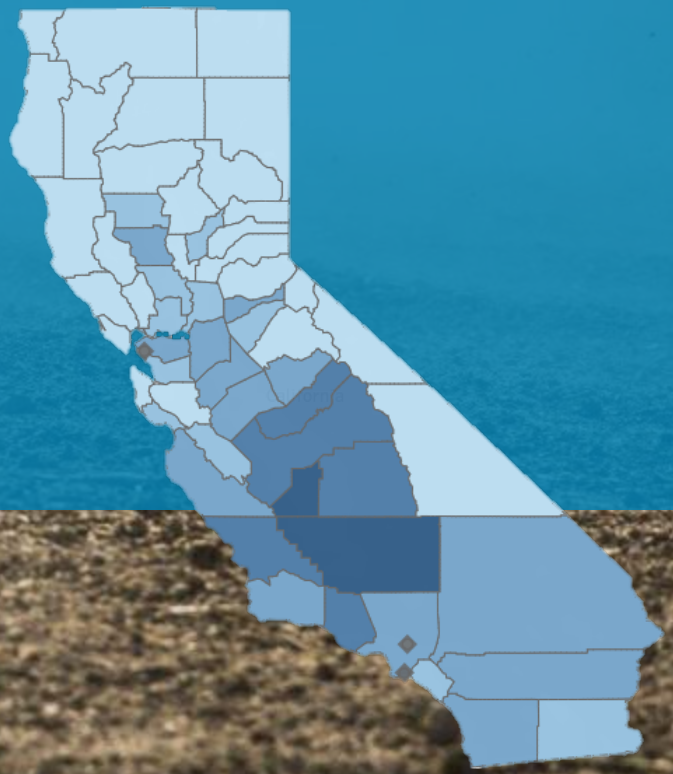
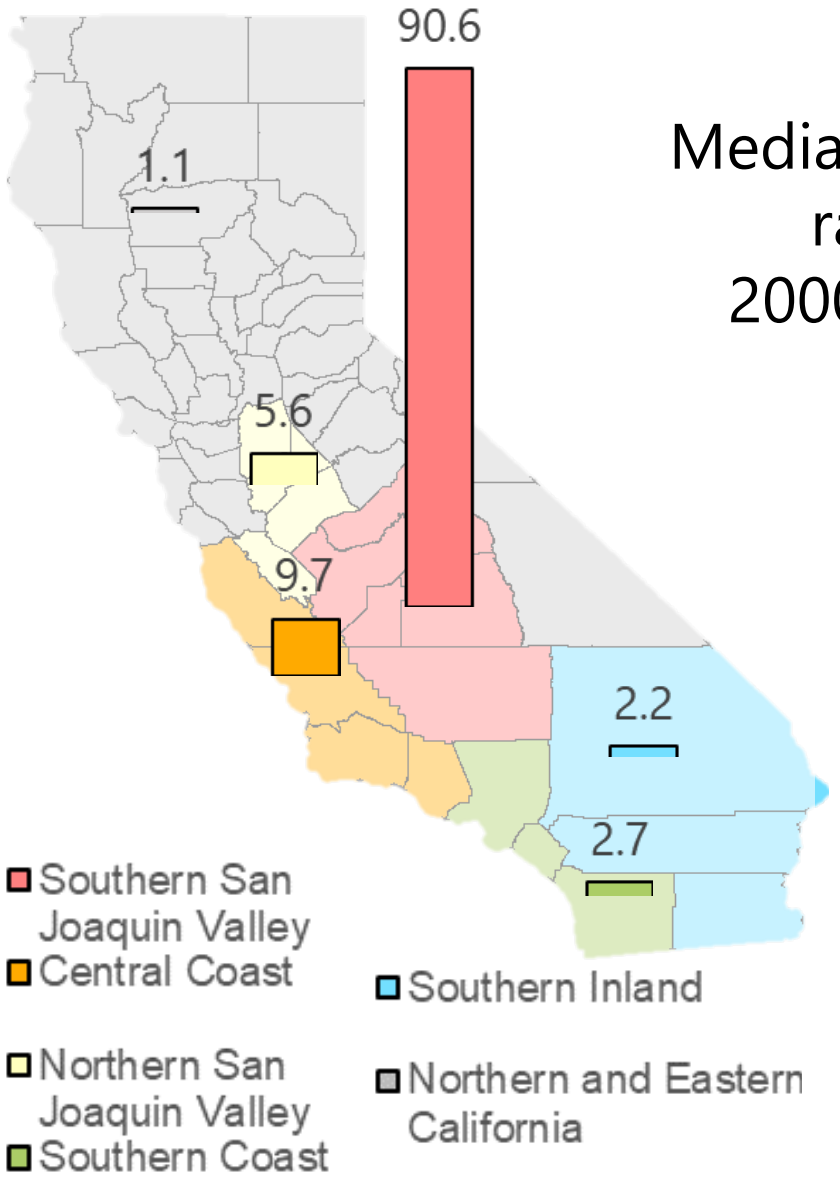
Valley Fever in a Changing California

Gail Sondermeyer Cooksey, MPH
Infectious Diseases Branch
Division of Communicable Disease Control
California Department of Public Health (CDPH)



Valley fever is endemic in CA

- 7000-9000 annual cases
  - One of CA's most reported diseases
- In 2020, rate of 18.1 cases per 100,000 population
- VF rates in CA vary widely

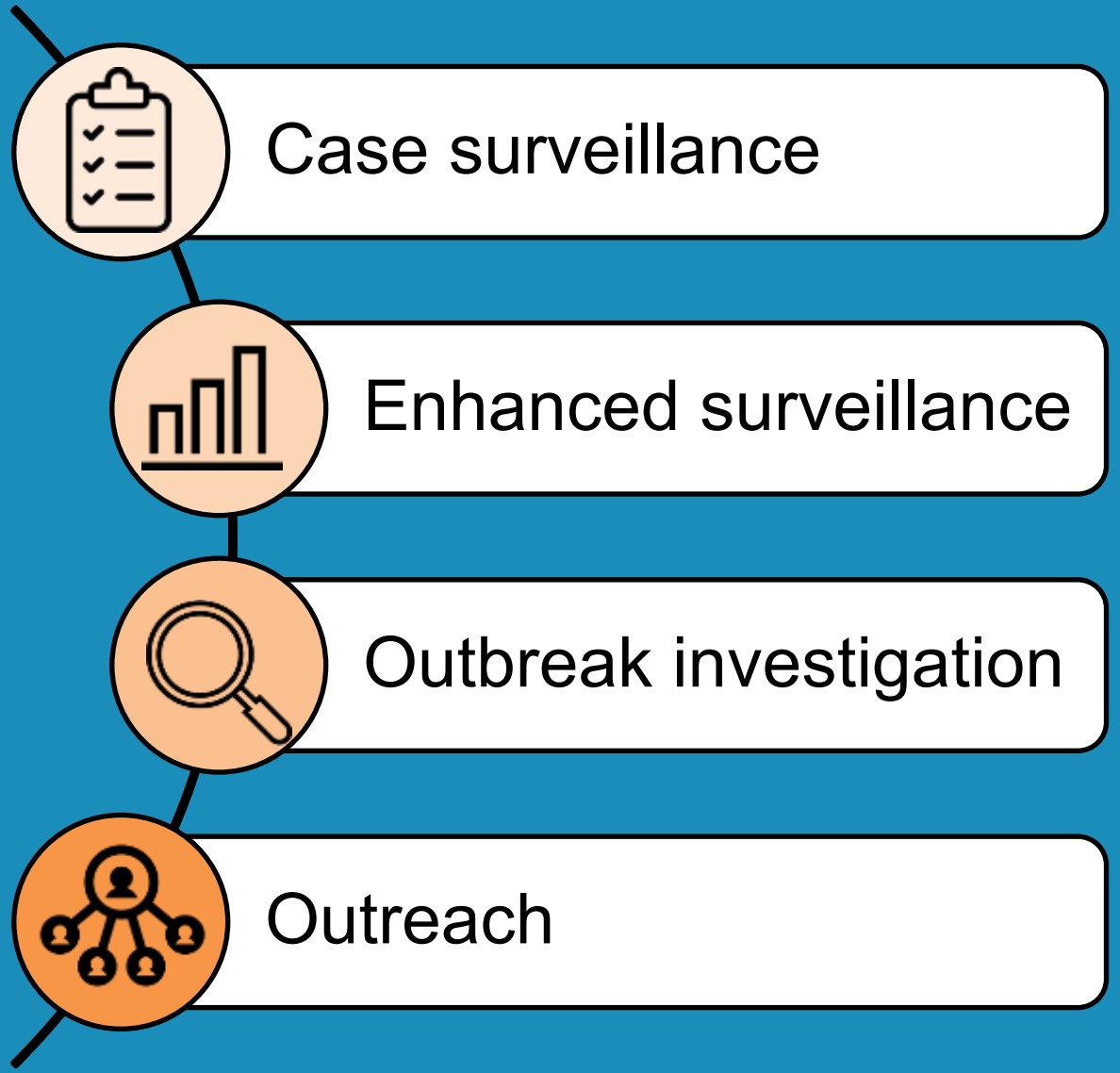


Median annual rates 2000-2018

Sondermeyer Cooksey, G. Regional Analysis of Coccidioidomycosis Incidence — CA, 2000–2018. *Emerg Infect Dis.*

Coccidioidomycosis (Valley Fever) (ca.gov)

Major Valley fever activities at CDPH



What do we know from these sources?

