

Asthma Brief

What is Asthma?

Asthma is a chronic inflammatory disease of the respiratory system in which the airways of the lungs constrict and become inflamed in response to certain triggers. It is among the most common long-term disease in children, but is also found in adults.¹ About 26 million Americans, including 7 million children, had asthma in 2010.²

Asthma causes wheezing, breathlessness, chest tightness, and nighttime or early morning coughing. “Asthma attacks” occur when a trigger causes the sides of the airways in the lungs to swell and the airways shrink.¹ Less air gets into the lungs, and the person has difficulty breathing. Very severe attacks can be fatal.

Asthma triggers include, but are not limited to¹:

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

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.

Symptoms of an asthma attack²:

- Coughing
- Shortness of breath or trouble breathing
- Wheezing
- Tightness or pain in the chest

Risk Factors for Asthma

Demographic Risk Factors

- *Race / Ethnicity*
 - Multi-race and black adults are more likely to have asthma than white adults.²
- *Genetics or Family History*
 - Asthma is associated with multiple genes which interact with environmental factors to influence the onset and severity of the disease.³
 - If one parent has asthma, children have a 1 in 3 chance of having the disease. If both parents have asthma, children have a 7 in 10 chance of having the disease.⁴

- *Age*
 - Children are diagnosed with asthma more often than adults.⁴
 - Individuals over the age of 65 years account for nearly 60% of asthma deaths.⁴
- *Gender*
 - Among children, boys are more likely to have asthma than girls.²
 - Among adults, women are more likely to have asthma than men.²

Social and Behavioral Risk Factors

- *Low Birth Weight*
 - Low birth weight is associated with a higher risk for asthma.⁵
 - Infants with birth weights of less than 2500g may have a higher risk of asthma during childhood and adolescence than larger infants.⁶
- *Living in Polluted Areas*
 - Ozone, nitrogen dioxide, acid aerosols, particulate matter, and elemental carbon have been associated with impaired breathing in children with asthma.⁷
 - Exposure to air pollution has long-term effects on lung development in children.⁷
 - Children who played three or more sports in areas with high ozone concentrations were more than three times as likely to develop asthma as sedentary children.⁸
- *Obesity*
 - Asthma incidence is about 1.5 times higher among overweight American children than among children who are not overweight.⁹

Intermediate Outcomes

- *Atopic Dermatitis* (chronic inflammation of the skin)
 - In the United States, 50-80% of patients with atopic dermatitis either has or develops asthma.¹⁰
- *Allergic Rhinitis* (hay fever)
 - Among Americans, those with allergic rhinitis are three times more likely to develop asthma than those without allergic rhinitis.¹¹
 - In the United States, children who develop allergic rhinitis within the first year of life are twice as likely to develop asthma as those who develop allergic rhinitis later in life.¹¹
- *Premature or Low Birth Weight Infants*
 - Women who have asthma are more likely to give birth to infants who are premature or have a low birth weight.¹²

National Statistics and Disparities Statistics

- In 2009, 3,388 people died from asthma.²
- Nearly 13 million Americans reported at least one asthma attack in the previous year.¹⁴
- Asthma is responsible for more than 15 million physician office and hospital outpatient department visits and nearly 2 million emergency department visits each year.¹⁵
- Nationally, 1 in 11 children has asthma.²

Disparities

- In the U.S., blacks visit the emergency department due to asthma at a rate 330% higher than whites.¹⁵
- The asthma death rate among blacks is 190% higher than the death rate among whites.¹⁵
- Nationally, Puerto Ricans had an asthma prevalence rate 113% higher than non-Hispanic whites and 50% higher than non-Hispanic blacks.¹⁵
- In 2009, adult females had higher asthma prevalence than adult males, but among children aged 0-17 years, boys had a higher prevalence than girls.¹⁴
- Females have a higher asthma mortality rate than males in the United States.¹⁴

