

The Public Health Significance of Coccidioidomycosis (Valley Fever) in the US- Mexico Border Region

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Health and Wellness for all Arizonans

azdhs.gov



Disclaimer

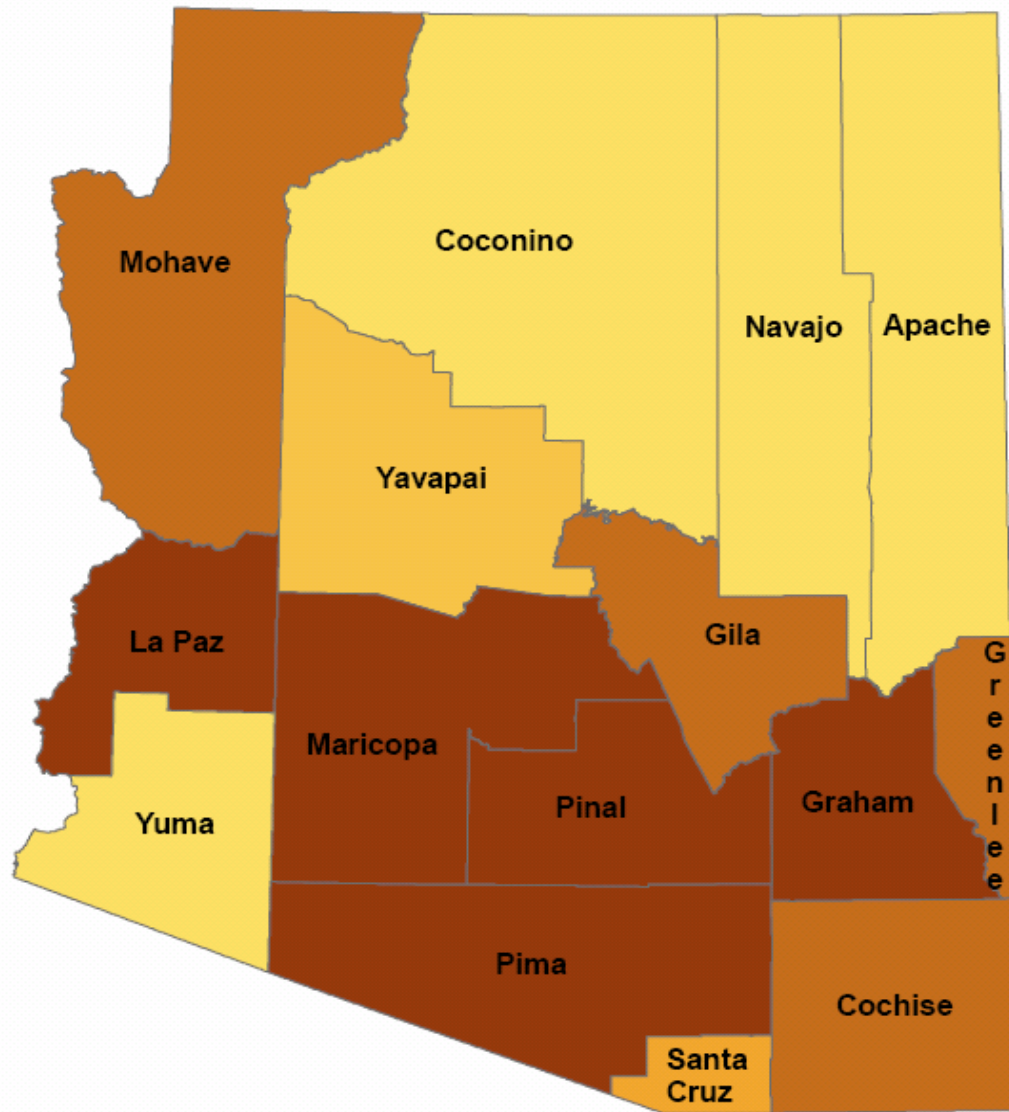
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Coccidioidomycosis

