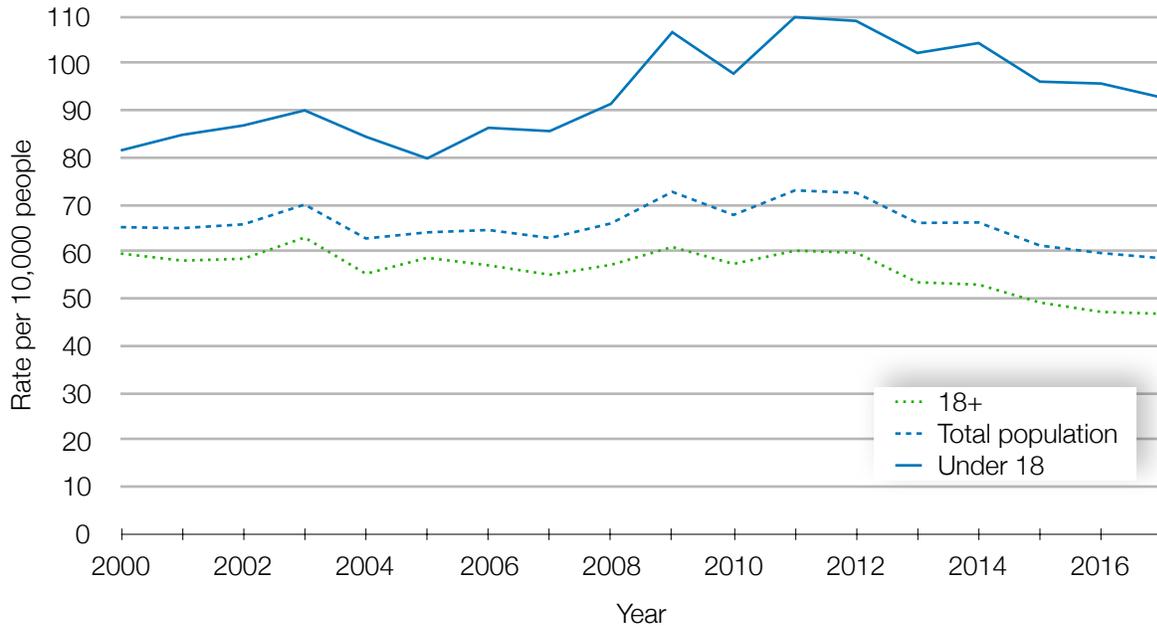
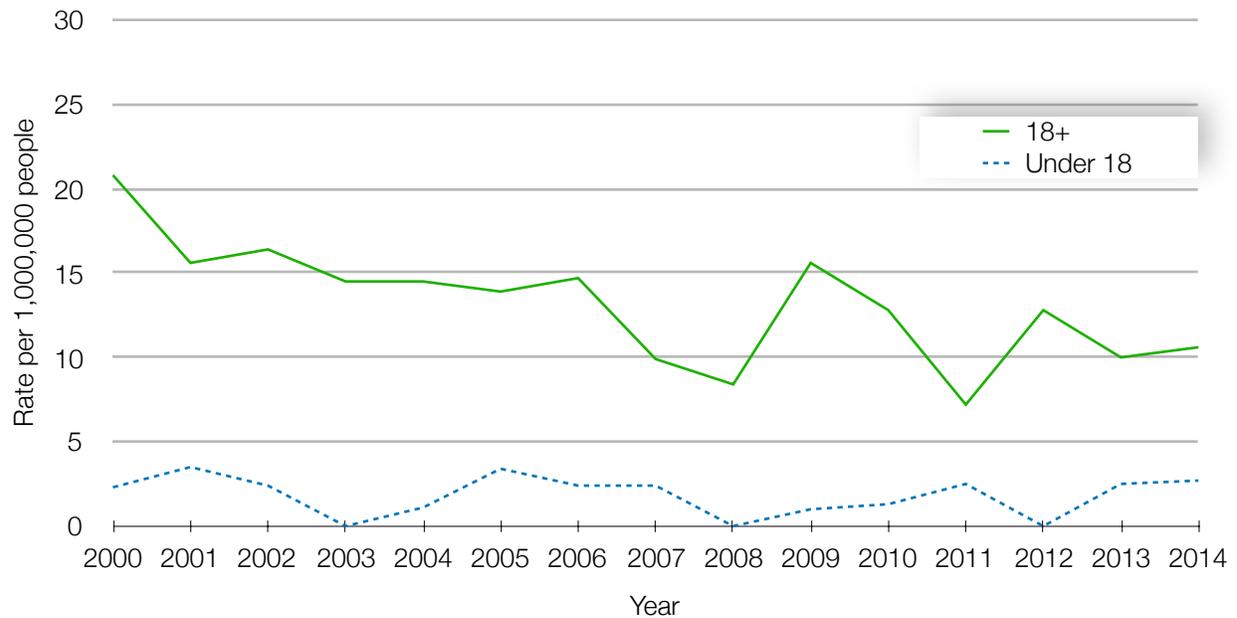


Figure 7. Age-adjusted emergency department (ED) visit rates by age group, Connecticut, 2000-2017



In terms of asthma mortality, the good news is that fewer children have been dying from asthma in recent years. In 2014, the mortality rate for children was almost half of what it was in 2000 (Fig. 8). While this is a positive trend, for every 1,000,000 children, there are still about 3 children dying from asthma each year, despite it being a largely manageable condition.

