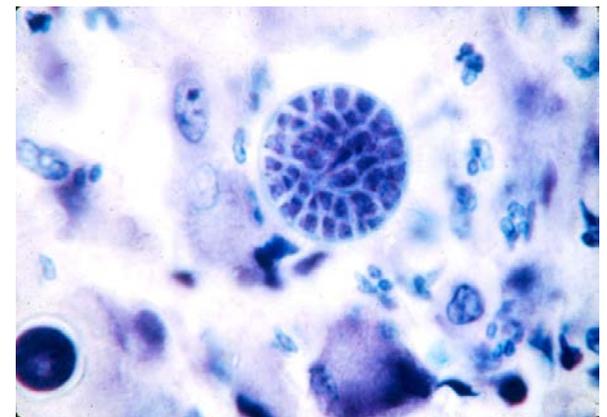


# Enhancing Prevention: Coccidioidomycosis Skin Test Screening Acceptance and Results Among California State Inmates

**Kim Lucas, MPH**

**California Correctional Health Care  
Services, Public Health Branch**

**July 23, 2015**

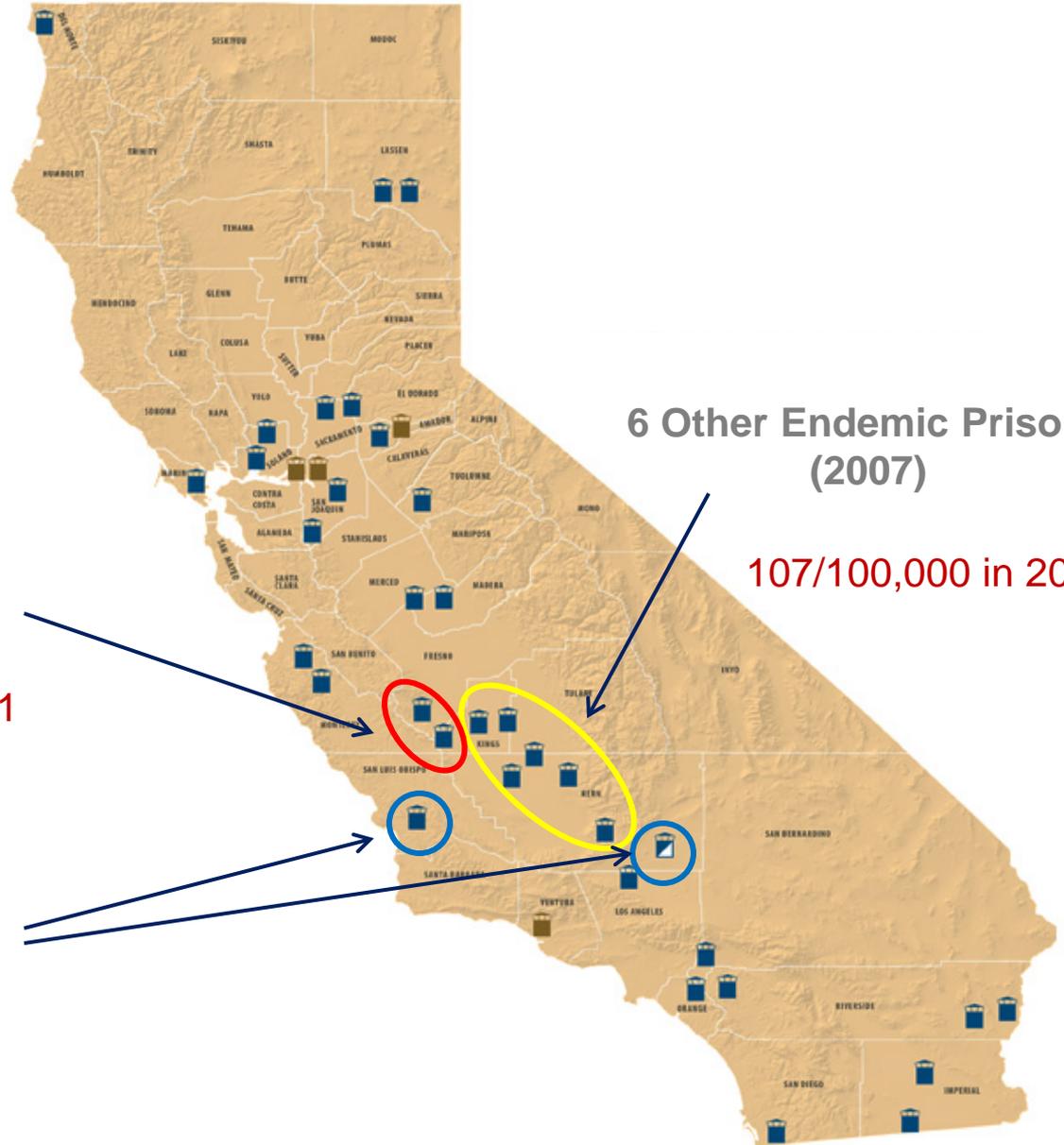


# Background

**ASP and PVSP  
(2007)**

5,247/100,000 in 2011

**9<sup>th</sup> & 10<sup>th</sup> Endemic Prisons  
(2015)**



**6 Other Endemic Prisons  
(2007)**

107/100,000 in 2011

# Cocci Cases/100,000 Population (2011)

County	Rate Including Prisons <sup>1</sup>	Rate Excluding Prisons	Endemic Area Prisons
Kern	303	298	5
Kings	246	84	3 (Including ASP)
Fresno	77	43	1 (PVSP)
San Luis Obispo	62	48	1
Statewide	14	12	10
Los Angeles	3	3	0

<sup>1</sup><http://www.cdph.ca.gov/healthinfo/discond/pages/coccidioidomycosis.aspx>



# Prevention: Risk-Based Restriction

- (2007) Medically restrict inmates with immunocompromising conditions or severe COPD from eight designated cocci endemic area prisons
- (2013) Medically restrict African-American, Filipino, and inmates with diabetes from ASP and PVSP
- (2015) Two additional prisons designated in the cocci endemic area



## Prevention: Test-Based Restriction

- (2013) Consulted with CDC
