

# Parkinson's Disease in Ohio

## December 2022

### Introduction

Parkinson's disease (PD) is the second-most common neurodegenerative disorder in the United States after Alzheimer's disease. A neurodegenerative disorder is a type of disease in which cells of the central nervous system stop working or die. PD is a type of movement disorder that happens when nerve cells in the brain do not produce enough dopamine. The precise cause of PD is unknown, but some cases are hereditary while others are thought to occur from a combination of genetics and environmental factors.

PD's effects on the central nervous system are both chronic and progressive. By the time a diagnosis is made, PD has typically already progressed to a point where people have difficulty controlling the movement of their bodies due to tremors, slowness of movement and reflexes, stiffness in their limbs or the trunk of their body, and impaired balance. As these symptoms progress, walking, talking, swallowing, and completing other simple tasks can become challenging. In addition to these motor-related symptoms, non-motor symptoms such as cognitive impairment, mood and behavioral problems, sleep disorders, and constipation can significantly impair quality of life.

Over time, as the disease progresses, some people may develop dementia and be diagnosed with Parkinson's dementia, a type of Lewy body dementia in which clumps of proteins called Lewy bodies appear in the nerve cells of the brain. The time from the onset of movement symptoms to the onset of dementia symptoms varies greatly from person to person. People with Parkinson's dementia may have severe memory and thinking problems that affect daily living. Dementia is a leading reason for people with PD to transition from independent living at home to long-term care facilities.

### Prevalence

It is difficult to know exactly how many people have PD because there is no national registry or data collection system. The Parkinson's Foundation estimates that nearly one million people in the United States (30,000 in Ohio) are living with PD, which is more than the number of people diagnosed with multiple sclerosis, muscular dystrophy, and Lou Gehrig's disease (or Amyotrophic Lateral Sclerosis) combined. Nearly 90,000 people in the U.S. are diagnosed with PD each year, according to a 2022 Parkinson's Foundation-backed study.

### Key Findings

- Parkinson's disease claimed the lives of 1,651 Ohioans in 2020, at a death rate (10.8 per 100,000 population) that was 9% higher than the U.S. rate (9.9 per 100,000).
- Men accounted for nearly 59% of Parkinson's disease deaths in Ohio in 2020.
- White Ohioans had more than double the death rate for Parkinson's disease in 2020 compared with Black Ohioans.
- Death rates for Parkinson's disease in Ohio increased 50% from 2011 to 2020.

## Deaths by Sex and Race

**Table 1. Number and Age-adjusted Rates of Parkinson's Disease Deaths per 100,000 by Sex and Race, Ohio and the United States, 2020**

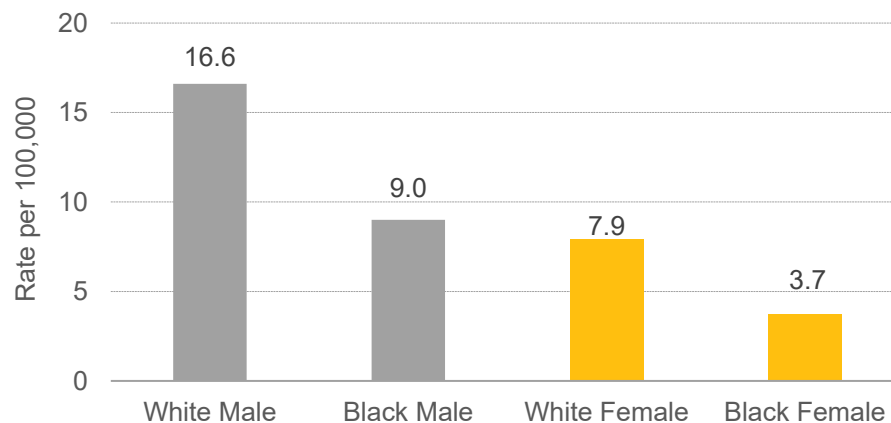
|              |                        | Ohio Deaths | Ohio Rate | U.S. Rate |
|--------------|------------------------|-------------|-----------|-----------|
| <b>Total</b> |                        | 1,651       | 10.8      | 9.9       |
| <b>Sex</b>   | Male                   | 972         | 15.7      | 14.5      |
|              | Female                 | 679         | 7.4       | 6.6       |
| <b>Race</b>  | White                  | 1,566       | 11.4      | 10.6      |
|              | Black                  | 78          | 5.5       | 5.5       |
|              | Asian/Pacific Islander | 4           | *         | 5.8       |

Source: Bureau of Vital Statistics, Ohio Public Health Data Warehouse, Ohio Department of Health, 2022; CDC WONDER, 2022.

\*Rate not calculated when the number of deaths is less than 10.

