Current status of Valley fever surveillance and trends: Incidence of human disease

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Impact and Control of Valley fever
National Academies of Sciences, Engineering, and Medicine
November 17, 2022
Overview of Valley fever surveillance in the Americas
Valley fever (coccidioidomycosis) has a global presence

https://www.cdc.gov/fungal/diseases/coccidioidomycosis/maps.html
Valley fever is reportable in only one country in Latin America

Reportable in Guatemala and one state in Argentina
In the United States, Valley fever is a nationally notifiable disease

https://www.cdc.gov/fungal/diseases/coccidioidomycosis/maps.html
Valley fever has a revised case definition

• Updated 2022 Valley fever case definition passed at the Council of State and Territorial Epidemiologists (CSTE)

• Tiered designation of endemic vs. low/non-endemic states

CDC tracks national Valley fever incidence through the National Notifiable Disease Surveillance System

20,003 cases reported in 2019
In 2019, Valley fever incidence ranged from 3.8 to 22.8 per 100,000 in low/non-endemic states.
AI/AN and Hispanic persons are disproportionately affected by Valley fever

Incidence per 10,000 population

- AI/AN, non-Hispanic: 17.4
- Hispanic or Latino (all races): 11.2
- Asian and Native Hawaiian or other Pacific Islander, non-Hispanic: 4.6
- White, non-Hispanic: 4.1
- Black, non-Hispanic: 4

Challenge: Valley fever is not reportable everywhere

Reportable in only 26 states and DC

https://www.cdc.gov/fungal/fungal-disease-reporting-table.html
Challenge: Race and ethnicity data were available for 39% of Valley fever cases

Smith DJ, Williams SL, Endemic Mycoses State Partners Group, et al. Surveillance for coccidioidomycosis, histoplasmosis, and blastomycosis—United States, 2019. MMWR. 2022; 71(7);1–14
Challenge: Many more pieces are needed
In low and non-endemic states, travel information is critical

- **83%** from nonendemic states traveled to endemic area
- **63%** sought care in endemic state
- **59%** from low-endemic and **17%** from nonendemic states did not report travel to endemic areas

Valley fever is often mistaken with other conditions

- 54% visited healthcare provider \( \geq 3 \text{ times} \) before being tested

- Median time from seeking healthcare to diagnosis was 38 days (range 1–1,654 days)

- 70% had another condition diagnosed first. Prescribed antibacterial medications
Preliminary national burden estimates
Developed multiplicative model to estimate incident symptomatic cases

- Underreporting
  - Multipliers are distinct by endemicity (high, low, non-endemic) of state of residence
  - CA, AZ
  - NM, NV, UT, WA, TX
  - Rest of the states

- Underdiagnosis
  - Multipliers are distinct by severity of disease (mild vs. hospitalized)

- Seeking care

- Incident symptomatic cases

\( a=\text{multipliers are distinct by endemicity (high, low, non-endemic) of state of residence} \)
\( b=\text{multipliers are distinct by severity of disease (mild vs. hospitalized)} \)
Estimation of national burden of Valley fever is challenging!

Underreporting

Underdiagnosis

Healthcare-seeking behavior
Solicited input from clinicians and public health officials

Endemic, low-endemic, and non-endemic regions

Requested estimates from each expert and asked them to rank certainty for each multiplier

1=Not certain at all
5=Very certain

Responses were weighted according to self-reported certainty and area of expertise
Multipliers: Percent reported

- Endemic: 58%
- Low-endemic: 32%
- Non-endemic: 13%
Multipliers: Percent diagnosed: Mild cases

- Endemic: 20%
- Low-endemic: 10%
- Non-endemic: 6%
Multipliers: Percent diagnosed: Hospitalized cases

- Endemic: 28%
- Low-endemic: 14%
- Non-endemic: 8%
Multipliers: Percent seeking care

- Mild: 30%
- Hospitalized: 99%
- Sought care in endemic states*:
  - Non-endemic: 44%
  - Low-endemic: 4%

*Based on enhanced surveillance project
Other considerations

• Applied incidence for non-reportable states

• 40% patients hospitalized
• 60% patients with mild disease

• Multipliers are buffered to add uncertainty
• Estimates based on mean value of 100,000 iterations
Preliminary estimated national burden of symptomatic Valley fever is 33 times reported cases

33 times reported cases

671,076 [506,257–881,747]
Preliminary estimated national burden of symptomatic Valley fever is 33 times reported cases

Endemic: 385,693 [278,675–527,945]

Low-endemic: 114,323 [77,867–164,895]

Non-endemic: 171,062 [111,960–254,815]
Next steps

• Include additional years

• Produce secondary outcomes (e.g., hospitalization, death)
Three proposed initiatives
Clinical diagnostic algorithm can help primary and urgent care doctors to diagnose patients earlier.

Collaborated with:
- Mycoses Study Group
- Coccidioidomycosis Study Group
National fungal surveillance will help enhance our understanding of Valley fever.

Collaborate with state partners to implement Fungal Disease Enhanced Surveillance (FungiSurv).
CocciHub will bring people together

Forecast incidence/risk

Predict endemicity

Predict the impacts of climate change
Quick summary
Summary

• Valley fever is nationally notifiable in the United States, but suffers from many challenges

• Estimated burden of symptomatic cases is approximately 33 times more than what is reported nationally

• Partnership is essential to improve our understanding of Valley fever in the Americas
Thank you
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For more information, contact CDC
1-800-CDC-INFO (232-4636)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.