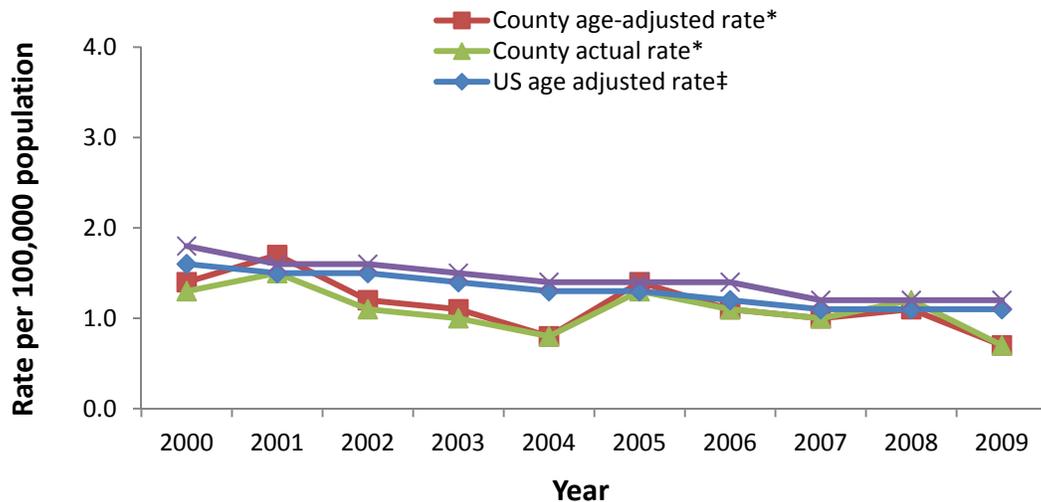
Cost

- Asthma costs the United States \$56 billion each year.²
- In 2008, nearly 10.5 million school days were missed due to asthma among children in the U.S.²
- More than 14 million work days were missed due to asthma among adults in 2008.²

Local Statistics and Disparities

- In 2009, 12.3% of San Diego County residents reported ever being diagnosed with asthma.¹⁶
- In 2007, of San Diego County residents who reported ever being diagnosed with asthma, 16.8% reported symptoms every week and 5.8% reported symptoms daily.¹⁶
- In 2009, 88.3% of asthmatic San Diego County residents had symptoms within the past 12 months.¹⁶

Asthma Death Rates per 100,00 Population, 2000-2009



* Source: Death Statistical Master Files (CA DPH), County of San Diego, Health & Human Services Agency, Epidemiology & Immunization Services Branch; SANDAG, Current Population Estimates, 10/2010.

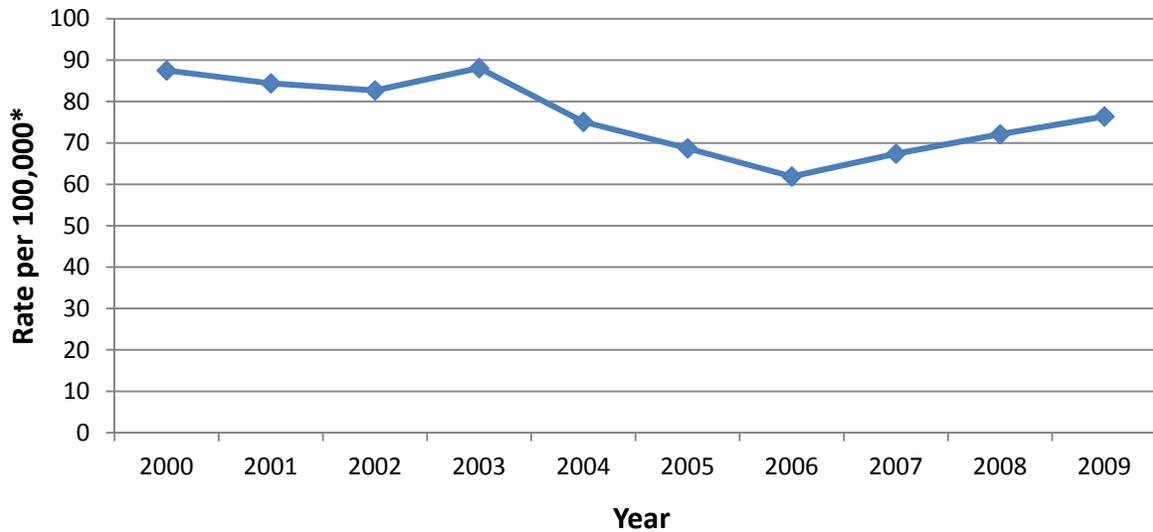
‡ Source: CDC, NCHS, Compressed Mortality Files. On-line database accessed 9/19/2012:

<http://wonder.cdc.gov/cmfi-icd10.html>.

