

Wisconsin Asthma Burden Report 2020





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Scope of the Problem

Over the past decade, some indicators point to significant improvements in reducing Wisconsin's asthma burden, while others show remains unchanged.

There have been **significant improvements** in reducing overall asthma mortality rates.

There have been **slight improvements** in the number of schools with asthma management plans on file for all students with asthma and reducing overall asthma emergency department visits.

There has been **no change** in racial and ethnic disparities in asthma prevalence, hospitalization rates, or mortality rates. In addition, the vaping and e-cigarette epidemic among youth is raising concern about the percentage of youth with asthma who are using vaping and e-cigarette products.

Note on racial and ethnic disparities:

Racial and ethnic disparities are **not** due to innate biological factors. Many social, economic, and environmental factors—social determinants of health—affect populations of color to a larger extent than white populations. This puts people of color at greater risk of negative outcomes from asthma. These social determinants of health include, but are not limited to:

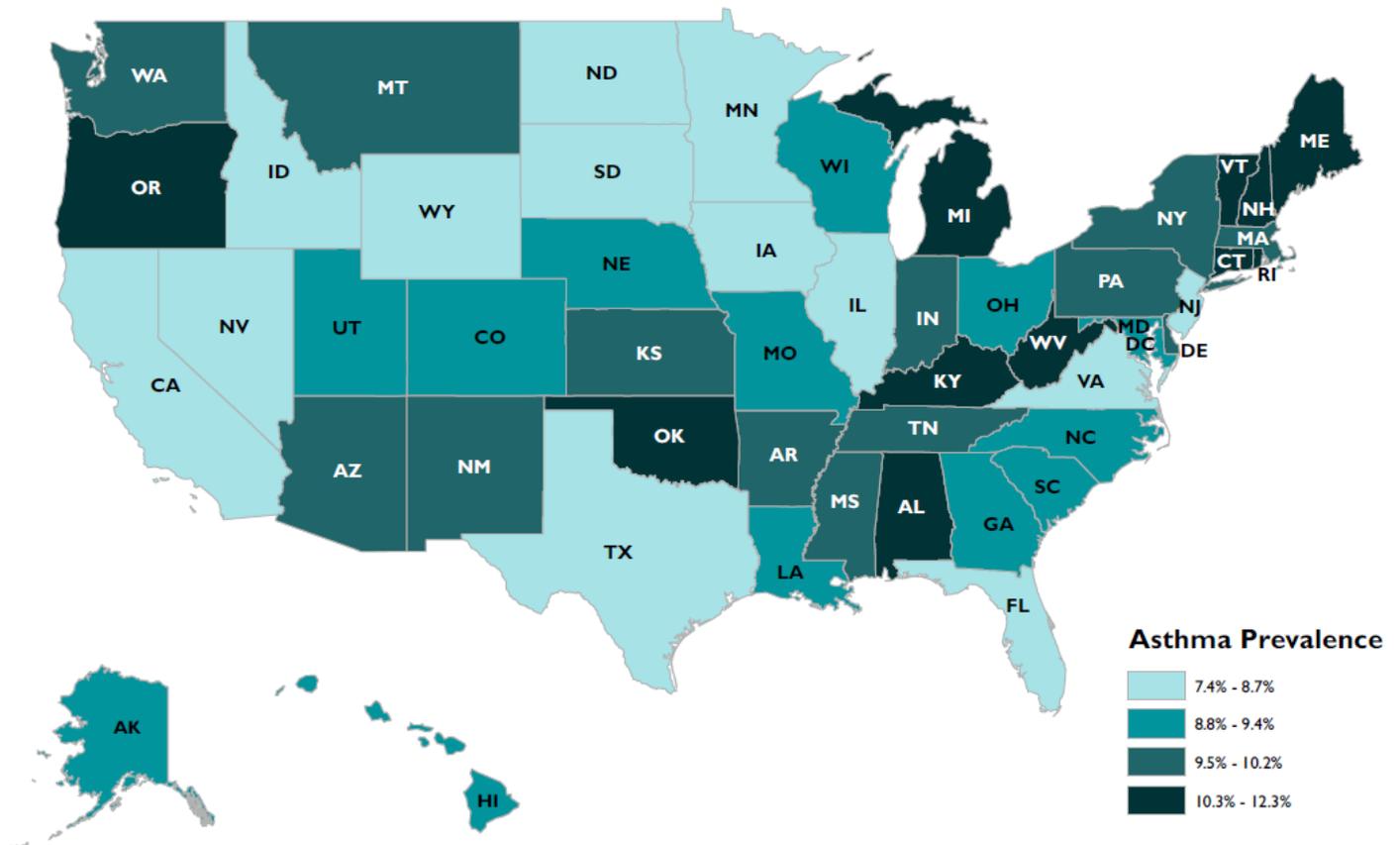
- Poverty
- Limited access to comprehensive asthma care
- Exposure to indoor and outdoor pollutants
- Access to healthy housing options
- Lack of asthma education
- Stress



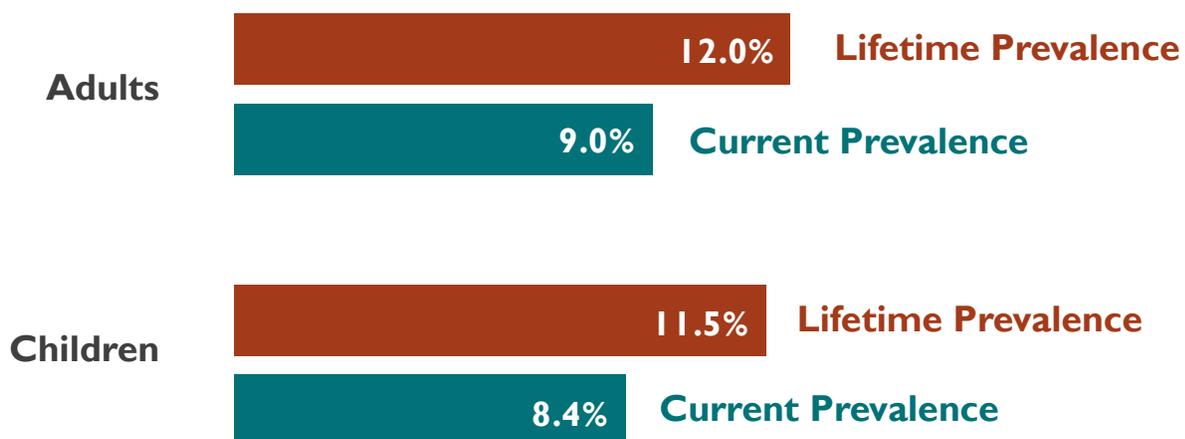
Asthma Prevalence

Asthma prevalence by state, 2018

In 2018, the U.S. adult current asthma prevalence was 9.3%. In Wisconsin, adult current asthma prevalence was 9%.