What are the challenges in addressing VF in CA?

What do we know from current data sources?

WHO? WHAT? WHEN? WHERE? WHY?

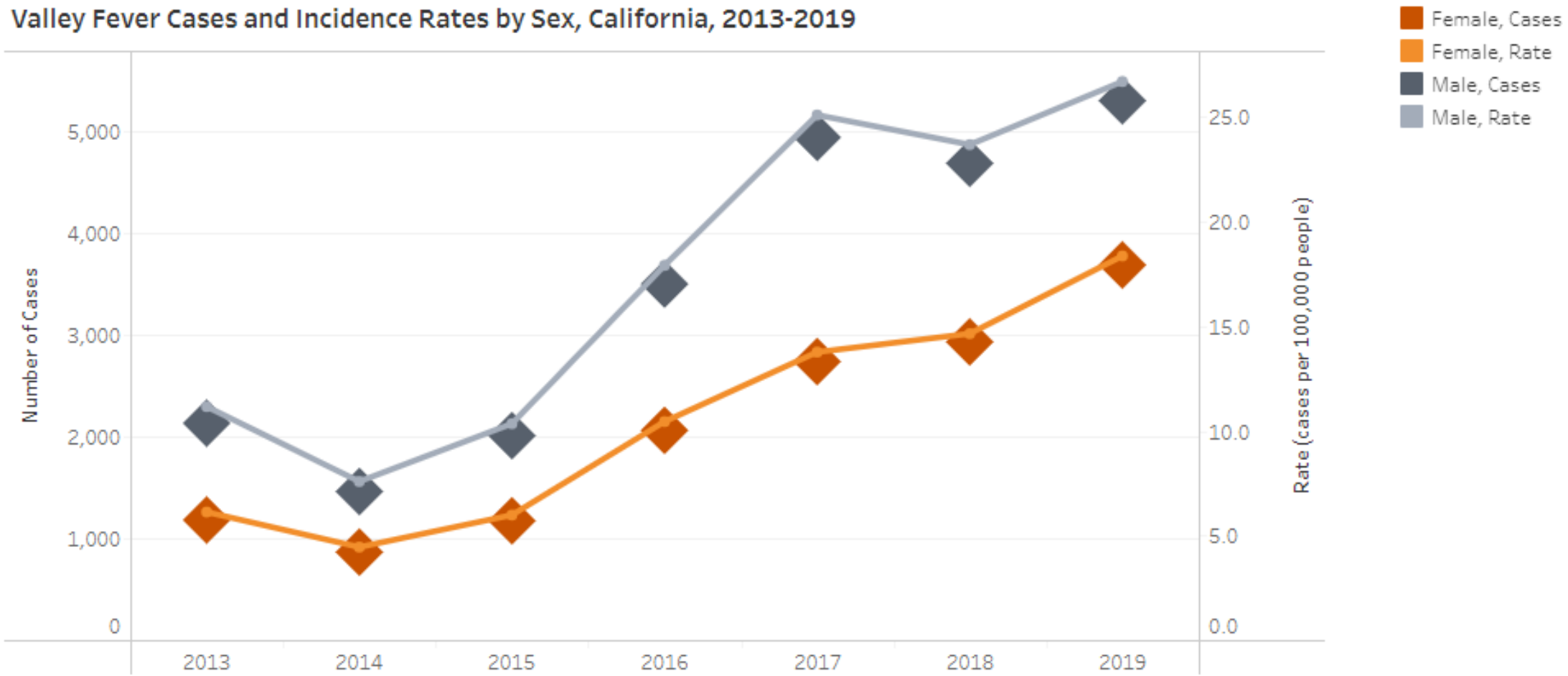




High VF rates in certain populations in CA

Consistently higher rates in males

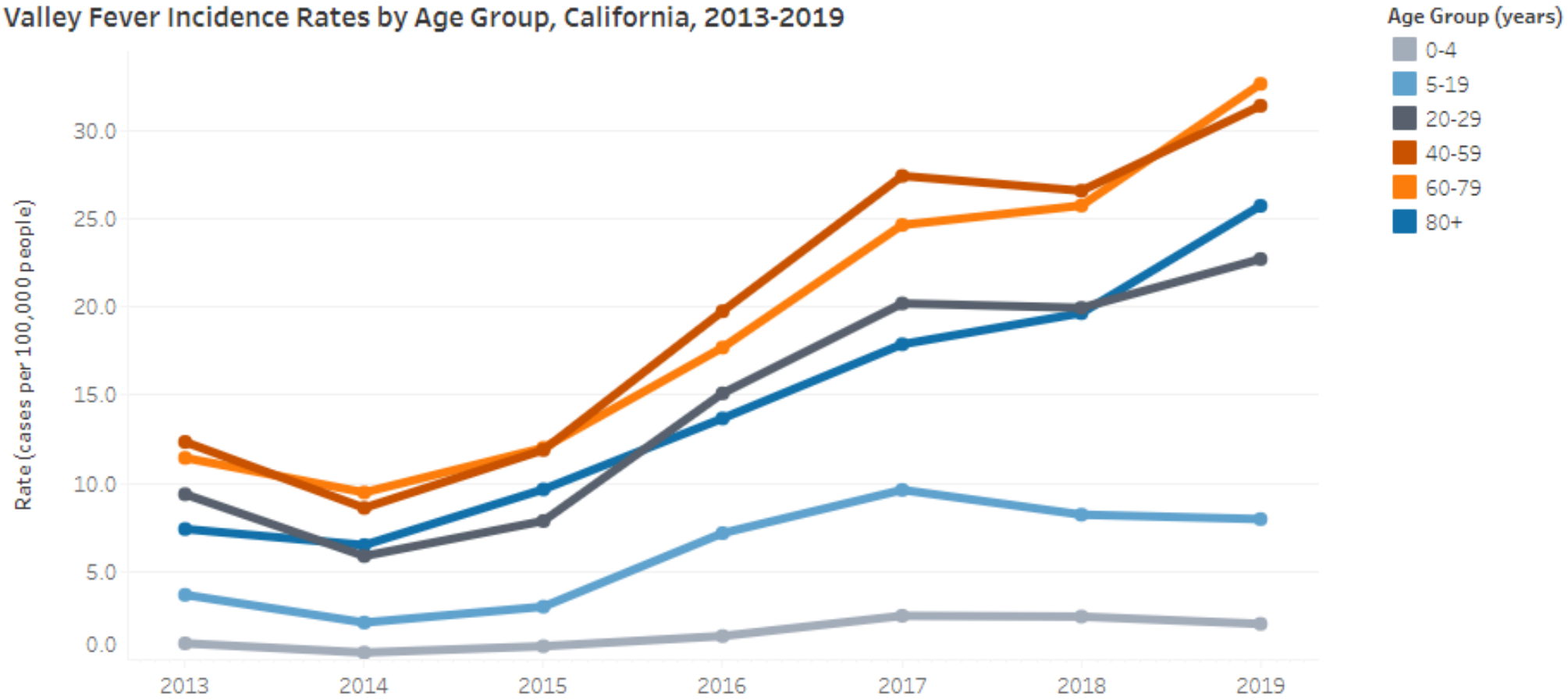
WHO?