PD was ranked as the 13<sup>th</sup> leading cause of death in Ohio in 2020. In Ohio, there were 1,651 deaths due to PD as the underlying cause of death in 2020. (Table 1). Ohio's age-adjusted death rate of PD (10.8 per 100,000 population) was 9% higher than the U.S. rate (9.9 per 100,000). More males (972) died of PD than females (679), and white Ohioans had a higher death rate (11.4 per 100,000) from PD than Black Ohioans (5.5 per 100,000).

**Figure 1. Death Rates of Parkinson's Disease per 100,000 by Sex/Race Group, Ohio, 2020**

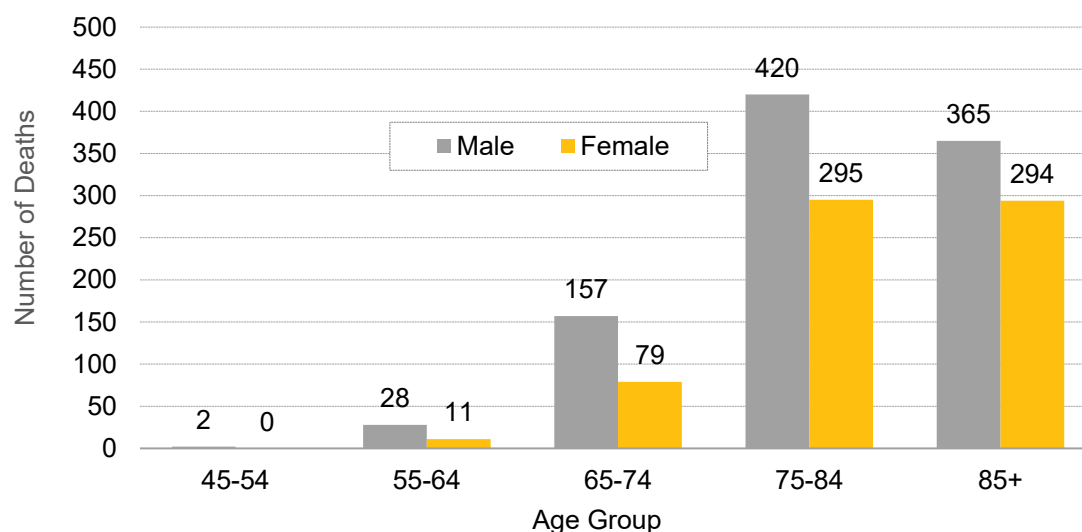


Source: Bureau of Vital Statistics, Ohio Public Health Data Warehouse, Ohio Department of Health, 2022.

White males had the highest PD death rate in Ohio (16.6 per 100,000) in 2020 (Figure 1). Black females had the lowest death rate (3.7 per 100,000) of the four sex/race groups.

## Deaths by Sex and Age Group

Figure 2. Number of Parkinson's Disease Deaths by Sex and Age Group, Ohio, 2020

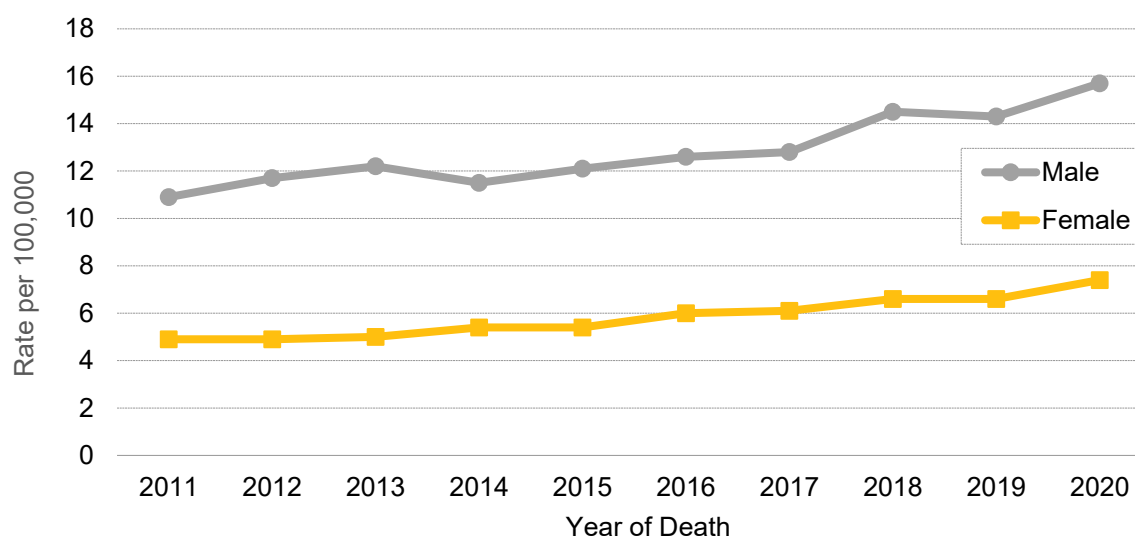


Source: Bureau of Vital Statistics, Ohio Public Health Data Warehouse, Ohio Department of Health, 2022.