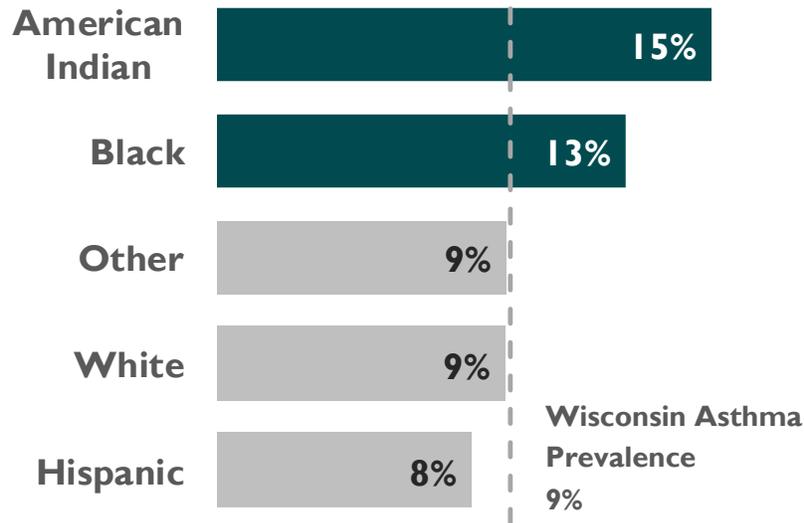


Adult and child asthma prevalence, Wisconsin, 2018



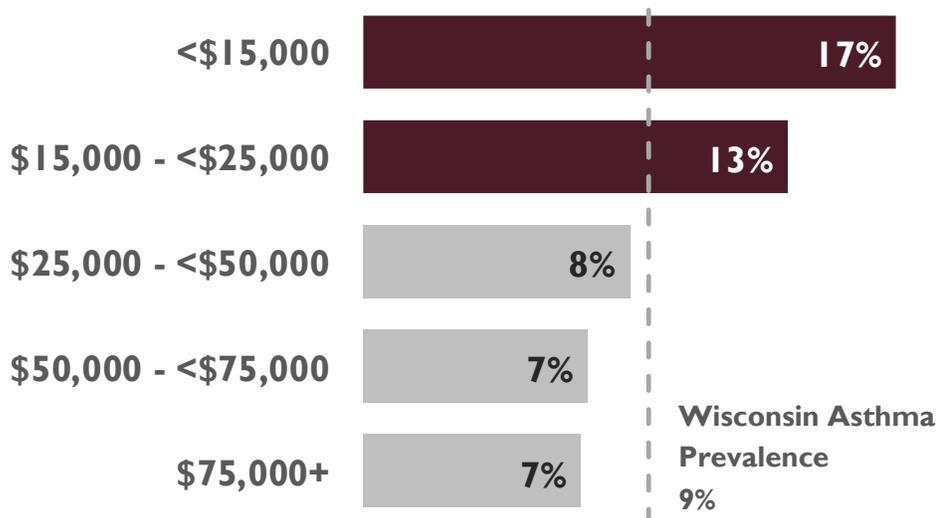
Asthma disparities by race and ethnicity, 2016–2018

In Wisconsin, the asthma burden disproportionately falls upon racial and ethnic minority populations. The black population has an asthma prevalence almost 1.5 times higher than the white population and American Indians have an asthma prevalence almost twice that of whites.



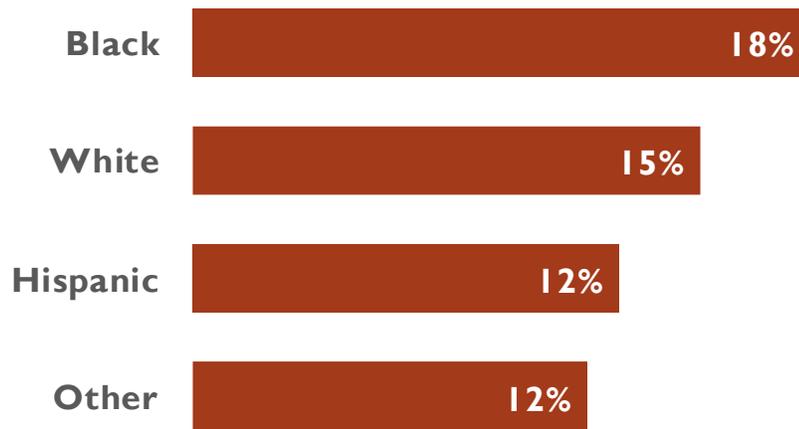
Asthma disparities by income, 2016–2018

Asthma disparities also exist by other factors, such as annual household income. Adults in the lowest income group have almost 2.5 times the rate of asthma as those in the highest income group.



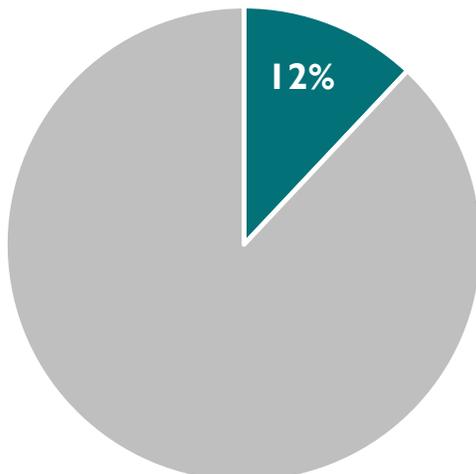
Asthma disparities by race and ethnicity within a lower income population, 2016–2018

As we saw on the previous page, there are asthma disparities by race and ethnicity and by income status. The following graph only includes people on Wisconsin Medicaid, which is health insurance for low-income individuals. Within this lower-income group, we still see prevalence differences by race and ethnicity, however the differences are not significant.

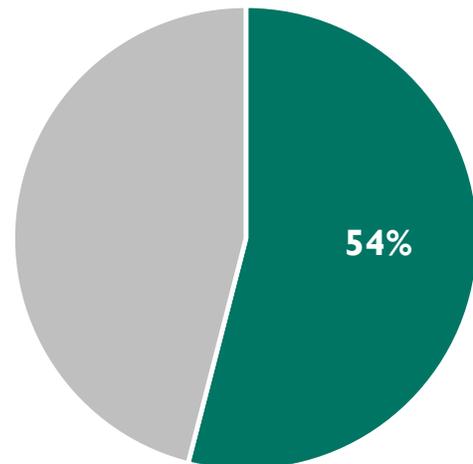


Work-related asthma, 2012–2016

12% of ever-employed adults with asthma had doctor-diagnosed work-related asthma

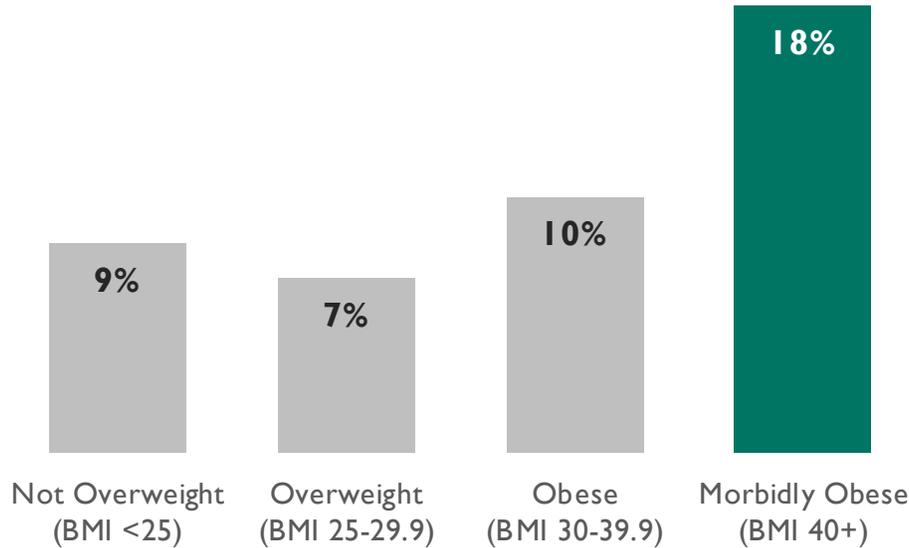


54% of ever-employed adults with asthma said their asthma was caused or made worse by their job.



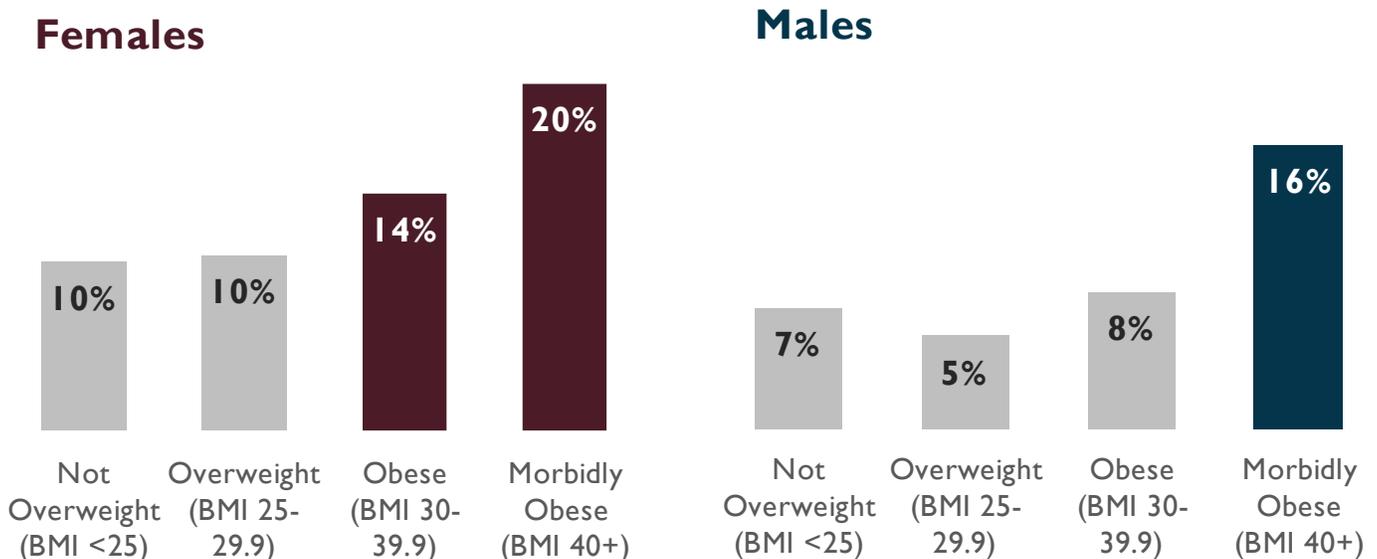
Asthma prevalence by BMI, 2016–2018

In Wisconsin, adults who are obese (BMI of 30+) have a higher asthma prevalence than adults who are overweight or not overweight (BMI <30). There is a dramatically higher prevalence of asthma among people who are morbidly obese. About 1 in 5 people with a BMI of 40+ have asthma.



