

## What is Asthma?

Asthma is a chronic inflammatory disease of the respiratory system.<sup>1</sup> In 2020, over 25 million Americans, including 4.2 million children under 18 years old, had asthma.<sup>2</sup> Asthma attacks occur when a trigger causes the sides of the airways in the lungs to swell and the airways to shrink.<sup>1</sup> Less air gets into the lungs leading to breathing difficulty.

*Asthma triggers include, but are not limited to<sup>1</sup>:*

- Tobacco smoke
- Dust mites
- Outdoor air pollution
- Cockroaches
- Pets
- Mold

*Symptoms of an asthma attack<sup>1</sup>:*

- Coughing
- Chest tightness
- Wheezing
- Trouble breathing

Asthma can be classified into four categories - mild intermittent, mild persistent, moderate persistent, and severe persistent. Individuals with mild intermittent asthma may have symptoms up to two days a week and up to two nights a month, while individuals with severe persistent asthma may have symptoms throughout the day on most days and frequently at night.<sup>3</sup> Children will often show warning signs if their asthma is getting worse. These warning signs include<sup>4</sup>:

- Coughing at night
- Recent cold, flu, or fever
- Stuffy or runny nose
- Tickle in the throat
- Sneezing and watery eyes
- Restlessness
- Pale face
- Dark under-eye circles
- Chest tightness
- Weakness or fatigue
- Headache

Asthma can be controlled, and the likelihood of an attack can be minimized by following an asthma management plan, avoiding triggers, and recognizing the warning signs of an attack.

## Risk Factors for Asthma

### Demographic Risk Factors

- *Race / Ethnicity*
  - Black children are three times as likely to have asthma when compared to White children.<sup>5</sup>
  - Black Americans are nearly 1.5 times more likely to have asthma compared to White Americans.<sup>6</sup>
  - Puerto Rican Americans are nearly 2 times more likely to have asthma compared to White Americans.<sup>6</sup>
- *Genetics or Family History*
  - Children of asthmatic parents are at an increased risk.<sup>7</sup>
    - If one parent has asthma, the risk is around 25%.
    - If both parents have asthma, the risk is around 50%.
  - Higher risk if relative has severe asthma or was affected from a young age.<sup>7</sup>
- *Sex*
  - Among children, boys are more likely to have asthma than girls.<sup>5</sup>
  - Among adults, women are more likely to have asthma than men.<sup>5</sup>

### Social and Behavioral Risk Factors

- *Exposure to Air Pollution*
  - Exposure to particulate matter and nitrogen dioxide (NO<sub>2</sub>) at the residential address is associated with higher incidence of asthma until age 20.<sup>8</sup>
- *Obesity*
  - Obese individuals are at an increased risk for asthma.<sup>9</sup>
  - Obese asthmatic individuals are likely to have more symptoms and increased severity.<sup>9</sup>
- *Smoking*
  - Active smokers, especially women, are at a higher risk for developing asthma.<sup>9</sup>
  - Secondhand smoke exposure is associated with an increased risk of developing asthma.<sup>9</sup>

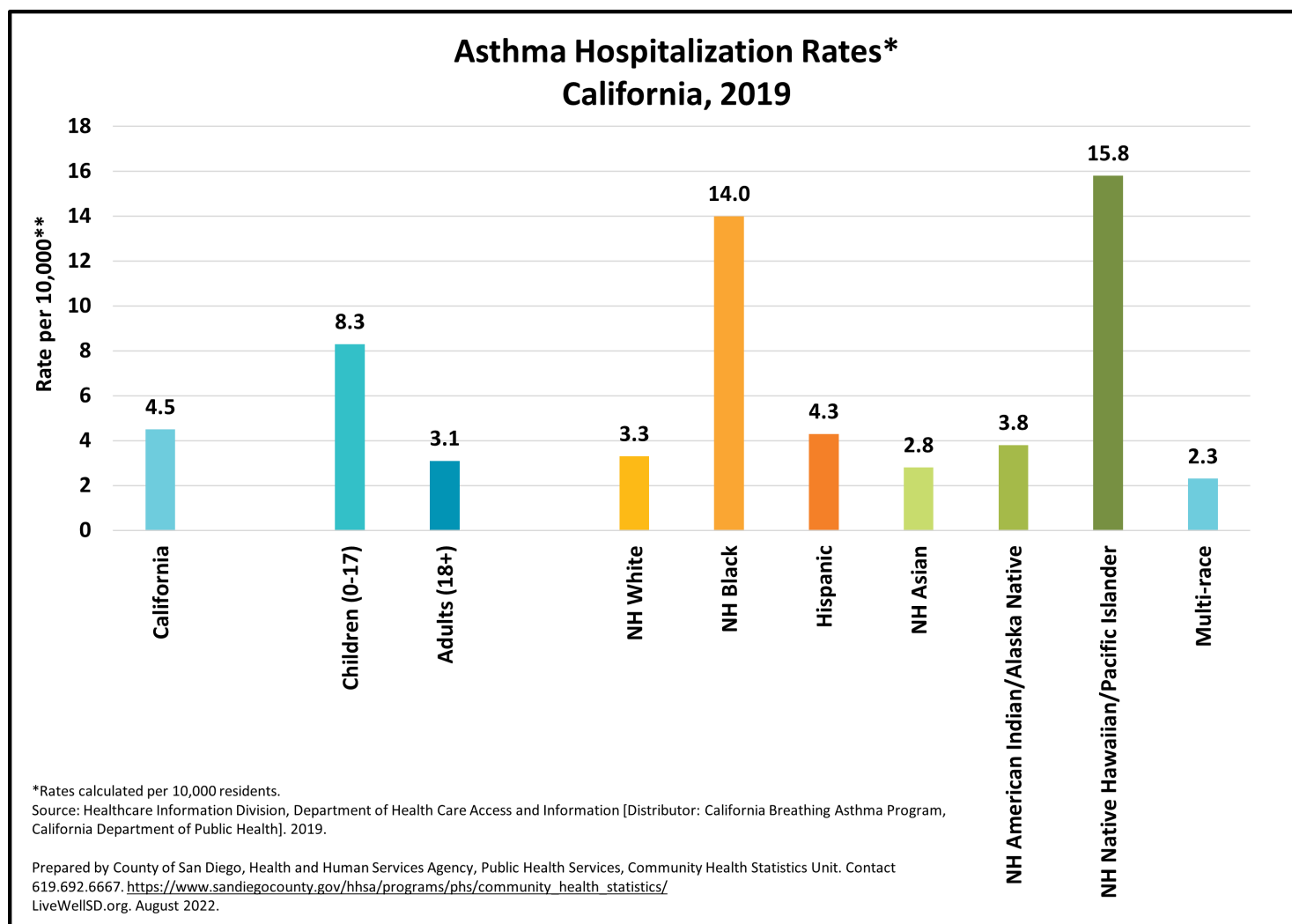
### Other Risk Factors

- *Low Birth Weight*
  - Low birth weight is associated with a higher risk for asthma.<sup>10</sup>
  - A prior meta-analysis study observed that children with low birth weight had 16% higher risk of asthma.<sup>10</sup>
- *Allergies*
  - Having conditions such as atopic dermatitis (eczema) or allergic rhinitis (hay fever) increases the risk for developing asthma.<sup>5</sup>

