

Evaluating Links Between Asthma Outcomes and Racial Composition of Major U.S. Cities

People with asthma living in cities with the highest concentration of Black residents were 1.6x more likely to visit the emergency department for asthma-related illness in 2020 than people living in predominantly white cities

KEY FINDINGS:

- Among asthma patients living in cities with the largest Black populations, 23% visited the emergency department (ED) with asthma-related illness at least once in 2020. Among asthma patients living in predominantly white cities, 15% visited the ED with an asthma-related illness during the same time period. The observed gap was even wider in patients who had multiple asthma-related ED visits in 2020.
- Of the cities examined in this study, asthma-related ED visits were most prevalent in New Orleans, where the population is 60% Black. Based on data analyzed, 29% of New Orleans residents with asthma visited the ED in 2020. Asthma-related ED visits were least prevalent in Salt Lake City, where the population is 3% Black and only 11% of residents with asthma visited the ED in 2020.
- From 2019 to 2020, overall asthma patient volume declined 11% across the sample of cities evaluated in this analysis. New asthma diagnoses in 2020 accounted for 31% of total asthma patients in predominantly white cities, but just 23% in cities with the largest concentration of Black residents.

EXECUTIVE SUMMARY:

Over the past year, asthma was in the spotlight due to concerns that the condition could be a risk factor for severe outcomes from COVID-19. Fortunately, the [data to date](#) shows no increased risk of infection or more severe COVID-19 in people with asthma.

Even so, the COVID-19 pandemic highlighted racial and socioeconomic disparities in healthcare, including asthma. An estimated 25 million Americans are living with asthma, and although people of all races and backgrounds can develop asthma, [evidence has shown](#) sharp disparities when it comes to who is diagnosed and most adversely impacted. According to a report from the Asthma and Allergy Foundation of America (AAFA), Black, Hispanic, and Indigenous Americans carry a higher overall risk of developing asthma than white Americans and are more likely to experience poor health outcomes due to asthma.

Because asthma can be caused by a wide range of genetic, environmental, and occupational factors, efforts to better understand racial disparities in its diagnosis and treatment must evaluate an equally wide range of variables. AAFA has been systematically tracking this issue, most recently publishing the [2021 Asthma Capitals](#) report. The report ranks the largest 100 U.S. metropolitan cities by how challenging they are to live in with asthma based on asthma prevalence, asthma-related ED visits, and asthma-related mortality rates. The report also considers risk factors for asthma, including poverty rates, air quality, and access to care.

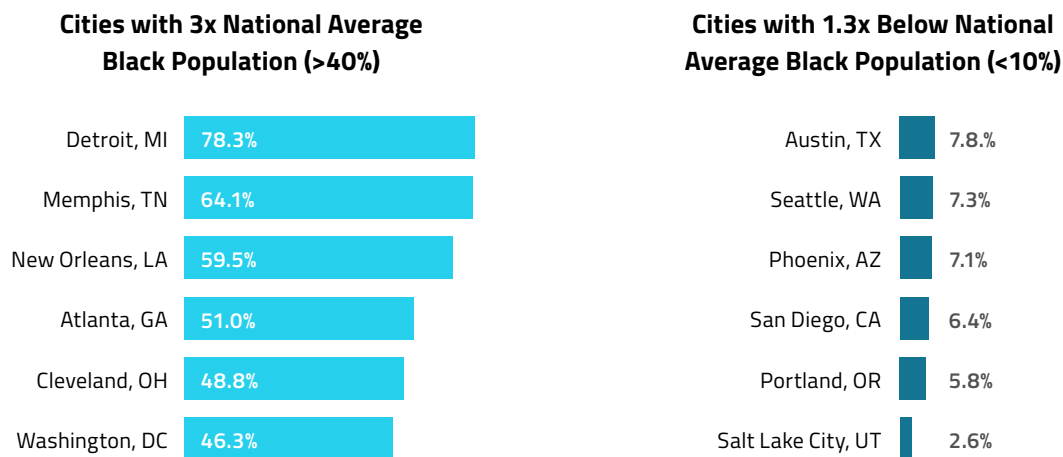
Building on this report and to better understand racial disparities in asthma care, Komodo Health and AAFA examined the relationship between the racial composition of several major cities and data from asthma-related healthcare utilization over the past two years. In order to provide a more granular look at patterns of patient behavior and treatment, we tracked and compared asthma diagnoses, ED visits, and prescriptions for patients in U.S. cities with high concentrations of Black residents versus those with high concentrations of white residents in 2019 and 2020.