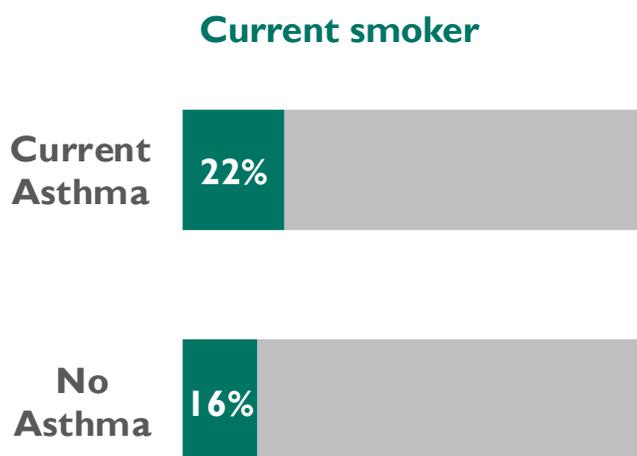
Asthma prevalence by BMI and sex, 2016–2018

When stratified by sex, we see that a significantly higher percentage of obese females reported having asthma compared to females who are overweight or not overweight. Among men, the asthma prevalence for those who are morbidly obese is 2 to 3 times greater than the other categories.



Prevalence of smoking by asthma status, 2016–2018

In Wisconsin, a significantly higher percentage of people with asthma smoke compared to people without asthma (22% versus 16%). Tobacco smoke can trigger asthma symptoms which is one reason why we encourage people to quit smoking.

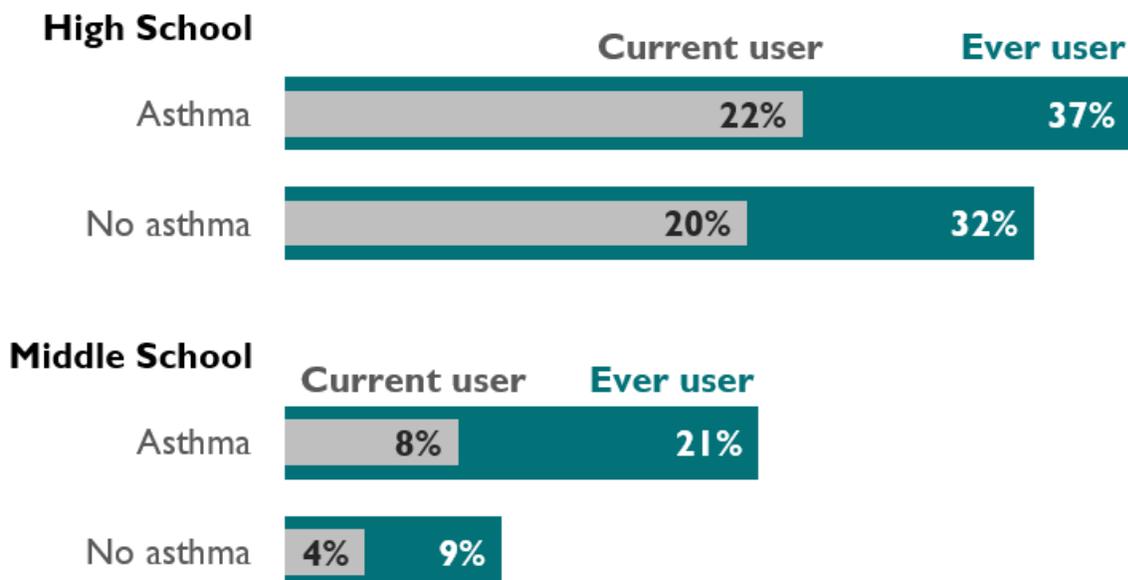


In 2018, 20% of people who called the Wisconsin Tobacco Quit Line had asthma.



E-cigarette use among youth with asthma, 2018

In Wisconsin, 1 in 3 high school students with asthma and 1 in 5 middle school students with asthma have tried e-cigarettes. In middle school, the percentage of youth with asthma who ever tried e-cigarettes is twice that of youth without asthma.



Asthma Control

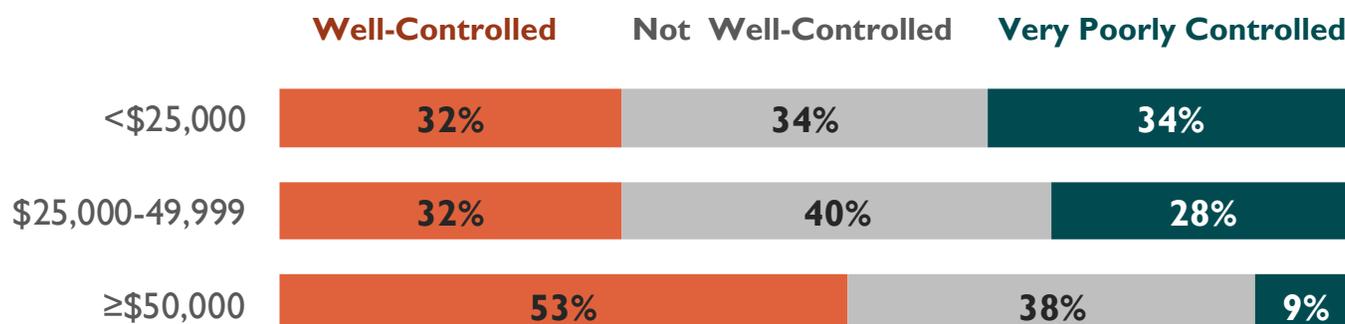
Asthma control among adults, 2012–2016

The frequency of asthma symptoms, nighttime awakenings, activity limitations, and rescue medication use among people with asthma were used to classify asthma control into the following categories: well-controlled, not well-controlled, and very poorly controlled. As shown below, **60%** of people with asthma are not well-controlled.



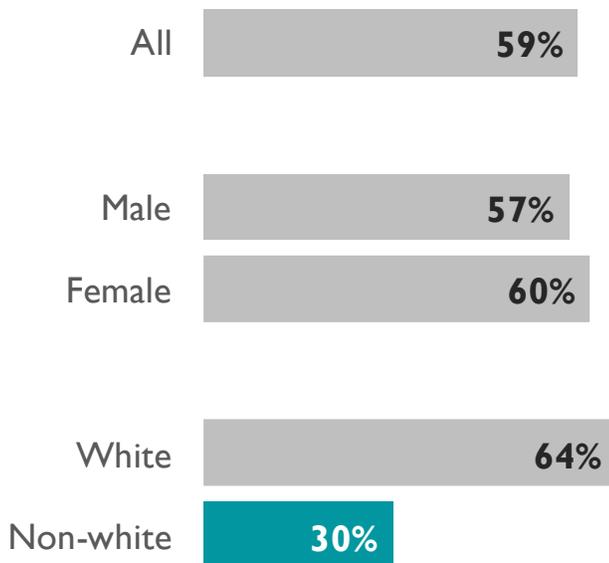
Asthma control by income, 2012–2016

Poor asthma control is associated with having a lower income. Adults in the highest income group are more likely to report well-controlled asthma compared to those in the lower income groups.



