

Valley Fever (Coccidioidomycosis) & TB in Arizona: Differential Diagnosis vs. Comorbidity

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What is Valley Fever?

Coccidioidomycosis, otherwise known as Valley Fever or Cocci, is caused by inhaling spores of a fungus endemic to desert soil in the Southwest, including Arizona's Sonoran Desert. Like TB, it is primarily a respiratory disease which can disseminate to other parts of the body. Also like TB, not everyone who becomes infected will go on to develop disease. It is estimated that:

- 60% of infections are mild, with little or no symptoms
- 30% have moderate clinical symptoms similar to community acquired pneumonia. Symptoms include: fever, fatigue, cough, chest pain, headache, skin rash, joint aches. Recovery can be weeks to months in otherwise healthy people.
- 10% may present with more severe disease. That can include complications such as residual lung nodules (~5%), lung cavity (~5%), and/or disseminated disease (<1%).

Unlike TB, many patients suffering from Valley Fever require no treatment. However, those with severe forms of Valley Fever can be treated withazole antifungals such as fluconazole. For those that develop meningitis or other life threatening infections, IV therapy with Amphotericin B may be part of initial therapy. Approximately one-third of patients requiring treatment may relapse, with some requiring lifelong drug therapy.

In contrast to TB, those who clear the infection are expected to have lifelong immunity.

Systematic case monitoring of TB patients in Arizona found that they were often concurrently diagnosed with Valley Fever. That led the TB program to ask:

How common is dual diagnoses (TB & Valley Fever) in Arizona?

Methodology: Data cross match of reported Valley Fever with TB counted in Arizona from 2009 to 2016

Oct: onset of symptoms: cough, night sweats, unintentional weight loss, fatigue

Jan: Xray detected cavitary lesion LUL. Started Fluconazole.

March: biopsy showed non-necrotizing granulomatous inflammation with necrosis. AFB stain neg. Referred for sleep apnea.

May: new diagnosis diabetes

Case Study: TB & Valley Fever

Each patient's experience is different. The following is one individual's story. The patient: 50 year old, white, US born male. Served 20 years in the military including overseas deployments to Asia. Retired from the Navy 12 years ago. Former smoker with 25 year pack history. Quit 9 years ago.

July: LUL lobectomy. Cavity had increased despite 5 months of Fluconazole. Had lost 60+ pounds over 8 months. BMI 27.8

Day after surgery: QFT done. Positive.
5 days later: 1st sputum collected. NAA detected MTB. Smear neg. RIPE started.

Aug: readmitted to hospital due to surgical complications (not TB related).

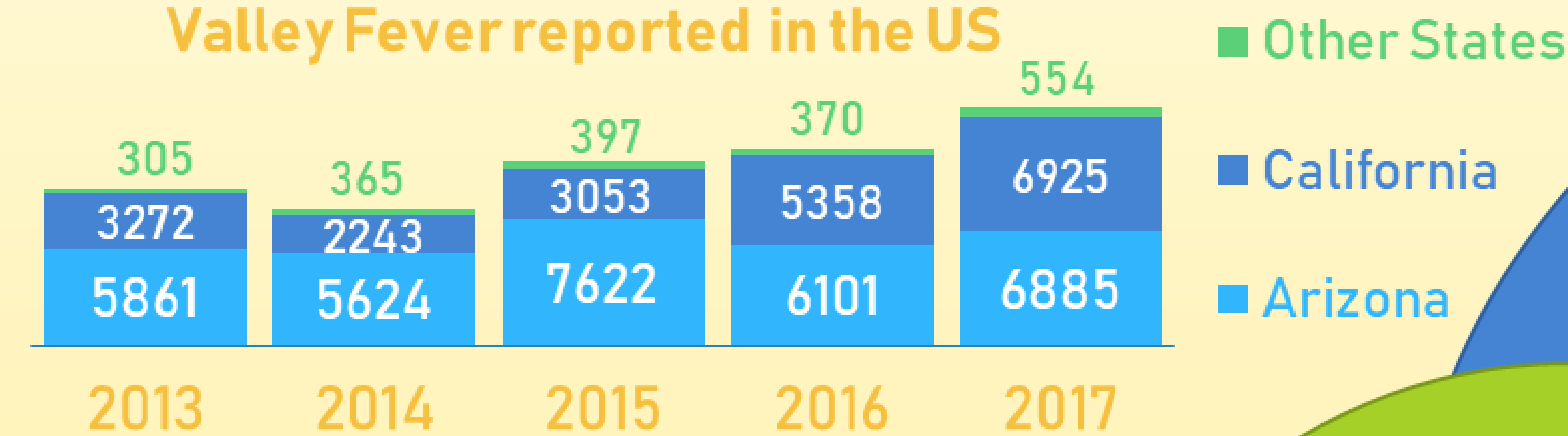
Nov: symptoms resolved. Back at work. Switched from 7 days/wk treatment to 3 days/wk DOT INH/RIPE