Prepared by County of San Diego (CoSD), Health & Human Services Agency (HHSA), Community Health Statistics, 9/19/2012.

- The County age-adjusted asthma death rate decreased only slightly between 2001 and 2004, before increasing again in 2005. It then decreased again in 2006 and hit a new low in 2009. It has been comparable to the age-adjusted rates for the U.S. and California since 2000.

Asthma Hospitalization: Actual Rates* San Diego County, 2000-2009



* County actual rates are per 100,000 population.

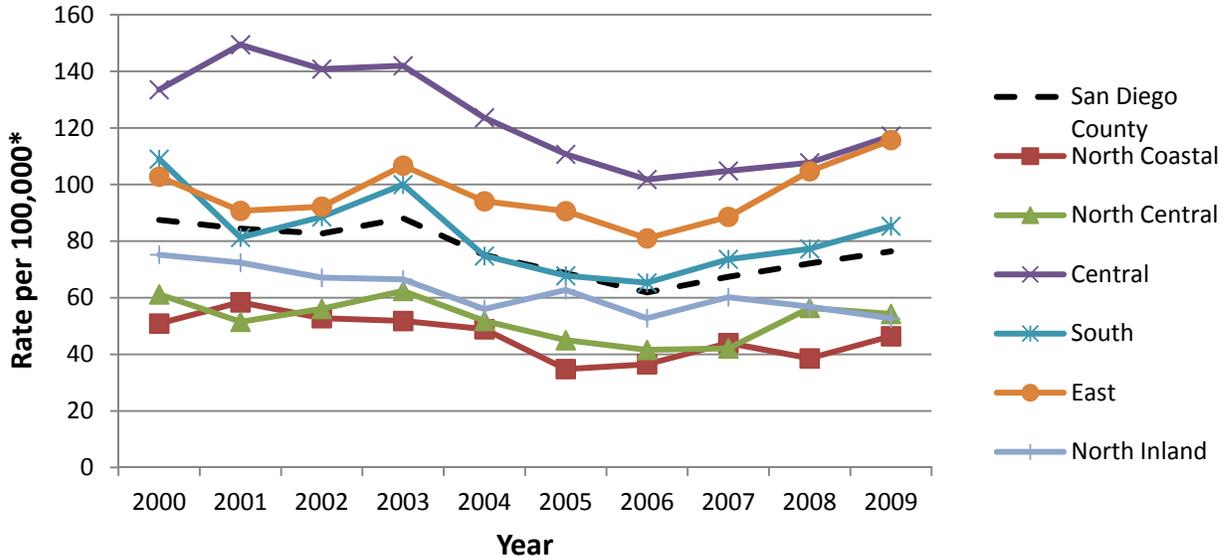
‡ Asthma hospitalization refers to (principal diagnosis) ICD-9 code 493.

Source: Patient Discharge Data, (CA OSHPD), County of San Diego, Health & Human Services Agency, Epidemiology & Immunization Services Branch; SANDAG, Current Population Estimates, 10/2010.

Prepared by County of San Diego (CoSD), Health & Human Services Agency (HHS), Community Health Statistics, 9/19/2012.

- From 2000-2009, the highest asthma hospitalization rate occurred in 2003, while the lowest was in 2006.

Asthma Hospitalization: Actual Rates* San Diego County Regions, 2000-2009



* County actual rates are per 100,000 population.

