

No Surge in Silicosis

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Key Findings:

- The rate of silicosis diagnoses per year has declined, from eight per million patients in 2017 to six per million in 2023.
- New silicosis diagnosis rates between January 2017 and July 2023 were highest in West Virginia, New Mexico, and Nevada, at 154.5, 150.9, and 90.9 per million patients, respectively.
- The most common demographics diagnosed with silicosis between January 2017 and July 2023 were males (44.5 per million) and those living in rural areas (49.1 per million).

Silicosis is a respiratory condition that is typically caused by inhaling fine silica particles in industries like construction, mining, manufacturing, and stone countertop finishing and installation.¹ Because the condition often results in permanent lung damage and can be disabling, the Occupational Safety and Health Administration (OSHA) has required employers to take steps to mitigate potential risks for silicosis since 1970.² It has recently been reported that silicosis is on the rise in the countertop industry in California.³

In response, we examined whether there has been a year-over-year change in silicosis diagnoses throughout the United States. We evaluated 129 million patients, of whom 3,014 were newly diagnosed with silicosis, between January 1, 2017, and July 31, 2023, for trends in diagnosis rates over time. In 2017, patients were newly diagnosed with silicosis at a rate of 8 per million patients. That rate fluctuated slightly over the following years and is 6 per million in 2023.

