Coccidioidomycosis (Valley Fever)

What can we learn together?

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Drought and Public Health Summit
June 18, 2019
Coccidioidomycosis (Valley fever)

Environmental form
*Coccidioides spp.*

Host-associated form
Coccidioidomycosis (Valley fever)
Valley fever impact on Patients

Symptoms last median of 120 days

• 40% require hospitalization
  • ~$50,000 a visit

• 1% life-threatening or disseminated disease

• 75% miss >14 workdays

http://www.centerforhealthjournalism.org/valleyfever/putting-valley-fever-front-burner
Reported Cases of Coccidioidomycosis in the U.S., 1998-2017

- Experts estimate 150,000 cases annually

- As reported in the National Notifiable Diseases Surveillance System
Where is it?
Skin Testing Studies late 1940s early 1950s

Outbreaks

Coccidioidomycosis Outbreaks, United States and Worldwide, 1940–2015

Michael Freedman, Brendan R. Jackson, Orion Mc Cotter, and Kaitlin Benedict

Author affiliations: Children’s Hospital of Pittsburgh, Pittsburgh, Pennsylvania, USA (M. Freedman); Centers for Disease Control and Prevention, Atlanta, Georgia, USA (B.R. Jackson, O. Mc Cotter, K. Benedict)
Rate of Reported Coccidioidomycosis, 2010-2015
Understanding the geographic range

- Highly endemic
- Established endemic
- Suspected endemic
- Primarily in thermic and hypothermic soils
Environmental Aspects
Precipitation, Drought, Soil Moisture

- Complex life cycle in environment
- Preceding precipitation, soil moisture for fungus to grow
- Period of drought for soil to be disturbed


What is the role of dust storms in transmission?

Intensified dust storm activity and Valley fever infection in the southwestern United States

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Regional dust storm modeling for health services: The case of valley fever

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Environmental sampling techniques have improved

Molecular detection of airborne *Coccidioides* in Tucson, Arizona

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Known endemic areas cover most of the US

Much more to be learned about the environmental aspects
Conclusions

- We need to build more collaborations to help better define ecological niche and understand areas of geographic risk.
- Drought will likely make new areas that could support *Coccidioides* but may make some historic areas too dry.
- Increased work and modeling can help improve understanding of environmental factors.
- How can we work utilize some of these tools for fungal diseases?
Histoplasmosis

EMERGING INFECTIOUS DISEASES

Volume 22, Number 3—March 2016
CME ACTIVITY - Synopsis
Epidemiology of Histoplasmosis Outbreaks, United States, 1938–2013

Kaitlin Benedict and Rajal K. Mody
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EMERGING INFECTIOUS DISEASES

Volume 24, Number 3—March 2018
Synopsis
Multistate Epidemiology of Histoplasmosis, United States, 2011–2014

Patie A. Armstrong, J. Brendan R. Jackson, Dink Hazelow, Virgil Fields, Malia Ireland, Connie Austin, Kimberly Sigs, Veronica Fadakowski, Reema Patel, Peggy Ellis, Peter C. Iowa, Caitlin Pedat, Suzanne Gibbons-Burgener, Jennifer Anderson, Thomas Dobbs, Sherri Davidson, Mary McIntyre, Kimberly Warren, Joanne Midla, Nhiong Luong, and Kaitlin Benedict