Asthma

Asthma is a chronic respiratory disease characterized by inflammation of the airways and lungs. During an asthma attack, the small airways leading to the air sacs in the lungs are constricted and inflamed, and as a result, less air is able to flow out of the lungs. Asthma attacks can cause a multitude of symptoms ranging in severity from mild to life-threatening. These symptoms include wheezing, breathlessness, chest tightness, and coughing. Currently, there is no cure for asthma; however, people who have asthma can still lead productive lives if they control their asthma (NHLBI, n.d.). Taking medication and avoiding contact with environmental "triggers" can help control asthma (AAAAI, n.d.).

A family history of asthma contributes to susceptibility, but mostly what causes the development of asthma is unknown. Environmental exposures such as environmental tobacco smoke, dust mites, cockroach allergen, outdoor air pollution (e.g., ozone, particulate matter), pets, and mold are considered important triggers of an asthma attack (CDC, 2019; Kanchongkittiphon et al., 2015; Matsui et al., 2016; U.S. EPA, 2013, 2019).

Statistics for period asthma prevalence, current asthma prevalence, and asthma attack prevalence are based on national estimates from the National Health Interview Survey (NHIS), conducted by the Centers for Disease Control and Prevention's (CDC's) National Center for Health Statistics (NCHS). The NHIS is the principal source of information on the health of the civilian non-institutionalized population of the U.S. and since 1960 has been one of the major data collection programs of NCHS. Period asthma prevalence (pre-1997 data) represents survey participants who had asthma in the past 12 months. To determine current asthma prevalence, adults/children who had ever received an asthma diagnosis from a healthcare practitioner were asked whether they still have asthma. Asthma attack prevalence is based on the number of adults/children with an asthma diagnosis who reported an asthma episode or attack in the past 12 months.

What the Data Show

Adult Asthma

In 2018, over 19 million adults within the U.S. (age 18+ years) were reported as still having asthma (NCHS, 2019a) and nearly 9 million reported experiencing an asthma episode or attack during the previous 12 months (NCHS, 2020; data not shown).

As shown in Exhibit 1, between 2002 and 2018 current asthma prevalence has ranged from a low of 64 cases per 1,000 in 2003 to a high of 83 cases per 1,000 in 2016. During this same time period, asthma attack prevalence has varied slightly, from a low of 33 cases per 1,000 in 2003 to a high of 42 cases per 1,000 in 2010.

Exhibit 2 compares age-adjusted asthma prevalence across racial and ethnic groups for the 2016-2018 time period. Blacks reported the highest current asthma prevalence across racial groups (93 cases per 1,000), followed by American Indians/Alaska Natives (87 cases per 1,000), whites (78 cases per 1,000), and Asians (47 cases per 1,000). For asthma attack prevalence, American Indians/Alaska Natives reported the highest rate (39 cases per 1,000), followed by blacks (38 cases per 1,000), whites (36 cases per 1,000), and Asians (23 cases per 1,000).

Exhibit 2 also compares both asthma prevalence categories for total Hispanics, non-Hispanic whites, and non-Hispanic blacks. For current asthma prevalence in adults, there were 60 cases per 1,000 for total Hispanics, 83 cases per 1,000 for non-Hispanic whites, and 94 cases per 1,000 for non-Hispanic blacks. For asthma attack prevalence in adults, there were 29 cases per 1,000 for total Hispanics and 39 cases per 1,000

for both non-Hispanic whites and non-Hispanic blacks.

Childhood Asthma

In 2018, about 5.5 million children within the U.S. (age 0-17 years) were reported as still having asthma (NCHS, 2019b) and over 3 million reported experiencing an asthma episode or attack during the previous 12 months (NCHS, 2020; data not shown).

As shown in Exhibit 3, crude period asthma prevalence increased on average approximately 4 percent per year between 1980 and 1996 (Akinbami et al., 2009). Rates in subsequent years (1997-2018) reported for current asthma and asthma attack prevalence varied slightly, but show no sharp upward or downward change through most of the time period. Since tracking began in 2001, current asthma prevalence has ranged from a lowest rate of 75 cases per 1,000 in 2018 to a highest rate of 96 cases per 1,000 in 2009. Current asthma prevalence rates have been declining in children since 2011 (Zahran et al., 2018). Between 1997 and 2018, asthma attack prevalence ranged from a lowest rate of 42 cases per 1,000 occurring in 2015 to a highest rate of 58 cases per 1,000 occurring in 2002 (Exhibit 3). Asthma attack prevalence in children over time has decreased significantly (Zahran et al., 2018).