## National Statistics and Disparities

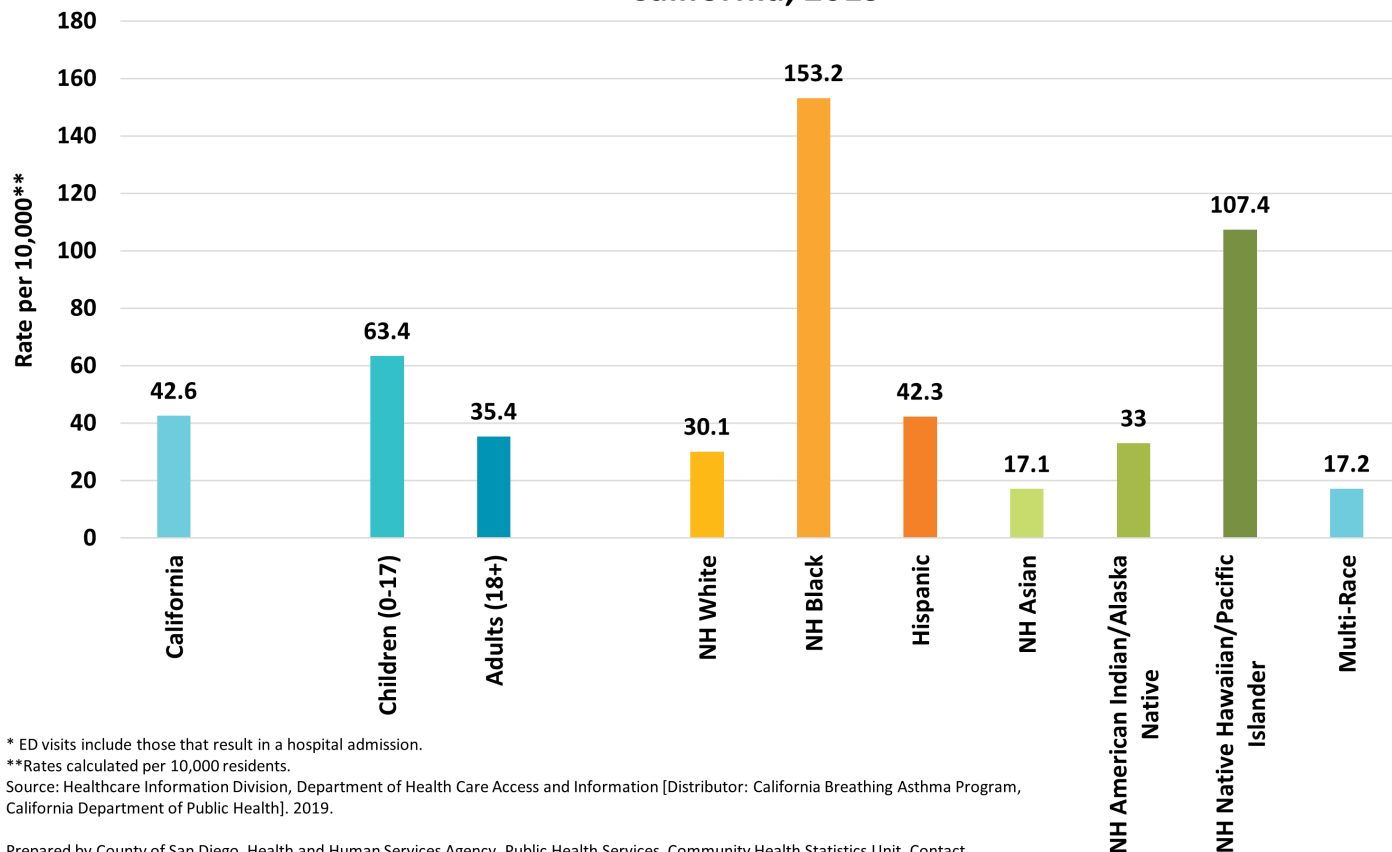
- In 2020, 4,145 people died from asthma in the United States. 204 of these deaths were among children under 18 years old.<sup>2</sup>
- Over 10 million Americans reported at least one asthma attack in 2020. This represents 41% of those with a current asthma diagnosis.<sup>2</sup>
- In 2019, asthma was responsible for more than 1.8 million emergency department visits and nearly 170,000 hospital stays.<sup>2</sup>
- In 2020, about 1 in 17 children had asthma.<sup>11</sup>
- In 2020, the rate of death due to asthma was 2.7 times higher among non-Hispanic Black Americans compared to non-Hispanic White Americans.<sup>11</sup>
- In 2020, the rate of death due to asthma was higher among non-Hispanic Black Americans (28.7 deaths per million persons) compared to Hispanics (7.3 per million persons), and all other non-Hispanics (7.2 per million persons).<sup>11</sup>

## State Statistics and Disparities



- In 2019, the asthma hospitalization rate in California was 4.5 per 10,000 residents.<sup>12</sup>
- The asthma hospitalization rate in California was 2.7 times higher among children ages 0 – 17 than among adults ages 18+.<sup>12</sup>
- The asthma hospitalization rate in California was the highest among non-Hispanic (NH) Native Hawaiian/Pacific Islander residents (15.8 per 10,000) followed by NH Black residents (14.0 per 10,000).<sup>12</sup>

## Asthma Emergency Department (ED) Visit\* Rates\*\* California, 2019



\* ED visits include those that result in a hospital admission.

\*\*Rates calculated per 10,000 residents.

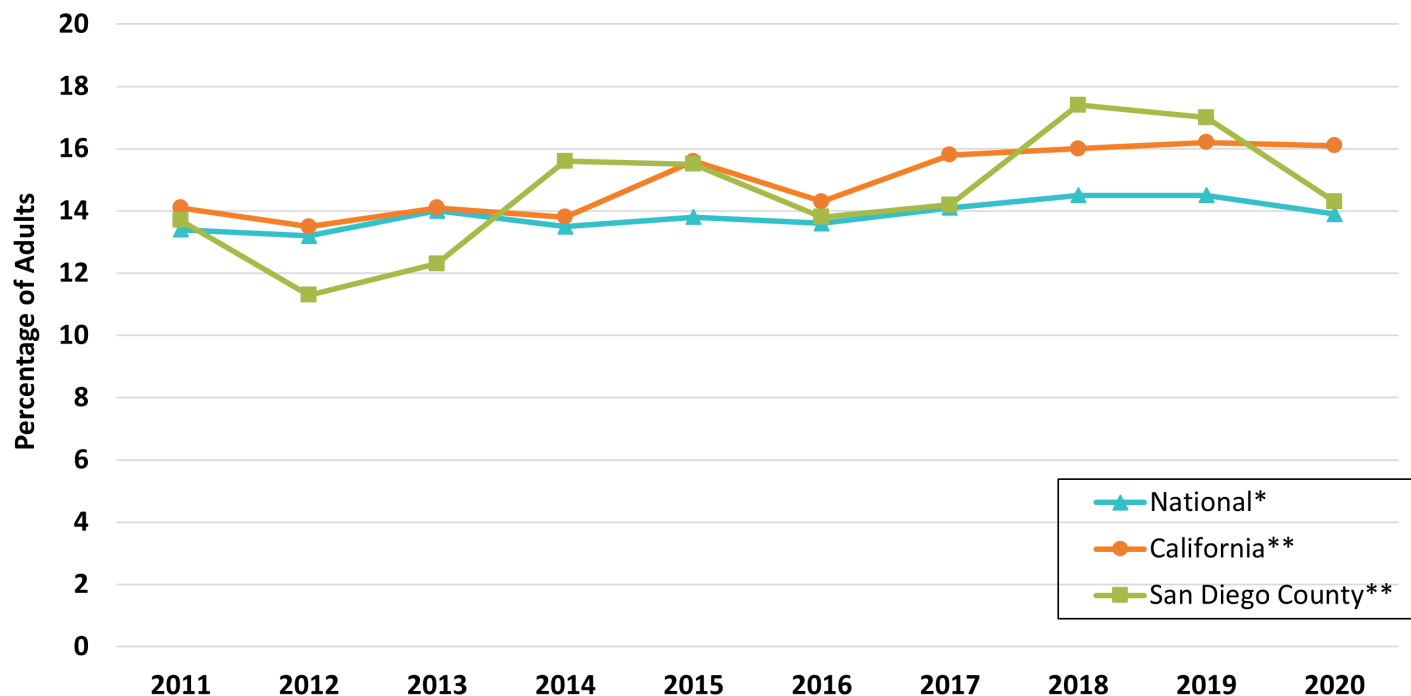
Source: Healthcare Information Division, Department of Health Care Access and Information [Distributor: California Breathing Asthma Program, California Department of Public Health], 2019.