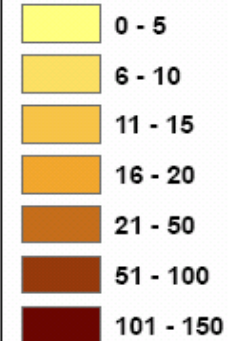
- Caused by a dimorphic fungi
 - *Coccidioides immitis* (California)
 - *Coccidioides posadasii* (Arizona)
- Grows in the soil
- Found in hot, arid areas (limited rainfall, high summer temps and few freezes)



Arizona 2007 Reported Valley Fever Cases by County



Cases per 100,000 County Residents



Arizona 2007 Reported Valley Fever Cases

County	Cases per 100,000 Residents	Total Cases
Pima	90	904
Maricopa	89	3,459
Pinal	87	256
La Paz	69	15
Graham	66	24
Gila	27	15
Mohave	25	50
Greenlee	24	2
Cochise	23	32
Santa Cruz	15	7
Yavapai	12	26
Coconino	10	13
Navajo	10	11
Apache	7	5
Yuma	6	13



Office of Infectious Disease Services
30 June 2008

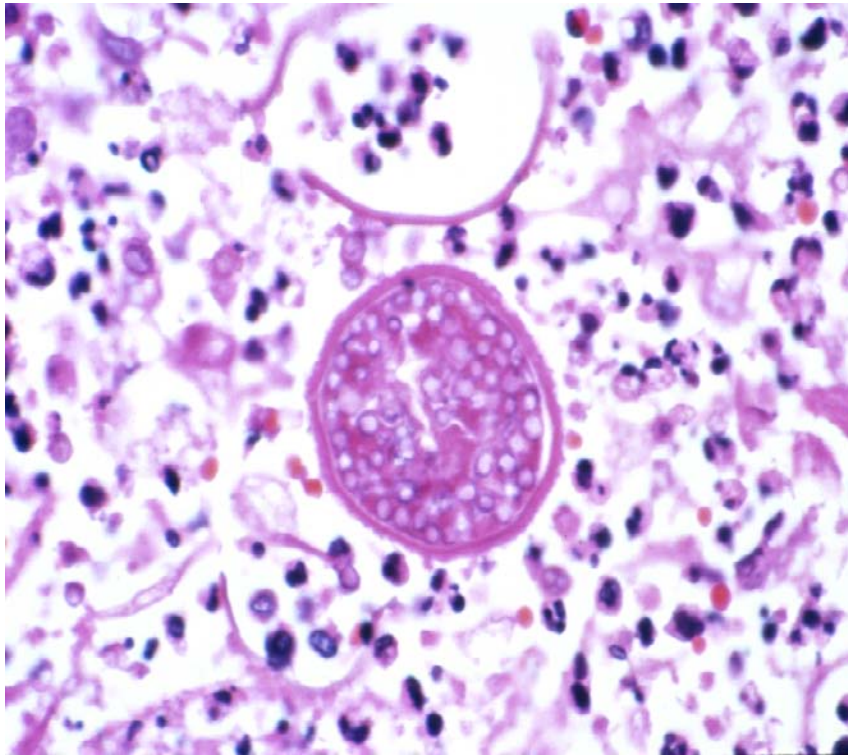
Coccidioidomycosis (Valley Fever, Cocci)

- Laboratory and Physician reportable in Arizona
- National Reportable Disease in US
- Dissemination may occur in 1-10% of cases*

*Chiller, Galgiani, Stevens Coccidioidomycosis.
Infectious Disease Clinics of North America. 17;41-57. 2003.



Coccidioidomycosis (Valley Fever)



Spherules (Hematoxylin-Eosin stain)

- Inhalation of the spores causes a Mycosis in People and Animals
- “Primary” Pulmonary Infection
- Known as Valley Fever, Cocci

Dust Exposure



Risk Factors for Valley Fever

- Primary Disease
 - >65 years old
 - Males ~5%
- Disseminated
 - Immunocompromised
 - Male
 - Race (African American, Filipino)
 - Pregnancy (Late)
 - Diabetes

Presentation of Valley Fever?