Exhibit 4 compares crude asthma prevalence across racial and ethnic groups of children during the 2016-2018 time period. Reported current asthma prevalence was highest among black children (140 cases per 1,000), followed by American Indians/Alaska Natives (112 cases per 1,000), whites (68 cases per 1,000), and Asians (39 cases per 1,000). Asthma attack prevalence rates across racial groups followed a similar pattern to the reporting of current asthma prevalence. Exhibit 4 also compares both asthma prevalence categories for total Hispanics, non-Hispanic whites, and non-Hispanic blacks. The highest number of cases of current asthma (142 cases per 1,000) were observed among non-Hispanic blacks, followed by total Hispanics (75 cases per 1,000), and then non-Hispanic whites (68 cases per 1,000). Non-Hispanic blacks also had the highest number of asthma attack cases (76 cases per 1,000), followed by non-Hispanic whites (40 cases per 1,000), and then total Hispanics (38 cases per 1,000).

Limitations

- The NHIS questionnaire underwent major changes in 1997, and with the exception of Exhibit 3 that shows historical (1980-1996) data for children, the data presented focus on surveys conducted from 1997 (children) and 2002 (adults) to the most currently available release (2018). The redesigned NHIS is different in content, format, and mode of data collection from earlier versions of the survey. Due to changes in methodology, 1997-2018 NHIS estimates are not directly comparable to pre-1997 NHIS estimates.

- Prevalence data reported in the NHIS are based on self-reported responses to specific questions pertaining to airway-related illnesses, and are subject to the biases associated with self-reported data. Self-reported data may underestimate the disease prevalence being measured if, for whatever reason, the respondent is not fully aware of his/her condition.

Data Sources

Current asthma prevalence data in Exhibits 1 and 3 were obtained from annual reports and standalone tables published by NCHS (NCHS, 2004a,b, 2005a,b, 2006a-d, 2007a,b, 2008a,b, 2009a,b, 2010a,b, 2011, 2012a-c, 2014a,b, 2015a-d, 2017a,b, 2018a-d, 2019a,b), which summarize health statistics compiled from the NHIS (https://www.cdc.gov/nchs/nhis/nhis_series.htm and https://www.cdc.gov/nchs/nhis/shs.htm). Asthma attack prevalence data from 2002 to 2018 for Exhibits 1 and 3 were obtained by running Stata analyses on the NHIS public-use data files (NCHS, 2020), and obtained from annual reports for 1997 to 2001 data in Exhibit 3 (2002a,b, 2003a-c). The pre-1997 data for Exhibit 3 also originate from the NHIS, as compiled by NCHS in Akinbami et al. (2009). Current asthma and asthma attack prevalence data for 2016-2018 in Exhibits 2 and 4 were obtained by running Stata analyses on the NHIS public-use data files (NCHS, 2020).

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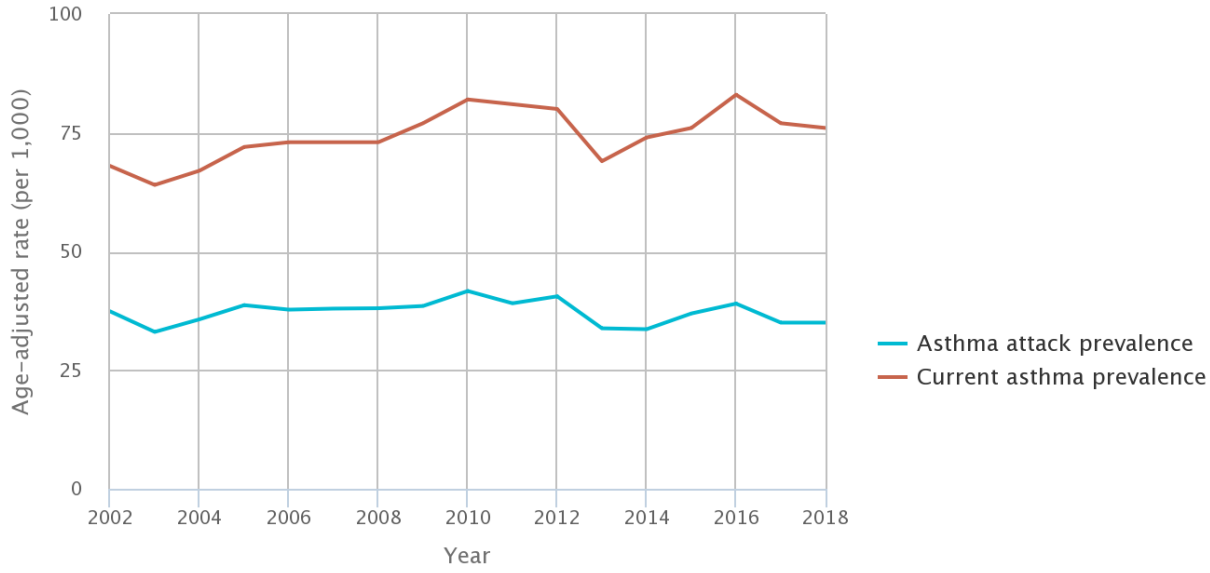
Exhibit 1. Age-adjusted asthma prevalence in U.S. adults (18+ years), 2002–2018