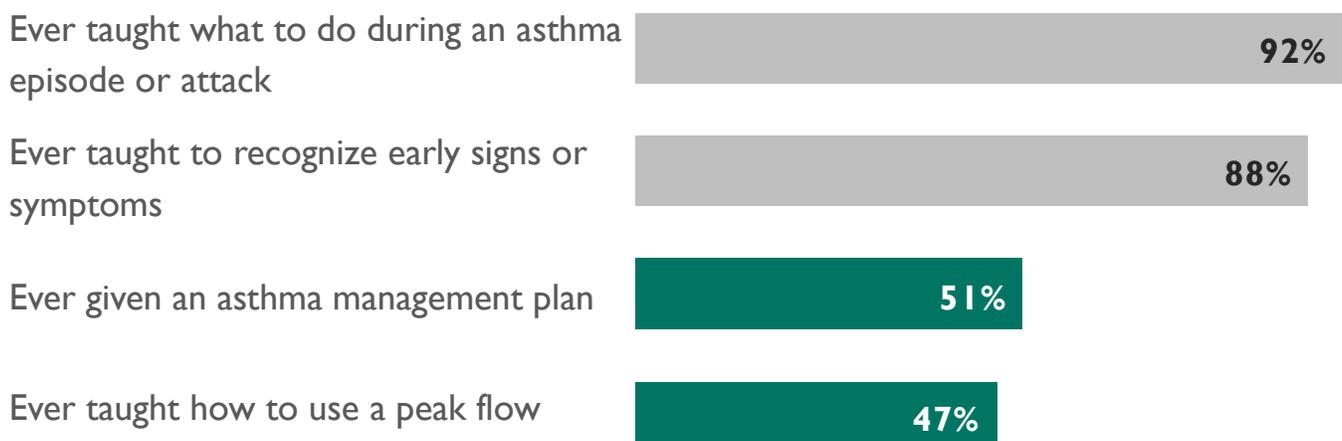
Asthma control among children, 2012-2014

There is a higher percentage of children who report having their asthma under control compared to adults (59% versus 40%). Among all children, there is little difference between males and females. However, there is a large disparity between white and non-white children. Non-white children are significantly less likely to have their asthma under control.



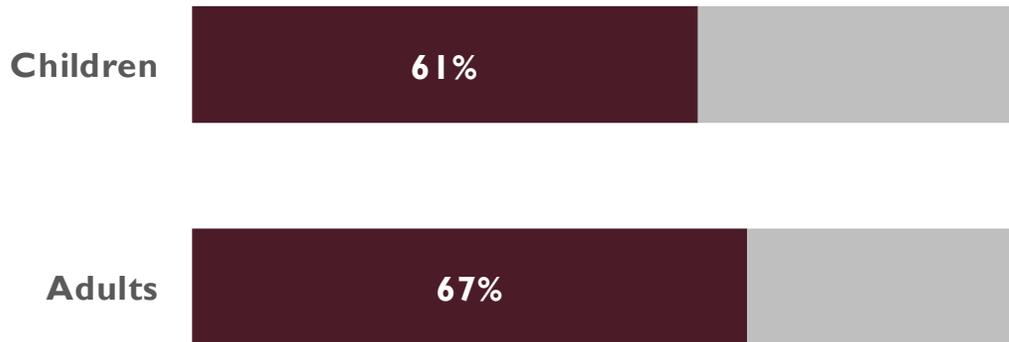
Asthma knowledge and management among children, 2012-2014

About 90% of children with current asthma know what to do during an asthma attack and can recognize early signs and symptoms of asthma. However, only about 50% were ever given an asthma management plan or taught how to use a peak flow meter to manage asthma.



Talked to a doctor about asthma in last year*

Establishing routine health care visits with a medical provider is an essential part of asthma management. Only **3 in 5** children with asthma and **2 in 3** adults with asthma have talked with their doctor about asthma in the last year.



Missing school, work, or activities due to asthma*

Symptoms of asthma may be severe enough to cause a child to miss school or an adult to miss work or their usual activities.

About 1 in 3 children have missed school due to asthma



About 1 in 4 adults have missed work or usual activities due to asthma



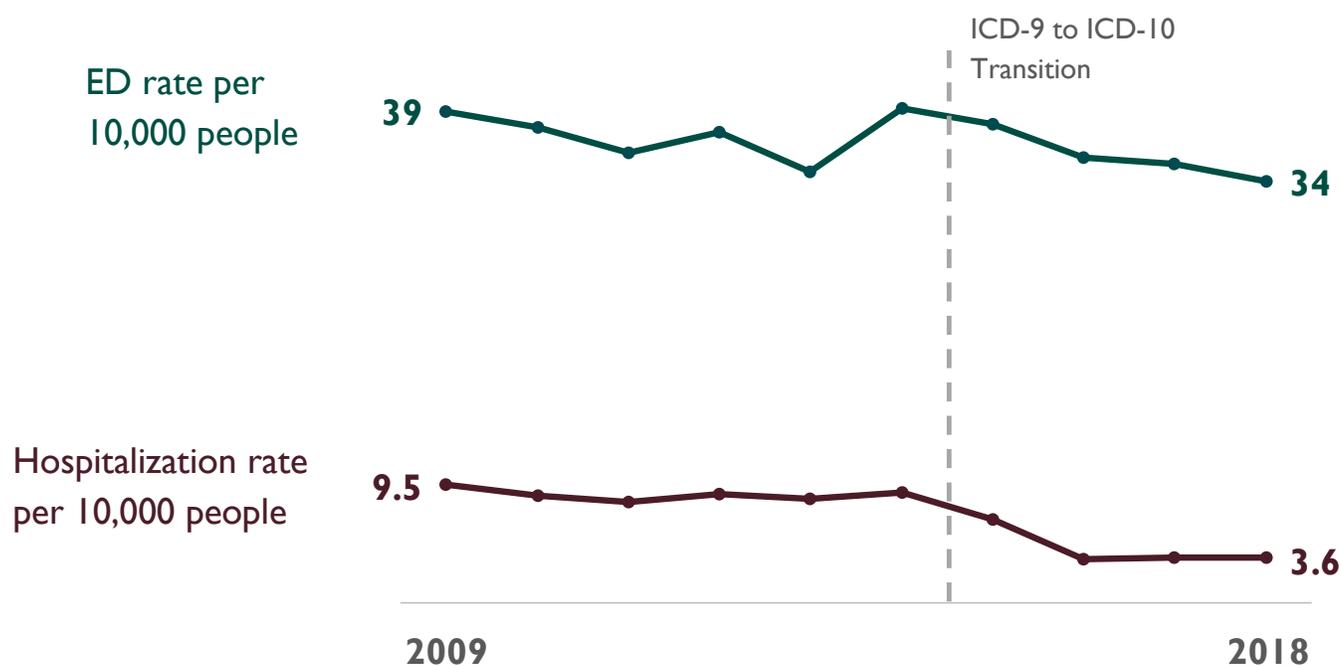
*Child data is 2012-2014, Adult data is 2012-2016



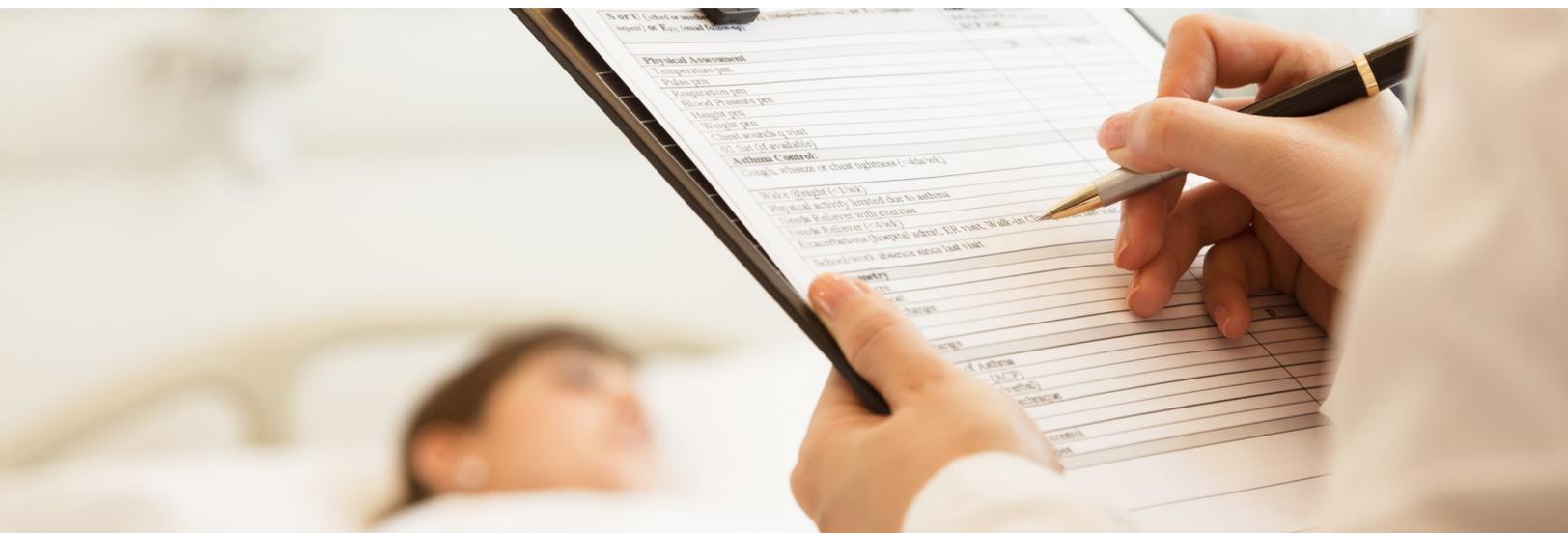
Asthma Health Care Utilization

Asthma emergency department (ED) visit rates and hospitalization rates over time

In 2015, asthma coding transitioned from ICD-9* to ICD-10. In this process, one of the asthma ICD-9 codes was translated to COPD in ICD-10. The decrease in asthma ED visits and hospitalizations from 2009 to 2018 is primarily attributable to the ICD-10 change. However, there has been a small decrease in ED visits from 2016 to 2018 (36 to 34).