Figure 8. Age-adjusted asthma mortality rate, Connecticut, 2000-2014



A fact sheet published in 2009 by the Connecticut Department of Public Health, gives insight on exactly who is dying from asthma. The fact sheet focuses on the five largest cities in the state, of which New Haven comes in second. Between 1996 and 2005, women were 4 times more likely than men to die from asthma.⁸ Deaths from asthma were highest among adults between the ages of 35 and 44 years old, as well as those 65 and older.⁹ Blacks were more than 2 times more likely than whites and 1.7 times more likely than Latinos to die from asthma.¹⁰ Climate change is expected to worsen these disparities as groups with more resources are likely to be more prepared to combat the threatening effects of our changing climate.¹¹

Regional perspective

The next part of this report will narrow in on four particular places in southern Connecticut: the city of New Haven and the towns of Hamden, East Haven, and Woodbridge.

Residents living in New Haven have both the highest asthma hospitalization rates and asthma ED visit rates compared to those living in the suburbs around the city (Fig. 9). The average ED visit rates from 2010-2014 for New Haven residents (133 per 10,000) are more than twice as high as the ED visit rates for East Haven residents (58,000), 3 times as high as the ED visit rates for Hamden residents (44 per 10,000), and ten times as high as the ED visit rates for Woodbridge residents (13 per 10,000).¹²

Children in New Haven visit the emergency room for asthma far more than children from neighboring suburbs (Fig. 10).

Figure 9. Age-adjusted hospitalization rate, 2010-2014 average

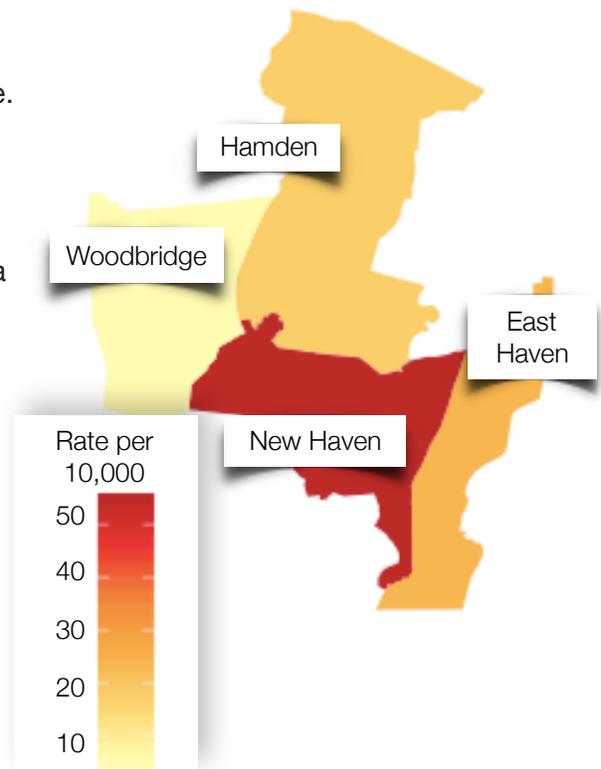
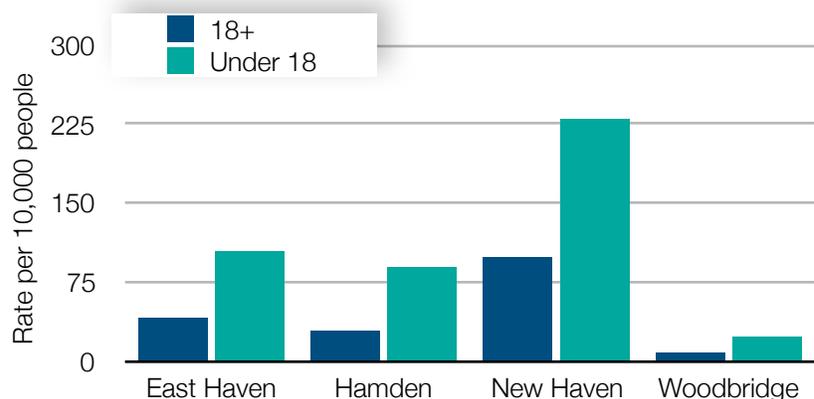
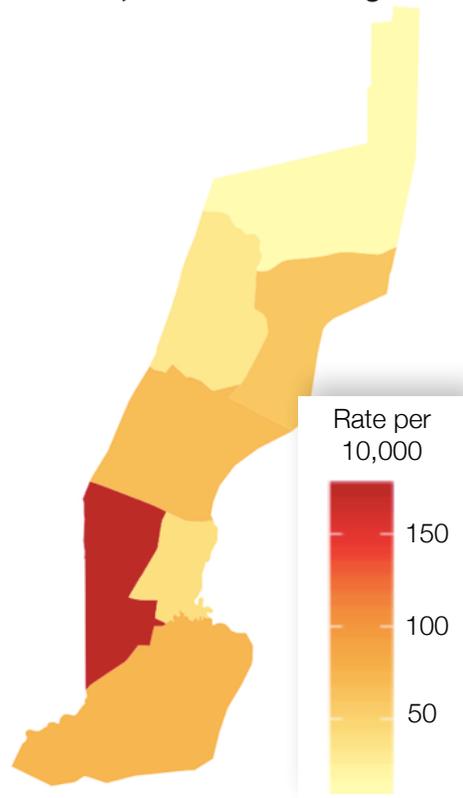