Annual Silicosis Diagnoses per Million Patients

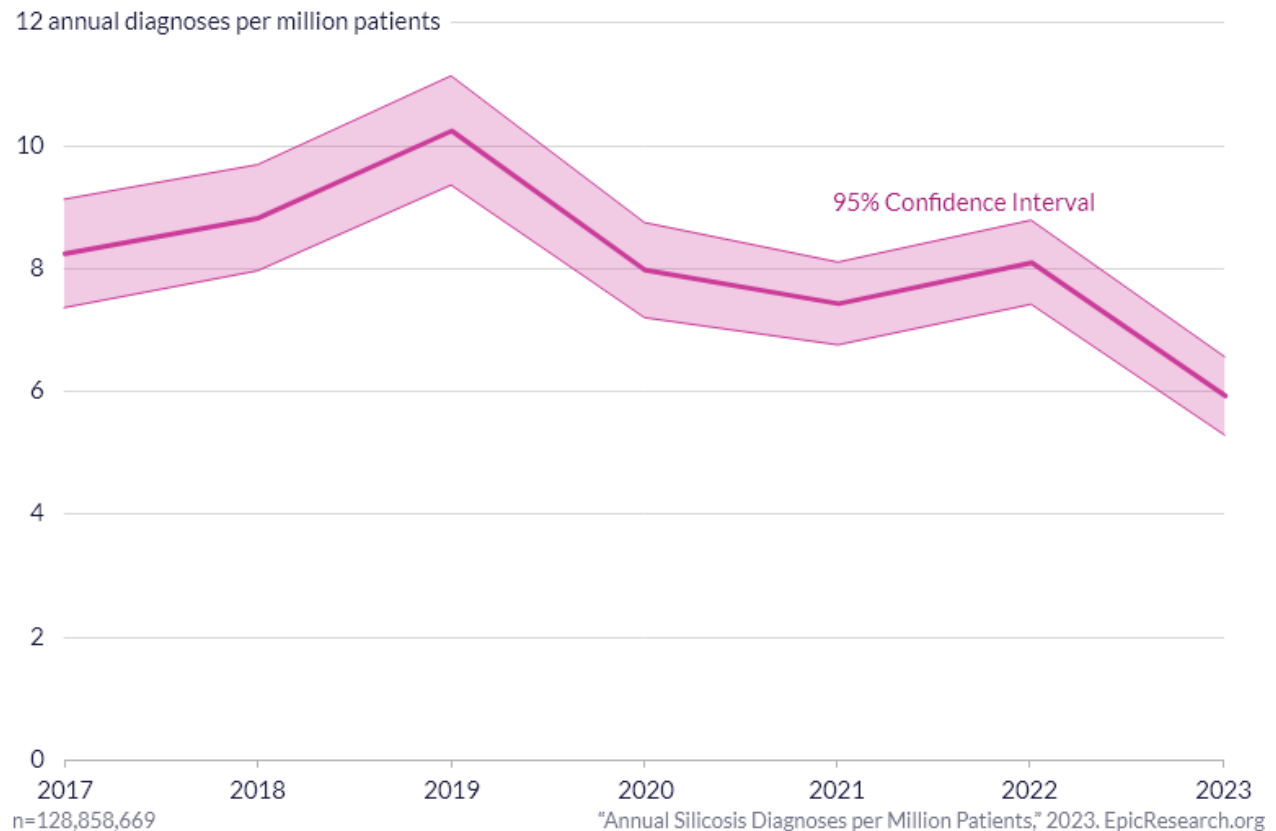


Figure 1. The annual rate of new silicosis diagnoses per million patients.

We further evaluated the diagnosis rate across states to identify which states had the highest rates of diagnosis. Because of the infrequency of silicosis, trends over time could not be evaluated at the state level. The national rate for new silicosis diagnoses for the entire study period—January 2017 through July 2023—was 23.5 per million patients. At the state level, West Virginia had the highest rates in our study period (154.5 per million patients), followed by New Mexico (150.9 per million), and Nevada (90.9 per million). The states with the lowest rates were Tennessee (7.7 per million), Hawaii (7.7 per million), and California (9.4 per million).

