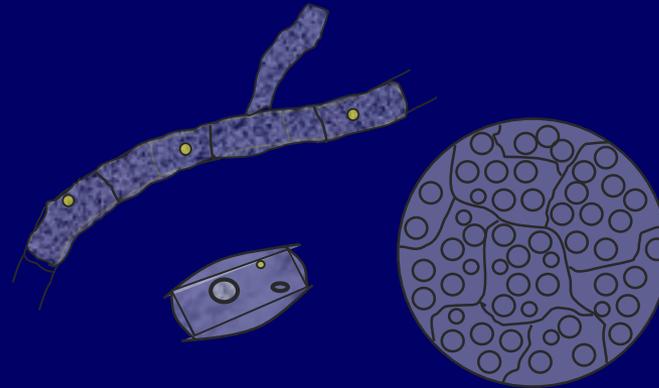


Using Hospitalization Data To Estimate The Public Health Burden of Coccidioidomycosis in California

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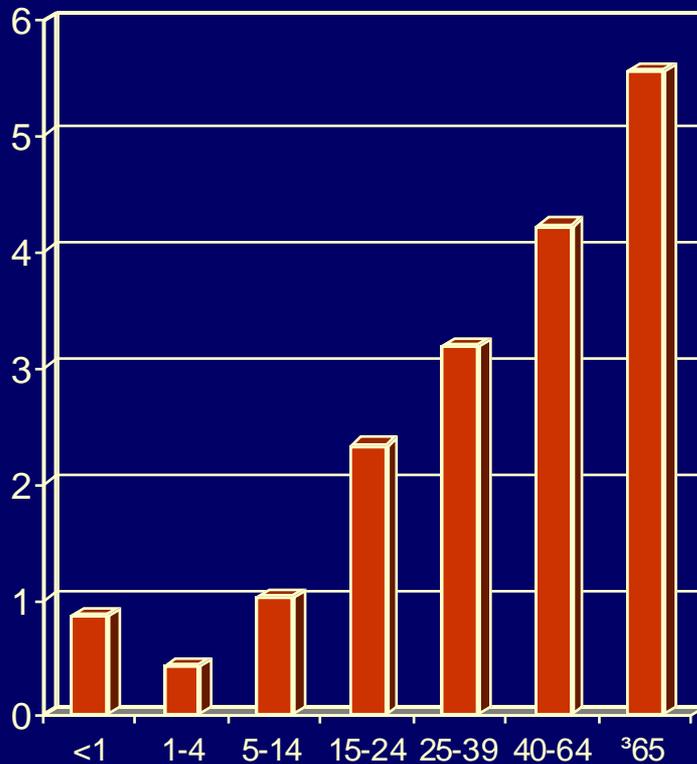
Valley Fever Vaccine Project

Descriptive epidemiology

- U.S. population at risk ~30 million, including central and southern California and most of Arizona, parts of NM, TX, UT, NV
- Mexican population at risk ~14 millions, including most of BC, BCS, CO, CH, NL, SO
- Estimated 150,000 new infections in US annually, 50,000 cases of primary disease (7,000 reported), 3,500 cases of disseminated disease and 200 deaths per year

