You say Haboob
I say Dust Storm:
Cocci Blowing in the Wind

John N Galgiani MD
Valley Fever Awareness Week
BIO5 Institute
November 6, 2011
Valley Fever in the U.S.

% Positive Skin Test
- Yellow: 50-70%
- Orange: 30-50%
- Red: 10-30%
- Blue: 5-10%
- Green: <5%

www.vfce.arizona.edu
Office of the Governor

* ARIZONA VALLEY FEVER WEEK *

WHEREAS, Valley Fever infections have increased significantly in Arizona over the last decade, with 60% of all reported cases of Valley Fever in the U.S. occurring in Arizona; and

WHEREAS, Valley Fever is the second most commonly reported infectious disease in Arizona; and

WHEREAS, enhanced surveillance and Valley Fever cases demonstrates the serious impact Valley Fever has on the health of our citizens and on Arizona’s healthcare system; and

WHEREAS, the Arizona Department of Health Services, governmental entities, corporations, and organizations are united to educate the public and healthcare providers about Valley Fever in Arizona; and

WHEREAS, through public education and promoting early diagnosis, the number of individuals impacted by Valley Fever may be reduced; and

WHEREAS, Arizona is the focal point of quality clinical care and research for Valley Fever

NOW, THEREFORE, I, Janice K. Brewer, Governor of the State of Arizona, do hereby proclaim November 2-10, 2011 as

* ARIZONA VALLEY FEVER WEEK *

in recognition of the outstanding treatment and research conducted by the Valley Fever Center for Excellence at the University of Arizona and of the advances in Valley Fever education and public health by the Arizona Department of Health Services.

IN WITNESS WHEREOF, I have hereunto set my hand and caused to be affixed the Great Seal of the State of Arizona

Janice K. Brewer
GOVERNOR

DONE at the Capitol in Phoenix on this twelfth day of October in the year Two Thousand and Eleven, and of the Independence of the United States of America the Two Hundred and Thirty-sixth.

Kym Bruner
Secretary of State

9th Annual Valley Fever Awareness Week
October 31st thru November 6th 2011
Coccidioidomycosis as Community-Acquired Pneumonia

In Southern Arizona
A third of all pneumonia is Valley Fever

Tourists to Arizona (or out-of-state students) would have the same risk soon after returning home

Valley Fever in Arizona
Findings from a telephone survey
10% of reported cases in 2007

Impact on People
- Illness lasted an average of 6 months
- 75% of workers off for over 1 month

Impact on Health Care
- 25% needed more than 10 doctor visits
- 40% hospitalized ($86 million in 2007)

Tsang et al., Emerg. Inf. Dis. 2010
The Valley Fever Corridor:
2/3 of all US disease occur here
Valley Fever Corridor Project

• Initiated by the Valley Fever Center in 2008
• Primary goals
  – Increase understanding
  – Improve patient care
  – Assist clinical research
Medical Education

• Valley Fever CME for Primary Care clinicians
  – Phoenix 2008, 2010
  – Tucson 2009, 2011
  – Alternating each year in the future

• On line CME course: released 2009

• Advanced CME for specialists
  – Scottsdale 2010; Tucson 2011
## Organizations Supporting the Valley Fever Corridor Project

<table>
<thead>
<tr>
<th>Medical Groups</th>
<th>Non-Medical Groups</th>
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</thead>
<tbody>
<tr>
<td>Arizona Department of Health Services</td>
<td>Maricopa Association of Governments</td>
</tr>
<tr>
<td>Maricopa County Medical Society</td>
<td>Marana City Council</td>
</tr>
<tr>
<td>Pima County Medical Society</td>
<td>Oro Valley City Council</td>
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<tr>
<td>Arizona Infectious Diseases Society</td>
<td>Tucson City Council</td>
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</tbody>
</table>


Valley Fever Alliance of Arizona Clinicians (VFAAAC)

Patient Needing Help

Primary Care Clinician

Another Subspecialist

Subspecialist

Valley Fever Center for Excellence
Maricopa Community

- 61% of Arizona’s 2010 census population
- Half of all US Valley Fever infections
- Large retirement community: VF is more severe in older persons.
Valley Fever Center in Phoenix: January 2012
Clinical Network and Research