*ICD stands for International Classification of Disease



Asthma ED visit rates by county, 2016–2018*

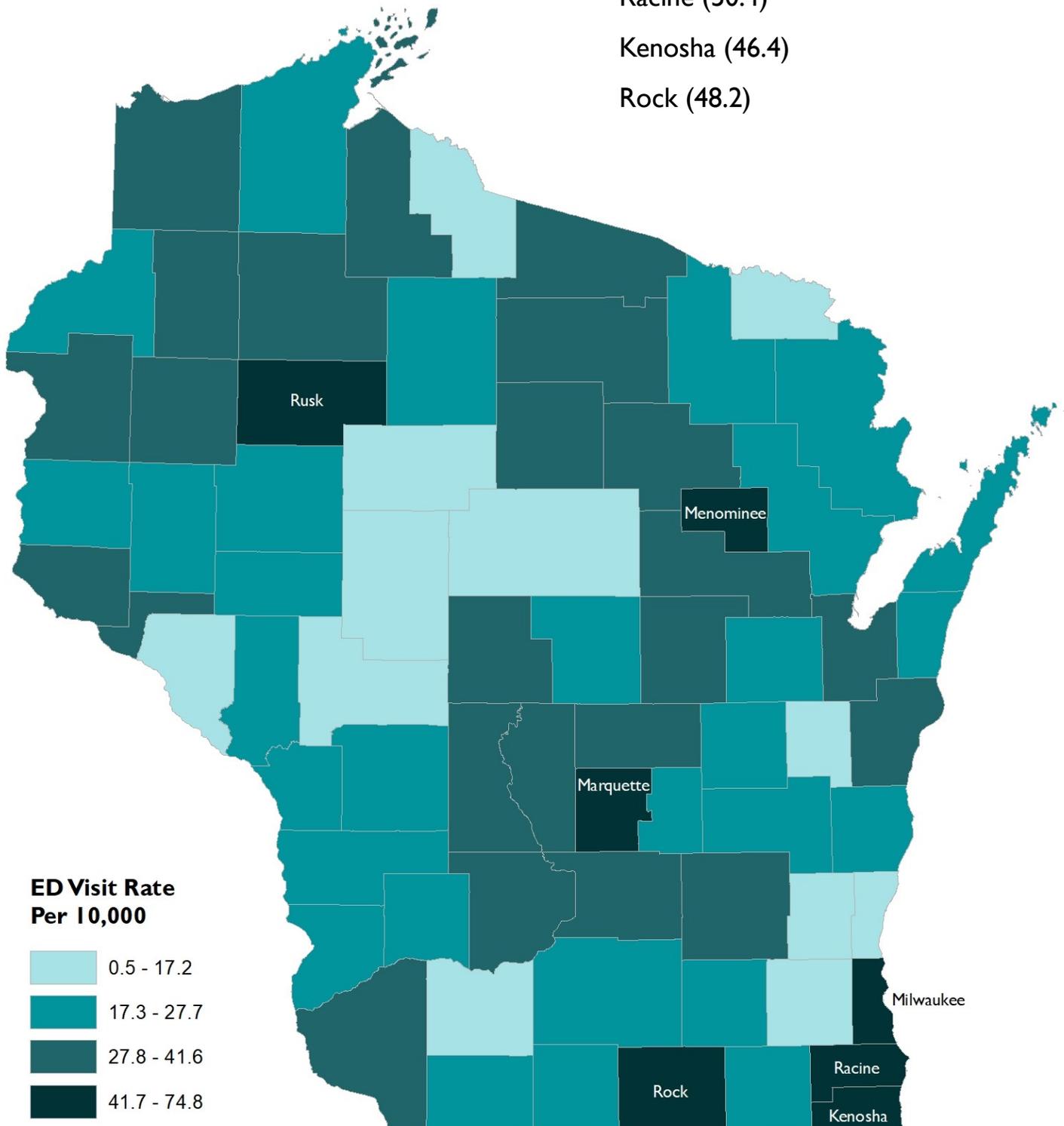
The counties with the highest rates in Wisconsin are: Milwaukee (74.8)

Menominee (60.6)

Racine (50.4)

Kenosha (46.4)

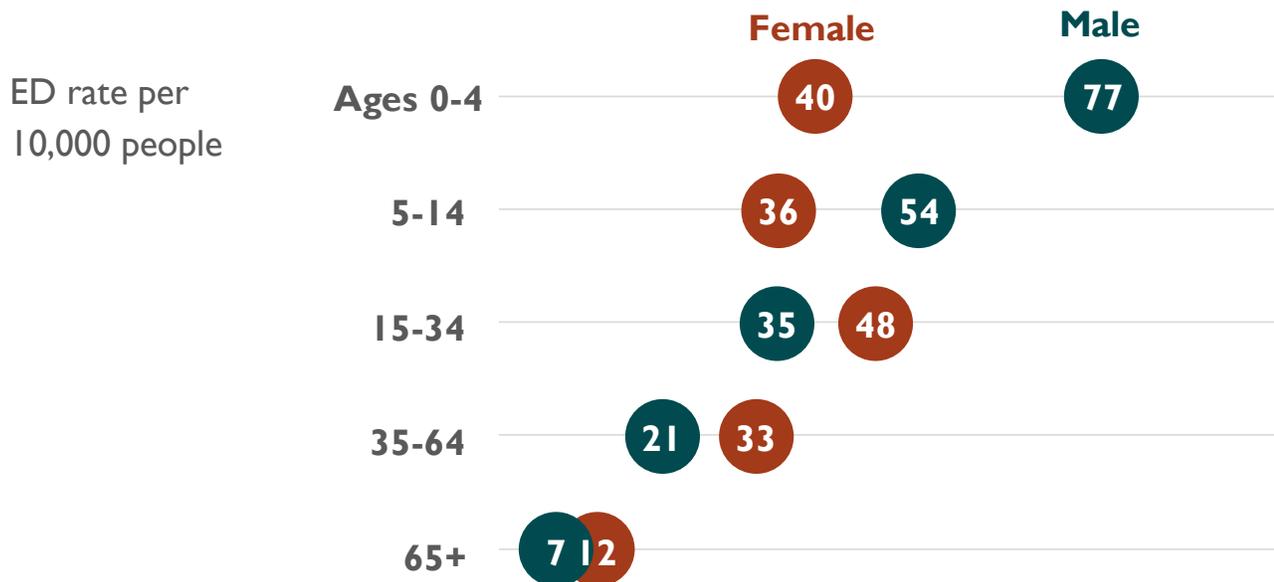
Rock (48.2)



*See appendix for table of county rates.

