Coccidioidomycosis Surveillance Data Caveats

For questions, please reach out to cocci@azdhs.gov

Important information related to the provided coccidioidomycosis dataset:

- The posted data is composed solely of Arizona residents, with case location counted by area of residence not location of exposure.
- Only confirmed cases are included (for coccidioidomycosis case definition used to define confirmed cases see below and refer to the case definition manuals for public health surveillance posted here)
- Cases have been counted by the month/year of their 'Event Date.' Event date stands for the earliest date among: date of onset, date of specimen collection, date lab result is finalized, diagnosis date, date reported to County, date entered into MEDSIS (Medical Electronic Disease Surveillance Intelligence System), date reported to ADHS, or date submitted to state.
    - Note that this differs from the counts reported in either the Valley fever data dashboard or annual report, which is by the date first reported to public health (county or state) by MMWR epidemiologic week/year (e.g., if a case first got sick in Feb. 2013, was tested in June 2013, and reported in July 2013, then they would be counted in July).

Other major surveillance changes affecting coccidioidomycosis trends

In addition to the information above, the following points are in regards to major changes that have affected coccidioidomycosis surveillance, and thus should be considered when interpreting the data :

- In 1997, laboratory reporting of coccidioidomycosis was mandated in Arizona: labs are required to submit a report to ADHS within 5 working days of obtaining a positive coccidioidomycosis result. However, reporting delays are possible as laboratories may have technical difficulties or be out-of-state.
- Prior to the implementation of MEDSIS in 2006, communicable disease reports were largely received by fax or mail and manually reviewed against the state's disease registry. Robust surveillance data processes were limited due to database limitations. Therefore, data during this time should be interpreted with caution especially if compared to later years.
- ADHS data entry changes: In consultation with infectious disease physicians, starting October 1st, 2019, ADHS began entering (and classifying as confirmed) coccidioidomycosis 1:2 complement fixation results on serum or unknown specimen type into our disease surveillance system.
    - Impact: It is rare for a patient to receive a 1:2 CF on serum with no other positive labs so this may have resulted in a **small increase of cases (≤1%)** but should not be substantial.
- In 2024, the increase in reported cases is partly due to a higher number of false-positive results caused by a malfunctioning batch of test kits. These kits were used from January to March and across three laboratories in Arizona that on average report 65% of all positive results annually. The issue was identified and discussed with the manufacturer and functioning kits were used from April 2024. Using data provided by the manufacturer we have estimated that up to 800 false positive Valley fever cases have been counted in the 2024 surveillance year.
- Case definition changes:
    - Restrictions around titer levels demonstrating immunologic evidence of infection:
        - Surveillance years 2005 to 2006, all titers demonstrating evidence of infection must be ≥ 1:4 regardless of specimen type (serum, CSF or other body fluids)

        - Surveillance years 2007 to 2010, all titers from serum demonstrating evidence of infection must be ≥ 1:4
        - The Lab-only case definition (i.e., no clinical criteria required) has been in use since 2008. The case count of years preceding 2008, are representative of individuals who met both the clinical and laboratory criteria for a coccidioidomycosis infection.
        - Surveillance years 2011 to 2019, complement fixation titers from serum must be ≥ 1:4, however, all other laboratory tests (IgM EIA, IgG EIA, latex agglutination, tube precipitin) can report confirmatory titers of ≥ 1:2.
        - Finally, surveillance years 2020 to present, all laboratory tests can report a confirmatory serum titer of ≥ 1:2
    - The laboratory-confirmed case definition was updated in 2023 to exclude positive Coccidioidial skin test conversions after the onset of clinical signs and symptoms
    - Impact: loosened restrictions on specimen titers demonstrating evidence of infection (≥ 1:4 to ≥ 1:2) would increase the number of confirmed cases. Conversely, while minor, the removal of a laboratory test may decrease the case total unless additional testing is performed for that individual.

- Laboratory changes:
    - In **mid-2009**, a major laboratory altered its reporting practices for coccidioidomycosis, after consultation with ADHS, to include the reporting of all positive enzyme immunoassay (EIA) results—regardless of reflex confirmatory testing results—which **greatly increased the total number of reported cases**.
    - In late 2012, SQL changed the kit manufacturer used for EIAs, which contributed to a **substantial decline** in the number of cases reported in late 2012 and 2013.
    - Impact: The changes in reporting and testing practices align closely with an increase in coccidioidomycosis cases in Arizona in 2009, followed by a decrease starting in December 2012. The effect on the numbers of reported cases due to changes in practices cannot be disentangled from changes in the incidence or diagnosis of coccidioidomycosis in the community in this period.

Other useful information on coccidioidomycosis in Arizona available from ADHS:

ADHS enhanced surveillance study
(Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3294516/ and 2007 Annual Report) :

- On average, people with Valley fever waited 44 days before seeking healthcare for their symptoms
- The average time between seeking healthcare and getting diagnosed with Valley fever was about five months
- An average of 209 days from coccidioidomycosis symptomatic onset to diagnosis.
- If a patient knew about Valley fever prior to seeking healthcare, he or she was more likely to be diagnosed and treated earlier than those who were not familiar with the disease [79 days vs. 282 days, respectively (p=0.04)]

ADHS Valley fever annual reports and data dashboard are available online here: https://www.azdhs.gov/preparedness/epidemiology-disease-control/valley-fever/index.php#reports-publications