Silicosis Diagnoses per Million Patients by State

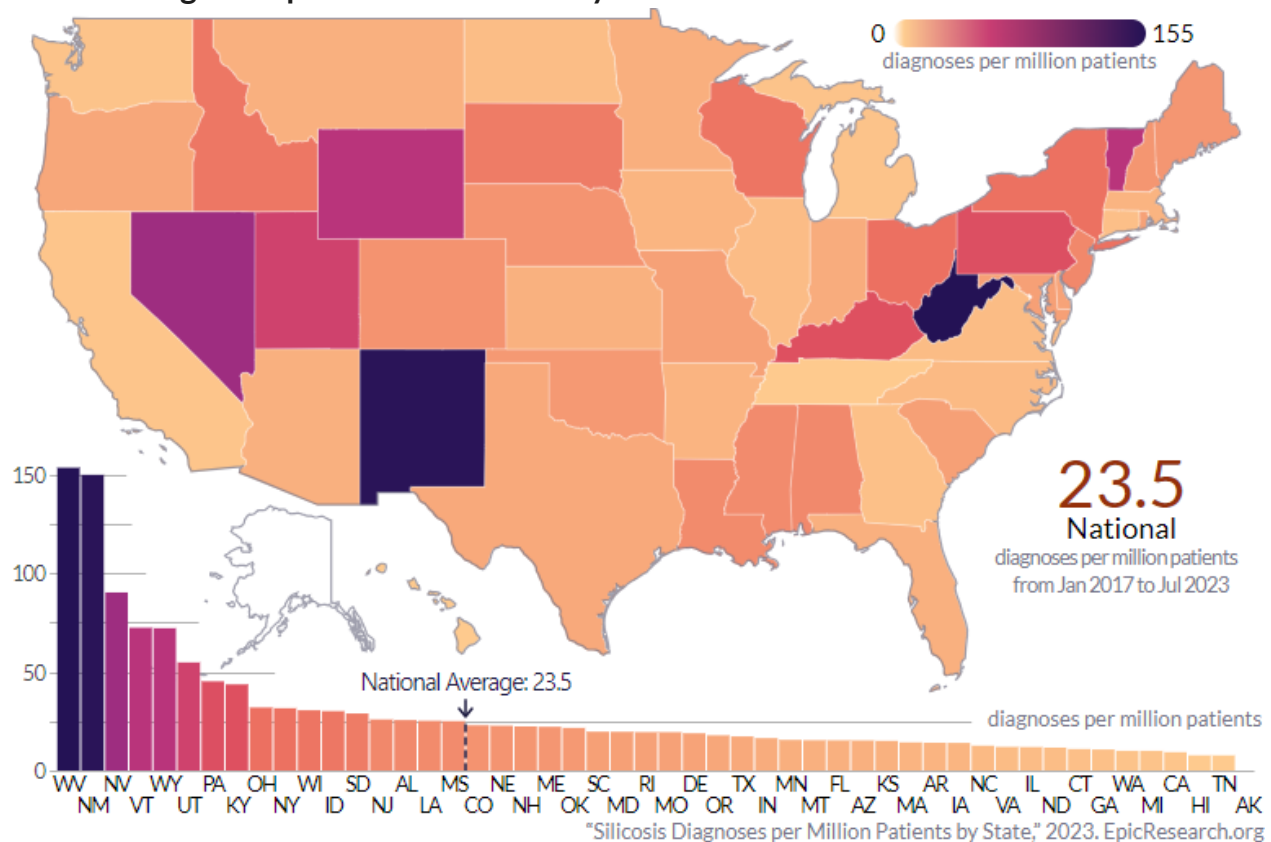


Figure 2. The rate of new silicosis diagnoses per million by state between January 1, 2017, and July 31, 2023.

Finally, we stratified the diagnosis rates by patient sex, race, ethnicity, and social vulnerability index (SVI) quartile during our study period. We found that males were 6.5 times more likely to be diagnosed with silicosis than females. When evaluating by race and ethnicity, we found that non-Hispanic White patients were 41% more likely than Black patients and 34% more likely than Hispanic patients to be diagnosed. Patients living in rural areas were more than twice as likely to be diagnosed with silicosis than those living in an urban area. Additionally, those in the most vulnerable SVI quartiles were most likely to be diagnosed with silicosis compared to the least vulnerable quartiles.