- Asymptomatic
 - ~60% of cases

- Primary

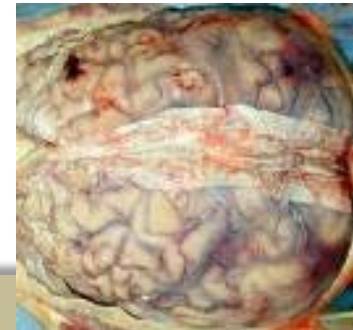
Influenza-like or Pneumonia-like

- Cough
- Fatigue
- Fever
- Chest pains



- Disseminated

- Bone
- Joints
- Skin
- Brain (meningitis)
- Lymph nodes



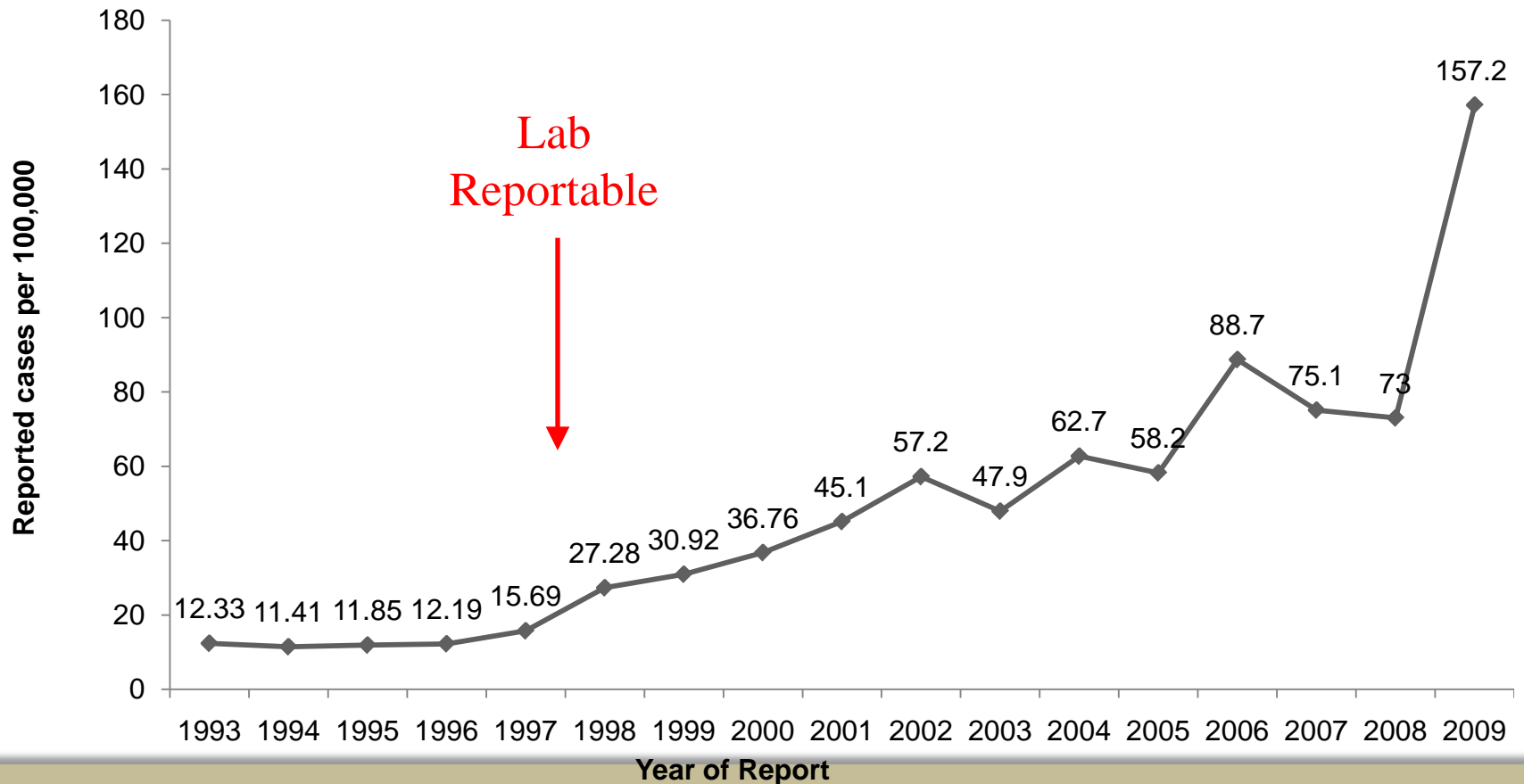
Coccidioidomycosis Burden

- The pulmonary presentation of Valley Fever often appears as influenza-like illness or a pneumonia
- It is misdiagnosed as a viral or bacterial infection, if diagnosed at all
- In Arizona endemic regions coccidioidomycosis is estimated to represent between 17%-29% of community acquired pneumonias.^{1,2}
- Correctly identifying coccidioidomycosis infections can greatly reduce medical, financial, and patient emotional burden
- The cases that progress to the disseminated disease can become life threatening