Prepared by County of San Diego, Health and Human Services Agency, Public Health Services, Community Health Statistics Unit. Contact 619.692.6667. [https://www.sandiegocounty.gov/hhsa/programs/phs/community\\_health\\_statistics/](https://www.sandiegocounty.gov/hhsa/programs/phs/community_health_statistics/) LiveWellSD.org. August 2022.

- In 2019, the asthma ED visit rate in California was 42.6 per 10,000 residents.<sup>12</sup>
- The asthma ED visit rate in California was 1.8 times higher among children ages 0 – 17 than among adults ages 18+.<sup>12</sup>
- The asthma ED visit rate in California was the highest among non-Hispanic (NH) Black residents (153.2 per 10,000) followed by NH Native Hawaiian/Pacific Islander residents (107.4 per 10,000).<sup>12</sup>

## Local Statistics and Disparities

### Percentage of Adults 18+ Ever Diagnosed with Asthma National, State, and Local, 2011 - 2020



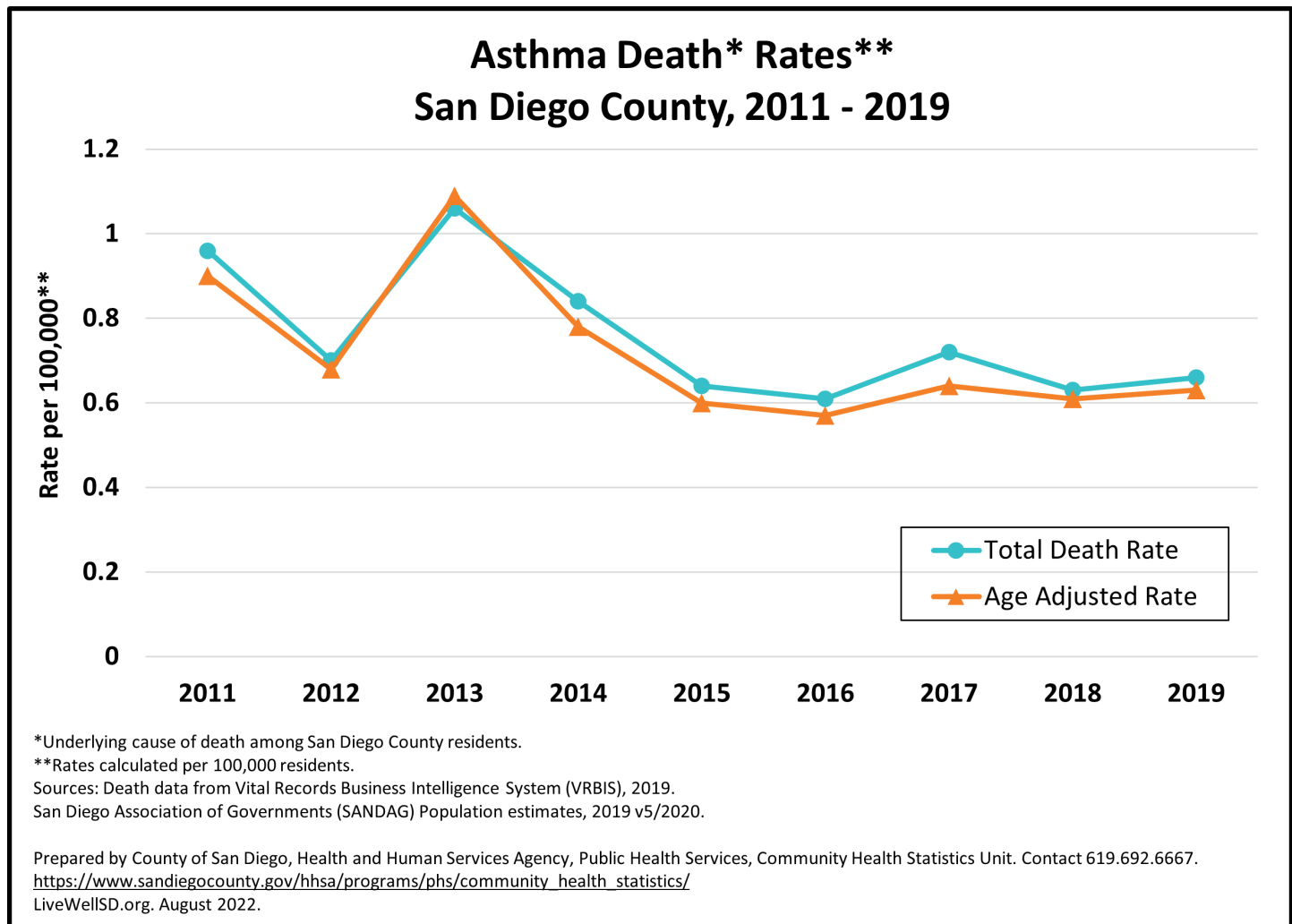
\* Source: Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, [2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020].

\*\* Source: UCLA Center for Health Policy Research, "2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020 California Health Interview Survey," <http://www.chis.ucla.edu>.