2019 Valley Fever Epidemiologic Summary Dashboard (ca.gov)

Rates highest 40-79 years, but age risk varies somewhat by region

WHO?

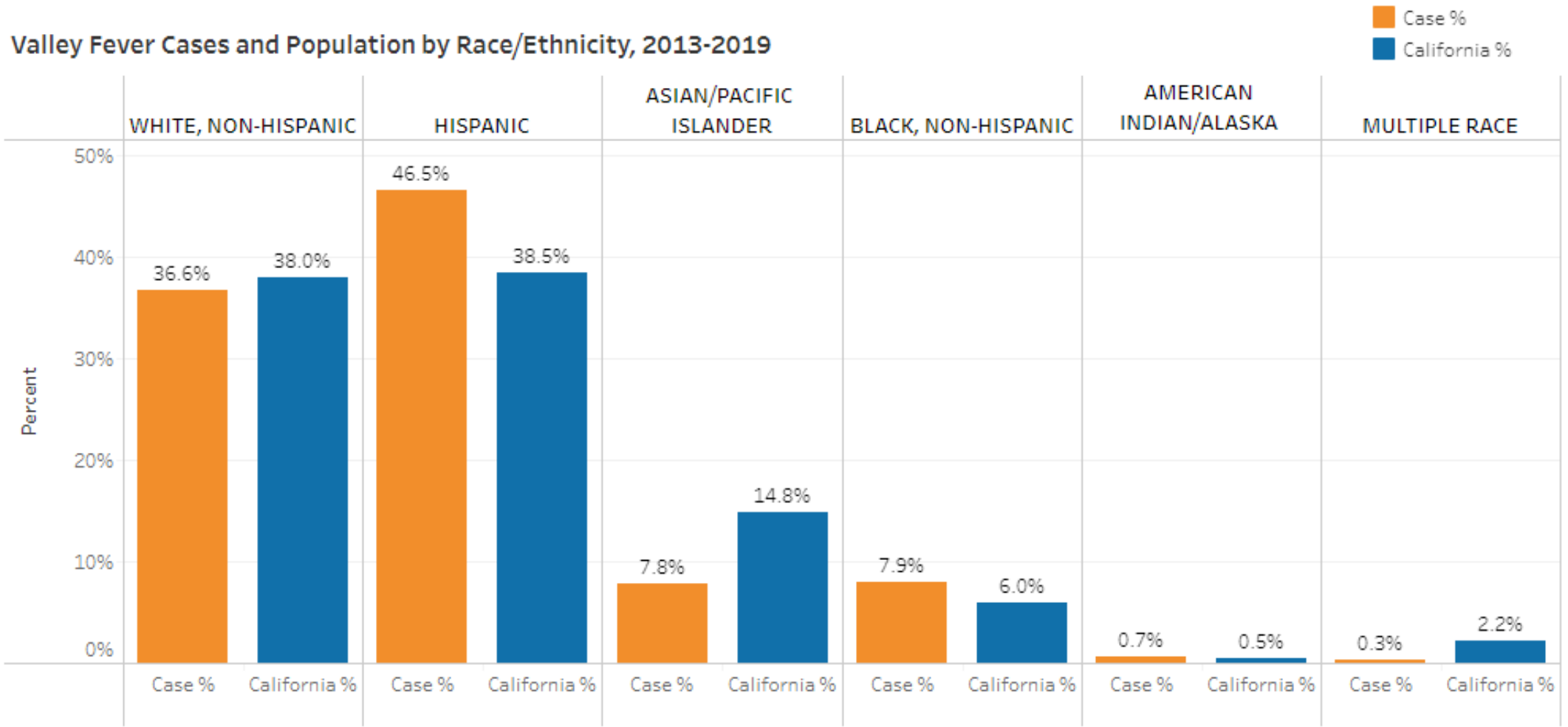


*Potentially unreliable rate: relative standard error 23% or more.

2019 Valley Fever Epidemiologic Summary Dashboard (ca.gov)

Higher than expected cases in Blacks statewide and Latinos regionally

WHO?



2019 Valley Fever Epidemiologic Summary Dashboard (ca.gov)

Also see high VF in…

- CA inmates

Wheeler C. Rates and risk factors for Coccidioi-domycosis among prison inmates, California, USA, 2011. *Emerg Infect Dis*.

De Perio, M. Occupational coccidioidomycosis surveillance and recent outbreaks in California. *Medical Mycology*.

WHO?

- Outdoor workers
  - Exposed to dirt and dust
    - Construction
    - Wildland firefighting
    - Wildlife biologists
    - Archaeologists/researchers
  - Outbreaks

Also see high rates in…

- CA inmates

1:45-3:00

Session 3: Disease Impact

John Galgiani, University of Arizona College of Medicine - Tucson; Valley Fever Center for Excellence
Moderator

Cocci and Indigenous populations
Shawnell Damon, Indian Health Services

Valley fever among California State prison residents: epidemiology, prevention, and challenges
Kim Lucas, California Correctional Health Care Services

Occupational Valley Fever
Marie de Perio, US Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health

De Perio, M. Occupational coccidioidomycosis surveillance and recent outbreaks in California. *Medical Mycology*.

WHO?

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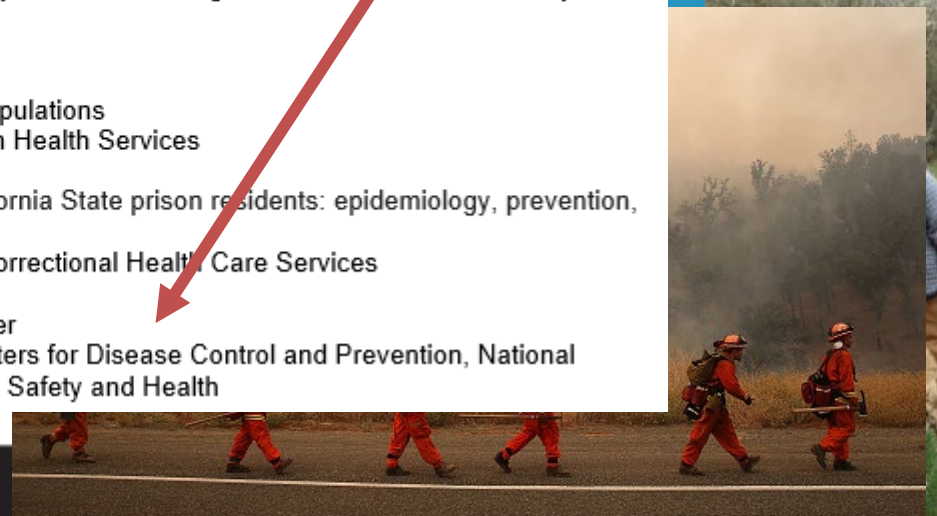


Hospitalization data show severe outcomes

On average, each year in CA from 2000-2017,

- 1400 patients hospitalized with VF
- Median length of stay of 8 days
- 13% stayed for >30 days
- $4.5 billion total hospital charges
- 8% died in-hospital

Sondermeyer Cooksey, G. Epidemiology of Coccidioidomycosis-associated Hospitalizations and In-hospital Deaths, California, 2000–2017. Poster IDSA 2019.

Severe outcomes from outbreaks

WHAT?