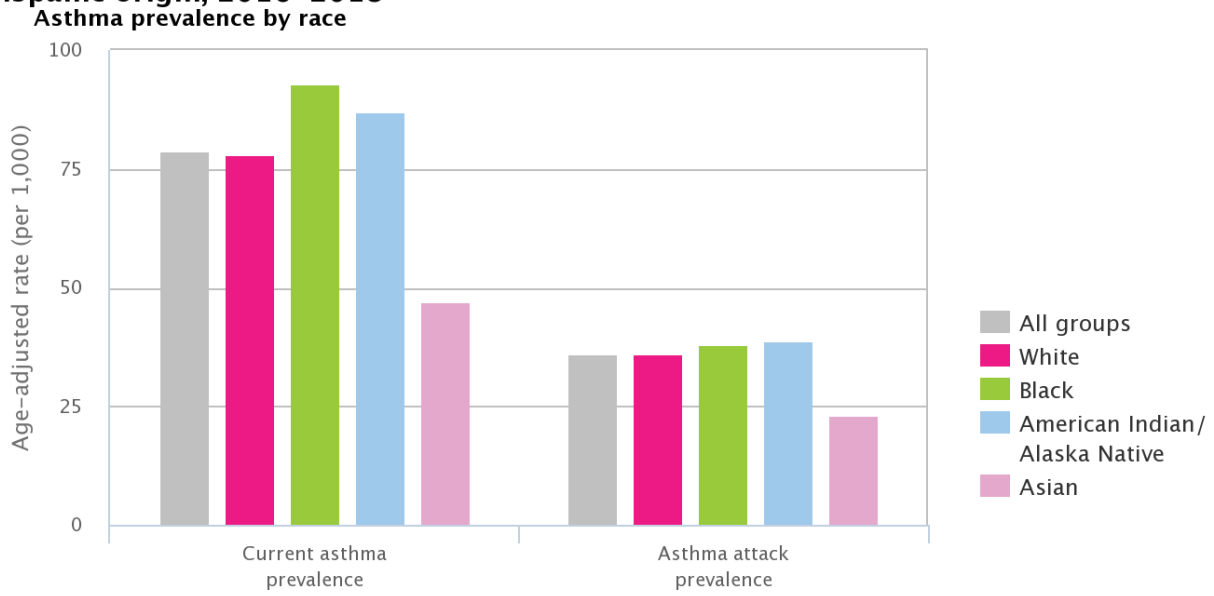


Current asthma prevalence is determined by asking adults who had ever received an asthma diagnosis from a healthcare practitioner whether they still have asthma. Asthma attack prevalence is determined by asking adults with an asthma diagnosis if they had an asthma episode or attack in the past 12 months.

Information on the statistical significance of the trends in this exhibit is not presented here. For more information about uncertainty, variability, and statistical analysis, view the technical documentation for this indicator.

Data source: NCHS, 2004a, 2005a, 2006a,c, 2007a, 2008a, 2009a, 2010a, 2012a,c, 2014a, 2015a,c, 2017a, 2018a,c, 2019a, 2020

Exhibit 2. Age-adjusted asthma prevalence in adults in the U.S. by race and Hispanic origin, 2016-2018



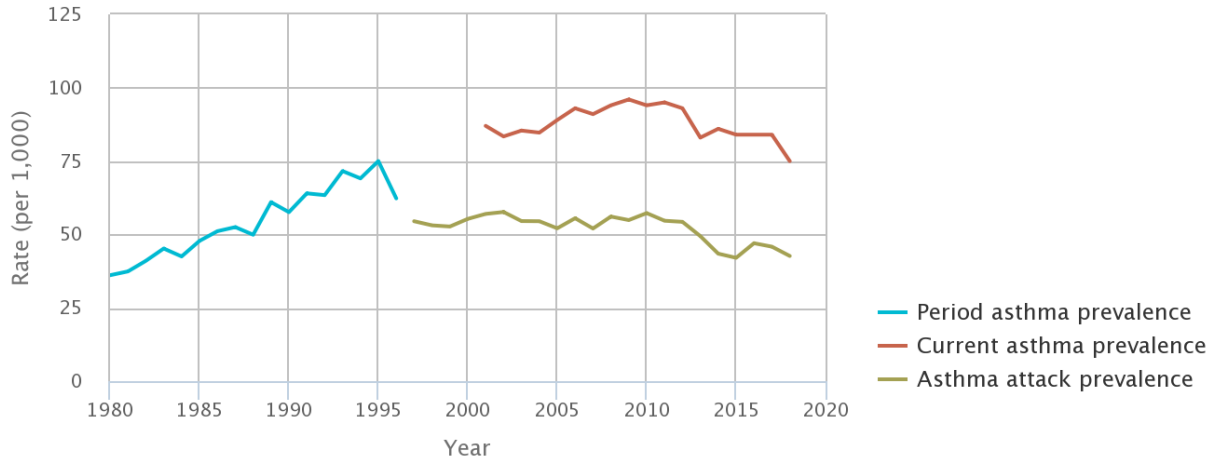
Current asthma prevalence is determined by asking adults who had ever received an asthma diagnosis from a healthcare practitioner whether they still have asthma. Asthma attack prevalence is determined by asking adults with an asthma diagnosis if they had an asthma episode or attack in the past 12 months.

