SURVEILLANCE BRIEF

Wisconsin Environmental Public Health Tracking Program

COPD MORBIDITY AND MORTALITY IN WISCONSIN

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SUMMARY — Chronic obstructive pulmonary disease (COPD) is a group of lung diseases that makes it difficult to breathe. Cigarette smoking is the primary risk factor for developing COPD. COPD emergency department visit rates in Wisconsin show disparities by sex and race, with higher rates among Black, American Indian/Alaska Native, and female populations. Key prevention strategies include not smoking and avoiding lung irritants. Additional data on COPD are available on the Wisconsin Environmental Public Health Tracking Portal.

BACKGROUND

Chronic obstructive pulmonary disease (COPD) is a group of lung diseases, including chronic bronchitis, emphysema, and small airways disease. COPD symptoms include shortness of breath, cough, wheezing, and chest tightness. Cigarette smoking is the primary cause of COPD. While smoking causes 85-90% of COPD cases,[1] other causes include exposure to dust and smoke, asthma, respiratory infections, and a genetic condition called α1-antitrypsin deficiency. People over age 65 are more likely to have COPD than other age groups.[2]

Chronic lower respiratory disease, including COPD, was the fourth leading cause of death in the U.S. in 2019.[3] Changes in smoking prevalence rates impact COPD rates. Smoking prevalence has declined considerably after 1965; prevalence rates in 2010 were one-half the rates of 1965.[4] This may have contributed to reductions in COPD hospitalization rates in men and women in the U.S. during 1999–2010.[4] COPD age-adjusted mortality rates also decreased during 2000–2014 by 22.5% and 3.8% for men and women, respectively, with little clarity on the smaller decline for women.[5]

COPD burden is not distributed equally among populations, and there are notable disparities by sex, race, and ethnicity in the U.S. COPD prevalence rates were significantly higher in females than males during 1998–2009.[6] Furthermore, the crude rate of COPD mortality significantly increased for women during 2000–2014.[5] Disparities by race also persist: COPD is more likely to affect American Indians/Alaska Natives and multiracial non-Hispanics.[2] Blacks are at greater risk of undiagnosed COPD than non-Hispanic whites.[7] The age-adjusted mortality rate among Black men decreased 24.3% during 2000–2014, but the age-adjusted rate for Black women increased 4.2% during this period.[5]

The purpose of this analysis was to describe the burden of COPD morbidity and mortality in Wisconsin by sex, age, and race, prior to the COVID-19 pandemic.

METHODS

Hospitalization and emergency department (ED) data for this brief were obtained from the Wisconsin Department of Health Services' Office of Health Informatics' hospital discharge files. The Centers for Disease Control and Prevention's (CDC's) National Environmental Public Health Tracking Network has developed standard indicators for health outcomes associated with COPD, including hospitalizations, ED visits, and mortality.

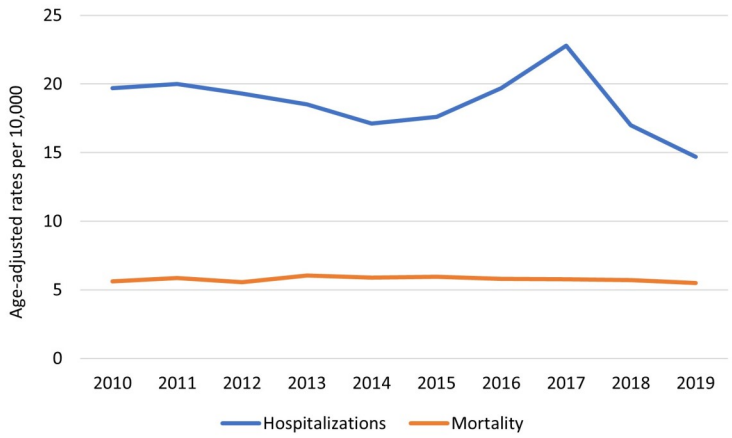
COPD hospitalizations and ED visits during 2010–2019 for Wisconsin residents were identified using the Tracking Program's indicator template. Cases included hospitalizations and ED visits among patients aged 25 years and older with a primary diagnosis of International Classification of Diseases (ICD)-9-Clinical Modification (CM) codes 490, 491, 492, 496, or 493.2 during 2010–September 2015 and a primary diagnosis of ICD-10-CM codes J40-J44 during October 2015–2019.