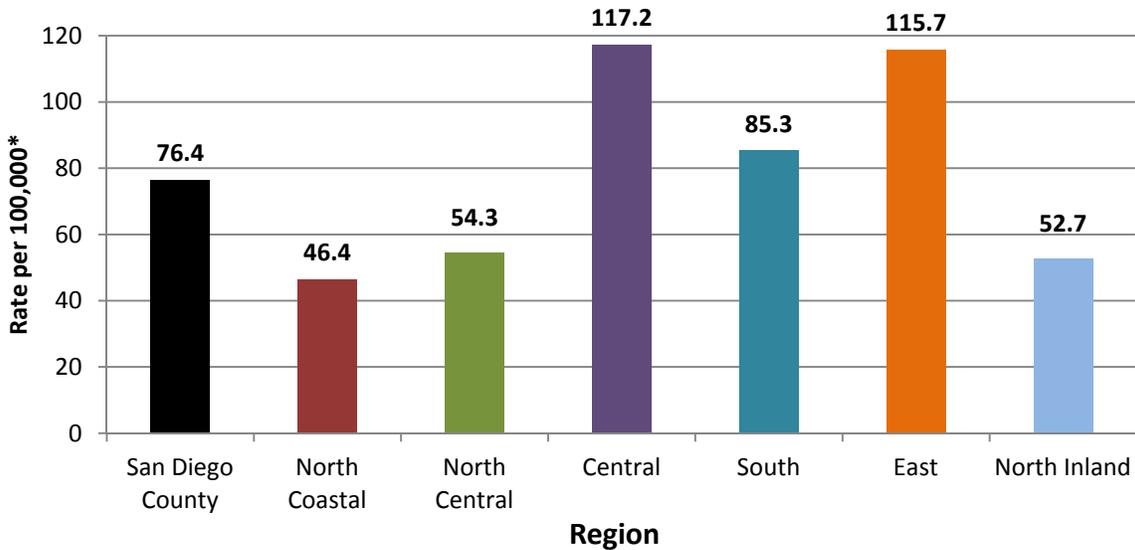
‡ Asthma hospitalization refers to (principal diagnosis) ICD-9 code 493.

Source: Patient Discharge Data, (CA OSHPD), County of San Diego, Health & Human Services Agency, Epidemiology & Immunization Services Branch; SANDAG, Current Population Estimates, 10/2010.

Prepared by County of San Diego (CoSD), Health & Human Services Agency (HHSA), Community Health Statistics, 9/19/2012.

- From 2000-2009, most regions of San Diego County had a decrease in rates of asthma hospitalizations, except East Region which had a slight increase in 2009.

Asthma Hospitalization: Actual Rates* per 100,000 Residents in San Diego County, 2009



* County actual rates are per 100,000 population.

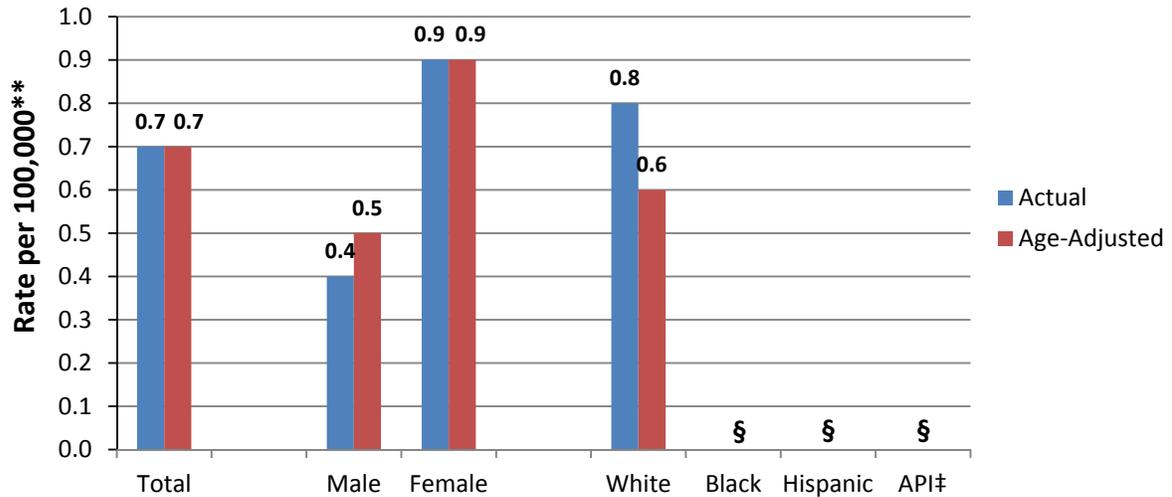
‡ Asthma hospitalization refers to (principal diagnosis) ICD-9 code 493.

Source: Patient Discharge Data, (CA OSHPD), County of San Diego, Health & Human Services Agency, Epidemiology & Immunization Services Branch; SANDAG, Current Population Estimates, 10/2010.

Prepared by County of San Diego (CoSD), Health & Human Services Agency (HHSA), Community Health Statistics, 9/19/2012.