¹ Valdivia et al. Coccidioidomycosis as a Common Cause of Community-Acquired Pneumonia. *Emerging Infectious Diseases*. 17;41-57. 2006.

² Kim et al. Coccidioidal Pneumonia, Phoenix, Arizona, USA 200-2004. *Emerging Infectious Diseases*. 15;396-401. 2009.

Rates of Reported Valley Fever (VF) in Arizona, 1993-2009



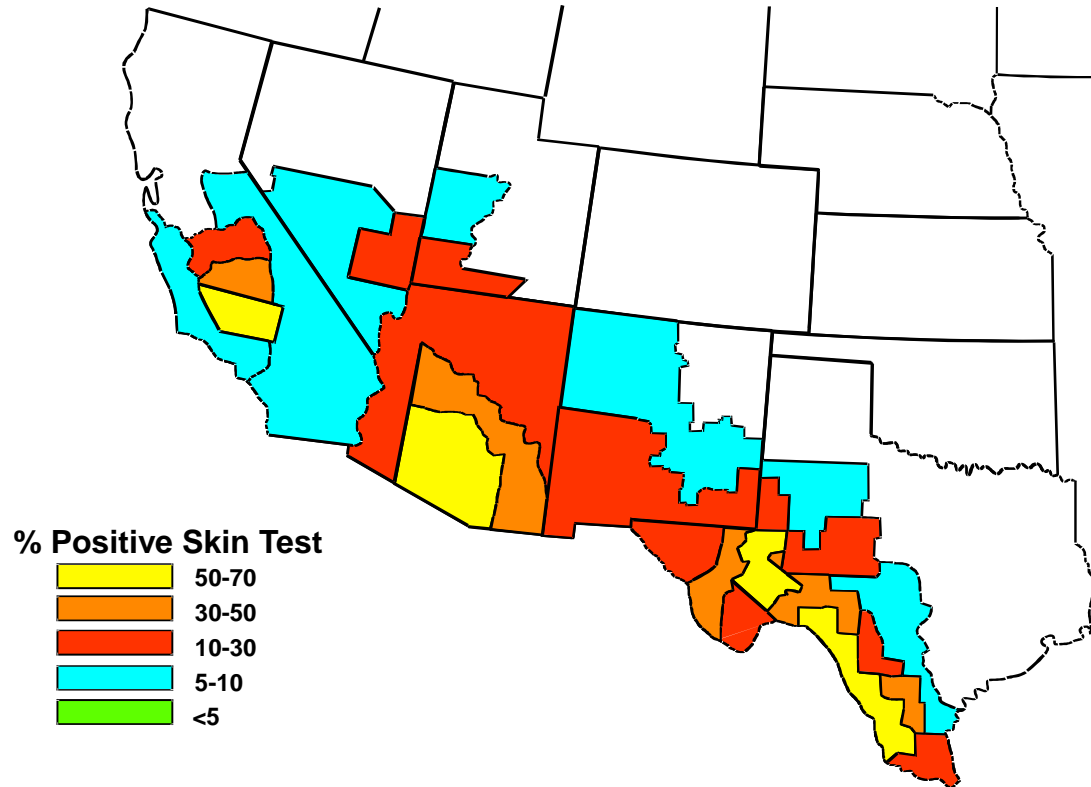
Public Health Mission

- The Arizona Department of Health Services has been working to educate both the public and clinicians about Valley Fever for many years.
- Coccidioidomycosis is endemic to the southwestern United States, parts of northern Mexico, Central and South America.
- Arizona has a large burden of the disease with 60% of nationally reported cases occurring in Arizona.

What We Know?