Valley Fever Corridor Project
Clinical Network and Research

Better Diagnostics

Valley Fever Corridor Project
Clinical Network and Research

- New Drugs (Nikkomycin Z)
- Better Diagnostics
- Valley Fever Corridor Project
Clinical Network and Research

- Vaccines
- New Drugs (Nikkomycin Z)
- Better Diagnostics
- Valley Fever Corridor Project
<table>
<thead>
<tr>
<th>Action</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Educate Arizona patients and doctors</td>
<td>$100 thousand/year</td>
</tr>
<tr>
<td>Referral network and case management</td>
<td>$300 thousand/year</td>
</tr>
<tr>
<td>Diagnostic test development</td>
<td>$1.5 million</td>
</tr>
<tr>
<td>Nikkomycin Z development</td>
<td>$40-$60 million (if things go well)</td>
</tr>
<tr>
<td>Vaccine development</td>
<td>$40 million before clinical trials could begin</td>
</tr>
<tr>
<td>Doing nothing</td>
<td>$86 million per year just for hospital costs</td>
</tr>
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</table>
Reported Valley Fever

* 2011 extrapolated from week 43 MMWR

Arizona | California
Climate and Valley Fever

**Mycelial growth in soil (seasonal rain)**

- **Wind Dispersion**
- **Symptoms and Clinical diagnosis**

C. immitis present in soil

- High Temperatures
- Low Precipitation

Soil sterilization during dry foresummer or fall (other microorganisms removed from soil)

C. immitis grows relatively free of competition

- Increased soil moisture
- Soil dries

Spore formation

C. immitis dispersed

- Spores inhaled by host

Symptoms appear in 10-21 days

Infected host chooses to see doctor

Doctor diagnoses and reports estimated date of disease onset
Dust Levels and Rain Fall in Relation to Reported Coccidioidomycosis in Tucson

AC Comrie. Environ. Health Perspect. March 5, 2005. ehponline.org
Phoenix, July 5th, 2011
## Kern 1978 vs Maricopa 2011

<table>
<thead>
<tr>
<th></th>
<th>Kern California</th>
<th>Maricopa Arizona</th>
</tr>
</thead>
<tbody>
<tr>
<td>County Population</td>
<td>400,000</td>
<td>4 million</td>
</tr>
<tr>
<td>% of pop. susceptible</td>
<td>~25%</td>
<td>~75%</td>
</tr>
<tr>
<td>Excess Cocci Cases</td>
<td>120*</td>
<td>3,600</td>
</tr>
<tr>
<td>Predicted Disseminated</td>
<td></td>
<td>140*</td>
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*Pappagianis, West J Med, 1978*
Cases to date

VF in Maricopa Cumulative


Maricopa 2011
Maricopa 2010

July 5th Haboob
VF in Other Counties Cumulative

- **Pima 2011**
- **Pima 2010**
- **Pinal 2011**
- **Pinal 2010**
- **All other counties 2011**
- **All other Counties 2010**

**July 5th Haboob**

Cases to date

- 9-Jan
- 23-Jan
- 6-Feb
- 20-Feb
- 6-Mar
- 20-Mar
- 3-Apr
- 17-Apr
- 1-May
- 15-May
- 29-May
- 12-Jun
- 26-Jun
- 10-Jul
- 24-Jul
- 7-Aug
- 21-Aug
- 4-Sep
- 18-Sep
- 2-Oct
- 16-Oct
- 30-Oct
- 13-Nov
- 27-Nov
- 11-Dec
- 25-Dec
Weekly Through Week 43

2011 difference from 2010

- Maricopa
- Pima
- Pinal

2011 compared to 2010
Why More Valley Fever Now?

- July dust storms may have accounted for some but not all of the increase.
- Dust storms may reflect an overall dry year (until September).
- Doctors may be doing a better job of diagnosing Valley Fever.
Thank-you
And
Questions?
Valley Fever Center for Excellence