- (2014) CDC recommended cocci skin testing and restriction of inmates with a negative result from ASP and PVSP
  - Model estimated that a test-based strategy with restriction of inmates with a negative test is likely to prevent 60% of disease compared with 10% expected with the risk-based strategy



# Prevention: Test-Based Restriction

- (2014) Spherusol® became commercially available
- (January 2015) Conducted a statewide mass skin test screening event
- (February 2015) Integrated skin test into reception center intake health assessment



# Methods

- Educated inmates during 2 months before cocci skin test mass screening event and at offer
- Offered skin test to all inmates who could be eligible for placement at ASP or PVSP
- Halted inmate transfers for skin test administration (Jan 11 – 14)
- Conducted follow-up screening for those not offered or with incomplete tests (Jan 15 - 31)
- Healthcare staff entered testing and adverse reaction data real-time into a web-based application
- Analyzed data using SAS

# Mass Screening

# Acceptance and Results

(As of 1/31/15)

	N	%
Eligible <sup>1</sup>	98,348	83.2%
Offered	96,987	98.6%
Accepted	37,089	38.2%
Administered	36,914	99.5%
Read	36,789	99.7%
Positive Result	3,169	8.6%

<sup>1</sup>Men,  $\geq 18$  years old, not condemned, without immunocompromising conditions or COPD.