Feb: Treatment complete for Pansusceptible TB. Genotyping associated with the Philippines. No epi link within Arizona.

Lung fluid 4+ AFB. Necrotizing granulomatous inflammation with numerous mycobacteria

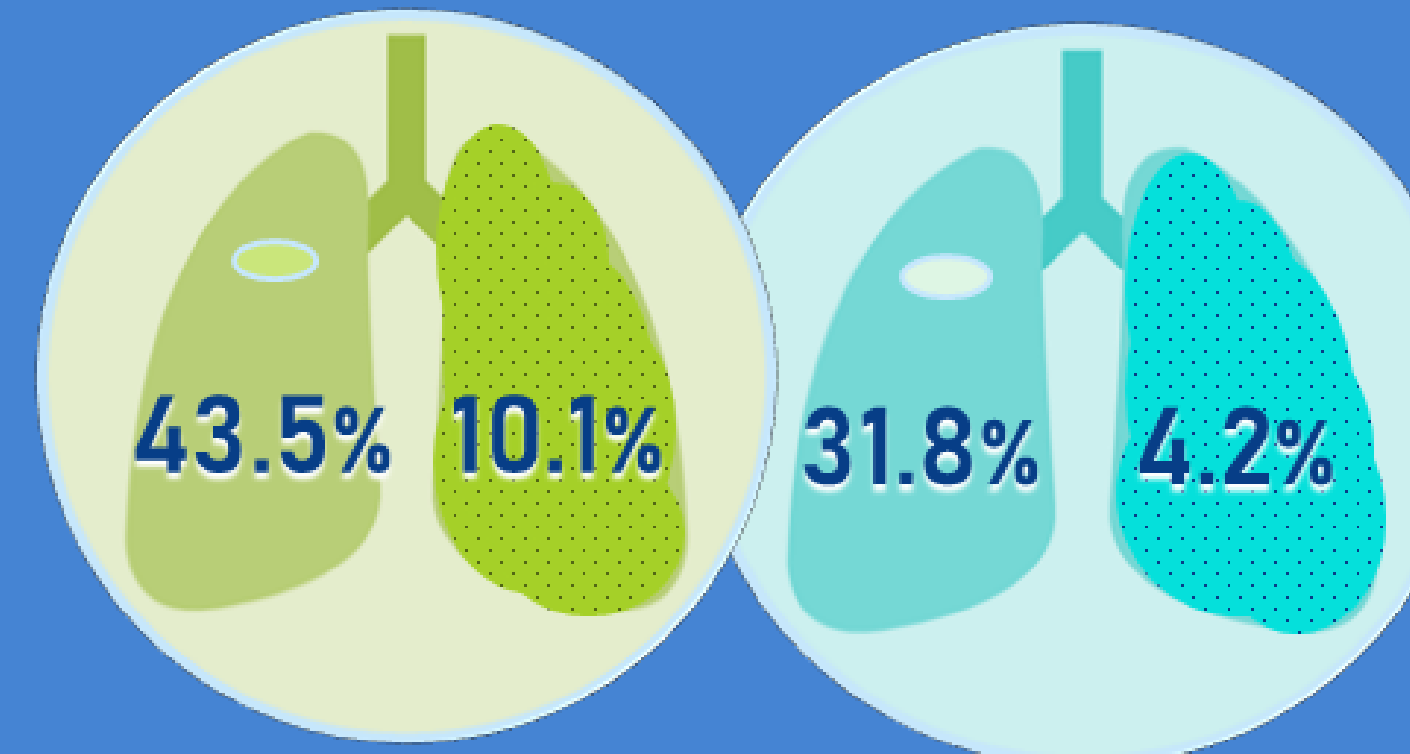
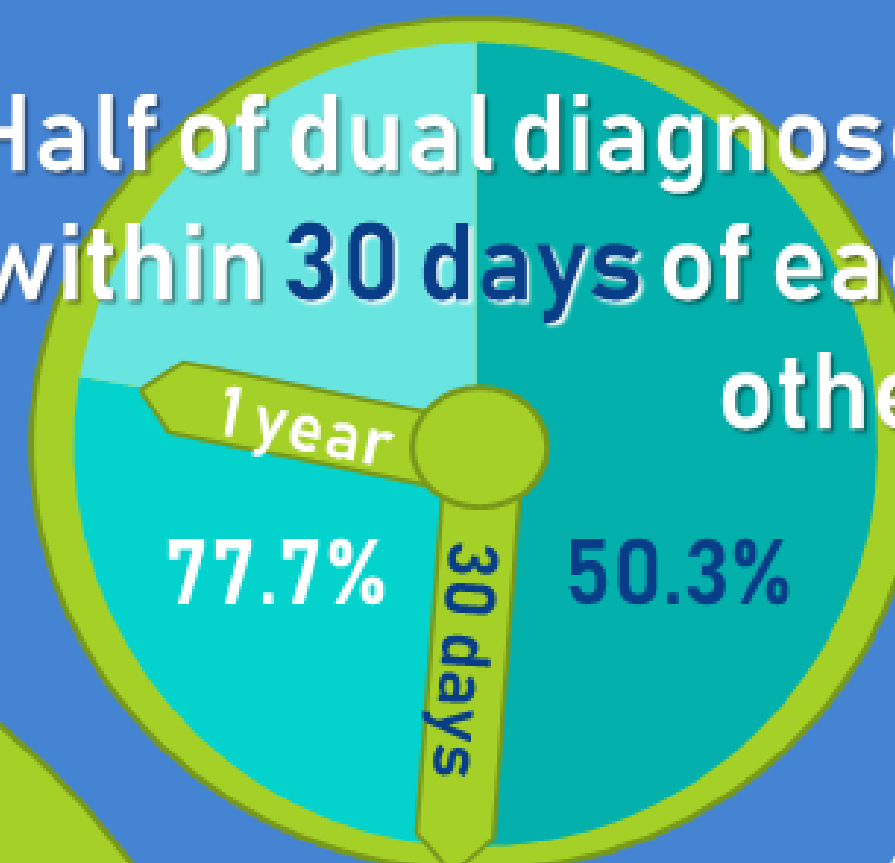
2018 Valley Fever in Arizona: 7,636