Figure 10. Age-adjusted asthma ED visit rate by age group, 2010-2014 average



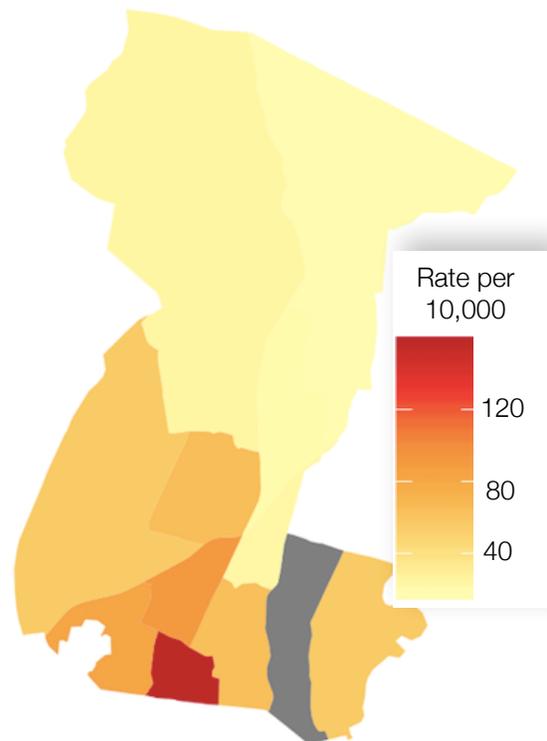
So far, it may seem as though the data calls for improving asthma conditions for children and adults in New Haven as opposed to East Haven, Hamden, and Woodbridge. However, there is more to the story, as great disparities also exist within each of these places. As illustrated in Figure 11, in East Haven, there is a disproportionately high burden of asthma in one particular census tract. This happens to be the tract nearest a local airport and power plant. It is likely that residents in that tract have greater exposure to poor air quality, which is a well-known asthma risk factor, than residents elsewhere in the town. The combined ED visit and hospitalization rate for residents living in the highly-burdened tract is 173.9 per 10,000 residents—up to 13 times greater than other parts of the town of East Haven.

Figure 11. Combined asthma ED and hospitalizations by census tract, East Haven, 2010-2014 average



East Haven is not alone in regard to stark disparities within the town borders. Hamden is similar in the sense that there is one census tract that has disproportionately higher asthma-related hospital encounters compared to the rest of the suburb (Fig. 12). One possible, although, partial explanation supported by Figure 15 is the relatively low household income in that particular tract compared to the others. It is possible that housing conditions may be in worse shape compared to homes in the other tracts. Housing-related asthma risk factors include pet dander, overcrowding, dust mites, cockroaches, rodents, and mold, among others.¹³