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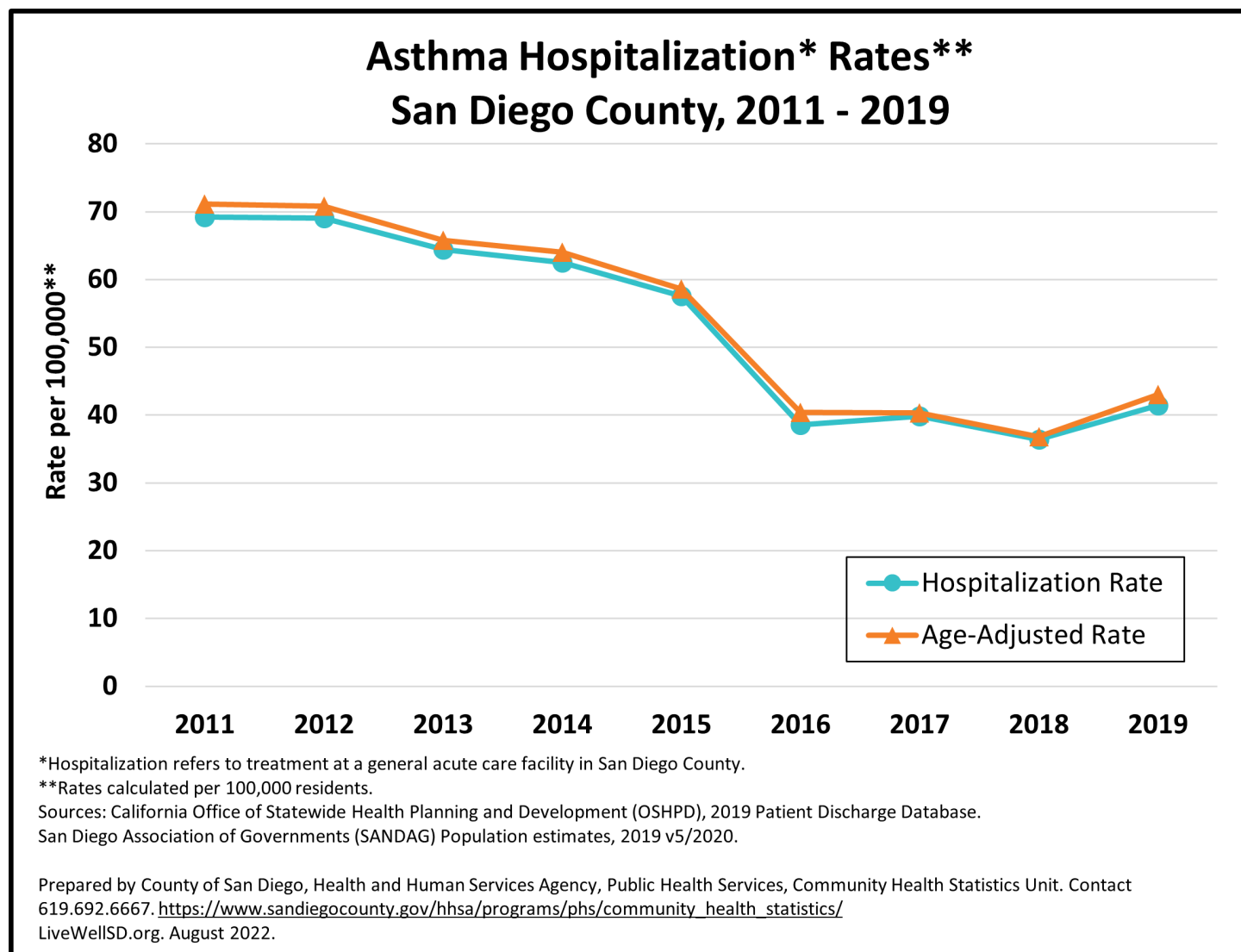
- According to the California Health Interview Survey, in 2020, 14.3% of San Diego County and 16.1% of California adults age 18+ reported ever being diagnosed with asthma.<sup>13</sup>
- According to the Behavioral Risk Factor Surveillance System, in 2020, 13.9% of US adults age 18+ reported ever being diagnosed with asthma.<sup>14</sup>
- In 2020, the percentage of residents ever diagnosed with asthma was higher in California than in San Diego County.<sup>13</sup>
- Between 2011 and 2020, there was an overall increase in the percentage of California residents ever diagnosed with asthma and an overall decrease in the percentage of San Diego residents ever diagnosed with asthma.<sup>13</sup>
- Between 2014 and 2020, the percentage of adults ever diagnosed with asthma was consistently higher in California and San Diego County compared to the US.<sup>13,14</sup>
- In 2020, 24.1% of San Diego County residents diagnosed with asthma had an asthma attack in the past 12 months.<sup>13</sup>

## Death Rates:



- The asthma death rate in San Diego County reached a high in 2013 and then started to decrease.<sup>15</sup>
- Between 2015 and 2019, the asthma death rate remained steady, with a slight increase in 2017.<sup>15</sup>
- Overall, the asthma death rate in San Diego County decreased between 2011 and 2019.<sup>15</sup>

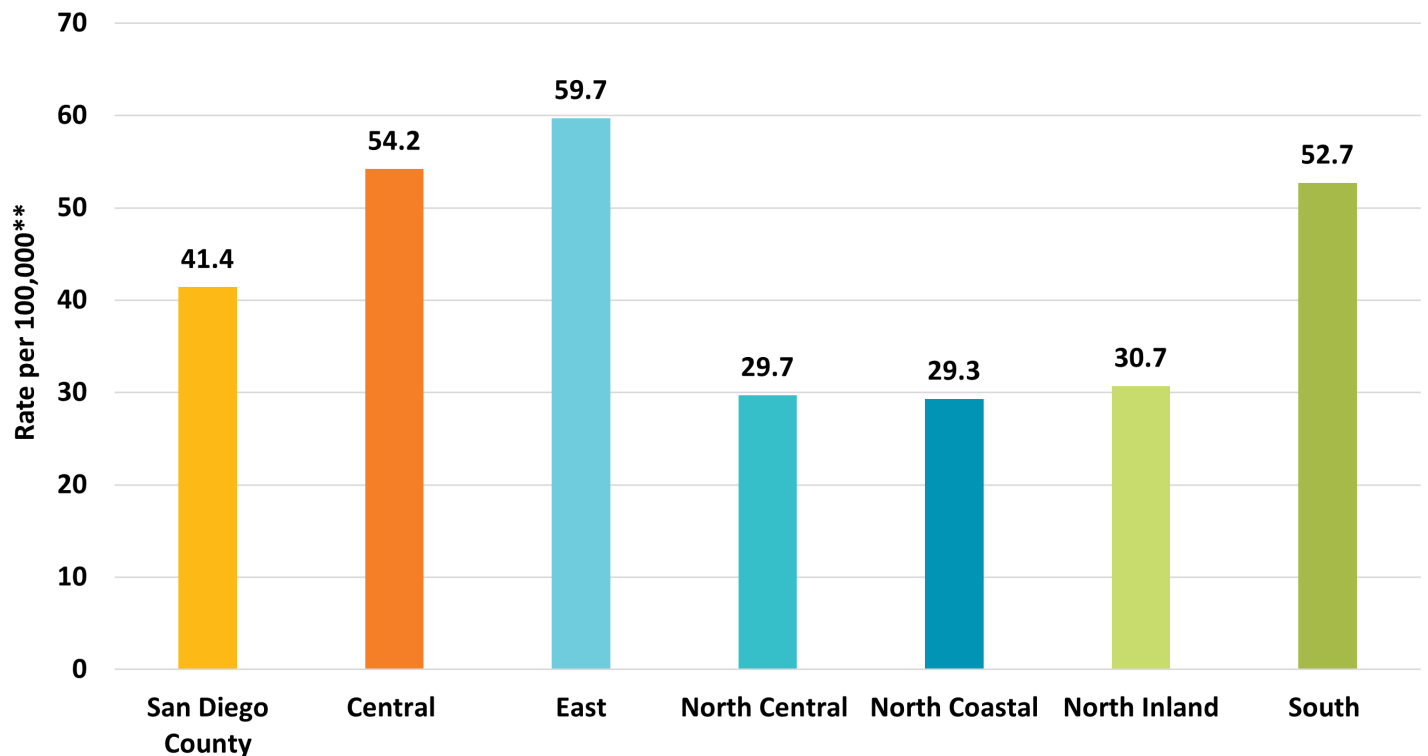
## Hospitalization Rates:



- The asthma hospitalization rate in San Diego County decreased from 2011 to 2016.<sup>16</sup>
- Between 2018 and 2019, there was an increase in the rate of hospitalization due to asthma.<sup>16</sup>
- Overall, the asthma hospitalization rate in San Diego County decreased between 2011 and 2019.<sup>16</sup>



## Asthma Hospitalization\* Rates\*\* by HHSA Region San Diego County, 2019



\*Hospitalization refers to treatment at a general acute care facility in San Diego County.

\*\*Rates calculated per 100,000 residents.

Sources: California Office of Statewide Health Planning and Development (OSHPD), 2019 Patient Discharge Database.

San Diego Association of Governments (SANDAG) Population estimates, 2019 v5/2020.