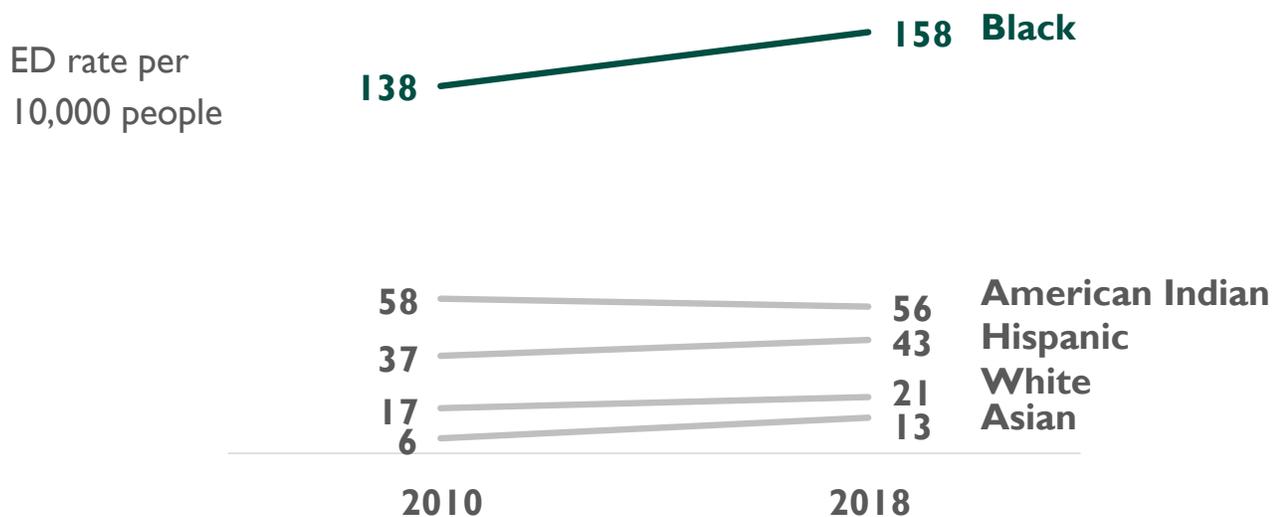
Asthma ED visit rates by age and sex, 2016–2018

Children under five years of age experience the highest asthma ED rates in Wisconsin, but there are differences in ED rates by sex in every age group. Among children under 15 years, males have higher ED rates. Among persons 15 years and older, females have higher rates.



Asthma ED visit rates by race and ethnicity, 2010–2018

Asthma ED rates have increased between 2010 and 2018 for each racial and ethnic group except for American Indians, which decreased slightly. Furthermore, the black population rate is almost **8 times higher** than the white rate. The American Indian rate is almost 3 times higher and the Hispanic rate is 2 times higher than the white rate.



Asthma hospitalization rates by county, 2016–2018*

The counties with the highest rates in Wisconsin are: Menominee (6.9)

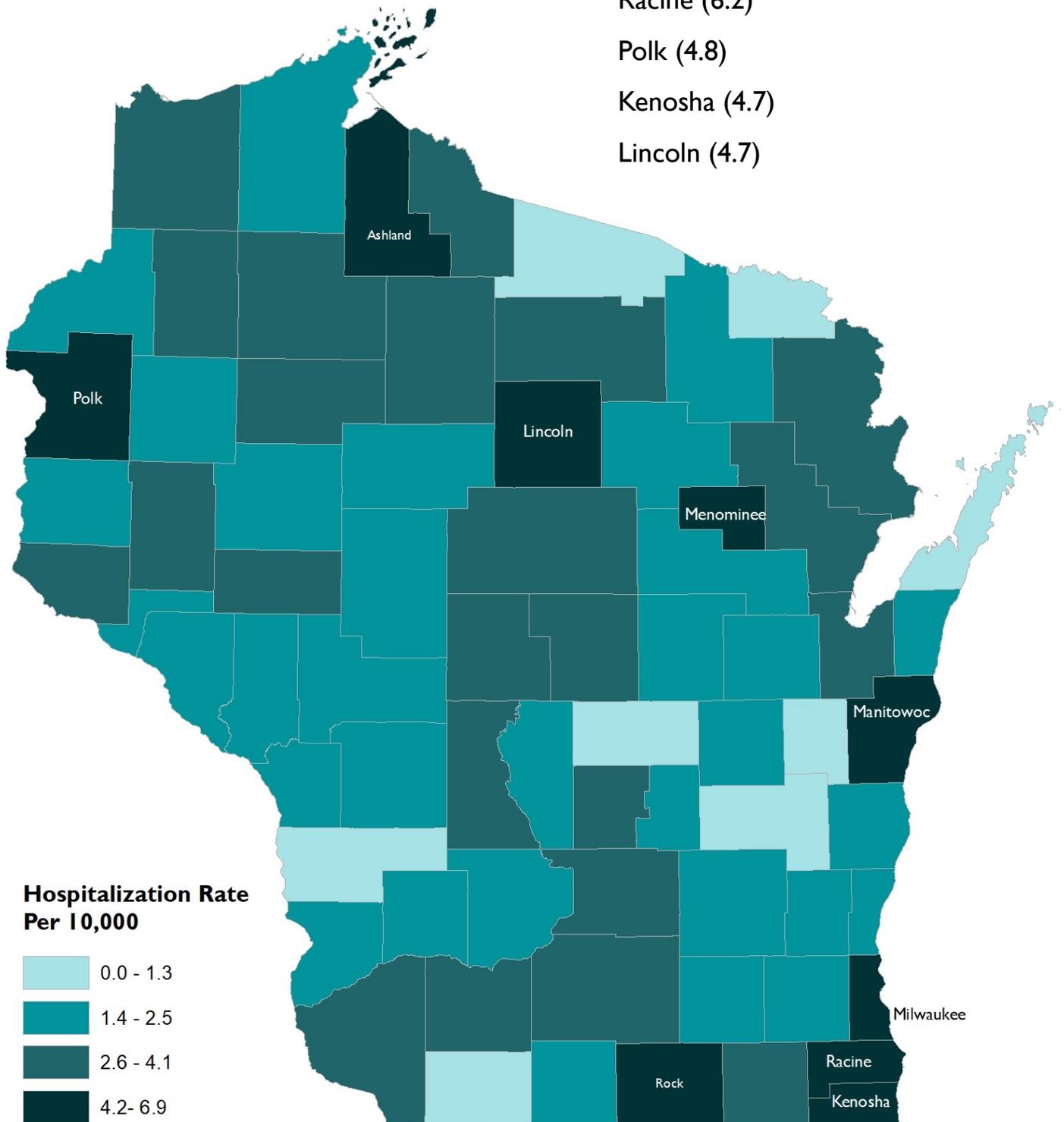
Milwaukee (6.7)

Racine (6.2)

Polk (4.8)

Kenosha (4.7)

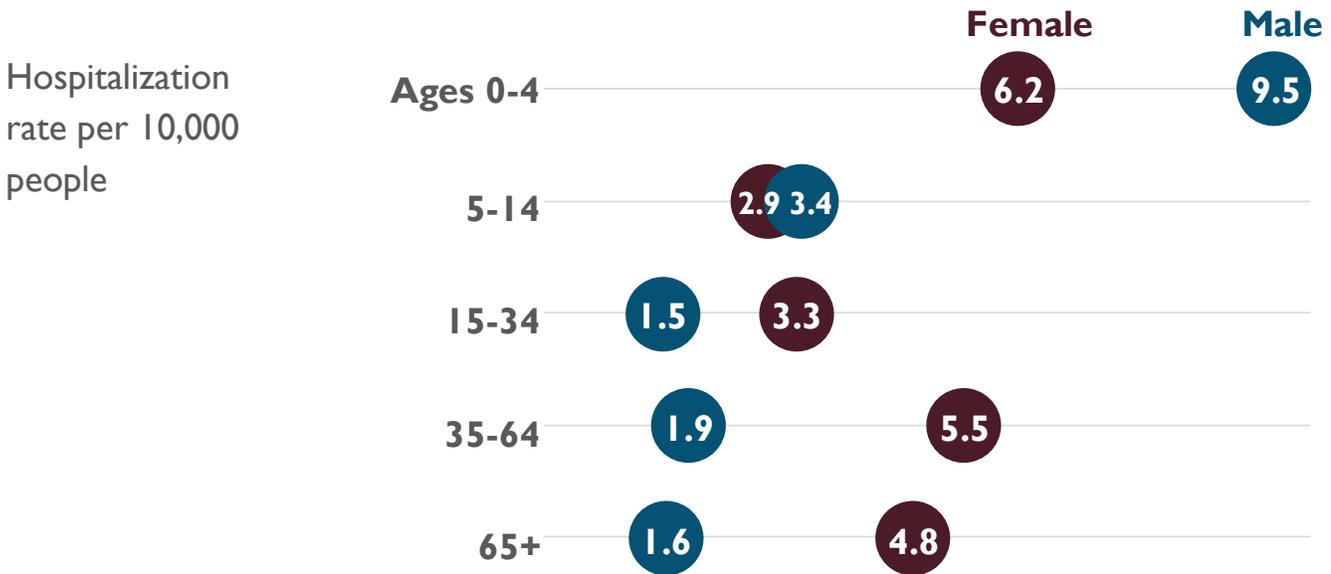
Lincoln (4.7)



*See appendix for table of county rates.