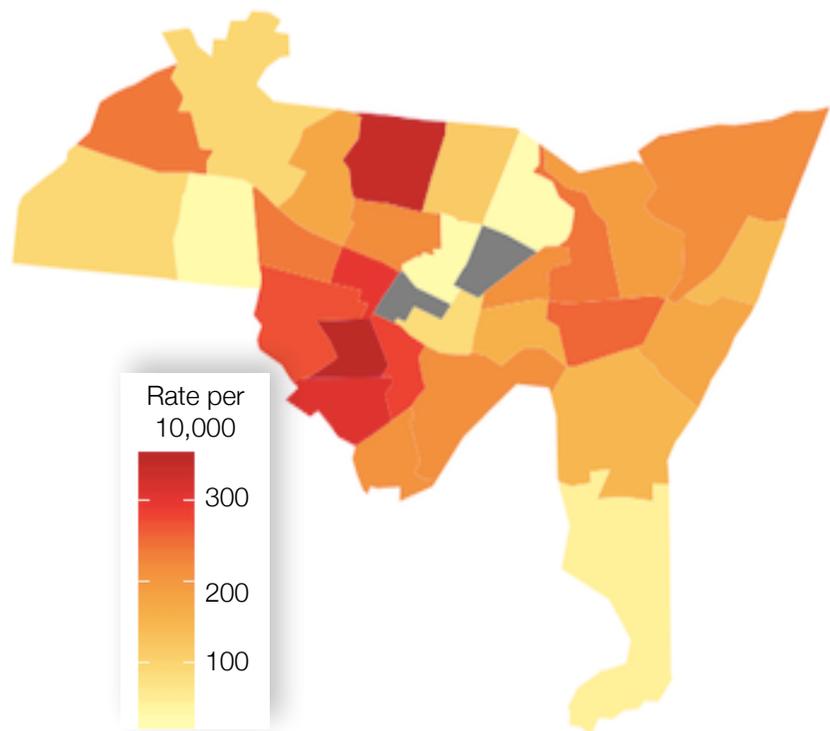
Figure 12. Combined asthma ED and hospitalizations by census tract, Hamden, 2010-2014 average



There happen to be several hotspots—places where residents are experiencing comparably worse asthma outcomes—within the City of New Haven (Fig. 13). The areas with high asthma-related hospital encounters tend to also be neighborhoods where residents are mostly people of color and low-income.¹⁴ Residents also carry a heavier load of other chronic diseases in these areas.

Woodbridge is not included since its rates are generally lower and since there are only two census tracts.

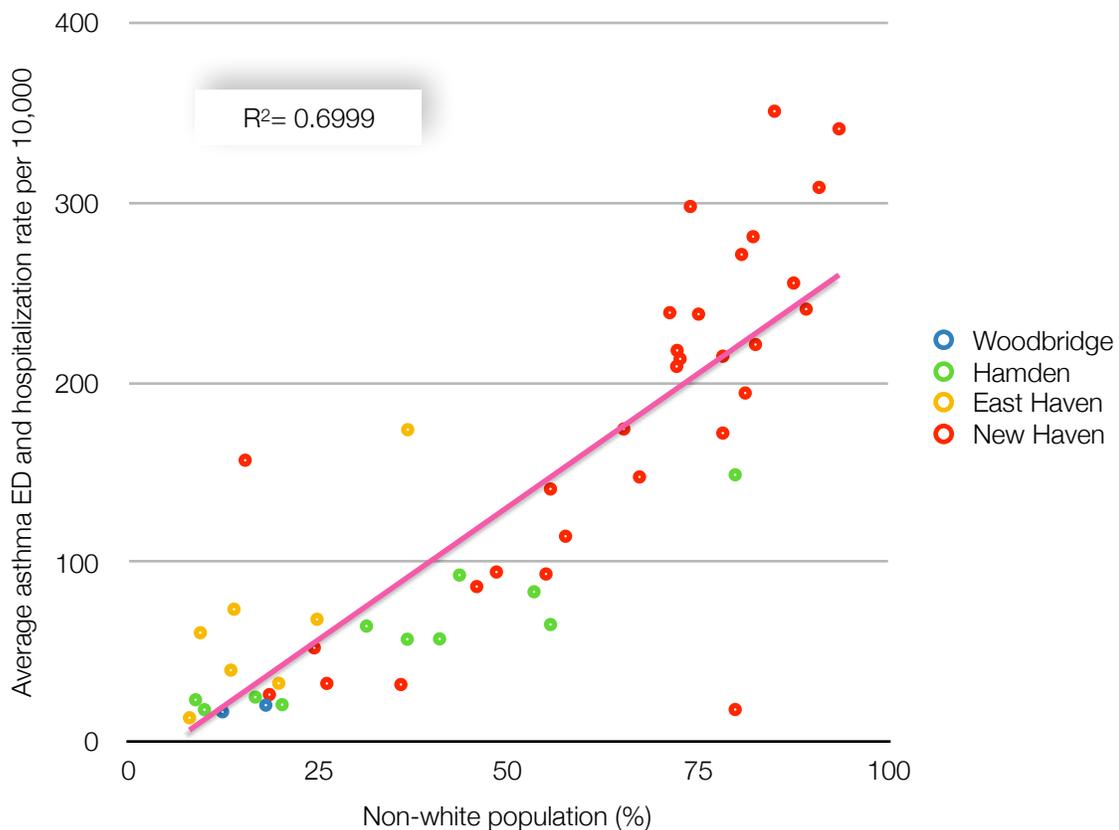
Figure 13. Combined asthma ED and hospitalizations by census tract, New Haven, 2010-2014 average



To further illustrate the reality that poor asthma outcomes are more pronounced for certain groups than others, two regressions were plotted. The purpose of the first regression (Fig. 14) is to examine how the asthma ED and hospitalization rate for a census tract is influenced by the racial composition of the population. The figure shows that every 1 percent increase in the non-white share of the population correlates with an increase of 3 in the combined ED and hospitalization rate per 10,000 people. Further, 70 percent of the variance in these rates is explained by the non-white share of the population.