Most years, Arizona accounts for >50% of Valley Fever reported in the US



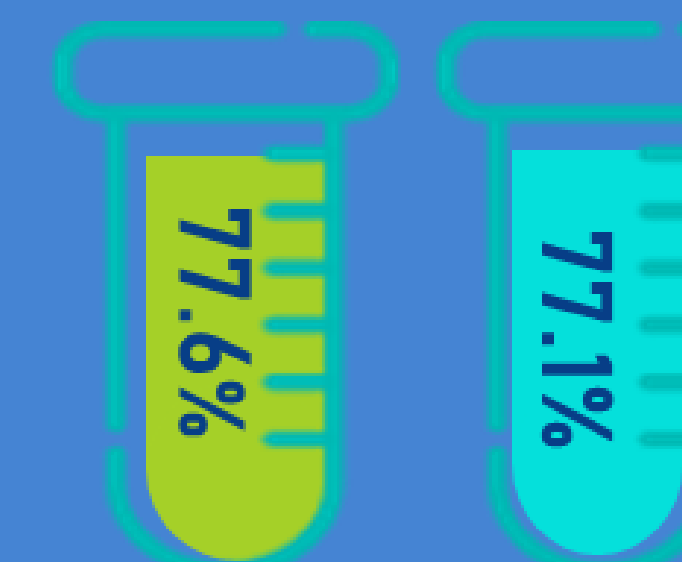
Four Interesting Findings on Dual Diagnoses

1) Half of dual diagnoses were within 30 days of each other.