Trend analysis has not been conducted because these data represent a single snapshot in time. For more information about uncertainty, variability, and statistical analysis, view the technical documentation for this indicator.

Data source: NCHS, 2020

Visit https://www.epa.gov/roe to see the full exhibit.

Exhibit 3. Asthma prevalence in U.S. children (0–17 years), 1980–2018



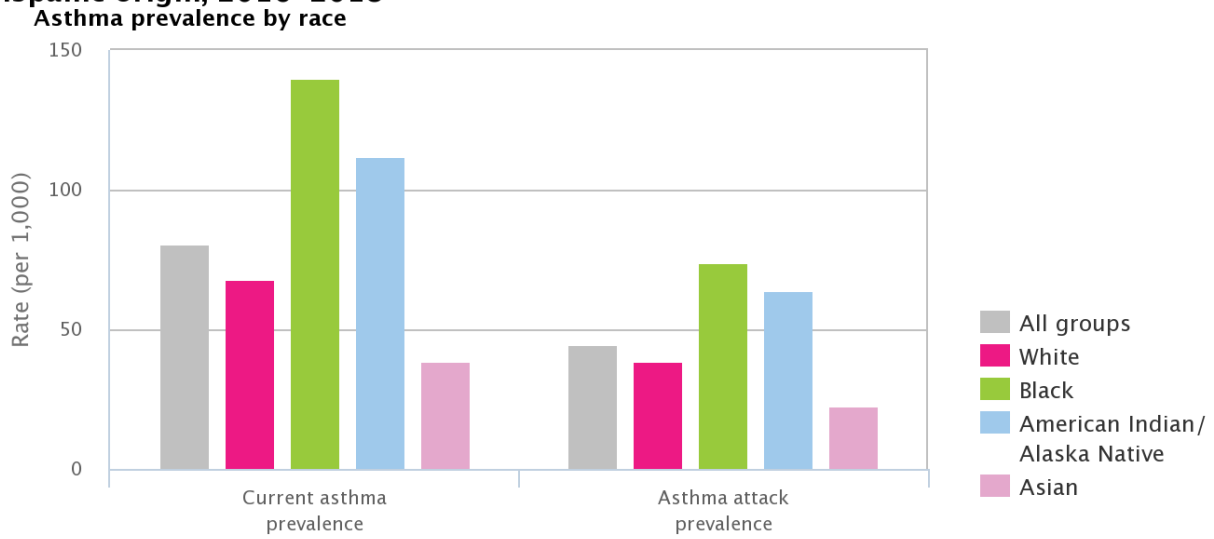
Rates presented are crude rates.

Period asthma prevalence is determined by asking if the child had asthma in the past 12 months. Current asthma prevalence is determined by asking if a child who had ever received an asthma diagnosis from a healthcare practitioner still has asthma. Asthma attack prevalence is determined by asking whether a child with an asthma diagnosis had an asthma episode or attack in the past 12 months. Due to changes in NHIS questions in 1997, asthma prevalence data collected from 1980 to 1996 are not directly comparable to the data collected from 1997 to 2018.

Information on the statistical significance of the trends in this exhibit is not presented here. For more information about uncertainty, variability, and statistical analysis, view the technical documentation for this indicator.

Data source: Adapted from Akinbami et al., 2009; NCHS, 2002a,b, 2003a–c, 2004b, 2005b, 2006b,d, 2007b, 2008b, 2009b, 2010b, 2011, 2012b, 2014b, 2015b,d, 2017b, 2018b,d, 2019b, 2020

Exhibit 4. Asthma prevalence in children (0–17 years) in the U.S. by race and Hispanic origin, 2016–2018



Rates presented are crude rates.

Current asthma prevalence is determined by asking if a child who had ever received an asthma diagnosis from a healthcare practitioner still has asthma. Asthma attack prevalence is determined by asking whether a child with an asthma diagnosis had an asthma episode or attack in the past 12 months.

Trend analysis has not been conducted because these data represent a single snapshot in time. For more information about uncertainty, variability, and statistical analysis, view the technical documentation for this indicator.

Data source: NCHS, 2020

Visit https://www.epa.gov/roe to see the full exhibit.