The purpose of the second regression (Fig.15) is to examine if there is any association between household income and the asthma ED and hospitalization rate. It turns out that there is.

Figure 14. Relationship between share of non-white population and asthma ED/hospitalizations by census tract, 2010-2014 average



Note: regression equation is $y = 2.9644x - 17.229$

Role of the environment

A substantial body of research supports the claim that the environment plays a large role in asthma outcomes. This report examines the local context of asthma, but due to space limitations does not consider the potential role of other factors in asthma, such as housing quality, health care, smoking, trauma, and financial stress. The factors that are known to affect asthma that will be discussed are neighborhood safety,¹⁵ walkability,¹⁶ bikeability,¹⁷ and access to parks and public recreation facilities.¹⁸

Children in neighborhoods that parents perceive to be only sometimes or never safe are more likely to have asthma compared to those in neighborhoods that parents do perceive to be safe.¹⁹ Parents who view their neighborhood as unsafe are likely to limit their children's outdoor play. In addition to actual incidences of crime and violence, there are many built characteristics—that sometimes even help to facilitate crime—of an unsafe neighborhood. A few general features of safe neighborhoods include ample street lighting, pedestrian-oriented building entries, and well-kept public transit shelters.²⁰

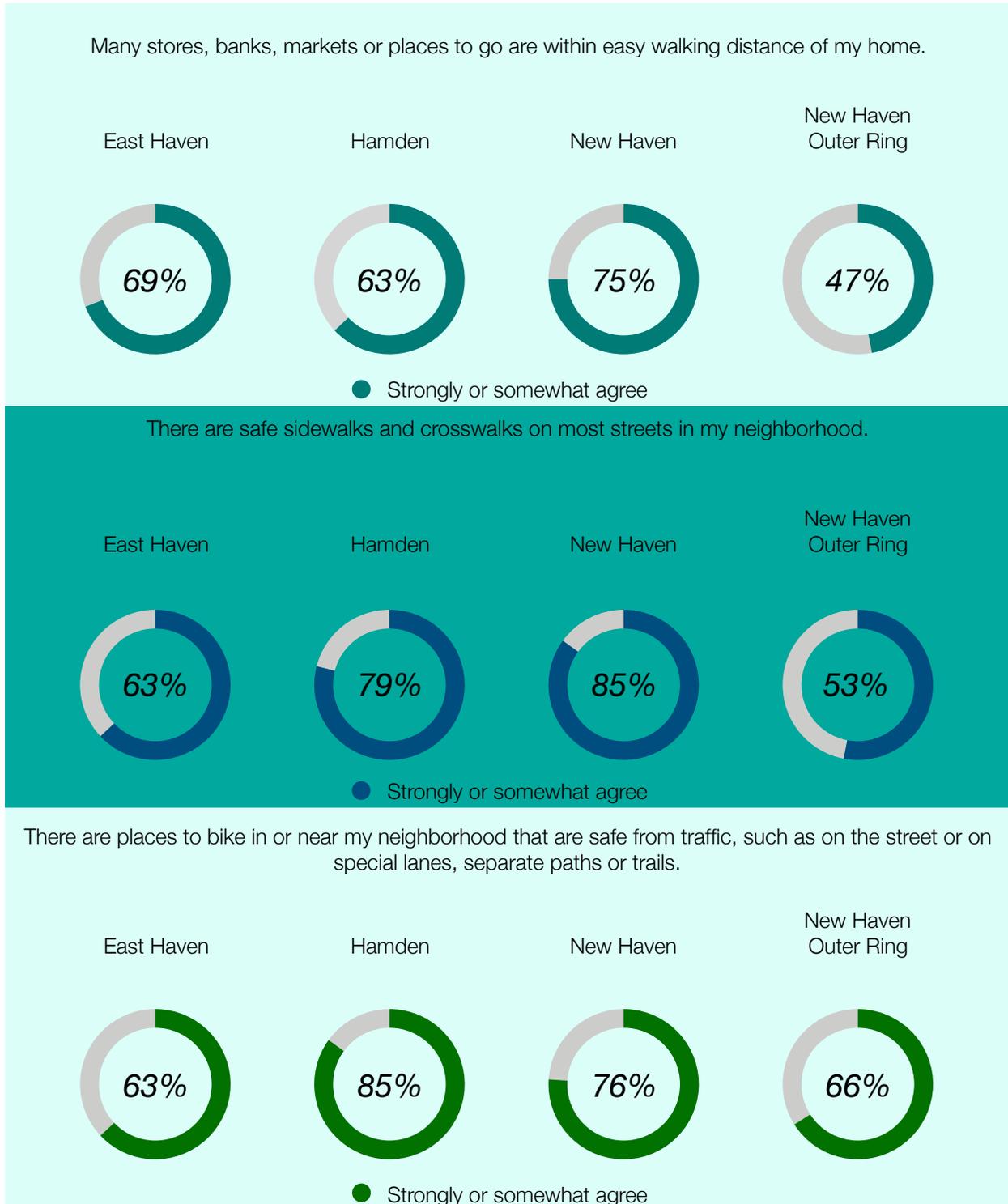
Additionally, walkable and bikeable areas are those that are safe, convenient and comfortable for people traveling by foot or bicycle, as well as those traveling by any non-motorized means.²¹ Features of walkability and bikeability include clearly marked and well-lit bike paths, maintained and easy-access sidewalks, tire-pump stations, comfortable benches, rest areas, and conveniently-located water fountains.²² People—older adults in particular—living in areas that lack these features tend to have lower levels of physical activity than those that live in areas that support walking and other non-motorized movement.²³