- In 2009, the Central Region of San Diego County had the highest asthma hospitalization rate, while the North Coastal Region had the lowest rate.

Asthma Deaths*: Actual and Age-Adjusted Rates** San Diego County, 2009



* Asthma Death refers to (underlying cause of death) ICD-10 codes J45-46.

** County actual rates are per 100,000 individuals. County age-adjusted rates per 100,000 2000 US standard population.

§ Rates not calculated for fewer than 5 events.

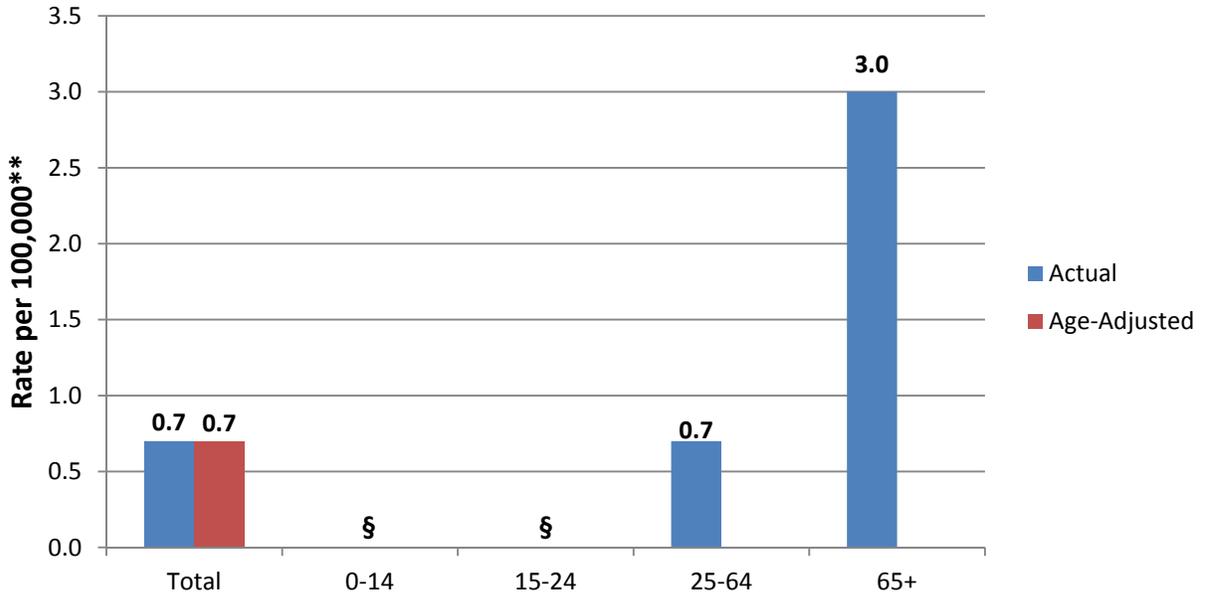
‡ API includes Asian and Pacific Islander.

Source: Death Statistical Master Files (CADPH), County of San Diego, Health & Human Services Agency, Epidemiology & Immunization Services Branch; SANDAG, Current Population Estimates, 10/2010.

Prepared by County of San Diego (CoSD), Health & Human Services Agency (HHS), Community Health Statistics, 9/19/2012.

- The total age-adjusted death rate in San Diego County was 0.7 per 100,000 residents in 2009.
- The age-adjusted death rate from asthma was almost twice as high for women as for men (0.9 per 100,000 female residents vs. 0.5 per 100,000 male residents).

Asthma Death* Rates** by Age Group San Diego County, 2009



* Asthma death refers to (underlying cause of death) ICD-10 codes J45-J46.

** County actual rates per 100,000 population. County age-adjusted rates per 100,000 2000 US standard population.

§ Rates not calculated for fewer than 5 events.

Source: Death Statistical Master Files (CA DPH), County of San Diego, Health & Human Services Agency, Epidemiology & Immunization Services Branch; SANDAG, Current Population Estimates, 10/2010.

Prepared by County of San Diego (CoSD), Health & Human Services Agency (HHSA), Community Health Statistics, 9/20/2012.

- Asthma deaths were most frequent among residents aged 65+ years (3.0 per 100,000) in 2009.