Death data were obtained from the National Center for Health Statistics. COPD mortality data during 2010–2019 included records in which COPD (ICD-9-CM codes J40-J44) was listed as an underlying cause of death in death certificates. Overall age-adjusted and sex- and race-stratified COPD ED visit and mortality rates for all health outcomes were calculated. Data were age-adjusted using the U.S. 2000 population standard.

RESULTS

During 2010–2019, there was an annual average of 8,540 COPD hospitalizations in Wisconsin. The rate of COPD hospitalizations decreased while mortality remained stable over time (Figure 1).

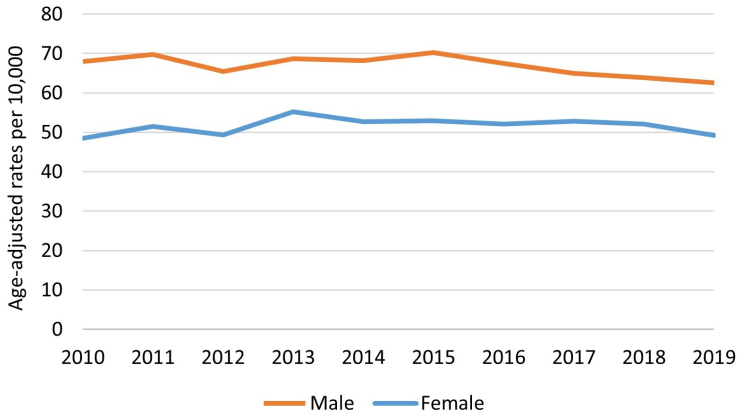
FIGURE 1. Wisconsin COPD hospitalization and mortality age-adjusted rates per 10,000 persons aged 25 years and older, 2010-2019



The rate of COPD hospitalizations decreased while mortality in Wisconsin has remained stable over time.

While the overall age-adjusted rate of COPD mortality in Wisconsin remained stable over the last decade, there were disparities in rates when stratifying by sex as shown in Figure 2. These disparities are likely related to differences in smoking prevalence between the groups; in 2020, 14.1% of men in the United States smoked, compared with 11% of women.[11] The COPD mortality rate for men decreased from 68 to 62.5 per 100,000 population, while the rate for women remained relatively stable during this period.

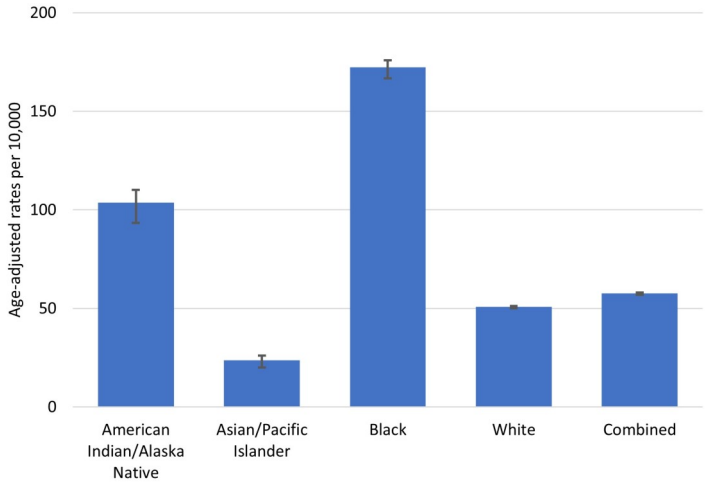
FIGURE 2. Wisconsin COPD age-adjusted mortality rates by sex per 10,000 persons aged 25 years and



Wisconsin's COPD mortality rate for men declined in the last decade, but the rate for women remained relatively stable.