Men and women 75-84 years old had the highest number of deaths from PD in Ohio in 2020, followed by those 85 years old and older (Figure 2).

## Mortality Trends by Sex

Figure 3. Trends in Parkinson's Disease Death Rates by Sex and Year, Ohio, 2011-2020



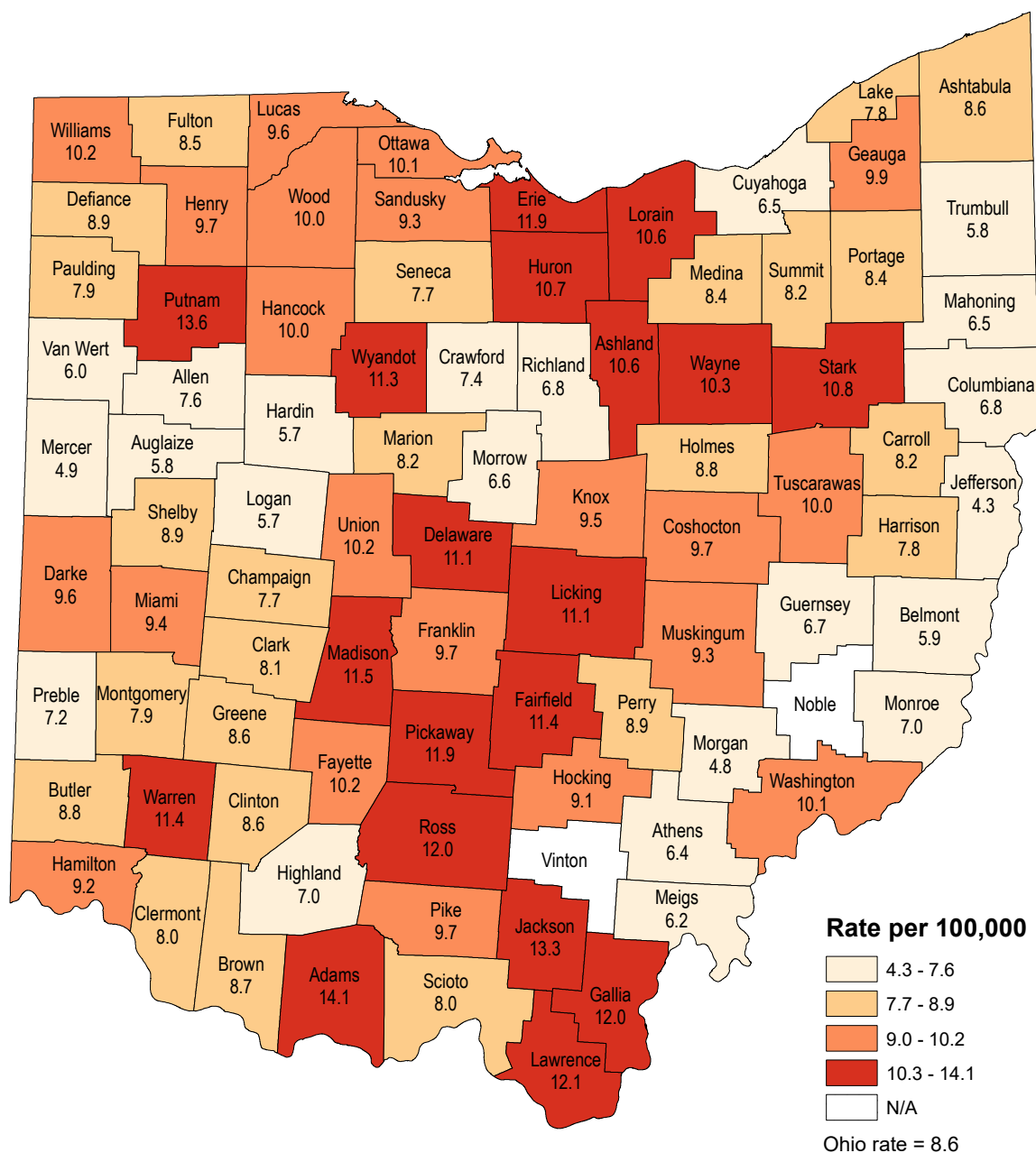
Source: Bureau of Vital Statistics, Ohio Public Health Data Warehouse, Ohio Department of Health, 2022.

PD death rates increased in Ohio 50% overall, 44% among males, and 51% among females from 2011 to 2020 (Figure 3). This trend is partly due to aging of the population; however, reasons remain unclear.