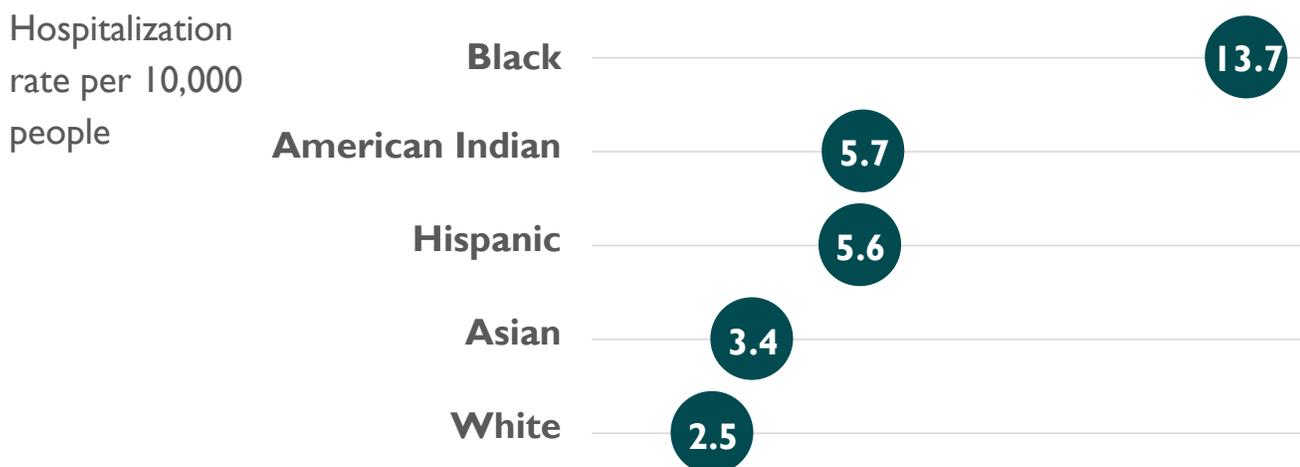
Hospitalization rates by age and sex, 2016–2018

Children under five years of age experience the highest asthma hospitalization rates in Wisconsin, and similar to ED rates, there are differences in hospitalization rates by sex in every age group. Among children under 15 years, males have higher hospitalization rates. Among persons 15 years and older, females have higher rates.



Hospitalization rates by race and ethnicity, 2016–2018

Similar to ED rates, there are significant racial and ethnic disparities within asthma hospitalization rates. The black population rate is more than **5 times higher** than the white rate. The American Indian and Hispanic rates are more than 2 times higher than the white rate.



Asthma Mortality

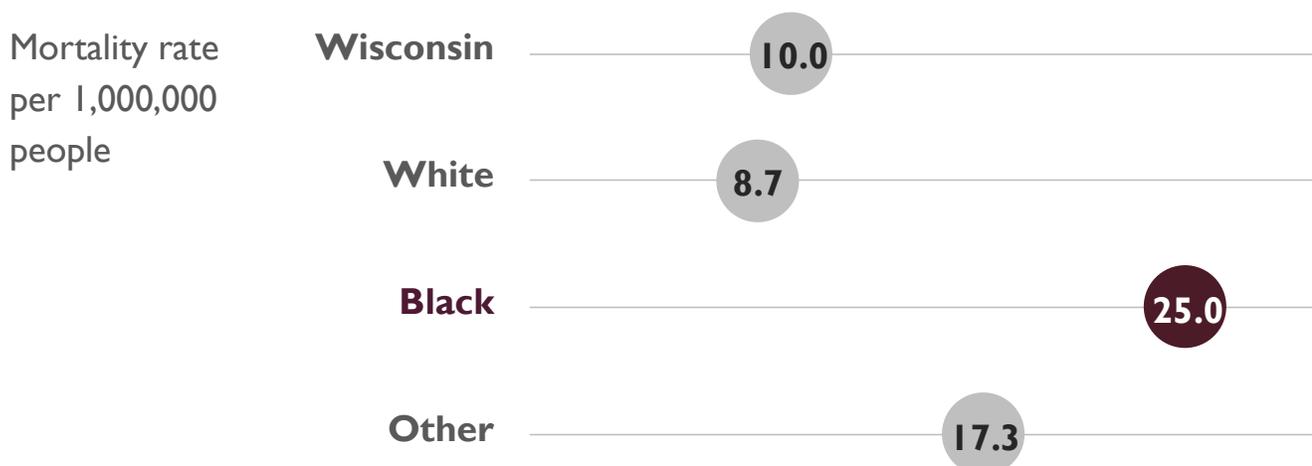
Asthma mortality over time

In Wisconsin, asthma mortality rates have decreased over time. From 2000 to 2018, the mortality fell from 16 to 10.6 deaths per one million.



Asthma mortality rates by race, 2015–2018

While we have seen a decrease in overall mortality rate, we still see large disparities by race. Black people were almost 3 times more likely to die from asthma than white people



Data Sources

Prevalence

US map from 2018 BRFSS US File

Wisconsin rates from BRFSS Core and BRFSS Asthma Call-Back Surveys

Youth e-cigarette use from Youth Tobacco Survey

Asthma Control

BRFSS Asthma Call-Back Survey

Health care Utilization

Wisconsin Inpatient and Emergency Department Visit files

Mortality

Wisconsin Vital Records

Appendix

Adjusted Asthma Emergency Department (ED) Visit Rates and 95% Confidence Intervals (CIs) for Wisconsin Counties and Overall State, 2016–2018

County	Number of ED Visits (2016-2018)	ED Visit Rate per 10,000 (95% CI)	ED Visit Rate County Rank
ADAMS	146	32.5 (27.1 - 38.8)	17
ASHLAND	141	32.1 (26.8 - 38.1)	21
BARRON	362	29.7 (26.7 - 33.1)	26
BAYFIELD	71	20.0 (15.3 - 25.8)	53
BROWN	2651	35.5 (34.1 - 36.9)	14
BUFFALO	51	13.2 (9.6 - 17.8)	70
BURNETT	100	27.7 (22.2 - 34.3)	32
CALUMET	216	15.5 (13.5 - 17.8)	66
CHIPPEWA	408	23.3 (21.0 - 25.7)	45
CLARK	158	15.8 (13.4 - 18.6)	65
COLUMBIA	509	32.9 (30.0 - 35.9)	16
CRAWFORD	107	23.9 (19.3 - 29.3)	43
DANE	2925	19.1 (18.4 - 19.8)	59
DODGE	798	33.6 (31.2 - 36.1)	15
DOOR	160	26.5 (22.4 - 31.2)	35
DOUGLAS	408	35.9 (32.4 - 39.7)	13
DUNN	236	19.4 (16.9 - 22.2)	55
EAU CLAIRE	732	25.0 (23.2 - 27.0)	40
FLORENCE*	1	0.5 (0.0 - 6.2)	72
FOND DU LAC	636	22.6 (20.8 - 24.4)	47
FOREST	48	22.1 (16.0 - 29.8)	48
GRANT	399	28.2 (25.4 - 31.3)	30
GREEN	246	25.1 (22.0 - 28.6)	39
GREEN LAKE	119	25.2 (20.7 - 30.4)	38
IOWA	109	17.2 (14.1 - 20.9)	62
IRON*	12	9.8 (4.8 - 18.7)	71
JACKSON	96	17.0 (13.7 - 21.0)	63
JEFFERSON	602	25.9 (23.8 - 28.1)	36
JUNEAU	295	41.6 (36.9 - 46.9)	8
KENOSHA	2330	48.4 (46.4 - 50.4)	4
KEWAUNEE	102	19.2 (15.5 - 23.5)	58
LA CROSSE	642	19.2 (17.7 - 20.9)	57
LAFAYETTE	100	21.8 (17.6 - 26.9)	49
LANGLADE	147	32.1 (26.9 - 38.1)	20
LINCOLN	229	32.5 (28.2 - 37.2)	18
MANITOWOC	669	32.4 (29.9 - 35.0)	19