Diagnosis Rate of Silicosis by Patient Demographic

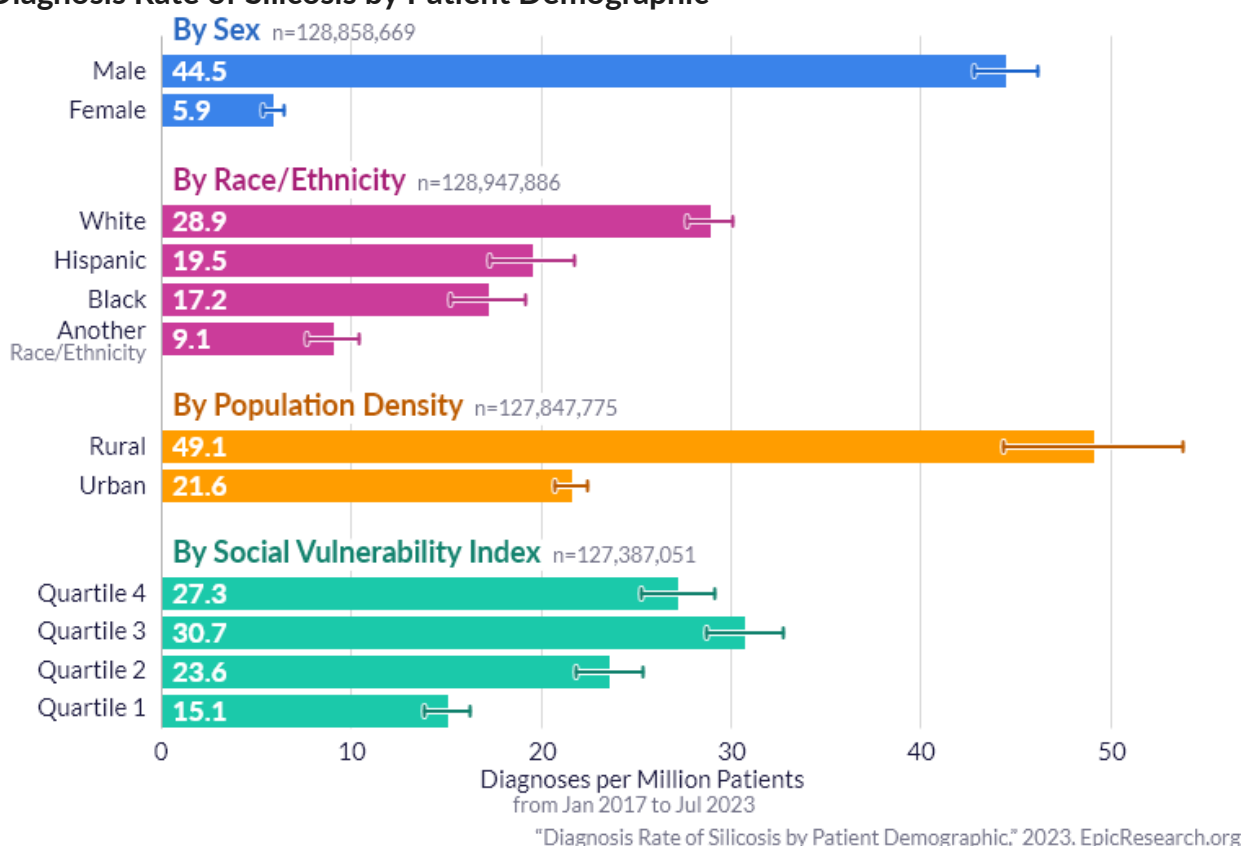


Figure 3. The rate of new silicosis diagnoses per million patients by demographics between January 1, 2017, and July 31, 2023.

These data come from Cosmos, a collaboration of 222 Epic health systems representing over 220 million patient records from 1,272 hospitals and more than 27,200 clinics from all 50 states and Lebanon. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions. Graphics by Brian Olson.

References

1. Silicosis. (n.d.). American Lung Association. <https://www.lung.org/lung-health-diseases/lung-disease-lookup/silicosis>. Accessed October 26, 2023.
2. Worker Exposure to Silica during Countertop Manufacturing, Finishing and Installation. (n.d.). Occupational Safety and Health Administration. [Worker Exposure to Silica during Countertop Manufacturing, Finishing and Installation \(osha.gov\)](https://www.osha-slc.gov/Worker-Exposure-to-Silica-during-Countertop-Manufacturing-Finishing-and-Installation). Accessed September 20, 2023.
3. Greenfieldboyce, N. (2023, July 24). Young men making quartz countertops are facing lung damage. One state is taking action. NPR. <https://www.npr.org/sections/health-shots/2023/07/24/1189745247/silicosis-young-workers-kitchen-countertops-lung-damage-california>

Data Definitions

Term	Definition
Study period	01/01/2017 - 07/31/2023
Study population	Patients with at least one face to face encounter in a given calendar year.

Face to face encounter	Encounter type of Allied Health, Ancillary procedure, Anticoagulation visit, Appointment, Audiology, Case management, Clinical support, Confidential, Diagnostic services, Education, Follow-up, Genetics, Home care visit, Hospital, Hospital encounter, Immunization, Infusion, Injection, Multidisciplinary visit, Nurse only, Nutrition, Office visit, Ophth exam, Occupational/Physical therapy, Procedural consult, Procedure visit, Radiology appointment, Research encounter, Sleep study, Social work, Speech therapy, Surgery, Transplant evaluation, Transplant follow-up, Treatment, Urgent care, Walk-in, E-Visit, E-Consult, Telemedicine, Telephone, or Telephone visit.
Silicosis diagnosis	First evidence of patient diagnosis with a code from SNOMED grouper 805002 or ICD-10-CM code J62.8.
Rural classification	Rural-Urban Commuting Area (RUCA) score of 7-10 based on the patient's most recent postal code.
Urban classification	RUCA score of 1-6 based on the patient's most recent postal code.