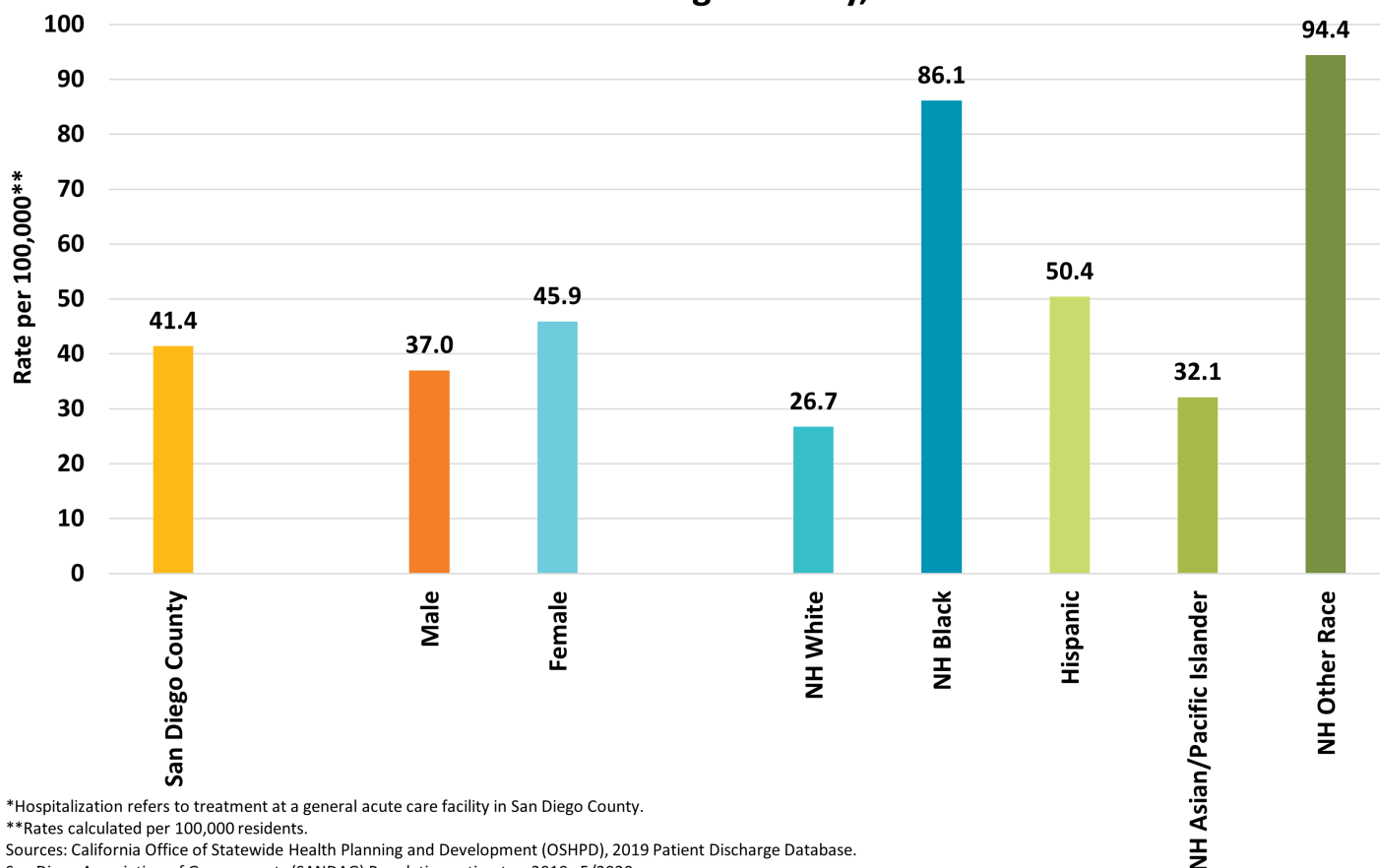
Prepared by County of San Diego, Health and Human Services Agency, Public Health Services, Community Health Statistics Unit. Contact 619.692.6667.

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- The total asthma hospitalization rate in 2019 in San Diego County was 41.4 per 100,000 residents.<sup>16</sup>
- The asthma hospitalization rate was the highest in East Region (59.7 per 100,000 residents) and the lowest in North Coastal Region (29.3 per 100,000 residents).<sup>16</sup>

## Asthma Hospitalization\* Rates\*\* San Diego County, 2019



\*Hospitalization refers to treatment at a general acute care facility in San Diego County.

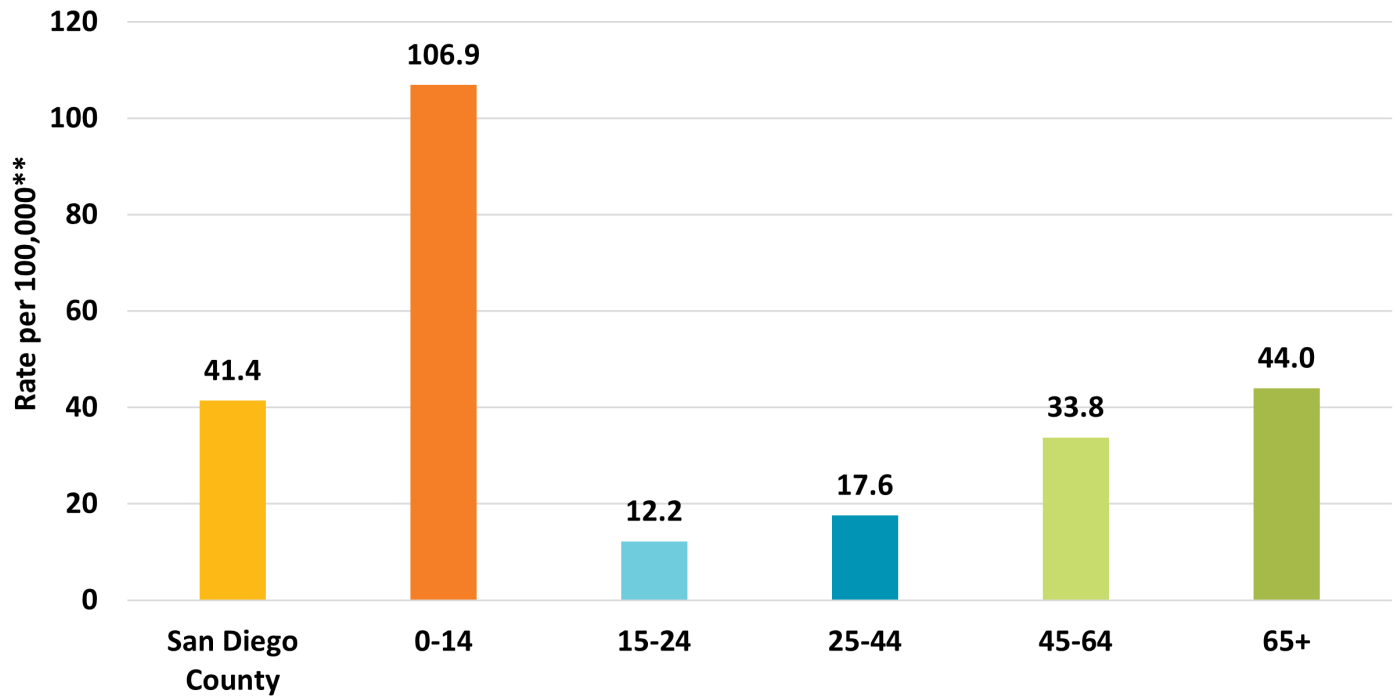
\*\*Rates calculated per 100,000 residents.

Sources: California Office of Statewide Health Planning and Development (OSHPD), 2019 Patient Discharge Database.  
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- In 2019, the asthma hospitalization rate in San Diego County was highest among residents who were American Indian/Alaska Native, multiple races, or some other race (grouped into “NH Other Race” category).<sup>16</sup>
- The asthma hospitalization rate among non-Hispanic (NH) Black residents was 3.2 times higher compared to NH White residents.<sup>16</sup>
- The asthma hospitalization rate in San Diego County was higher among females (45.9 per 100,000 female residents) than males (37.0 per 100,000 male residents).<sup>16</sup>

## Asthma Hospitalization\* Rates\*\* by Age San Diego County, 2019



\*Hospitalization refers to treatment at a general acute care facility in San Diego County.

\*\*Rates calculated per 100,000 residents.

Sources: California Office of Statewide Health Planning and Development (OSHPD), 2019 Patient Discharge Database.

San Diego Association of Governments (SANDAG) Population estimates, 2019 v5/2020.