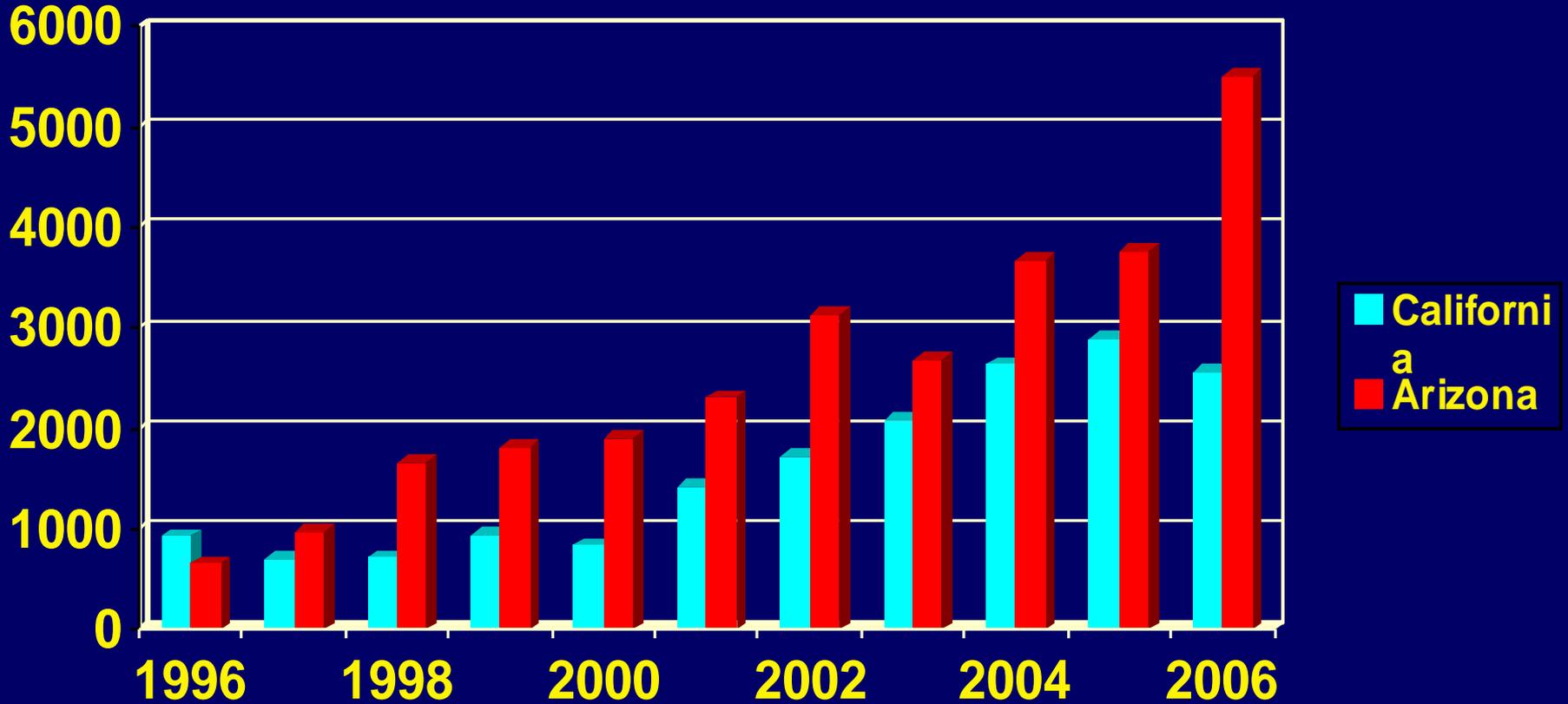
Coccidioidomycosis, United States, 2002

Rate per 100,000 by age group



- 4,984 cases reported
- Rates increase with increasing age
- Rates in males (3.65 per 100,000) higher than females (2.63 per 100,000)
- 97% of cases reported from California and Arizona

Reported Cases of Valley Fever



Costs of hospitalizations for coccidioidomycosis, Arizona, 1998-2001

- 598 (11.8 per 100,000) patients hospitalized in Arizona in 2001
 - 34% ≥ 65 years old
 - 26% had disseminated disease
 - 10% had meningitis
- Direct hospital charges were \$19,342,776 in 2001
- Hospital charges for the 1998-2001 period were \$33,762 per hospitalized patient

Park BJ, Sigel K, Vaz V, et al. An epidemic of coccidioidomycosis in Arizona associated with climate changes, 1998-2001. J Infect Dis 2005; 191:1981-7.