One construction site outbreak:

- 44 confirmed VF cases
- 34 missed work
  - Median 22 days
- 9 hospitalized
- 2 disseminated disease

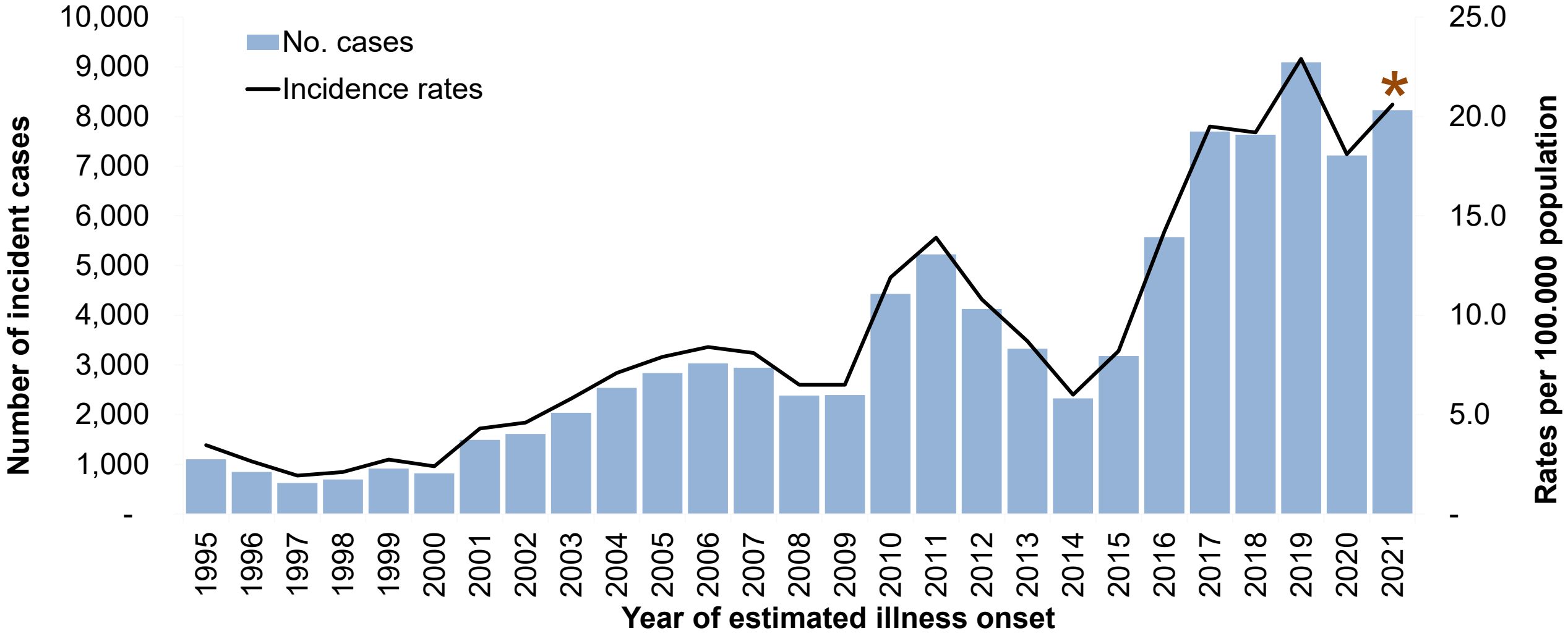
- From 2012-2021, investigations of worksite VF outbreaks identified

>200 confirmed and clinical cases

Wilken, J. Coccidioidomycosis among Workers Constructing Solar Power Farms, California, USA, 2011–2014. *Emerg Infect Dis.*

What are the VF trends in California?

WHEN?

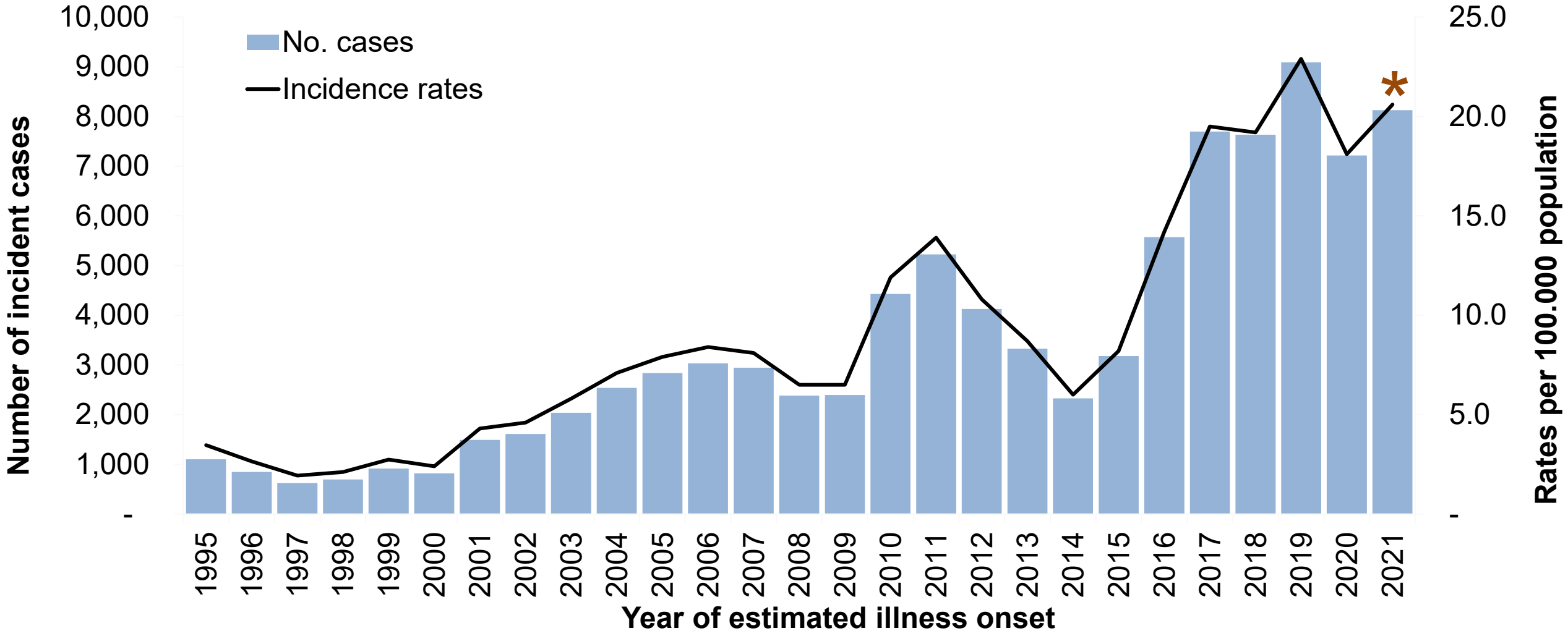


*Provisional data reported for 2021

Valley Fever Data and Publications

In California, periodic peaks and dips in VF incidence

WHEN?

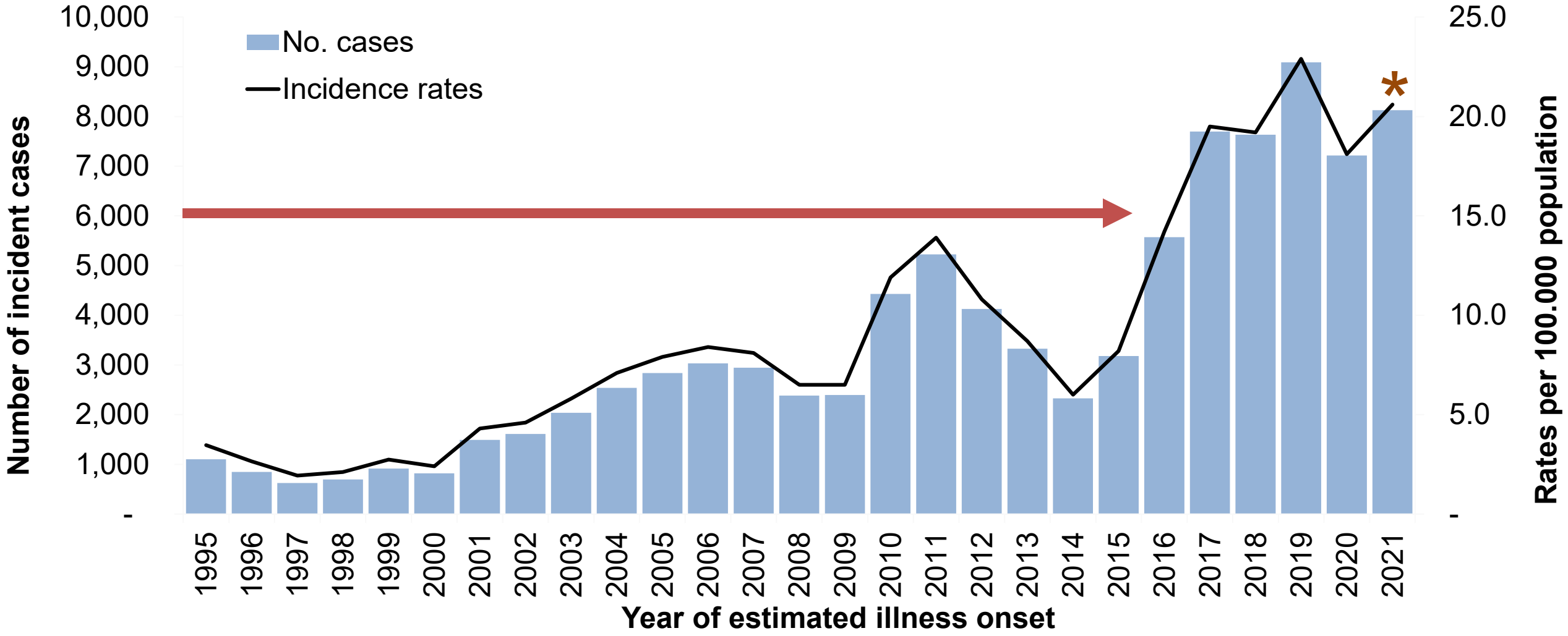


*Provisional data reported for 2021

Valley Fever Data and Publications

From 1995-2015, average of 2000 cases per year

WHEN?