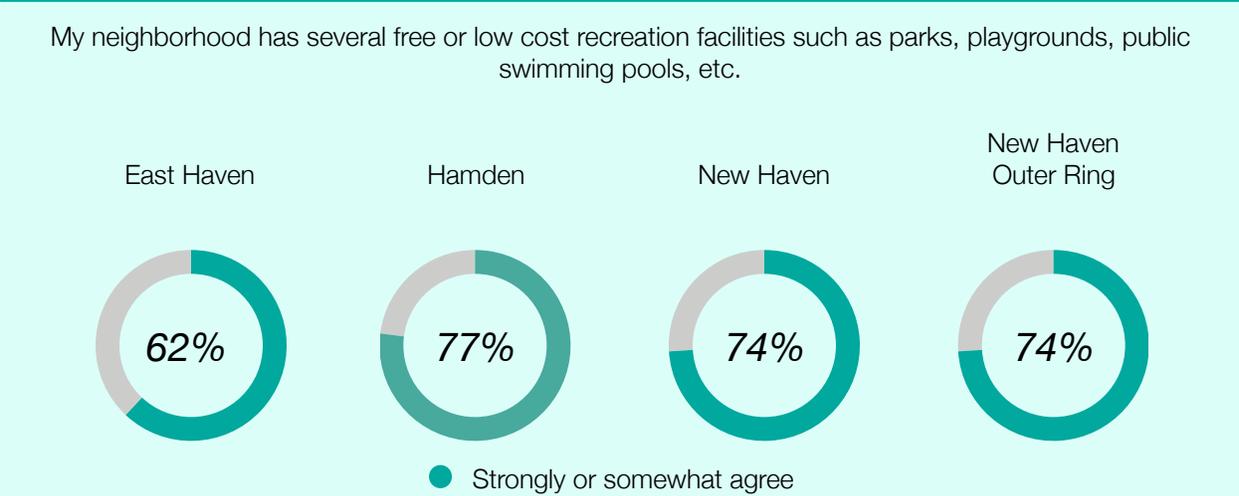
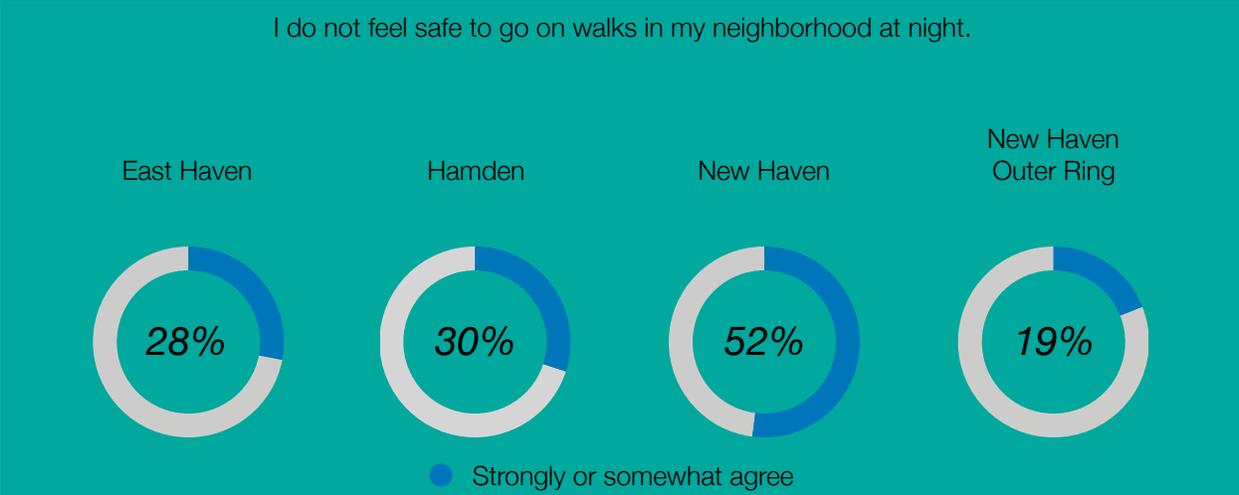
Children in these neighborhoods are more likely to develop asthma than those who live in areas deemed more walkable or bikeable. They are also more likely to have asthma persist as they age.²⁴