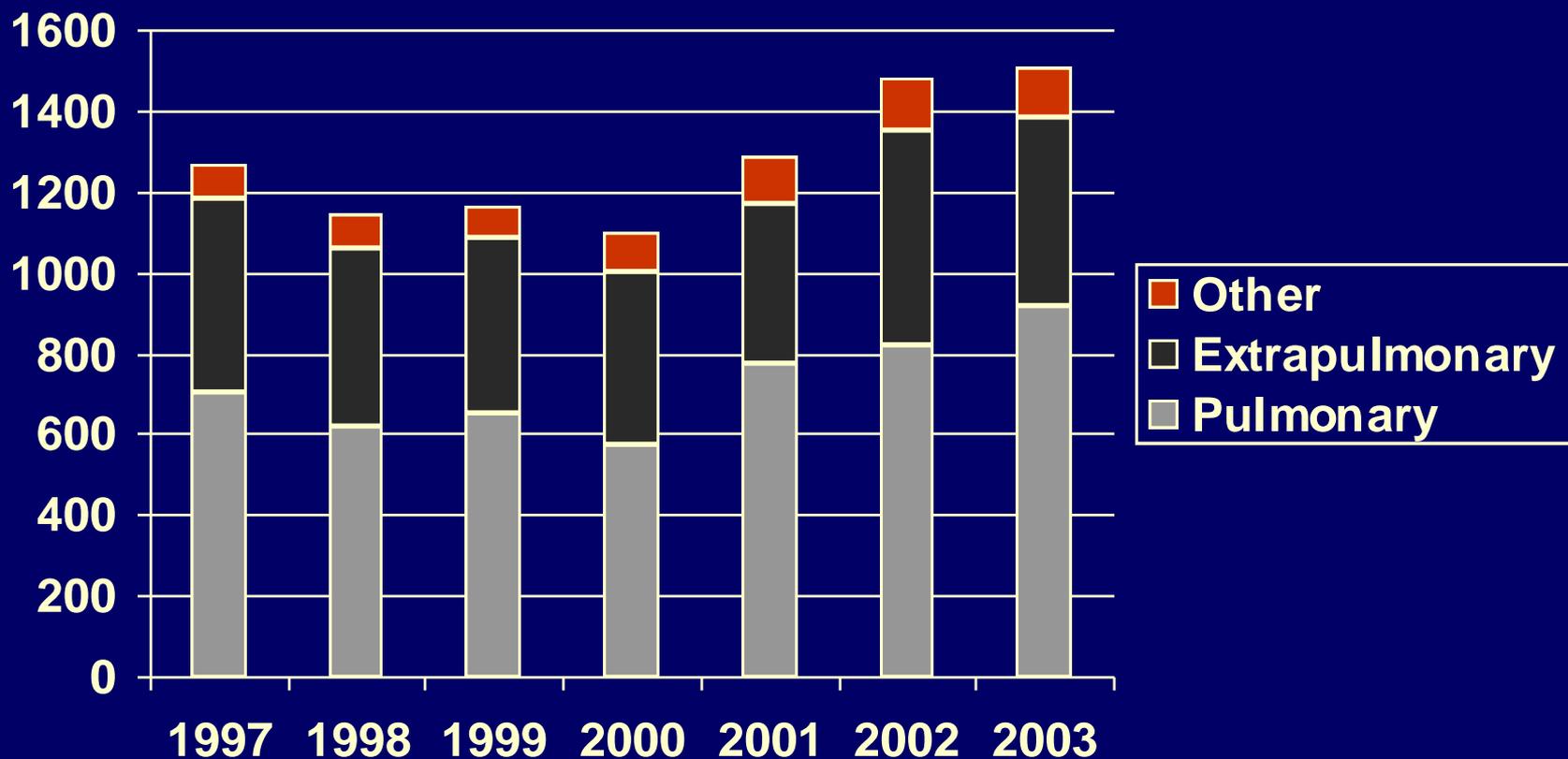
Sources of Data for California Study

- **Inpatient Hospital Discharge Data Set, California Office of Statewide Health Planning and Development**
 - Data from all non-federal hospitals in California
- **Abstracted all discharge records with ICD codes for coccidioidomycosis (ICD-9 codes 114.0-114.5, 114.9)**
 - Each record treated as discrete hospitalization
 - Extracted years of admission, residence, age, race/ethnicity, sex, HIV status, vital status at discharge
- **California population estimates from Dept. of Finance**
 - County residence, age, race/ethnicity, sex, HIV population