The number of COPD ED visits increased by 23% in 2016 compared to 2014 as a result of the ICD-CM coding transition which occurred in late 2015. Persons aged 65-84 years comprised the largest percentage of ED visits (41% of cases). In 2019, the age-adjusted rates of COPD ED visits by race were statistically significantly higher for Black and American Indian/Alaska Native (AI/AN) populations compared to white and Asian/Pacific Islander populations: 172.4 and 103.7 per 10,000 vs. 50.7 and 23.7 per 10,000, respectively (Figure 3).

FIGURE 3. Wisconsin COPD emergency department age-adjusted rates by race per 10,000 persons aged 25 years and older, 2019



Significant disparities exist in COPD emergency department visit rates by race in Wisconsin. This trend is also found in hospitalization rates.

HEALTH EQUITY IMPLICATIONS

These data show that Wisconsinites who are white or Asian/Pacific Islander are at significantly lower risk of going to the emergency room with COPD than Wisconsinites who are American Indian/Alaska Native or Black. The existence of such disparities demonstrates one way that social factors such as race impact individual, community, and population level health outcomes (in this case, rates of COPD).

Smoking rates reflect similar patterns of inequity, and are likely a factor in creating the disparity observed in COPD rates. According to the CDC, smoking rates are higher among the same racial groups affected by higher rates of COPD. Smoking rates are also higher in all historically marginalized communities, such as people who live in poverty, members of the LGBTQ community, and people with disabilities.[10] Smoking as a behavioral risk factor for COPD should be viewed in the context that influences that behavior, and measures can be taken to change that context to create better health outcomes.[11] For example, low-income communities experience high levels of pressure due to limited resources; tobacco companies exploit this stress by advertising to youth and discounting prices in low-income neighborhoods.[12] Forces like these push people toward commercial tobacco use. Similarly, living in the Midwest makes Wisconsinites more likely to smoke than people in most other regions of the U.S. due to our region's less restrictive tobacco policies. Some strategies to reduce disparities that have worked in other contexts and would likely improve COPD rates and smoking cessation in Wisconsin include:

- Identifying and reducing barriers to healthcare.[11]
- Engaging in community-wide policy or systemic changes to reduce structural discrimination. [11]
- Improving the availability, accessibility, and effectiveness of cessation services for populations affected by smoking-related disparities.[13]
- Raising tobacco taxes and increasing funding for tobacco control. Since they are sovereign nations, Wisconsin's tribes can choose to enact their own policies to reduce non-ceremonial smoking rates and protect people from secondhand smoke exposure.[13]

The CDC has created a comprehensive guide providing best practices for health equity in tobacco cessation.

COPD PREVENTION

- Don't smoke. The best way to prevent COPD is to not start smoking or to quit. If you are already a smoker, quitting with the assistance of a smoking cessation program can help.
- Avoid exposure to lung irritants. Exposure over time to secondhand smoke, air pollution, and chemical fumes can increase the risk of developing COPD. Wear protective gear in workplaces with chemicals and dust when possible.

For additional prevention strategies, please reference the COPD Ideas for Taking Action resource.

CONCLUSION

Over the last decade, COPD hospitalization rates in Wisconsin have generally declined while COPD ED rates have increased. Disparities in these trends exist by sex and race. For example, COPD mortality rates have declined among males but have remained stable among females. Rates of COPD ED visits in 2019 showed disparities by race, including a three-fold higher rate among the Black population. Caution should be taken when interpreting temporal trends since shifts in ICD coding have notably impacted ED counts. Surveillance of COPD is important to understanding trends and disparities in the disease and can inform prevention messaging about tobacco cessation.

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ABOUT TRACKING

The Wisconsin Environmental Public Health Tracking Program is your source for environmental public health data on Wisconsin communities. Explore the data at dhs.wisconsin.gov/epht.

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