

Arizona economic burden of valley fever totals \$736 million

February 10 2021



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A University of Arizona Health Sciences study has estimated total lifetime costs at \$736 million for the 10,359 valley fever patients diagnosed in Arizona in 2019, underscoring the economic burden the disease places on the state and its residents.

The prevalence of valley fever, formally known as coccidioidomycosis or cocci, has increased in recent years, from 5,624 cases diagnosed in Arizona in 2014 to 10,359 cases in 2019. There currently are no certain means of prevention or vaccination for the fungal disease, which is caused by spores of *Coccidioides*, a family of fungi found in soils of the Southwest.

The findings highlight the need for a vaccine, better therapeutic options and more consistent use of rapid diagnostic testing—all areas of focus at the UArizona College of Medicine—Tucson's Valley Fever Center for Excellence. The study, "Clinical and Economic Burden of Valley Fever in Arizona: An Incidence-Based Cost-of-Illness Analysis," was recently published in the journal *Open Forum Infectious Diseases*.

"I was overwhelmed by how important this disease is in Arizona and how preventable some of the costs may be," said lead author Amy Grizzle, PharmD, associate director of the Center for Health Outcomes & PharmacoEconomic Research (or HOPE Center) in the UArizona College of Pharmacy. "Because it's kind of an isolated disease, I didn't necessarily think it was that expensive. I'm gratified that this study was able to shed some light on how many people this disease affects and how costly it is, especially taking into consideration some of the long-term complications."

Dr. Grizzle said she was surprised by the \$736 million total, which can be broken down into direct and indirect costs of \$671 million and \$65 million, respectively. Among direct costs, she said, are health expenses expected over a person's lifetime, including hospitalization, diagnosis and treatment (chest X-rays, rapid diagnostic tests, medications, surgery, etc.), and follow-up care including skilled nursing facilities for rehabilitation. Indirect costs include short-term work loss and lost earnings due to premature mortality.

The study examined the cost-of-illness for valley fever's five primary manifestations:

- Primary uncomplicated pneumonia, which comprises 85% of diagnosed valley fever cases;
- Chronic pneumonia, which often requires treatment for two to three years;
- Disseminated infection, which requires lifelong medication, periodic testing, and recurring hospitalization, and is the leading cause of death among valley fever patients;
- Other pulmonary changes—pulmonary nodules, which account for about 7% of all valley fever cases; and,
- Other pulmonary changes—pulmonary cavities, which affect about 3% of all valley fever patients. Patients with pulmonary changes, whether nodules or cavities, often require expensive diagnostics to rule out [lung cancer](#), and about 40% of such cases require hospitalization.

Researchers found that severe cases of valley fever where the disease spreads to other parts of the body, known as disseminated valley fever, resulted in the highest [economic burden](#) at nearly \$1.4 million per person.

The study's estimated lifetime costs are comparable to a 2019 California study that put total lifetime costs for the 7,466 people diagnosed with Valley fever in the Golden State in 2017 at just under \$700 million, according to co-author John Galgiani, MD, an infectious diseases specialist with the College of Medicine—Tucson who also is director of the UArizona Valley Fever Center for Excellence and a member of the BIO5 Institute.

Leslie Wilson, Ph.D., of the University of California San Francisco, led the California study and is a co-author on the Arizona study along with

Drs. Grizzle and Galgiani, and David Nix, PharmD, of the UArizona College of Pharmacy.

Dr. Galgiani, who founded the Valley Fever Center in 1996, said two-thirds of all valley fever cases reported in the U.S. occur in Arizona, with half in Maricopa County. Only about 5% of U.S. valley fever cases are reported outside of Arizona and California.

The primary symptoms of valley fever are respiratory problems similar to bacterial pneumonia, though more serious complications can arise when the infection spreads beyond the lungs to other areas including bones, joints, and the brain and central nervous system.

Delays in diagnosis are common because valley fever symptoms can mimic those of the flu or bacterial pneumonia. Such confusion often means ineffective treatment with antibiotics, instead of antifungals like fluconazole, for days or weeks, during which time a patient's condition might deteriorate. The situation has worsened with the emergence of COVID-19, Dr. Galgiani said.

"Basically, doctors were under-diagnosing [valley fever](#) in the springtime, because of several reasons. One, people were being tested for COVID and, when they were negative, they didn't do any more testing," Dr. Galgiani said. "And two, people weren't seeking hospital care for anything if they didn't think it was COVID."

Drs. Galgiani and Grizzle say the economic impacts highlighted in the study underscore the value of supporting research into developing more [rapid diagnostic tests](#), better therapies and ultimately a preventative vaccine to address this important public health problem in Arizona.

"Hopefully, after more treatments and/or a vaccine are available, we can do another cost of illness analysis 10 years from now and see that these

medications have greatly reduced the economic burden to Arizona," Dr. Grizzle said.

More information: Amy J Grizzle et al, Clinical and Economic Burden of Valley Fever in Arizona: An Incidence-Based Cost-of-Illness Analysis, *Open Forum Infectious Diseases* (2020). [DOI: 10.1093/ofid/ofaa623](https://doi.org/10.1093/ofid/ofaa623)

Provided by University of Arizona Health Sciences

Citation: Arizona economic burden of valley fever totals \$736 million (2021, February 10) retrieved 20 September 2024 from <https://medicalxpress.com/news/2021-02-arizona-economic-burden-valley-fever.html>

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