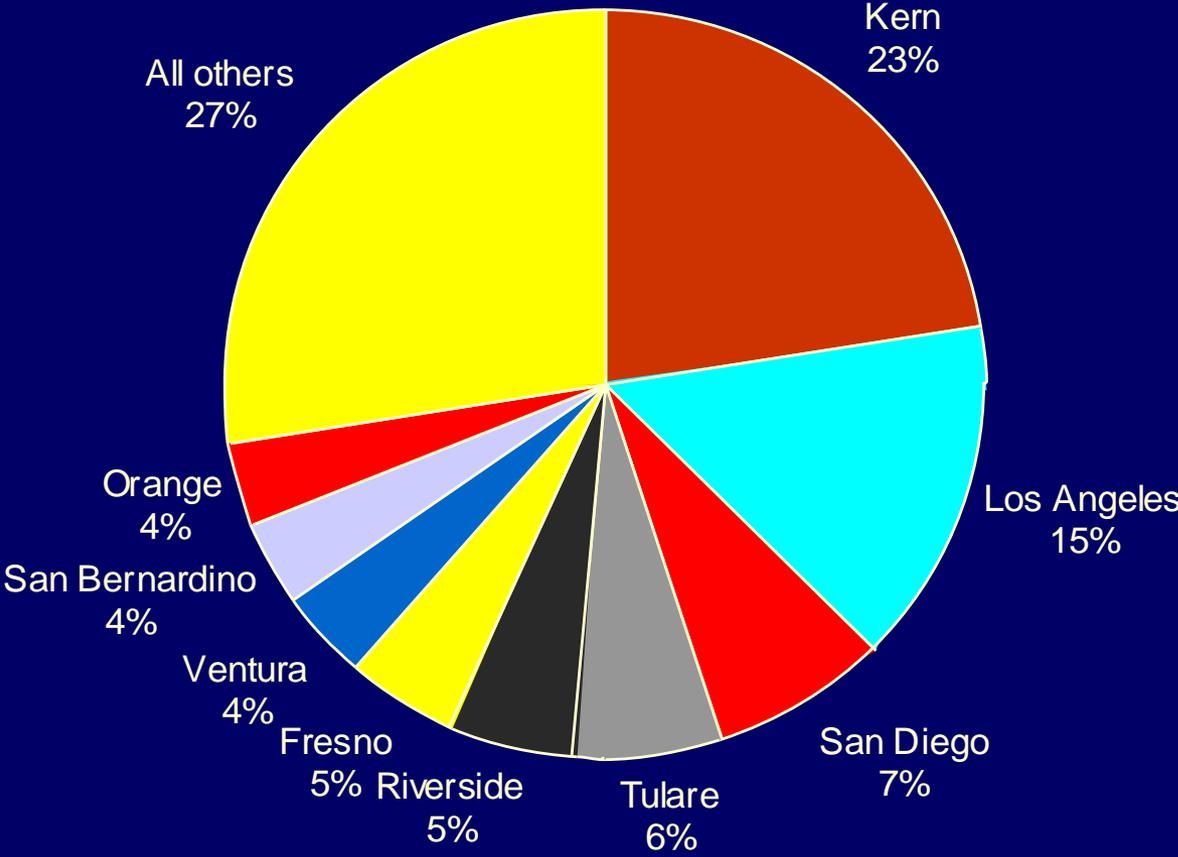
Hospitalizations for Coccidioidomycosis California, 1997-2002

- **7,457 hospitalizations for coccidioidomycosis**
 - Average 1,258 per year
 - Incidence 3.7 per 100,000 per year
 - 2.4 per 100,000 after adjustment for rehospitalization (37%)
 - 72% had principal or first additional diagnosis of coccidioidomycosis; 12% as second additional diagnosis
- **417 discharged dead from hospital**
 - Average 70 per year
 - 8.9% of persons initially hospitalized with coccidioidomycosis had fatal outcome

Hospital discharges with diagnosis of coccidioidomycosis, California, 1997-2003



Coccidioidomycosis hospitalizations by county, 1997-2002



Incidence of hospitalized coccidioidomycosis by county, California, 1997-2002

County	Cases	Incidence per 100,000
Kern	1,700	42.8
Tulare	479	21.7
Kings	133	17.4
San Luis Obispo	170	11.5
Merced	110	8.7
Fresno	350	7.3
Ventura	311	6.9
San Joaquin	193	5.7



Incidence of hospitalized coccidioidomycosis by race and county, 1997-2002

	Incidence of hospitalization (crude per 100,000)	RR of hospitalization	Kern, Kings, Tulare and San Luis Obispo Counties	
			Incidence of hospitalization	RR of hospitalization
White	3.6	Ref	26.6	Ref
Hispanic	3.4	0.73 (0.68-0.78)	24.1	0.71 (0.63-0.79)
Black	8.0	2.68 (2.48-2.91)	80.8	2.43 (2.10-2.82)
Native American	1.4	0.32 (0.21-0.51)	12.7	0.37 (0.20-0.70)
Asian	2.0	0.78 (0.70-0.87)	51.0	1.62 (1.34-1.97)

