

# Study finds pesticide use linked to Parkinson's in Rocky Mountain, Great Plains region

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Pesticides and herbicides used in farming have been linked to Parkinson's disease in the Rocky Mountain and Great Plains region of the country, according to a preliminary study released today, February 27, 2024, that will be presented at the American Academy of Neurology's [76th Annual Meeting](#) taking place April 13–18, 2024, in

person in Denver and online.

"We used geographic methods to examine the rates of Parkinson's disease across the United States and compared those rates to regional levels of pesticide and herbicide use," said study author Brittany Krzyzanowski, Ph.D., of Barrow Neurological Institute in Phoenix, Arizona.

"Our methods enabled us to identify parts of the nation where there was a relationship between most [pesticides](#) and Parkinson's disease and subsequently pinpoint where the relationship was strongest so we could explore specific pesticides in that region. In the Rocky Mountain and Great Plains region, we identified 14 pesticides associated with Parkinson's disease."

Krzyzanowski said the region included parts of Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah and Wyoming.

The study involved review of records from the 21.5 million people enrolled in Medicare in 2009 to determine the rate of Parkinson's disease for various regions across the country. The researchers then looked for a possible relationship between these rates of Parkinson's and the use of 65 pesticides.

They found that the pesticides and herbicides simazine, atrazine and lindane had the strongest relationship with Parkinson's disease. When researchers divided counties into 10 groups based on exposure to pesticides, people living in the counties with the highest amount of application of the herbicide simazine were 36% more likely to have Parkinson's disease than people living in the counties with the lowest amount of exposure.

In the counties with the highest exposure to simazine, 411 new Parkinson's disease cases developed per every 100,000 people compared to 380 cases in the counties with the lowest exposure.

For the herbicide atrazine, those exposed to the highest amount were 31% more likely to have Parkinson's disease than those with the lowest exposure. For the insecticide lindane, those with the most exposure were 25% more likely to have the disease.

In the counties with the highest exposure to atrazine, 475 new Parkinson's disease cases developed per every 100,000 people compared to 398 cases in the counties with the lowest exposure. In the counties with the highest exposure to lindane, 386 new Parkinson's disease cases developed per every 100,000 people compared to 349 cases in the counties with the lowest exposure.

The results remained the same when researchers adjusted for other factors that could affect the risk of Parkinson's disease, such as air pollution exposure.

"It's concerning that previous studies have identified other pesticides and [herbicides](#) as potential risk factors for Parkinson's, and there are hundreds of pesticides that have not yet been studied for any [relationship](#) to the disease," Krzyzanowski said. "Much more research is needed to determine these relationships and hopefully to inspire others to take steps to lower the risk of disease by reducing the levels of these pesticides."

A limitation of the study was that it relied on the use of county-level estimates since person-level information on pesticide exposure was not available for the study population.

Provided by American Academy of Neurology

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