According to a study based on national survey data, children who are overweight are more likely to have asthma compared to those who have normal weight.²⁵ Those who have access to parks and public recreation facilities are less likely to be overweight or obese than those who do not.²⁶ Increasing access to aesthetically-pleasing, physically-accessible and multi-purpose parks can potentially increase physical activity, promote healthy weight, and improve asthma outcomes.²⁷

On the next three pages, data from the 2018 DataHaven Community Wellbeing Survey will help sketch a picture of three environmental factors: neighborhood safety, walkability/bikeability, and access to parks and public recreation facilities in East Haven, Hamden, New Haven, and Woodbridge. The results derive from live interviews of 35,000 residents in every zip-code across the state. Due to the small sample size in Woodbridge, the New Haven Outer Ring—a group that consists of towns similar to Woodbridge, such as Orange—will be used instead. Respondents were asked to share how much they agree or disagree with a series of statements about their neighborhood. They also shared perceptions about their neighborhood’s public parks, how often they exercise and daily modes of transportation.

Figure 16. Perceptions of neighborhood walking, biking and physical activity features





According to Figure 16, perception of neighborhood walkability is highest among New Haven respondents compared to the other towns. Walkability is perceived the lowest by those from the New Haven outer ring, (“outer ring”). In terms of bikeability, New Haven and Hamden respondents feel the most positive about being able to get around by bike, while East Haven residents do not share those sentiments quite as much. Additionally, neighborhood safety is most positively perceived in the outer ring.

Figure 17. Comparison of asthma rates, frequency of physical activity and perception of public parks

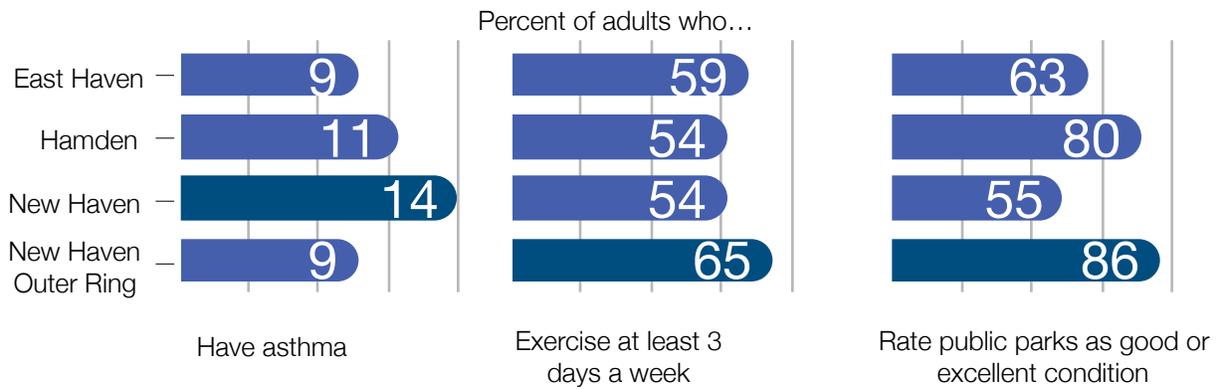
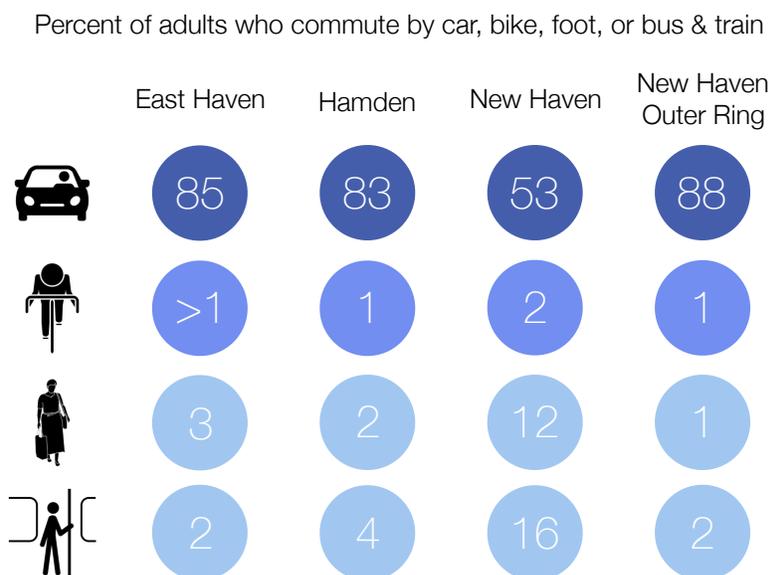