The findings point to many similarities in general trends, such as the rate of diagnosis and prevalence of severe asthma within the larger asthma cohort, but also some stark differences within these populations. Notably, people with asthma living in cities with the highest concentration of Black residents were 36% more likely to visit the ED for asthma-related health issues compared to those living in predominantly white cities.

METHODOLOGY:

This analysis used Komodo’s Healthcare Map™, the industry’s largest and most complete database of de-identified, real-world patient data tracking U.S. patient journeys, to evaluate the frequency of asthma diagnoses, ED visits associated with asthma, prescription rates, and telehealth utilization in 12 major U.S. cities.

The sample of 12 U.S. cities was chosen by Komodo and informed by the [2019 U.S. Census](#) data, which estimates 13.4% of the total U.S. population is Black/African American. Using the [2019 U.S. Census Bureau’s Population Estimates Program \(PEP\)](#), cities were grouped into the following categories based on the percentage of Black residents in relation to the national average.



Total number of asthma-related encounters were gathered for each city during 2019 and 2020. Total asthma encounters were then compared across different cities for the two years.

RESULTS:

Higher ED Rates Among Asthma Patients in Cities with Larger Black Populations

Cities with the largest concentration of Black residents saw higher ED utilization rates among asthma patients. In cities with the largest Black populations per capita, 23% of residents with asthma visited the ED with asthma-related health issues at least once in 2020. In predominantly white cities, only 15% of residents with asthma visited the ED with an asthma-related illness during the same year.

That gap widened further for patients who had multiple asthma-related ED visits during the year. In cities with the largest Black populations, 5% of asthma patients visited the ED three or more times due to asthma in 2020. That number falls to 2% among asthma patients in predominantly white cities. This segment of the population that is seeking asthma treatment in the ED three or more times per year suggests a poorly managed disease state and that some patients are accessing the ED as a source of primary care for asthma management.

Across the cities examined in this analysis, asthma-related ED visits were most prevalent in New Orleans, where 29% of asthma patients visited the ED in 2020. They were least prevalent in Salt Lake City, where just 11% of asthma patients visited the ED during the same year.

Following is a snapshot of asthma-related ED volumes in 2020 for all 12 cities included in the analysis:

ASTHMA-RELATED ED VOLUMES 2020

Cities with >40% Black Population

City	Asthma Patients with 1 or More ED Visits	Asthma Patients with 3 or More ED Visits
New Orleans, LA	28.80%	6.99%
Atlanta, GA	24.41%	4.84%
Cleveland, OH	24.17%	7.31%
Detroit, MI	22.38%	4.09%
Washington, DC	20.18%	3.77%
Memphis, TN	18.01%	3.97%
Average	23.27%	5.29%

Cities with <10% Black Population

City	Asthma Patients with 1 or More ED Visits	Asthma Patients with 3 or More ED Visits
Seattle, WA	16.46%	3.15%
Phoenix, AZ	16.43%	2.38%
Portland, OR	13.51%	1.60%
San Diego, CA	13.05%	1.71%
Austin, TX	13.02%	1.97%
Salt Lake City, UT	10.60%	1.06%
Average	14.58%	2.12%

New Asthma Diagnoses and ED Visits Decline in 2020

In order to examine the impact of the COVID-19 pandemic on asthma-related patient behaviors and outcomes, total encounters for 2020 were compared against those from 2019. When looking at overall patient volumes, the total number of patients seen for asthma in 2020 was approximately 11% lower than the number seen in 2019. This trend may indicate underdiagnosis during 2020, as healthcare visits were impacted by fears of contracting COVID-19. The trend was observed irrespective of the racial makeup of different cities.

A drop in the percent of asthma patients who presented to the ED with an asthma-related complaint was seen in both demographic categories in 2020, with the most significant dropoff (3.68% lower than 2019) occurring in predominantly white cities. In 2019, cities with high Black populations had a 6.45% higher ED utilization rate among asthma patients when compared to predominantly white cities; this widened to 8.69% in 2020.