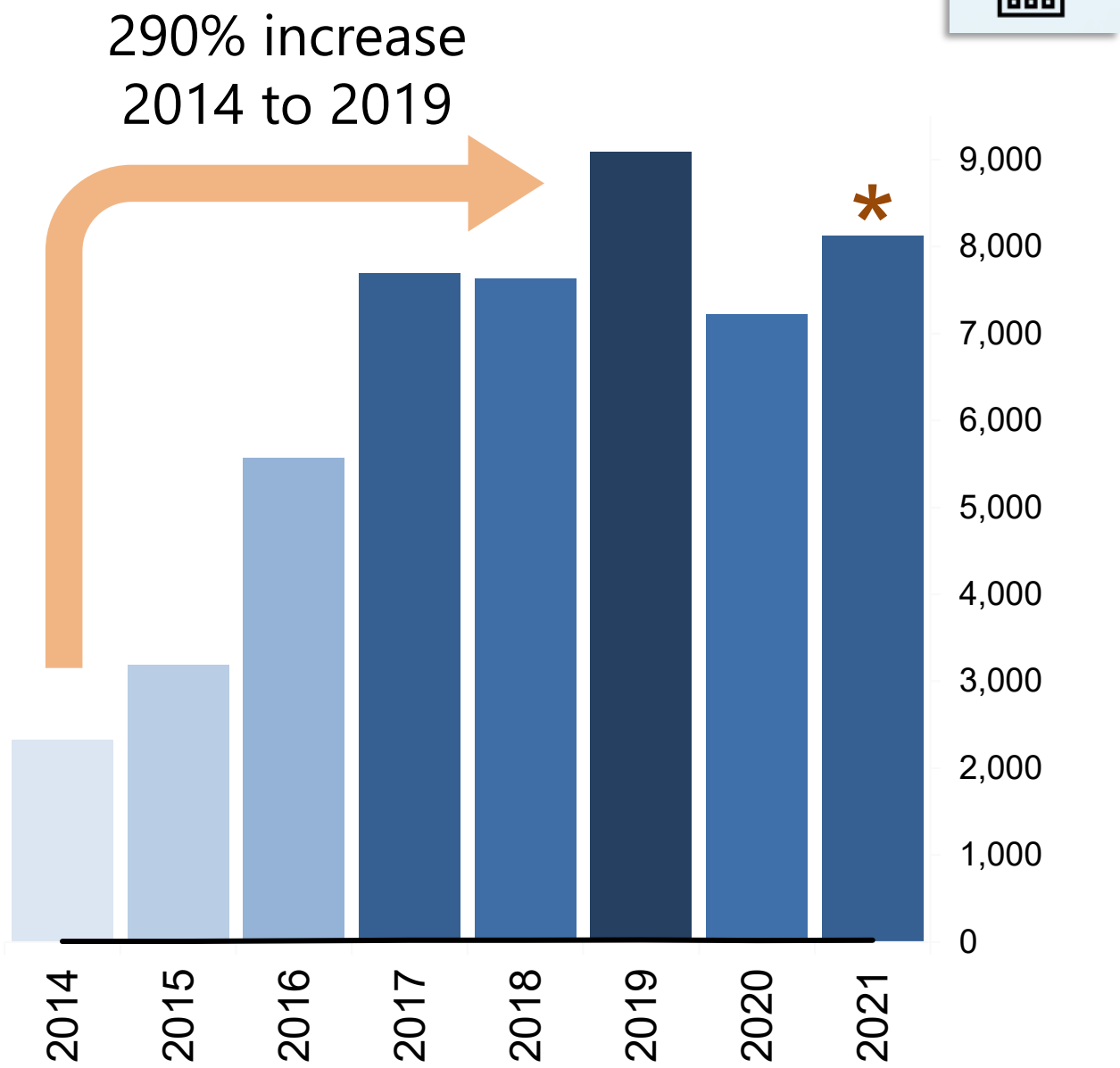
*Provisional data reported for 2021

Valley Fever Data and Publications

Recent years record-breaking numbers

7000-9000
annual cases
2016-2021

WHEN?



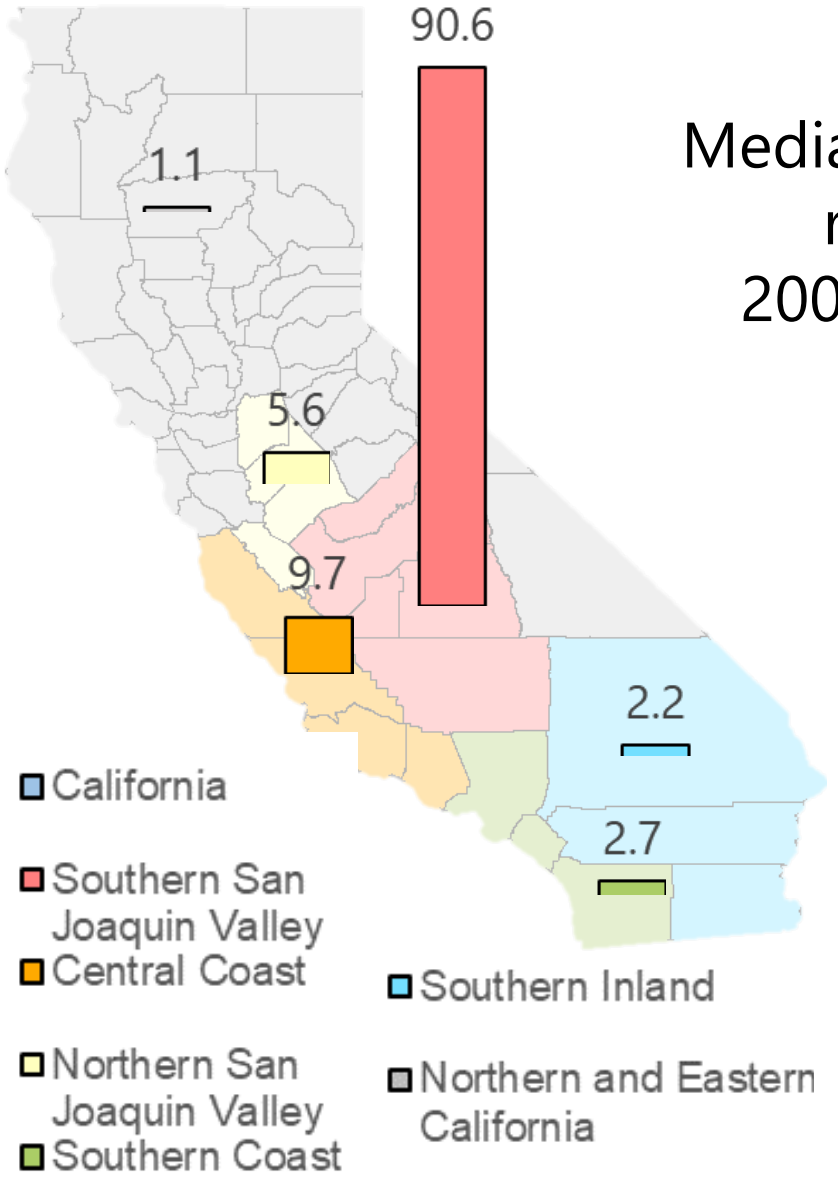
*Provisional data reported for 2021

Valley Fever Data and Publications

But where are the increases occurring?

Sondermeyer Cooksey, G. Regional Analysis of Coccidioidomycosis Incidence — California, 2000–2018. *Emerg Infect Dis.*

WHERE?