Figure 17 shows that residents in East Haven perceive the availability of parks and public recreation facilities to be low, while those in the outer ring and Hamden feel their parks are in better condition than do residents in New Haven and East Haven. Levels of physical activity are relatively similar but highest in the outer ring, and lowest in New Haven and Hamden. The current asthma rate is highest in New Haven and tied for lowest in East Haven and the outer ring. In all four places, most people drive to work or school (Fig. 18).

Figure 18. Modes of commuting



Conclusion

The main takeaways from this report are the following:

- The rate of asthma in Connecticut has been higher than that of the nation in recent years.
- In the state, people are still dying from asthma, which is a manageable condition.
- While the burden of asthma is greatest in New Haven, there are certain places within the city, as well as certain places within the neighboring suburbs that experience high rates of asthma hospitalizations and emergency department visits.
- Not everyone with asthma experiences the condition in the same way since environmental factors can have a positive or negative impact on how the disease is managed.
- Neighborhood characteristics such as walkability, bikeability, parks access, and safety can influence how asthma is experienced.

The DataHaven Community Wellbeing Survey data confirm that in East Haven, Hamden, New Haven, and Woodbridge there are perceived differences in these neighborhood characteristics. This means that there are opportunities to improve aspects of the built environment, such as street connectivity, and the quality of parks and sidewalks among many others. These efforts will consequently make a positive difference in the lives of people living with asthma.

Notes on figures

The data from figures 1-8 are all from the Connecticut Department of Public Health Behavioral Risk Factor Surveillance System. The data tables for each figure are specified below and can be found at this link: <https://portal.ct.gov/DPH/Health-Education-Management--Surveillance/Asthma/Asthma-Statistics>.

Figure 1. Percent of population with asthma by age, Connecticut, 2011-2016. Data table “Adult Lifetime Prevalence”.

Figure 2. Lifetime asthma prevalence by sex. Data table “Adult Lifetime Prevalence”.

Figure 3. Population with asthma by education level. Data table “Adult Lifetime Prevalence”.

Figure 4. Population with asthma by race/ethnicity. Data table “Adult Lifetime Prevalence”.

Figure 5. Population with asthma by household income. Data table “Adult Lifetime Prevalence”.

Figure 6. Age-adjusted asthma hospitalization rates by age group, Connecticut, 2000-2017. Data table “Hospital Discharge Rates-primary diagnosis”.

Figure 7. Age-adjusted emergency department (ED) visit rates by age group, Connecticut, 2000-2017. Data table “ED Visit Rates-primary diagnosis”.

Figure 8. Age-adjusted asthma mortality rate, Connecticut, 2000-2014. Data table “Mortality Rates-underlying cause”.

The data from figures 9 and 10 are from Connecticut Department of Public Health available at <https://portal.ct.gov/DPH/Health-Education-Management--Surveillance/Asthma/Asthma-Burden-Report>. Specific tables are listed below:

Figure 9. Age-adjusted hospitalization rate, 2010-2014 average. Data table “Table F-1: Asthma Hospitalization by Town”.

Figure 10. Age-adjusted asthma ED visit rate by age group, 2010-2014 average. Data table “Table H-1: Asthma ED Visit by Town”.

The data from figures 11-15 are primarily from the Connecticut Department of Public Health and can be found this link: <https://data.ct.gov/Health-and-Human-Services/Combined-Asthma-Emergency-Department-and-Hospitali/javn-ujwr>. Additional sources are listed accordingly.

Figure 11. Combined asthma ED and hospitalizations by census tract, East Haven, 2010-2014 average

Figure 12. Combined asthma ED and hospitalizations by census tract, Hamden, 2010-2014 average

Figure 13. Combined asthma ED and hospitalizations by census tract, New Haven, 2010-2014 average

Figure 14. Relationship between share of non-white population and asthma ED/hospitalizations by census tract, 2010-2014 average

Population estimates are from the 2014 American Community Survey, table B03002 “Hispanic or Latino Origin by Race”.

Figure 15. Relationship between median household income and asthma ED/hospitalizations by census tract, 2010-2014 average

Median household income estimates are from the 2014 American Community Survey, table B19013 “Median Household Income in Past 12 Months”.

The data from figures 16-18 are all from the 2018 DataHaven Community Wellbeing Survey available at ctdatahaven.org.

Figure 16. Perceptions of neighborhood walking, biking and physical activity features.

Figure 17. Comparison of asthma rates, frequency of physical activity and perception of public parks.

Figure 18. Modes of commuting.

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