- Cases waited average of 44 days before seeking care for their valley fever
- Average time between seeking healthcare and getting diagnosed: 5 months (median 23 days)
 - Those who knew about VF prior to seeking healthcare were diagnosed and treated 3 X earlier than those who were not familiar with the disease (79 days vs. 282 days; p-value: 0.04)
- A mean of 3 provider visits occurred before cocci diagnostic testing ordered

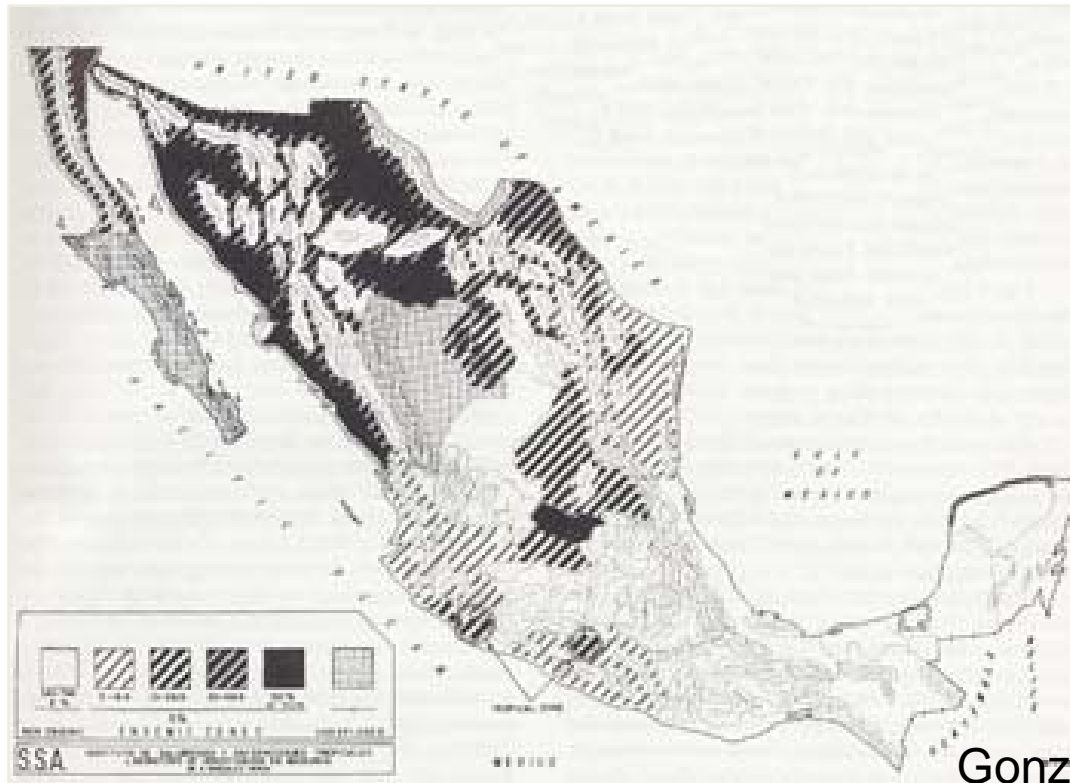
Valley Fever in the U.S.*



* P. Q. Edwards and C. E. Palmer. Prevalence of sensitivity to coccidioidin, with special reference to specific and nonspecific reactions to coccidioidin and to histoplasmin. *Dis.Chest* 31:35-60, 1957

Cocci in México

- Long known to be endemic: Sonora, Coahuila, Nuevo León and Baja California considered most affected



Gonzales-Ochoa, 1966

Valley Fever in the Americas



* Hector RF, Laniado-Laborin R (2005) Coccidioidomycosis—A fungal disease of the Americas. PLoS Med 2(1): e2.