# Test Performance Among Positive

Group	Induration Mean (range)	$\leq 39$ mm
CCHCS (n=3,169)	12 (5 – 83) mm	99%
Spherusol® Product Insert (n=51)	17 (5 – 39) mm	100%

# Adverse Reactions

	N	%
Immediate	6	0.016%

No reports consistent with anaphylaxis

At Read	N	%		N	%
Itching at site	1,182	3.21	Fever	56	0.12
Itching elsewhere	97	0.26	Chills	73	0.20
Rash at site	426	1.15	Nausea	97	0.26
Rash elsewhere	42	0.11	Arthralgias	67	0.18
Pain at site	299	0.81	Other reaction	159	0.43
Necrosis at site	8	0.02	Any adverse reaction	1,715	4.66

# Acceptance of Test

# Acceptance by Race/Ethnicity

Race/Ethnicity	N	%	P	OR	95% CI
Overall	37,089	38.2	--	--	--
African American	7,052	24.6	<.0.0001	0.39	0.37 – 0.40
Filipino	84	34.6	0.0005	0.62	0.48 – 0.81
Hispanic	18,020	44.0	<0.0001	0.93	0.90 – 0.96
Asian-PI	320	42.6	0.08	0.88	0.76 – 1.01
Other	2,461	40.5	<0.0001	0.81	0.76 – 0.85
White	9,252	45.8		<i>Reference</i>	

# Acceptance by Age

Age (Years)	N	%	p-value*
$\leq 30$	9,507	34.3	
31 - 45	15,701	38.0	<0.0001
$\geq 46$	11,881	43.1	

\*Cochran-Armitage test for trend

# Acceptance by Location

Prison	N	%	p	OR	95% CI
ASP	1,681	41.2	0.0002	1.13	1.06 – 1.20
Other (excl PVSP)	35,408	38.3		<i>Reference</i>	
PVSP	946	29.1	<0.0001	0.65	0.60 – 0.70
Other (excl ASP)	36,143	38.7		<i>Reference</i>	

# Test Result

# Positive Rate by Race/Ethnicity

Race/Ethnicity	N	%	P	OR	95% CI
Overall	3,169	8.6	--	--	--
African American	561	8.0	0.02	0.88	0.78 – 0.98
Filipino	6	7.1	0.54	0.77	0.34 – 1.78
Hispanic	1,567	8.8	0.39	0.96	0.88 – 1.05
Asian-PI	19	6.0	0.06	0.64	0.40 – 1.02
Other	195	8.0	0.10	0.87	0.74 – 1.03
White	821	9.1		<i>Reference</i>	

# Positive Rate by Age

Age (Years)	N	%	p-value*
$\leq 30$	459	4.9	
31 - 44	1,405	9.0	<0.0001
> 45	1,305	11.1	

\*Cochran-Armitage test for trend

# Positive Rate by Location

Prison	N	%	P	OR	95% CI
ASP/PVSP	423	16.2	<0.0001	2.33	2.08 – 2.61
Other Endemic	1,058	8.8	0.0003	1.16	1.07 – 1.26
Non-endemic	1,688	7.6		<i>Reference</i>	

# Conclusions

- Skin test mass screening achieved exceptionally high rates of offer, administration, read (all  $\geq 99\%$ )
- Test performed similarly among positives compared with product insert
- Adverse reactions ( $< 5\%$ ) comparable to Tubersol product insert (2–3% local redness/rash)
- Acceptance (38%) not surprising given new test with a complex educational message
- Lower acceptance among African American and Filipino inmates may be due to already being restricted from ASP and PVSP
- Positive rate (8.6%) within CDC predicted range (5–14%)

# Acknowledgements

- **Dr. Janet Mohle-Boetani, Deputy Medical Executive, Public Health Branch**
- **Dr. Charlotte Wheeler, Medical Epidemiologist, Public Health Branch**
- **Dr. Steven Ritter, Deputy Director, Medical Services**
- **Dr. Steven Tharratt, Director of Health Care Operations, Statewide Chief Medical Executive**
- **Cheryl Schutt, Statewide Chief Nurse Executive, Nursing Services Branch**
- **Public Health Nurses at headquarters and 33 CDCR institutions, CCHCS**
- **Information Services Technology Division**
- **Quality Management Program**