Median annual rates 2000-2018

Compared rates in 2018 to those in 2000

Sondermeyer Cooksey, G. Regional Analysis of Coccidioidomycosis Incidence — California, 2000–2018. *Emerg Infect Dis.*

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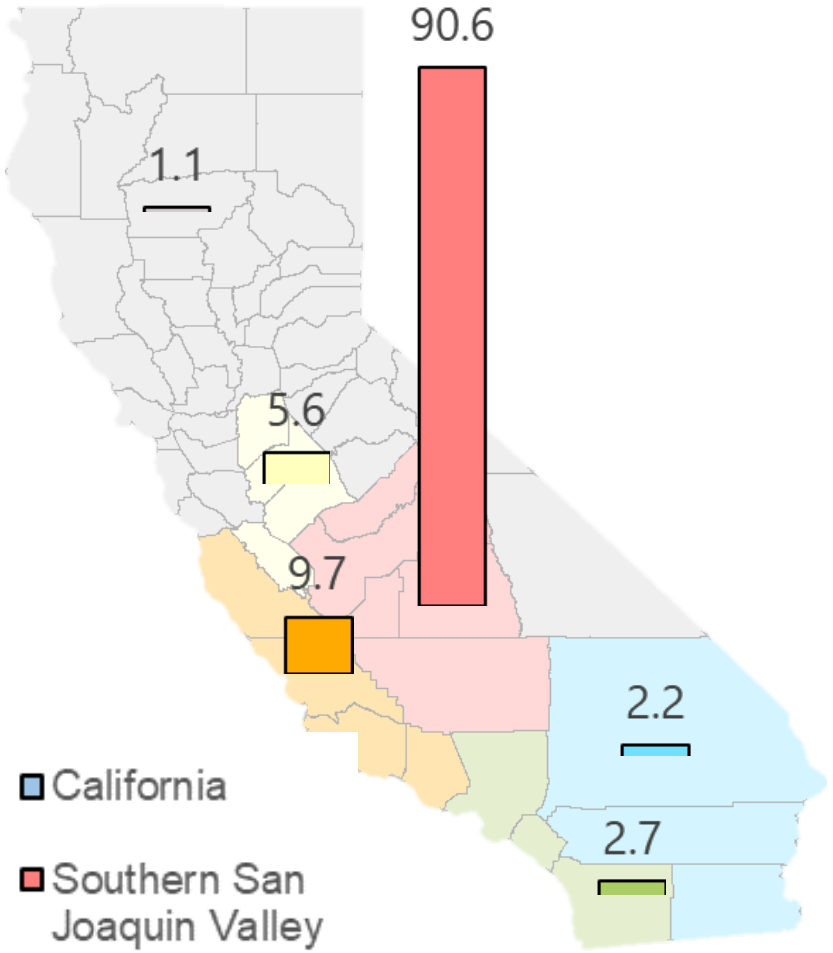