RR by multivariate Poisson model controlling for year, county, age, race and gender

Incidence of hospitalized coccidioidomycosis by sex, diagnosis and county, 1997-2002

	Incidence of hospitalization (crude per 100,000)	RR of hospitalization	Kern, Kings, Tulare and San Luis Obispo Counties	
			Incidence of hospitalization	RR of hospitalization
Female	2.3	Ref	21.9	Ref
Male	5.0	2.14 (2.03-2.27)	36.6	1.67 (1.53-1.85)
Pregnancy	3.8	2.5 (2.03-3.08)		
AIDS	133.0	36.2 (32.5-40.3)		

RR by multivariate Poisson model controlling for year, county, age, race and gender

Incidence of hospitalized coccidioidomycosis by age group and county, 1997-2002

	Incidence of hospitalization (crude per 100,000)	RR of hospitalization	Kern, Kings, Tulare and San Luis Obispo Counties	
			Incidence of hospitalization	RR of hospitalization
0-14 years	0.5	0.12 (0.10-0.14)	3.9	0.12 (0.09-0.15)
15-49 years	3.5	Ref	31.3	Ref
50-69 years	7.1	2.13 (2.01-2.26)	57.2	1.83 (1.66-2.03)
≥70 years	7.3	2.74 (2.54-2.97)	102.7	1.83 (1.58-2.12)

RR by multivariate Poisson model controlling for year, county, age, race and gender

Valley Fever as a cause of community acquired pneumonia (CAP)

Valdivia L, Nix D, Wright M, Lindberg E, Fagan T, Lieberman D, Stoffer T, Ampel NM, Galgiani JN. Emerg Infect Dis 2006; 12:958-62.

Prospective Study of Valley Fever as a cause of CAP

- Hypothesis:

One-quarter of all CAP in Southern Arizona are in fact due to Valley Fever.

- Study design:

Prospective, observational, non-interventional evaluation of Tucson residents seeking care for CAP.

METHODS

- **Study periods**

 - December 1, 2003 to February 21, 2004

 - May 1, 2004 to August 14, 2004

- **Sites of enrollment: Tucson**

 - a primary care practice

 - UMC urgent care clinic

- **Inclusion Criteria:**

 - Lower respiratory syndrome of < 1 month duration

 - Patients 18 or older

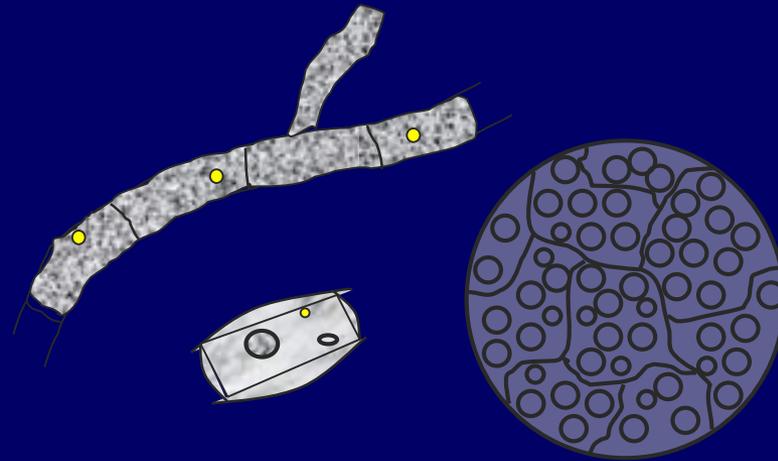
 - Endemic residence for > 1 week

PROTOCOL

- Initial assessment
 - Demographics and symptom inventory
 - Fatigue and respiratory infection severity scales self-administered.
 - Blood specimens for central serologic testing
- Repeat blood specimen at 2 weeks.
- Follow-up for seropositive patients

Results

- Of 55 patients enrolled, 16 were serologically positive for Valley Fever
 - 29% (CI: 16% - 44%)
 - 46 (84%) were prescribed antibacterial drugs
- Serology findings
 - 14 subj. were either IDTP or IDCF positive
 - 2 subj. were EIA IgG alone (no second specimen on either)
 - 38 subjects were sero negative
 - 27 did not have second specimen
- Median endemic exposure significantly shorter for sero-positive subjects (6 versus 10 years, $p=.027$)
- No differences related to gender or age



Valley Fever Vaccine Project