Asthma and Its Complications: Prevention for Individuals

- Quit smoking, and avoid secondhand smoke exposure
- Clean house and wash bedding in hot water weekly
- Keep pets outside
- Store food in airtight containers
- Dry damp or wet things completely
- Monitor the AQI (Air Quality Index)
- In 2008, the Central region of San Diego County had the highest asthma hospitalization rate, while the North Coastal region had the lowest.

Warning signs for children¹⁷:

- Coughing at night
- Has the cold or the flu
- Has a fever
- Stuffy or runny nose
- Tickle in the throat
- Sneezes and has watery eyes
- Tightness in the chest
- Feels weak or tired
- Has headaches
- Restless
- Face is pale
- Dark circles under the eyes

Prevention Tools for Public Health Professionals: Asthma Critical Pathway

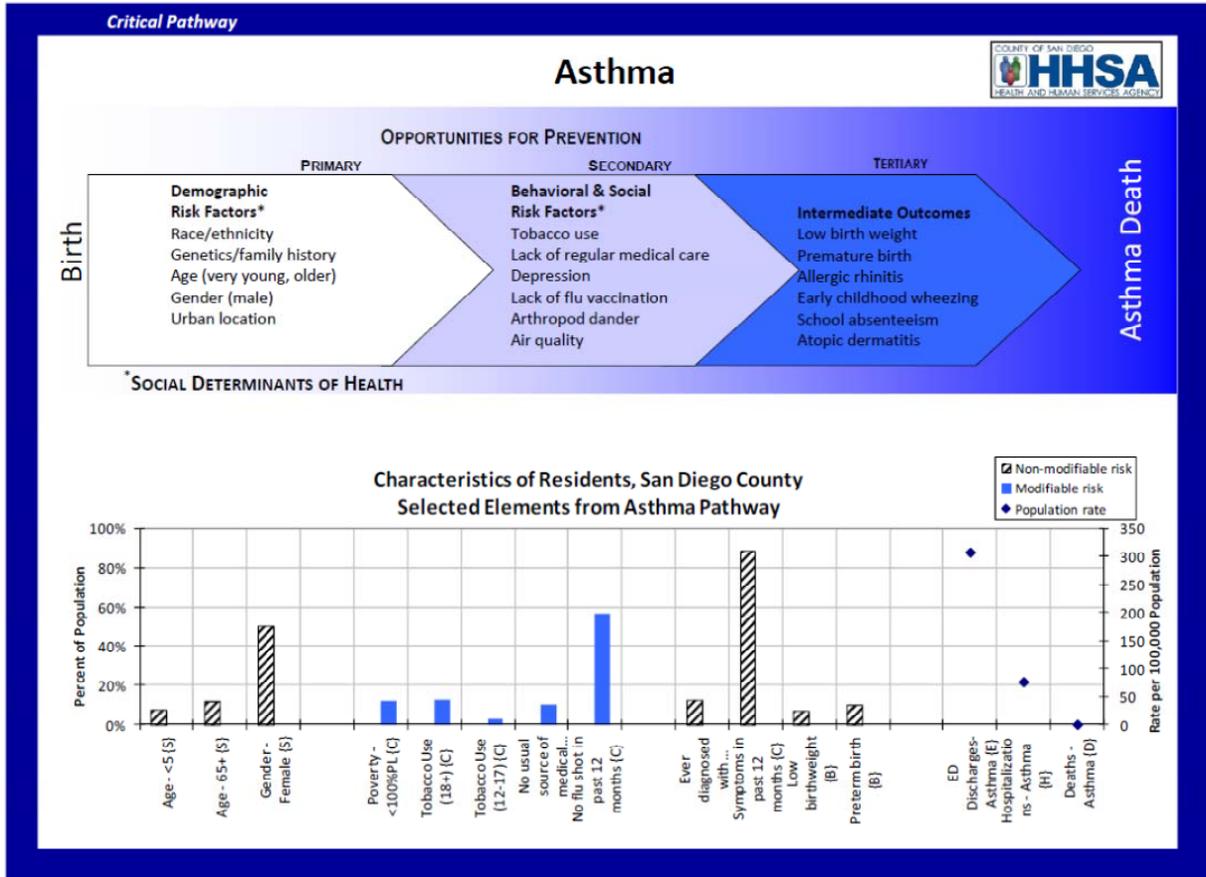
There are many opportunities for public health professionals in the community to help reduce the risk of asthma and to improve the health outcomes of individuals who already have the disease. To assist in community health efforts, an *Asthma Critical Pathway* was developed.