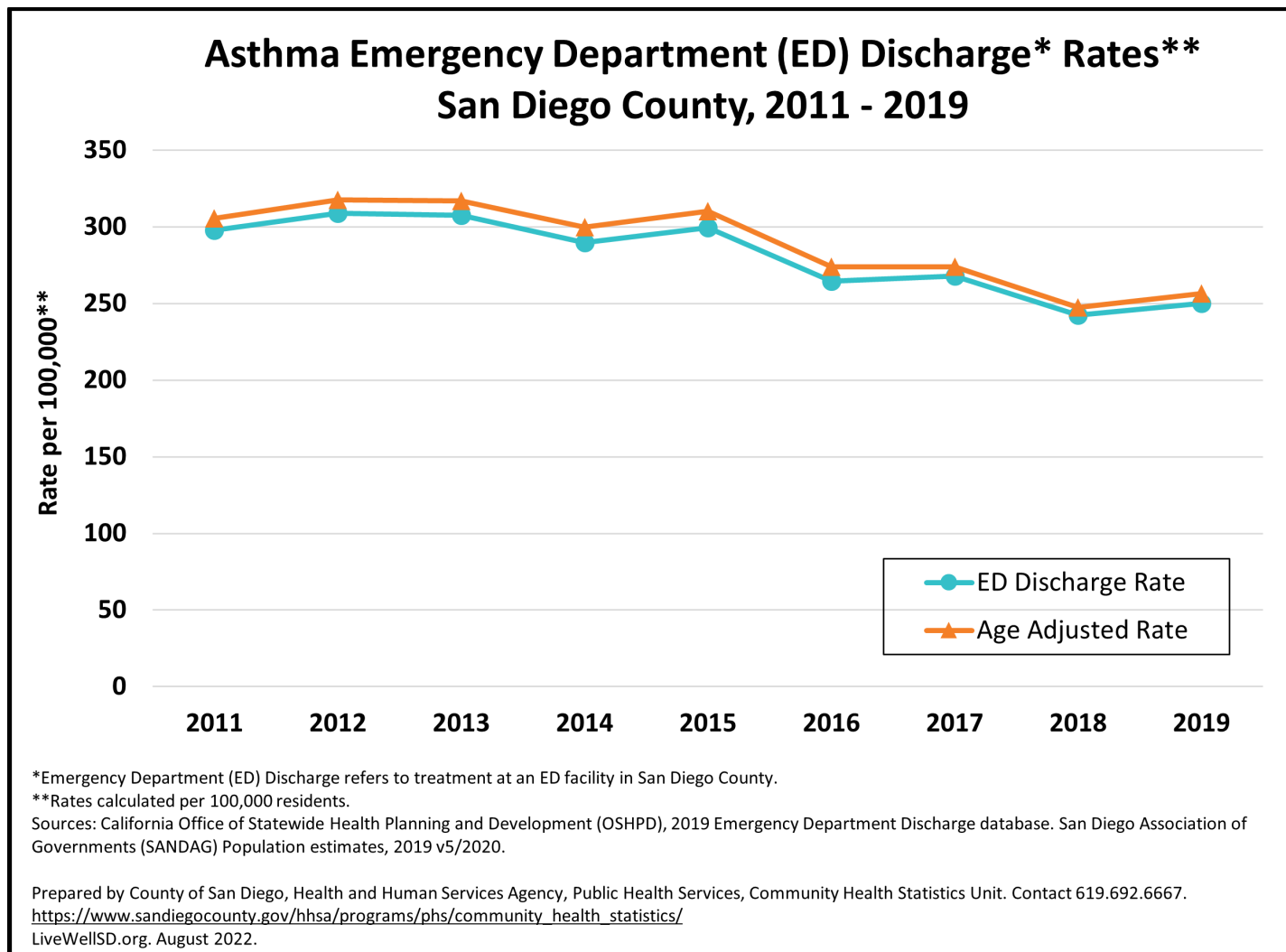
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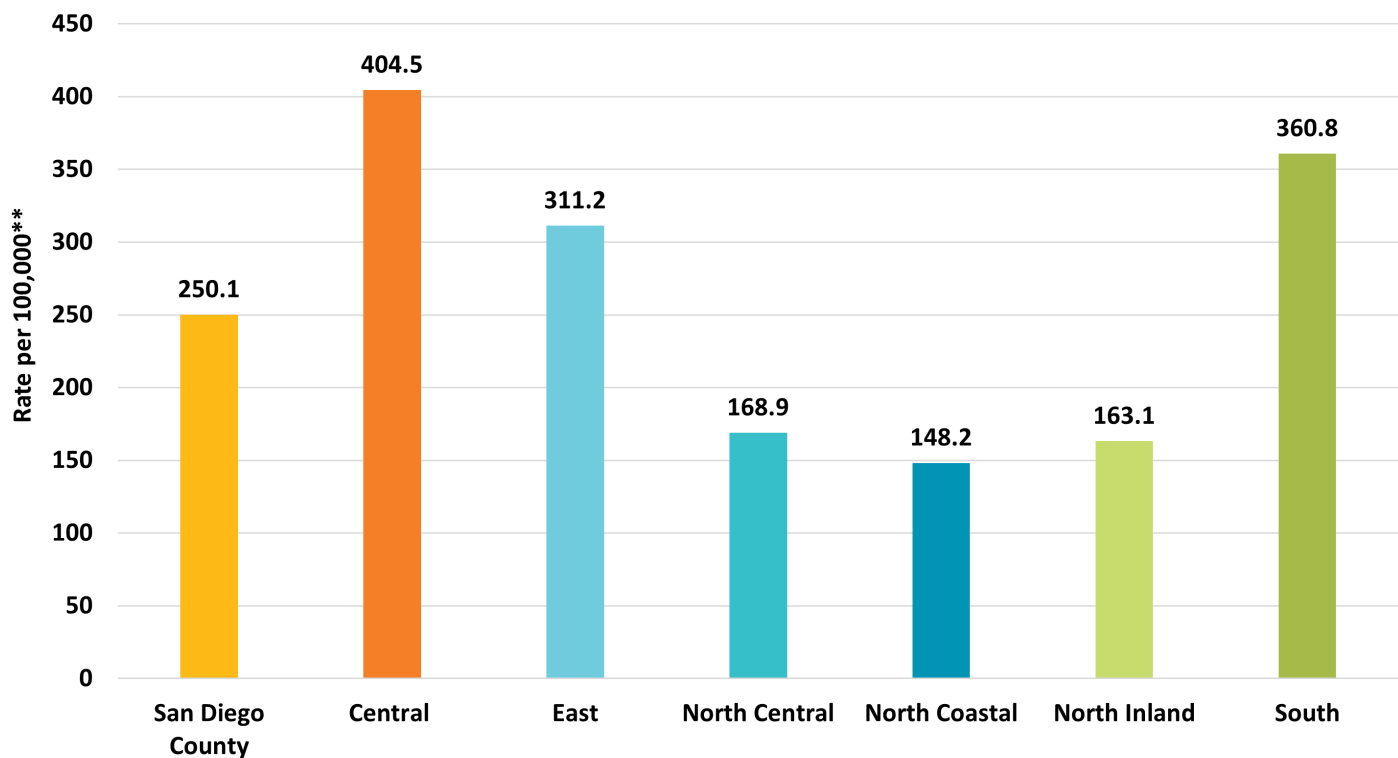
- In 2019, the asthma hospitalization rate was the highest among individuals ages 0-14 (106.9 per 100,000 residents).<sup>16</sup>

## Emergency Department (ED) Discharge Rates



- The asthma ED discharge rate in San Diego County decreased between 2011 and 2019.<sup>17</sup>

## Asthma Emergency Department (ED) Discharge\* Rates\*\* by HHSA Region, San Diego County, 2019



\*Emergency Department (ED) Discharge refers to treatment at an ED facility in San Diego County.