Laboratory Diagnostics

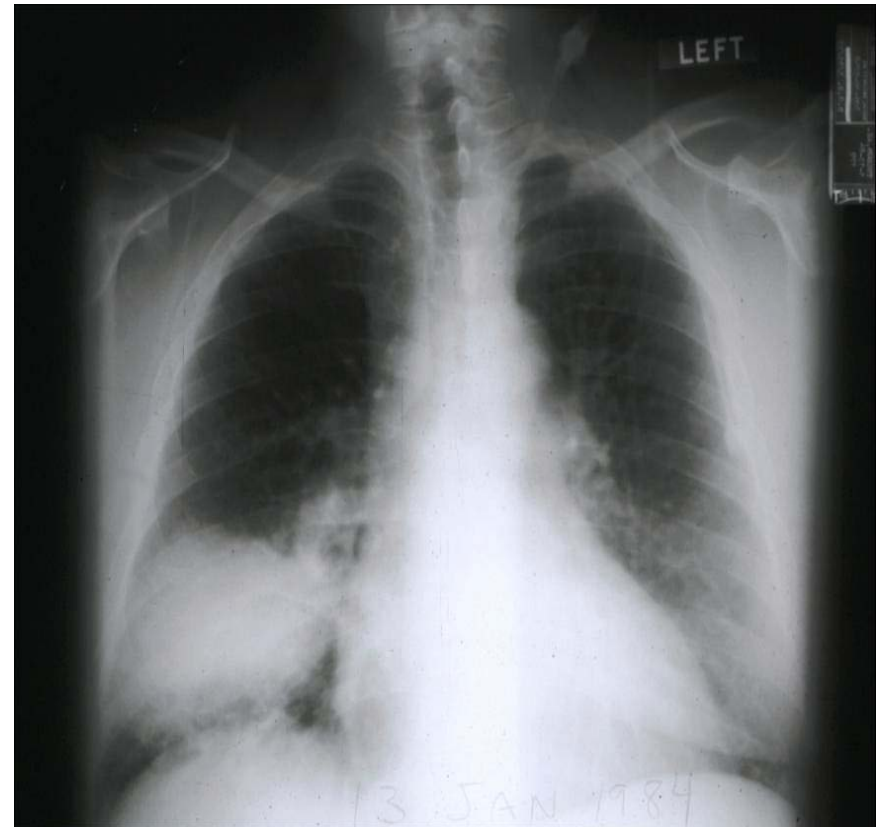
- **Direct**
 - Microscopy (spherules; mycelial forms)
 - PCR probe
- **Serologic** (Simple and most widely used)
 - Enzyme Immuno Assay (EIA) IgM & IgG
 - Immunodiffusion IgM & IgG
 - Complement fixation IgG titer
- **Skin Testing**
 - Established exposure and did not indicate current infection
 - No longer available in U.S.
- **Culture**

Laboratory Diagnostics

- **Serologic (Simple and most widely used)**
 - Enzyme Immuno Assay (EIA) IgM & IgG
 - Immunodiffusion IgM & IgG
 - Complement fixation IgG titer
- Based on your immunologic response
- People can test Negative and be positive for cocci
- Room for improvement

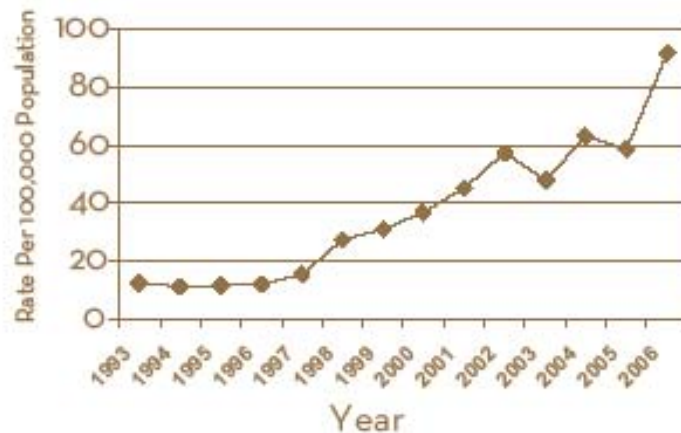
Physician Education

- ADHS recommends patients with community-acquired pneumonia (CAP) from endemic areas are tested for cocci
- Brochure and poster sent to primary care providers across AZ
- Poster targeting EDs with CAP recommendation
- Annual free CME and development of online CME



VALLEY FEVER CASES ARE INCREASING

Coccidioidomycosis rate per 100,000 population by year, Arizona -1993-2006



WHAT CAN YOU DO?