**ASTHMA-RELATED ED VISITS
2019–2020**

	Asthma Patients with 1 or More ED Visits in 2019	Asthma Patients with 1 or More ED Visits in 2020	Percentage Decrease
Cities with >40% Black Population	24.71%	23.27%	-1.44%
Cities with <10% Black Population	18.26%	14.58%	-3.68%

This is likely multifactorial. Exposure to allergens outside the home decreased in 2020 due to shelter-in-place orders, likely decreasing the number of asthma exacerbations, and recommendations to avoid hospital settings due to COVID-19 likely led people to seek other settings of care such as ambulatory clinics. The greater decline in ED utilization in cities with predominantly white populations, however, does suggest that patients in high-minority areas, who often do not have as robust access to primary-care physicians and ambulatory clinics, were still more likely to use the ED.

The analysis also found notable differences in the number of new asthma diagnoses based on racial composition of cities in 2020. New asthma diagnoses, defined as patients who had no prior claims associated with an asthma-related code prior to the year of interest, accounted for 31% of total asthma patients in predominantly white cities, but just 23% in cities with the largest concentration of Black residents. This 7.36% difference between the two was an increase from the new diagnosis gap observed in 2019 (6.71%).

DISCUSSION:

While a steadily growing body of evidence has proven that social and structural determinants of health – the conditions in which people are born, grow, live, work, and age – are among the most significant drivers of health outcomes, health disparities between distinct demographic groups continue to be a challenge for the U.S. healthcare system. By identifying disparities in care among cities with distinct racial compositions, this analysis spotlights one area in which the healthcare system is being utilized differently among different segments of the population.

More research is required to evaluate the impact of potential confounding factors, such as the role of regional lockdowns and primary care physicians’ office closures in each city, as well as the role of telehealth and related state-by-state insurance reimbursement rates, on asthma treatment patterns during the pandemic.

The authors posit that several factors may be influencing higher levels of ED utilization in cities with larger Black populations, including lack of access to primary-care physicians, lack of insurance coverage, and more severe asthma exacerbations among residents of these cities.

Concerted efforts to address health disparities in underserved communities have shown signs of success such as in [telehealth utilization in American Indian and Alaska Native populations](#). As healthcare providers, public health officials, and other healthcare stakeholders continue to focus on addressing social determinants of health in the aftermath of the COVID-19 pandemic, it is essential to continue measuring gaps in care in order to understand and address health disparities.

Several limitations should be noted. This analysis used a claims-based dataset that does not account for uninsured patients. As such, the impact of loss of individuals’ employer-based insurance on asthma patients in 2020 cannot be directly measured by this data. Further research is necessary to better understand the population-level effects of the loss of health insurance coverage, particularly for those with asthma. Secondly, this research brief aggregates findings regarding race at the city level and results cannot be applied to the individual patient within that geography. Authors attempted to control for data lag in this analysis.

AUTHORS:

Tabassum Khan, M.D., M.P.H., Medical Director, Komodo Health

Catherine Park, Product Analyst, Komodo Health

Dave Wunderlich, Product Strategy Director, Komodo Health

Reyn Kenyon, Senior Customer Success Associate, Komodo Health

Sanaz Eftekhari, Vice President, Research, Asthma and Allergy Foundation of America

About the Asthma and Allergy Foundation of America

Founded in 1953, AAFA is the oldest and largest non-profit patient organization dedicated to saving lives and reducing the burden of disease for people with asthma, allergies and related conditions through research, education, advocacy, and support. AAFA offers extensive support for individuals and families affected by asthma and allergic diseases such as food allergies and atopic dermatitis (eczema). Through its online patient support communities, network of local chapters and affiliated support groups, AAFA empowers patients and their families by providing practical, evidence-based information and community programs and services. AAFA is the only asthma and allergy patient advocacy group that is certified to meet the standards of excellence set by the National Health Council. For more information, visit www.aafa.org.

About Komodo Health

Komodo Health believes that smarter, more innovative use of data and analytics is essential for reducing disease burden. We apply artificial intelligence and other advanced data science techniques to our first-of-its-kind Healthcare Map™, which tracks the unique patient journeys of over 325 million patients. We empower a multitude of healthcare stakeholders – life science companies, healthcare payers and providers, patient advocacy groups, and others – to create a more cost-effective, value-driven healthcare system. For more information, visit www.komodohealth.com.