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County	Number of ED Visits (2016-2018)	ED Visit Rate per 10,000 (95% CI)	ED Visit Rate County Rank
MARATHON	637	17.3 (15.9 - 18.7)	61
MARINETTE	267	27.0 (23.7 - 30.6)	34
MARQUETTE	172	47.1 (39.9 - 55.2)	7
MENOMINEE	76	60.6 (47.0 - 77.5)	2
MILWAUKEE	20741	74.8 (73.8 - 75.9)	1
MONROE	257	20.2 (17.7 - 22.9)	52
OCONTO	193	19.6 (16.8 - 22.8)	54
ONEIDA	256	31.5 (27.6 - 35.9)	23
OUTAGAMIE	1138	21.4 (20.2 - 22.7)	51
OZAUKEE	331	14.0 (12.5 - 15.6)	69
PEPIN	62	31.2 (23.6 - 40.8)	24
PIERCE	344	29.6 (26.5 - 33.1)	27
POLK	335	29.0 (25.9 - 32.4)	28
PORTAGE	409	21.6 (19.5 - 23.9)	50
PRICE	82	25.2 (19.7 - 31.9)	37
RACINE	2724	50.4 (48.5 - 52.4)	3
RICHLAND	101	23.4 (19.0 - 28.6)	44
ROCK	2153	48.2 (46.2 - 50.3)	5
RUSK	157	47.2 (39.8 - 55.6)	6
SAUK	493	28.2 (25.7 - 30.9)	31
SAWYER	144	39.1 (32.8 - 46.4)	10
SHAWANO	328	31.0 (27.6 - 34.7)	25
SHEBOYGAN	751	23.9 (22.2 - 25.7)	42
ST. CROIX	464	18.5 (16.8 - 20.3)	60
TAYLOR	80	14.9 (11.7 - 18.6)	67
TREMPEALEAU	155	19.3 (16.3 - 22.7)	56
VERNON	225	27.1 (23.5 - 31.1)	33
VILAS	187	36.8 (31.3 - 43.1)	12
WALWORTH	672	24.7 (22.8 - 26.7)	41
WASHBURN	155	38.0 (31.9 - 45.2)	11
WASHINGTON	503	14.2 (13.0 - 15.5)	68
WAUKESHA	1746	16.4 (15.6 - 17.2)	64
WAUPACA	535	39.6 (36.2 - 43.3)	9
WAUSHARA	163	28.6 (24.3 - 33.5)	29
WINNEBAGO	1095	22.8 (21.4 - 24.2)	46
WOOD	601	31.9 (29.3 - 34.6)	22
WI STATE OVERALL		34.8 (34.5 - 35.1)	

* Rates are based on less than 20 events and should be interpreted with caution.

Data Source: 2016-2018 Wisconsin Emergency Department Visit Files, Office of Health Informatics

Note: Asthma listed as the principal diagnosis (ICD-10 code J45). Rates also include Wisconsin residents who were seen in Minnesota and Iowa hospital emergency departments.

Age-Adjusted Asthma Hospitalization Rate and 95% Confidence Intervals (CIs) for Wisconsin Counties and Overall State, 2016–2018

County	Number of Hospitalizations (2016-2018)	Hospitalization Rate per 10,000 (95% CI)	Hospitalization Rate County Rank
ADAMS*	14	2.6 (1.3 - 4.9)	33
ASHLAND	22	4.6 (2.8 - 7.3)	7
BARRON	25	1.8 (1.2 - 2.8)	55
BAYFIELD*	8	2.2 (0.9 - 4.7)	48
BROWN	248	3.3 (2.9 - 3.7)	19
BUFFALO*	10	2.4 (1.1 - 4.8)	43
BURNETT*	10	2.6 (1.1 - 5.1)	34
CALUMET*	7	0.5 (0.2 - 1.0)	71
CHIPPEWA	46	2.2 (1.6 - 3.0)	49
CLARK	25	2.2 (1.4 - 3.4)	47
COLUMBIA	46	2.9 (2.1 - 3.9)	24
CRAWFORD*	12	1.9 (0.9 - 3.8)	53
DANE	608	4.2 (3.8 - 4.5)	10
DODGE	62	2.5 (1.9 - 3.3)	36
DOOR*	11	1.0 (0.4 - 2.2)	67
DOUGLAS	42	3.5 (2.5 - 4.8)	16
DUNN	38	3.2 (2.3 - 4.5)	20
EAU CLAIRE	118	3.9 (3.2 - 4.7)	11
FLORENCE*	0	0.0	72
FOND DU LAC	32	1.0 (0.6 - 1.4)	68
FOREST*	4	1.6 (0.4 - 4.7)	62
GRANT	37	2.9 (2.0 - 4.0)	26
GREEN	24	2.3 (1.4 - 3.5)	44
GREEN LAKE*	8	1.5 (0.6 - 3.2)	63
IOWA*	19	2.7 (1.6 - 4.4)	32
IRON*	4	2.9 (0.8 - 9.4)	25
JACKSON*	10	1.7 (0.8 - 3.3)	60
JEFFERSON	49	2.0 (1.4 - 2.7)	52
JUNEAU	29	3.8 (2.5 - 5.6)	12
KENOSHA	238	4.7 (4.1 - 5.3)	6
KEWAUNEE*	15	2.5 (1.4 - 4.4)	38
LA CROSSE	52	1.6 (1.2 - 2.2)	61
LAFAYETTE*	3	0.5 (0.1 - 1.9)	70
LANGLADE*	11	2.4 (1.2 - 4.5)	42
LINCOLN	32	4.7 (3.1 - 6.7)	5
MANITOWOC	99	4.5 (3.6 - 5.6)	9
MARATHON	146	3.7 (3.1 - 4.4)	14
MARINETTE	37	3.7 (2.6 - 5.3)	13

Continued on next page

County	Number of Hospitalizations (2016-2018)	Hospitalization Rate per 10,000 (95% CI)	Hospitalization Rate County Rank
MARQUETTE*	12	3.5 (1.7 - 6.3)	17
MENOMINEE*	10	6.9 (3.1 - 14.5)	1
MILWAUKEE	1873	6.7 (6.4 - 7.0)	2
MONROE	25	1.8 (1.1 - 2.7)	57
OCONTO	28	2.8 (1.8 - 4.1)	30
ONEIDA	27	2.8 (1.8 - 4.3)	29
OUTAGAMIE	101	1.8 (1.4 - 2.2)	58
OZAUKEE	47	1.7 (1.2 - 2.3)	59
PEPIN*	4	2.1 (0.6 - 6.0)	50
PIERCE	33	2.8 (1.9 - 4.0)	31
POLK	62	4.8 (3.6 - 6.3)	4
PORTAGE	47	2.8 (2.0 - 3.8)	28
PRICE*	15	3.6 (1.8 - 6.6)	15
RACINE	362	6.2 (5.6 - 6.9)	3
RICHLAND*	13	2.5 (1.3 - 4.6)	35
ROCK	212	4.5 (3.9 - 5.2)	8
RUSK*	12	3.2 (1.5 - 5.9)	22
SAUK	44	2.4 (1.7 - 3.3)	39
SAWYER*	13	3.2 (1.7 - 5.8)	21
SHAWANO	27	2.4 (1.6 - 3.6)	41
SHEBOYGAN	85	2.5 (2.0 - 3.2)	37
ST. CROIX	39	1.5 (1.1 - 2.1)	64
TAYLOR*	12	2.0 (1.0 - 3.7)	51
TREMPEALEAU*	17	1.9 (1.1 - 3.2)	54
VERNON*	7	0.5 (0.2 - 1.3)	69
VILAS*	12	1.4 (0.6 - 3.0)	65
WALWORTH	82	3.0 (2.3 - 3.7)	23
WASHBURN	21	2.9 (1.7 - 5.0)	27
WASHINGTON	91	2.2 (1.8 - 2.8)	46
WAUKESHA	285	2.3 (2.0 - 2.6)	45
WAUPACA	35	2.4 (1.7 - 3.4)	40
WAUSHARA*	9	1.3 (0.5 - 2.6)	66
WINNEBAGO	90	1.8 (1.4 - 2.2)	56
WOOD	70	3.4 (2.6 - 4.3)	18
WI STATE OVERALL		3.6 (3.5 - 3.7)	

* Rates are based on less than 20 events and should be interpreted with caution.

Data Source: 2016-2018 Wisconsin Hospitalization Department Visit Files, Office of Health Informatics

Note: Asthma listed as the principal diagnosis (ICD-10 code J45). Rates also include Wisconsin residents who were seen in Minnesota and Iowa hospital emergency departments.

For more information

Visit: [Asthma Program webpage](#)

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Citation: Asthma in Wisconsin 2020. Wisconsin Department of Health Services, Division of Public Health, Wisconsin Asthma Program.