- Order Cocci serology on CAP cases
- Manage Valley fever cases
 - Inform patient of diagnosis
 - Report the case to public health
 - Consider treatment with anti-fungal drugs if the patient is at risk for severe disease

For more information on treatment guidelines, visit www.idsociety.org/pg

VALLEY FEVER MIMICS COMMUNITY ACQUIRED PNEUMONIA (CAP)

29% of Ambulatory CAP cases in Tucson, Arizona had diagnosis of Valley Fever.

Valdivia L, Nix D, Wright M, et al.

Coccidioidomycosis as a Common Cause of Community Acquired Pneumonia. *Emerging Infectious Diseases* 2006; 12: 958-62

Resources

Arizona Department of Health Services
Office of Infectious Disease Services
150 N. 18th Ave, Suite 140
Phoenix, Arizona 85007
(602) 364-4562
www.valleyfeverarizona.org

Valley Fever Center for Excellence
Mail Stop 11111NF
3601 S. 6th Avenue
Tucson, Arizona 85723
Hotline: (520) 629-4777
<http://www.vfce.arizona.edu/>

Public knowledge?

- 1/5 Arizonans have never heard of VF
- 60% believe VF is significant health problem
- More than 1/3 of general public do not know how VF is transmitted



Public Education

COUGH? FEVER? EXHAUSTION?



ASK YOUR DOCTOR TO TEST YOU FOR VALLEY FEVER



Arizona Department of Health Services | Office of Infectious Disease Services | 150 N. 18th Ave, Suite 140 | Phoenix, Arizona 85007 | (602) 364-4562 | www.azdhs.gov



Health and Wellness for all Arizonans



Impact on People

- Cases were sick for an average of 7 months (median 4 months)
- 75% of cases missed work due to cocci
 - Average: 1 month (median 2 weeks)
- 75% unable to do usual daily activities
 - Average: > 3 months (median 6 weeks)

Impact on Economy

- 2007 Hospital Discharge Database
 - 1,735 cocci-related hospital visits
 - Accounting for \$86 million in hospital charges
 - Average: \$50,000 hospital visit

Timeline

- 2007- Arizona-Sonora Meetings
- 2008- Border Infectious Disease Conf.
 - CDC Mycotics Ben Park & Myself present
- 2009- BIDS
 - Respiratory Disease Workgroup
- 2010- Binational CME NM-TX-CHI-SO
 - Las Cruces, NM
- Feb 11- Epi and Lab Exchange
- June 11- Arizona Mexico Commission
 - Declaration of Cooperation
 - Signed by States Governer & Health Dir.

ARIZONA-MEXICO COMMISSION 2011 PLENARY HEALTH SERVICES COMMITTEE / COMITÉ DE SERVICIOS DE SALUD

- **Objective / Objetivo:** Implement a regional program for epidemiologic surveillance and control of Coccidioidomycosis / Implementar un programa regional para la vigilancia epidemiológica y control de la Coccidioidomycosis
-
- **Action Item Target Completion Date / Fecha para concluir la línea de acción:** 1 Year / Año
-
- **Tactic / Táctica A):** Arizona and Sonora will sign a binational Declaration of Cooperation for Epidemiological Surveillance of Coccidioidomycosis. / Arizona y Sonora firmaran una Declaración de Cooperación para la vigilancia epidemiológica de Coccidioidomycosis
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- **Responsible party / Responsable:** Arizona Department of Health Services (ADHS) (AZ) / SSS (SON)
- **Tactic Target Completion Date / Fecha para concluir la táctica:** June 4, 2011
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- **Tactic / Táctica B):** Epidemiologists and Laboratory Personnel from the Secretaria de Salud del Estado de Sonora will visit the Arizona Department of Health Services and the Bio-5 Laboratory at the University of Arizona for trainings and become familiar with Arizona's Epidemiologic Surveillance / Epidemiólogos y personal de Laboratorio de la Secretaria de Salud de Sonora visitaran al Departamento de Servicios de Salud de Arizona y al Laboratorio Bio-5 de la Universidad de Arizona para capacitaciones y para familiarizarse con la vigilancia que se hace en Arizona.



Serial dilutions for the cocci EIA



Looking for immunodiffusion bands (for Histoplasmosis)

Thank You

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