\*\*Rates calculated per 100,000 residents.

Sources: California Office of Statewide Health Planning and Development (OSHPD), 2019 Emergency Department Discharge database. San Diego Association of Governments (SANDAG) Population estimates, 2019 v5/2020.

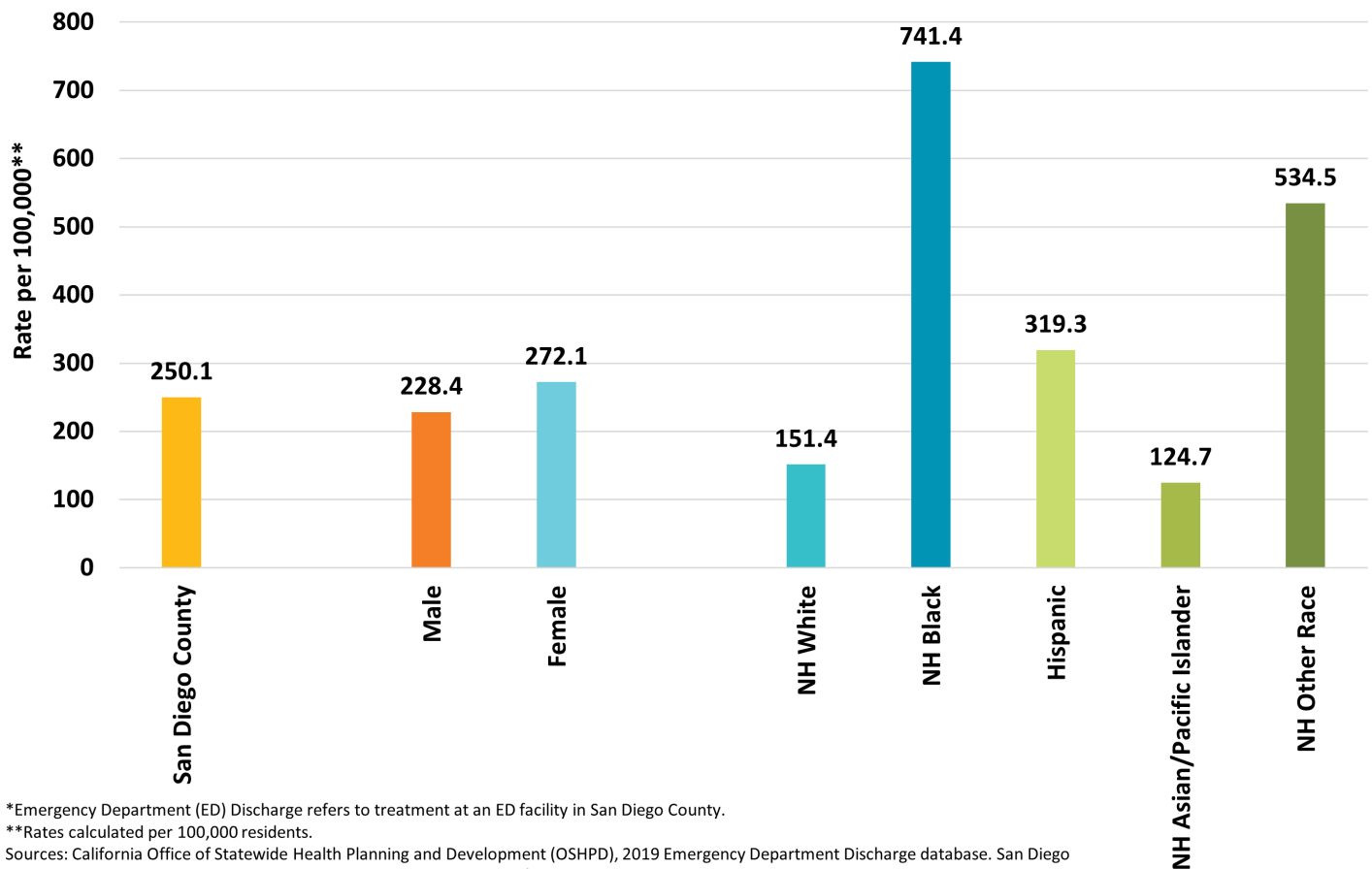
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LiveWellSD.org. August 2022.

- The total asthma ED discharge rate in 2019 in San Diego County was 250.1 per 100,000 residents.<sup>17</sup>
- The asthma ED discharge rate was the highest in Central Region (404.5 per 100,000 residents) and the lowest in North Coastal Region (148.2 per 100,000 residents).<sup>17</sup>

## Asthma Emergency Department (ED) Discharge\* Rates\*\* San Diego, 2019



\*Emergency Department (ED) Discharge refers to treatment at an ED facility in San Diego County.

\*\*Rates calculated per 100,000 residents.

Sources: California Office of Statewide Health Planning and Development (OSHPD), 2019 Emergency Department Discharge database. San Diego Association of Governments (SANDAG) Population estimates, 2019 v5/2020.

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- In 2019, the asthma ED discharge rate was highest among non-Hispanic (NH) Black residents in San Diego County.<sup>17</sup>
- The asthma ED discharge rate among NH Black residents was 4.9 times higher compared to NH White residents.<sup>17</sup>
- The asthma ED discharge rate in San Diego County was higher among females (272.1 per 100,000 female residents) than males (228.4 per 100,000 male residents).<sup>17</sup>

## Asthma and Its Complications: Prevention for Individuals:<sup>3</sup>

Medications are taken to alleviate long-term and short-term asthma symptoms. These may include inhaled corticosteroids, leukotriene modifiers, combination inhalers, theophylline, short-acting beta agonists, anti-cholinergic agents, and oral/intravenous corticosteroids.

Actions can also be taken to minimize asthma symptoms. These include:

- Using air conditioner to reduce the amount of airborne pollen and humidity indoors.
- Minimize household items that may trap dust: using dustproof covers for mattresses and pillows, replacing carpeting with hardwood flooring, and using washable curtains and blinds
- Cleaning and washing bedding regularly.
- Drying damp things completely to prevent mold spores.
- Regularly grooming pets and avoiding pets with fur or feathers if allergic.
- Regularly exercising to strengthen heart and lungs to help relieve asthma symptoms.
- Maintaining a healthy weight.

## Prevention Tools for Public Health Professionals: Asthma Critical Pathway

There are many opportunities for public health professionals in the community to help reduce the risk of asthma and to improve the health outcomes of individuals who already have the disease. To assist in community health efforts, an *Asthma Critical Pathway* was developed.

The *Asthma Critical Pathway* is a tool to be used in health promotion and disease prevention efforts. Its purpose is to identify populations at greater risk for asthma, and to identify prevention and early intervention opportunities. The *Asthma Critical Pathway* displays a diagram of the major risk factors, and intermediate outcomes or related diseases that have an impact on, or result from, asthma. Risk factors are marked as non-modifiable (black striped bars) such as race/ethnicity or sex and modifiable (solid-colored bars) such as physical activity or high blood pressure.