Table 1: Annual Silicosis Diagnoses per Million Patients

Year	Count	N	Cases per 1,000,000 patients	95% CI Low	95% CI High
2017	338	40,977,879	8.2	7.4	9.1
2018	403	45,647,564	8.8	8.0	9.7
2019	514	50,166,712	10.2	9.4	11.1
2020	409	51,254,275	8.0	7.2	8.8
2021	471	63,332,926	7.4	6.8	8.1
2022	543	66,987,627	8.1	7.4	8.8
2023	336	56,586,734	5.9	5.3	6.6

Table 2: Silicosis Diagnoses per Million Patients by State

State	Abbreviation	Cases per 1,000,000 patients	95% Margin of Error
Alaska	AK	0.0	0.0
Alabama	AL	25.8	12.2
Arizona	AZ	15.4	5.9
Arkansas	AR	14.2	5.8
California	CA	9.4	2.1
Colorado	CO	23.1	6.7
Connecticut	CT	11.0	4.5
Delaware	DE	19.0	11.2
Florida	FL	15.4	2.7
Georgia	GA	10.7	3.6
Hawaii	HI	7.7	6.8
Idaho	ID	30.3	10.2

Illinois	IL	12.0	2.6
Indiana	IN	16.5	4.6
Iowa	IA	14.1	5.0
Kansas	KS	15.1	7.4
Kentucky	KY	44.0	8.8
Louisiana	LA	25.4	7.9
Maine	ME	22.3	9.6
Maryland	MD	19.8	5.5
Massachusetts	MA	14.3	4.0
Michigan	MI	10.0	2.7
Minnesota	MN	15.6	4.9
Mississippi	MS	25.2	6.8
Missouri	MO	19.6	7.5
Montana	MT	15.5	15.2
Nebraska	NE	22.9	15.8
Nevada	NV	90.9	15.1
New Hampshire	NH	22.5	10.7
New Jersey	NJ	26.1	6.2
New Mexico	NM	150.9	40.6
New York	NY	31.8	3.8
North Carolina	NC	12.7	4.5
North Dakota	ND	11.7	11.5
Ohio	OH	32.2	3.9
Oklahoma	OK	21.7	10.3
Oregon	OR	18.0	5.4
Pennsylvania	PA	45.5	4.6
Rhode Island	RI	19.6	38.4
South Carolina	SC	19.8	5.6
South Dakota	SD	29.1	25.5
Tennessee	TN	7.7	6.2
Texas	TX	17.4	2.5
Utah	UT	55.1	14.6
Vermont	VT	72.9	35.7
Virginia	VA	12.1	3.1
Washington	WA	10.0	4.4
West Virginia	WV	154.5	23.4
Wisconsin	WI	30.8	5.4
Wyoming	WY	72.6	39.5

Table 3: Diagnosis Rate of Silicosis by Patient Demographic

Characteristic	Count	N	Cases per 1,000,000 patients	95% Margin of Error
Male	2,598	58,410,023	44.5	1.7
Female	416	70,448,646	5.9	0.6
White	2,261	78,253,253	28.9	1.2
Hispanic	290	14,840,551	19.5	2.2
Black	292	16,966,591	17.2	2.0
Another Race/Ethnicity	171	18,887,491	9.1	1.4
Rural	418	8,517,620	49.1	4.7
Urban	2,578	119,330,155	21.6	0.8
Quartile 4	761	27,924,528	27.3	1.9
Quartile 3	889	28,944,844	30.7	2.0
Quartile 2	700	29,625,460	23.6	1.8
Quartile 1	616	40,892,219	15.1	1.2