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 gender 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*.¹³

In addition, the Community Health Statistics Unit website (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



Data Sources

- ¹ Centers for Disease Control and Prevention. Asthma: Basic Information. <http://www.cdc.gov/asthma/fags.htm>. Accessed November 16, 2012.
- ² Centers for Disease Control and Prevention. Asthma's Impact on the Nation: Data from the CDC National Asthma Control Program. http://www.cdc.gov/asthma/impacts_nation/AsthmaFactSheet.pdf. Accessed November 16, 2012.
- ³ Office of Public Health Genomics, Centers for Disease Control and Prevention. Evidence of a genetic component to asthma. <http://www.cdc.gov/genomics/training/perspectives/asthma.html#Evidence> Accessed March 14, 2009.
- ⁴ Asthma and Allergy Foundation of America. Asthma Facts and Figures. <http://www.aafa.org/display.cfm?id=9&sub=30>. Accessed November 16, 2012.
- ⁵ Brooks AM, Byrd RS, Weitzman M, Auinger P, McBride JT. (2001). Impact of low birth weight on early childhood asthma in the United States. *Arch Pediatr Adolesc Med*. 155:401-406.
- ⁶ Seidman DS, Laor A, Gale R, Stevenson DK, Danon YL. (1991) Is low birth weight a risk factor for asthma during adolescence? *Arch Dis Child*. 66:584-587.
- ⁷ Gauderman WJ, Avol E, Gilliland F, Vora H, Thomas D, Berhane K, McConnell R, Kuenzli N, Lurmann F, Rappaport E, Margolis H, Bates D, Peters J. (2004). The effect of air pollution on lung development from 10 to 18 years of age. *N Engl J Med* 351:1057-1067.
- ⁸ McConnell R, Berhane K, Gilland F, London SJ, Islam T, Gauderman WJ, Avol E, Margolis HG, Peters JM. (2002). Asthma in exercising children exposed to ozone: a cohort study. *Lancet* 359: 386-391.
- ⁹ Gilliland FD, Berhane K, Islam T, McConnell R, Gauderman WJ, Gilliland SS, Avole E, Peters JM. (2002). Obesity and the risk of newly diagnosed asthma in school-age children. *Am J Epidemiol* 158:406-415.
- ¹⁰ Correale CE, Walker C, Murphy L, Craig TJ. (1999). Atopic dermatitis: a review of diagnosis and treatment. *AAFP*:1191-1209.
- ¹¹ Pawankar R. (2004). Allergic rhinitis and asthma: the link, the new ARIA classification and global approaches to treatment. *Curr Opin Allergy Clin Immunol* 4:1-4.
- ¹² Moyer, P. Prematurity, low birthweight are more likely with maternal asthma. (2006). *Medscape Medical News*.
- ¹³ County of San Diego Health and Human Services Agency, Public Health Services. Community Health Statistics Unit. (2011). Critical Pathways: the Disease Continuum, Asthma. April, 2011. http://www.sdcounty.ca.gov/hhsa/programs/phs/documents/CHS-Critical_Pathways_2012.pdf. Critical Pathways. Accessed November 19, 2012.
- ¹⁴ Centers for Disease Control and Prevention. National Center for Health Statistics. Asthma Prevalence, Health Care Use, and Mortality: United States, 2005-2009. <http://www.cdc.gov/nchs/data/nhsr/nhsr032.pdf>. Accessed November 19, 2012.
- ¹⁵ United States Environmental Protection Agency. Asthma Facts. http://www.epa.gov/asthma/pdfs/asthma_fact_sheet_en.pdf. Accessed November 19, 2012.
- ¹⁶ UCLA Center for Health Policy Research. California Health Interview Survey, 2009. <http://www.chis.ucla.edu/>. Accessed November 19, 2012.
- ¹⁷ Centers for Disease Control and Prevention. Help Your Child Gain Control Over Asthma. http://www.epa.gov/asthma/pdfs/ll_asthma_brochure.pdf. Accessed November 19, 2012.