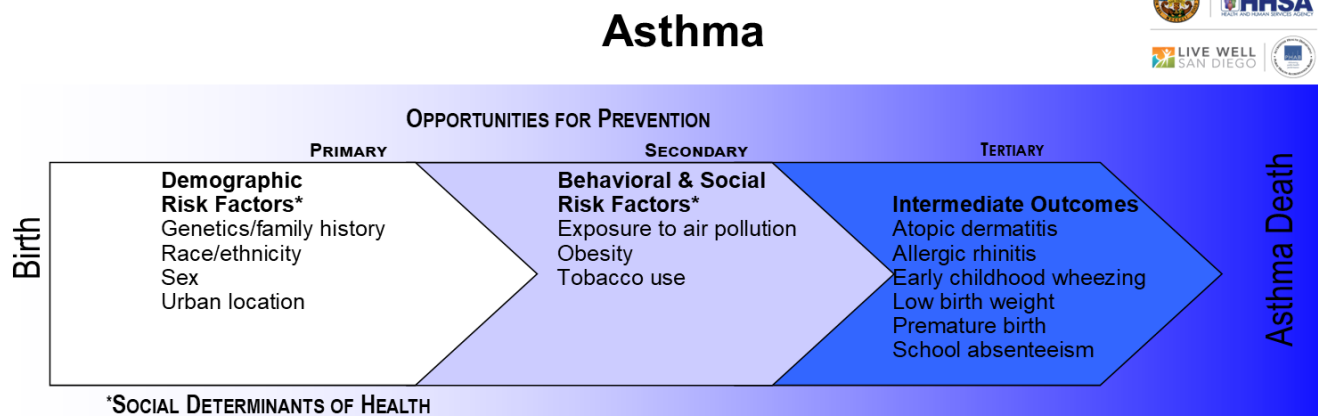
Beneath the risk factors diagram is a data grid describing the San Diego resident population in relation to selected elements of the pathway. The data grid is designed to assist in quick identification of opportunities for interventions that might have a high impact on a particular disease. The data represent all San Diegans, not only those with a particular disease. The left axis (bar) indicates the percent of the population with a known risk factor or intermediate outcome. The right axis (diamond) indicates the rate of a particular medical encounter within the population that is specified. The data are described fully in the complete version of the *Critical Pathways*.<sup>18</sup>

In addition, the Community Health Statistics Unit website ([www.SDHealthStatistics.com](http://www.SDHealthStatistics.com)) provides detailed demographic, health and facility data including maps of geographically formatted health data. Also available are links to other County data sources, state and national sites of interest. For further assistance with data or interpretation, please contact the Community Health Statistics Unit.

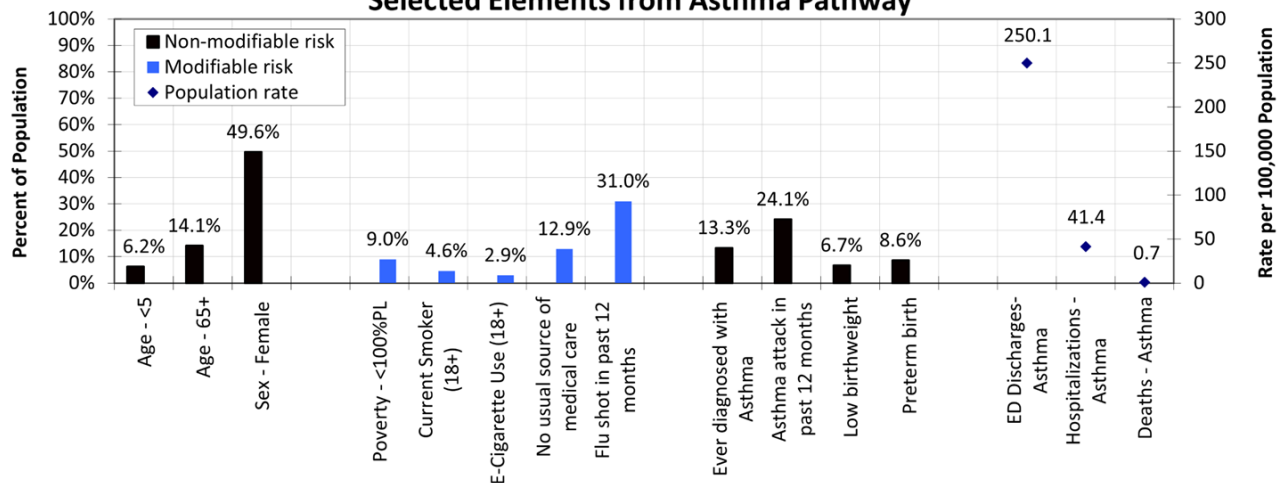


## Asthma Critical Pathway to Disease

### Critical Pathway



### Characteristics of Residents, San Diego County Selected Elements from Asthma Pathway



## Data Sources

- <sup>1</sup> Centers for Disease Control and Prevention. (2021). *Learn How to Control Asthma*. <https://www.cdc.gov/asthma/faqs.htm>.
- <sup>2</sup> Centers for Disease Control and Prevention. (2022). *Most Recent National Asthma Data*. <https://www.cdc.gov/asthma/most-recent-national-asthma-data.htm?msclkid=032e8621b55911ecb7a0e6077106a284>.
- <sup>3</sup> Mayo Clinic. (2022). *Asthma. Diagnosis and Treatment*. <https://www.mayoclinic.org/diseases-conditions/asthma/diagnosis-treatment/drc-20369660>.
- <sup>4</sup> United States Environmental Protection Agency. (2013). *Help Your Child Gain Control Over Asthma*. <https://www.epa.gov/sites/default/files/2013-08/documents/ll-asthma-brochure.pdf>.
- <sup>5</sup> Asthma and Allergy Foundation of America. (2022). *Asthma Facts and Figures*. <https://www.aafa.org/asthma-facts/>.
- <sup>6</sup> Asthma and Allergy Foundation of America. (2020). *Asthma Disparities in America*. <https://www.aafa.org/asthma-disparities-burden-on-minorities.aspx>.
- <sup>7</sup> Thomsen S. F. (2015). Genetics of asthma: an introduction for the clinician. *European clinical respiratory journal*, 2, 10.3402/ecrj.v2.24643. <https://doi.org/10.3402/ecrj.v2.24643>
- <sup>8</sup> Gehring U, Wijga AH, Koppelman GH, Vonk JM, Smit HA, Brunekreef B. Air pollution and the development of asthma from birth until young adulthood. *Eur Respir J*. 2020 Jul 2;56(1):2000147. doi: 10.1183/13993003.00147-2020. PMID: 32299858.
- <sup>9</sup> Toskala, E., & Kennedy, D. W. (2015). Asthma risk factors. *International forum of allergy & rhinology*, 5 Suppl 1(Suppl 1), S11–S16. <https://doi.org/10.1002/alr.21557>
- <sup>10</sup> Xu, X. F., Li, Y. J., Sheng, Y. J., Liu, J. L., Tang, L. F., & Chen, Z. M. (2014). Effect of low birth weight on childhood asthma: a meta-analysis. *BMC pediatrics*, 14, 275. <https://doi.org/10.1186/1471-2431-14-275>
- <sup>11</sup> United States Environmental Protection Agency. (2022). *Asthma Facts*. <https://www.epa.gov/sites/default/files/2021-04/documents/asthma-fact-sheet.pdf>.
- <sup>12</sup> Healthcare Information Division, Department of Health Care Access and Information [Distributor: California Breathing Asthma Program, California Department of Public Health]. 2019.
- <sup>13</sup> Source: UCLA Center for Health Policy Research, "2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020 California Health Interview Survey," <http://www.chis.ucla.edu>.

<sup>14</sup> Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, [2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020].

<sup>15</sup> Death data from Vital Records Business Intelligence System (VRBIS), 2019. San Diego Association of Governments (SANDAG) Population estimates, 2019 v5/2020.

<sup>16</sup> California Office of Statewide Health Planning and Development (OSHPD), 2019 Patient Discharge Database. San Diego Association of Governments (SANDAG) Population estimates, 2019 v5/2020.

<sup>17</sup> California Office of Statewide Health Planning and Development (OSHPD), 2019 Emergency Department Discharge database. San Diego Association of Governments (SANDAG) Population estimates, 2019 v5/2020.

<sup>18</sup> County of San Diego Health and Human Services Agency, Public Health Services. Community Health Statistics Unit. (2022). *Critical Pathways: Asthma*. August 2022.