2) Dual diagnoses were more likely than TB to be cavitary (OR 1.65; 95%CI: 1.16-2.35) and/or miliary (OR 2.58; 95%CI: 1.40-4.76)

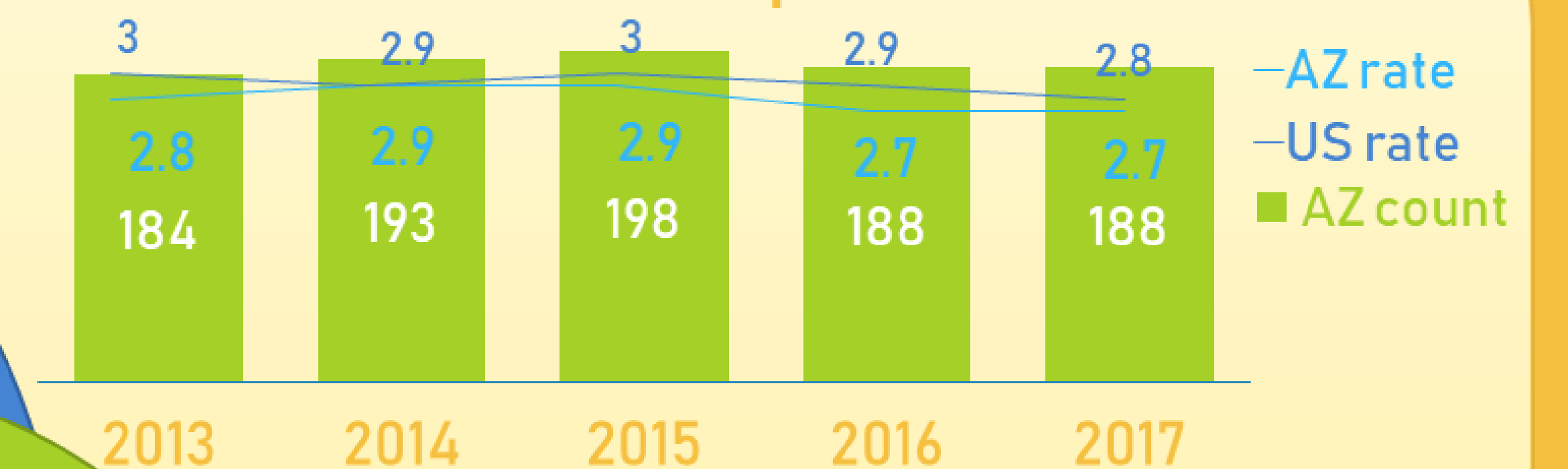
3) No difference in % culture confirmed TB between dual diagnoses & TB only



4) No difference found in TB treatment outcomes

2018 TB in Arizona: 178 (2.52/100,000)

Arizona's TB rate parallels national rate



Valley Fever Risk Ratios

44 x's more common than TB in Arizona

62 x's more likely to be diagnosed with TB than general population

TB case rate of patients reported with Valley Fever: **204.7** /100,000 vs. **3.3** /100,000 Arizonans during same time frame

TB Risk Factors (2017)

- 18.6% DM
- 15.6% Substance abuse
- 12.9% drug and/or 5.8% ETOH
- 5.3% HIV
- 4.0% Homeless (community)

Conclusion: Valley Fever and TB can be comorbidities as well as differential diagnoses. Diagnosis with one does not exclude the other. Working patients up simultaneously for Valley Fever and TB is of benefit to the patient. We found that 50% of patients with dual diagnosis are diagnosed within 30 days of each other, which implies that this recommendation is being implemented. However, as illustrated by the case study, Valley Fever patients who do not respond to treatment could benefit from TB workup, including sputum collections.

Limitations: There is limited data available on treatment of Valley Fever provided to those with dual diagnosis. Except for select case studies, we do not know what treatment, if any, was provided for Valley Fever. Diagnosis and treatment of Valley Fever primarily is performed by private providers separate from public health. We do not know how many TB patients are tested for Valley Fever. We also do not know if patients with a gap in dual diagnosis had distinct episodes of Valley Fever & TB or if it was a delay in diagnosis.

Next Steps: Outreach to providers who diagnose and treat Valley Fever. One opportunity is next year's Coccidioidomycosis Study Group, expected to be held in Arizona.