## Mortality Rates by County

PD death rates in Ohio during the 10-year period 2011-2020 are shown by county in Figure 4. The county with the highest death rate (Adams County, 14.1 per 100,000) had a rate more than three times higher than the county with the lowest rate (Jefferson County, 4.3 per 100,000).

**Figure 4. Average Annual Age-adjusted Parkinson's Disease Death Rates per 100,000 by County, Ohio, 2011-2020**



Source: Bureau of Vital Statistics, Ohio Public Health Data Warehouse, Ohio Department of Health, 2022.

N/A: Rate not calculated when the death count for 2011-2020 is less than 10.

## Signs and Symptoms

PD has four main symptoms:

1. Tremor in hands, arms, legs, jaw, or head.
2. Muscle stiffness, where muscle remains contracted for a long time.
3. Slowness of movement.
4. Impaired balance and coordination, sometimes leading to falls.

Other symptoms may include:

- Depression and other emotional changes.
- Difficulty swallowing, chewing, and speaking.
- Urinary problems or constipation.
- Skin problems.

There is no specific test for PD, so it can be difficult to diagnose. Doctors use a medical history and a neurological examination to diagnose it.

## Risk Factors

**Age:** Most people diagnosed with PD have a late-onset form of the disease, which does not have a clear genetic cause.

**Genetics:** Early-onset PD, defined as beginning before age 50, accounts for 2-10% of cases. This form may have a genetic cause.

**Pesticides:** Pesticides, including paraquat, maneb, ziram, benomyl, and several organophosphate pesticides, including diazinon and chlorpyrifos, contribute to PD onset and progression.

**Environmental toxicants:** Environmental toxicants could cause stress and damage to cells, triggering inflammation in the brainstem. These exposures could impair mitochondria, the structures within cells responsible for producing energy, and accelerate aging in the brain. Toxicant exposure may also trigger widespread accumulation of a misfolded version of protein called alpha-synuclein, which is toxic to nerve cells and a hallmark of PD.

**Head Injuries:** Studies indicate that head injuries could contribute to PD through the death of dopaminergic neurons.

## Costs

The National Institute of Neurological Disorders and Stroke (NINDS), part of the National Institutes of Health (NIH), indicates that in the United States alone, the cost of treating PD is estimated to be \$14 billion annually. Indirect costs, such as those associated with the loss of productivity, are conservatively estimated to total \$6.3 billion each year. As the U.S. population ages, these figures are expected to rise rapidly. The number of people diagnosed with PD in the United States is expected to double by 2040.

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## Technical Notes

**Age-Adjusted Rate:** A summary rate that is a weighted average of age-specific rates, where the weights represent the age distribution of a standard population (direct adjustment). The mortality rates presented in this report were standardized to the age distribution of the 2000 U.S. Standard Population. Under the direct method, the population was first divided into 11 age groups, i.e., <1, 1-4, 5-14, 15-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, and 85+, and the age-specific rate was calculated for each age group. Each age-specific rate was then multiplied by the standard population proportion for the respective age group.

**Mortality:** The number of deaths during a specified time period (e.g., 2020). Parkinson's disease deaths were defined by the International Classification of Diseases, 10th Revision (ICD-10) underlying cause-of-death codes: G20-G21. Ohio mortality data can be publicly accessed through the Ohio Public Health Data Warehouse, available at: <http://publicapps.odh.ohio.gov/EDW/DataBrowser/Browse/Mortality>.

**Population Data for Calculating Rates:** Rates were calculated using population estimates from the U.S. Census Bureau and National Center for Health Statistics. Population data were compiled from vintage 2020 bridged-race postcensal population estimates for July 1, 2010-July 1, 2020 (released 9/22/2021).

**Prevalence:** The number/percentage of existing cases of a disease, condition, or risk factor in the population during a specific time period.

**Rate:** The number of cases or deaths per unit of population (e.g., per 100,000 persons) during a specified time period (e.g., 2020). For mortality, rates may be unstable and are not presented when the count is less than 10.

## Sources of Information

Medline Plus: <https://medlineplus.gov/parkinsonsdisease.html>

National Institute on Aging: <https://www.nia.nih.gov/health/parkinsons-disease>

National Institute of Environmental Sciences (NIEHS):  
<https://www.niehs.nih.gov/health/topics/conditions/parkinson/>

National Institute of Neurological Disorders and Stroke: <https://www.ninds.nih.gov/health-information/disorders/parkinsons-disease>

The Michael J. Fox Foundation for Parkinson's Research: <https://www.michaeljfox.org/>

Parkinson's Foundation: <https://www.parkinson.org/>

## Acknowledgements

### Ohio Department of Health

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## Suggested Citation

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