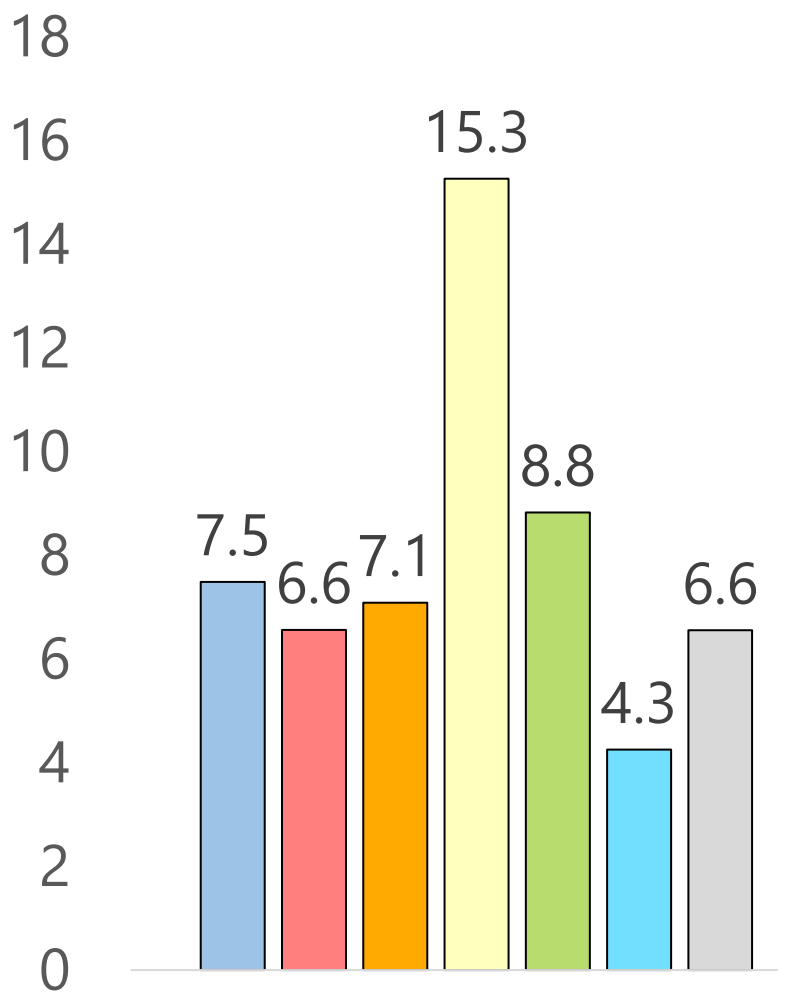

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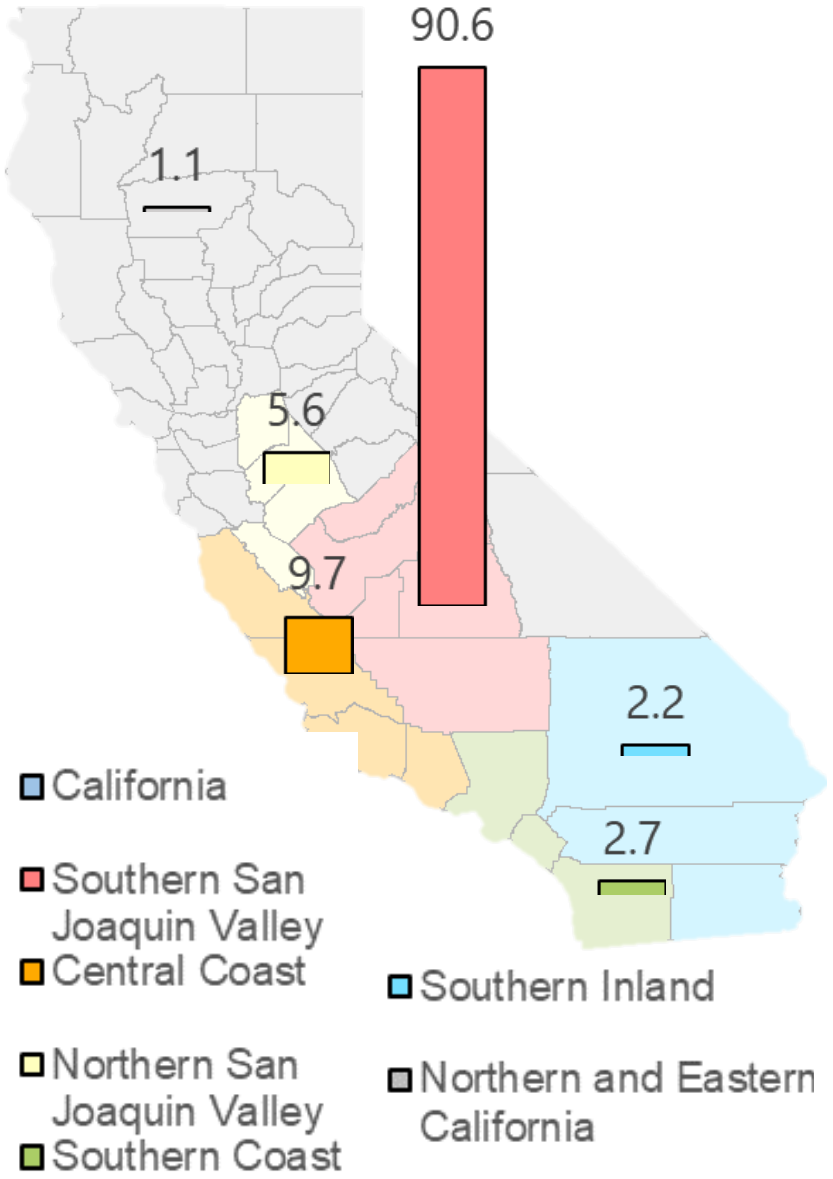
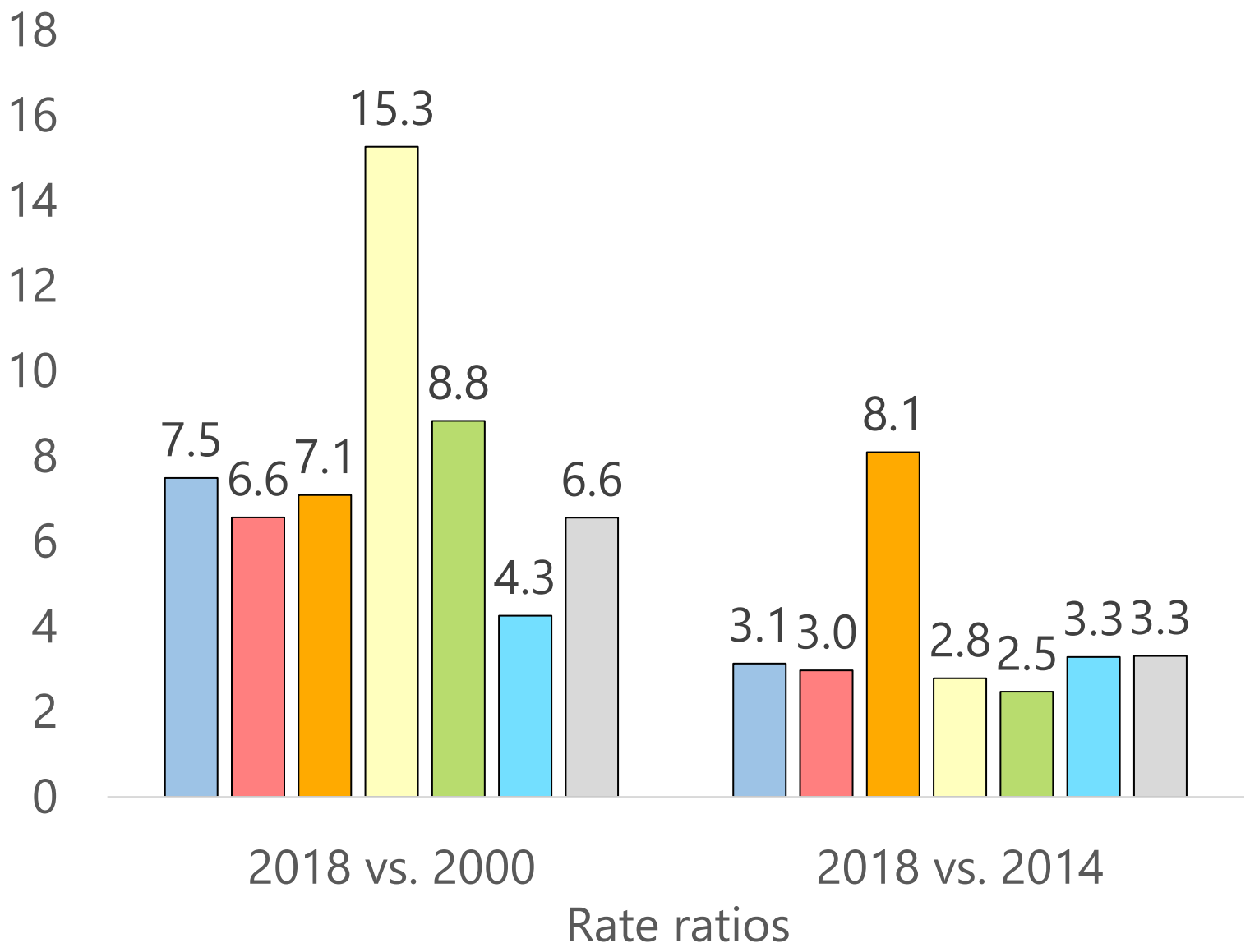
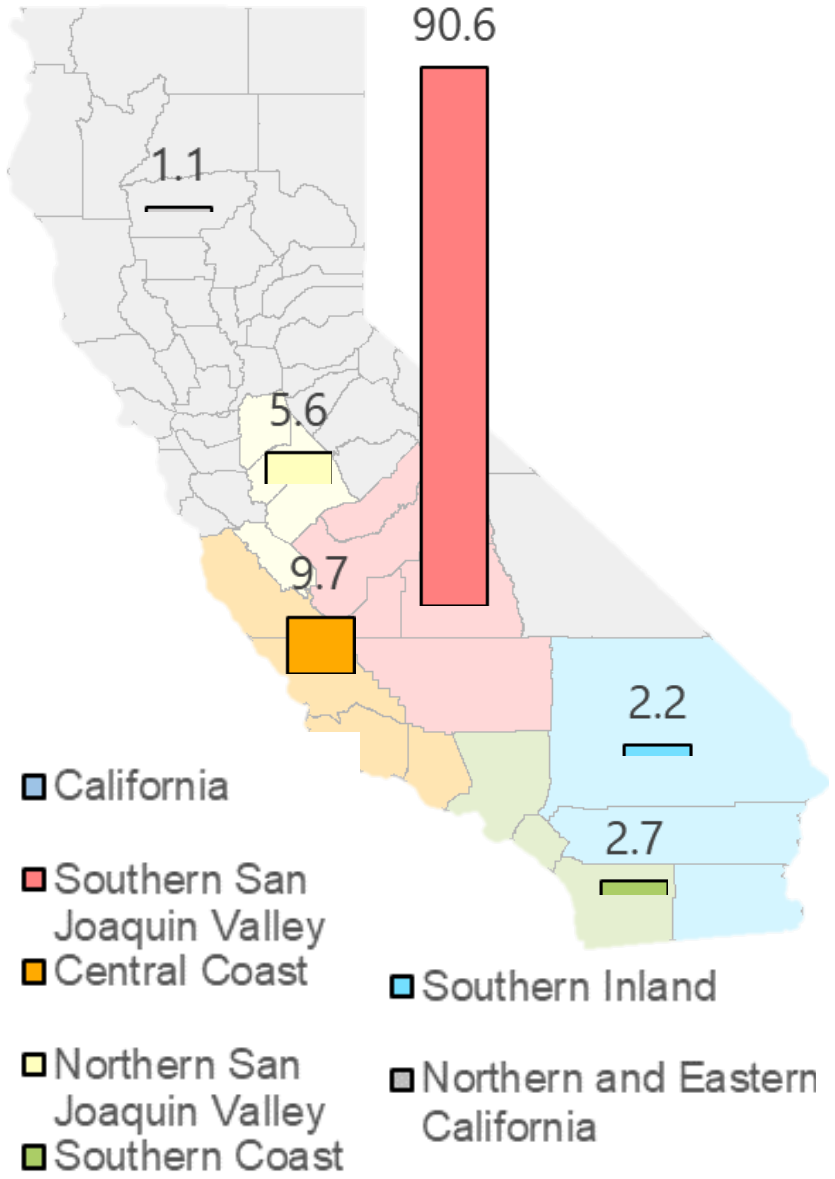


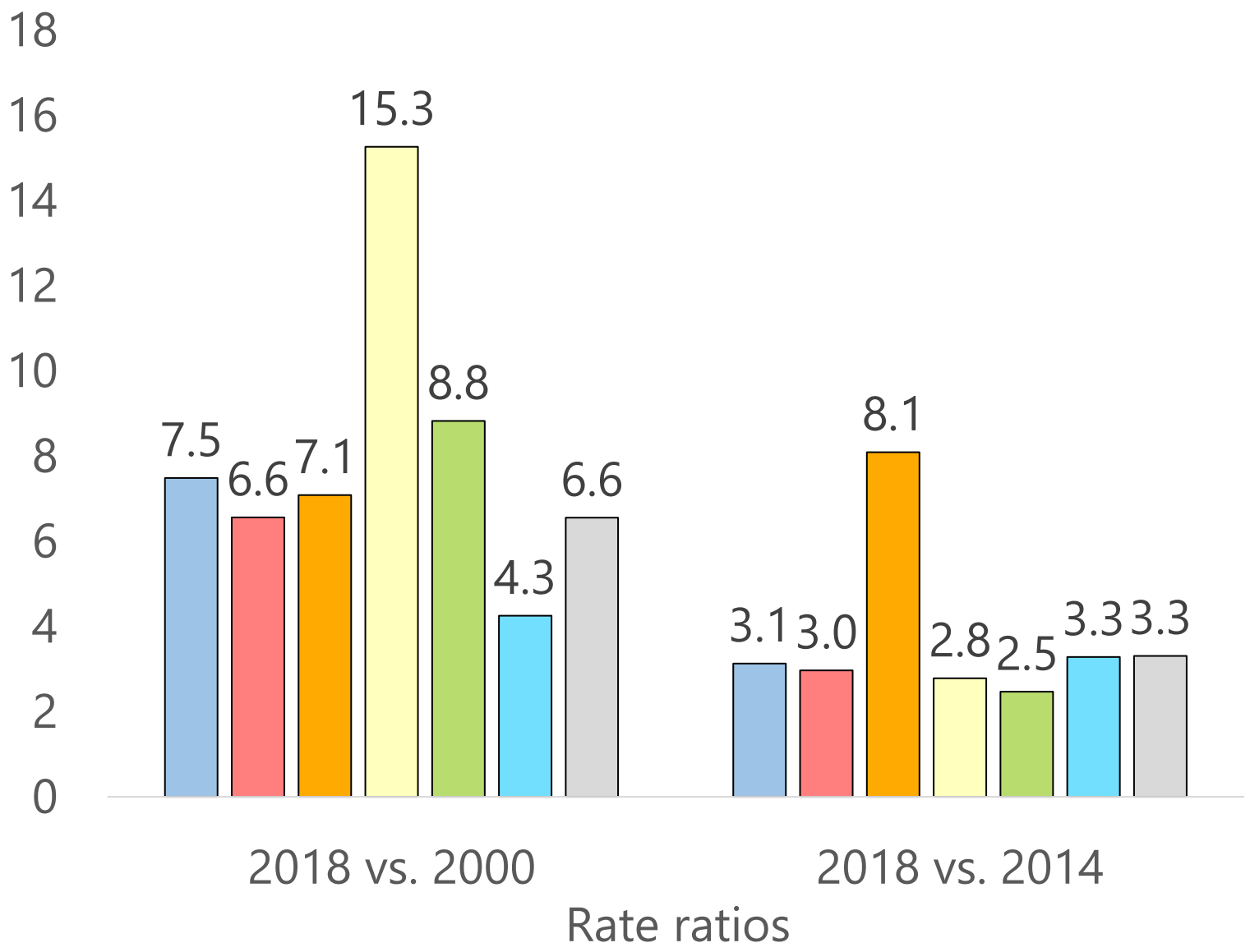


Sondermeyer Cooksey, G. Regional Analysis of Coccidioidomycosis Incidence — California, 2000–2018. *Emerg Infect Dis.*

WHERE?

Largest increases were outside of highest incidence region



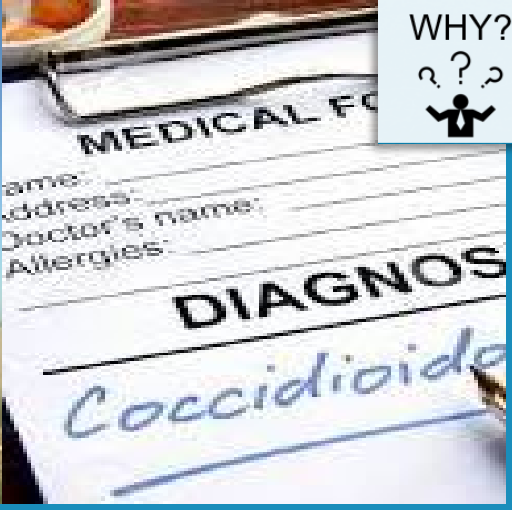


Winter rains after drought

Climatic and environmental factors

Soil disturbance activities in endemic areas

Susceptible people moving into endemic areas

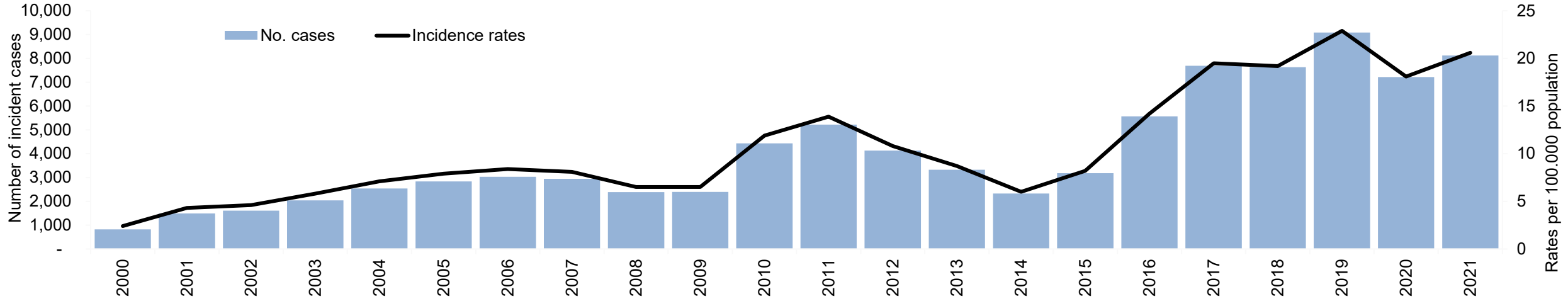


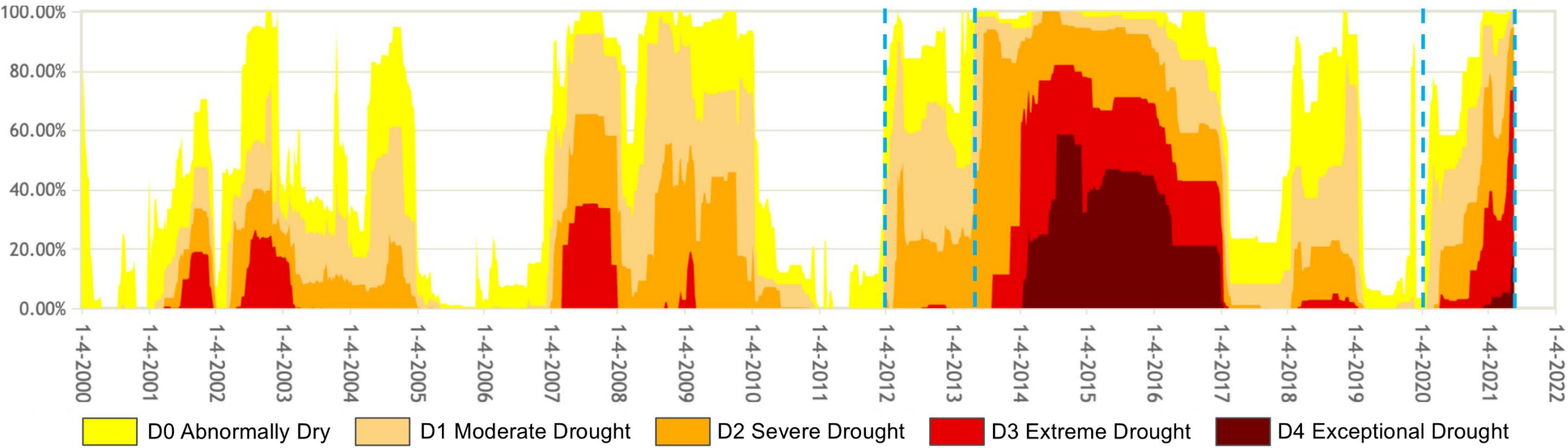
Increased recognition and reporting changes

Possible causes of increase not well understood

Suspected VF surges after droughts

WHY?

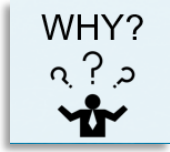




california droughts over time - Google Search

CDPH-UCB Collaboration

Berkeley Environmental Health Sciences
SCHOOL OF PUBLIC HEALTH



- Modeling CDPH VF case data with environmental and census data

Temperature	Precipitation	Soil moisture	Dust	Wind

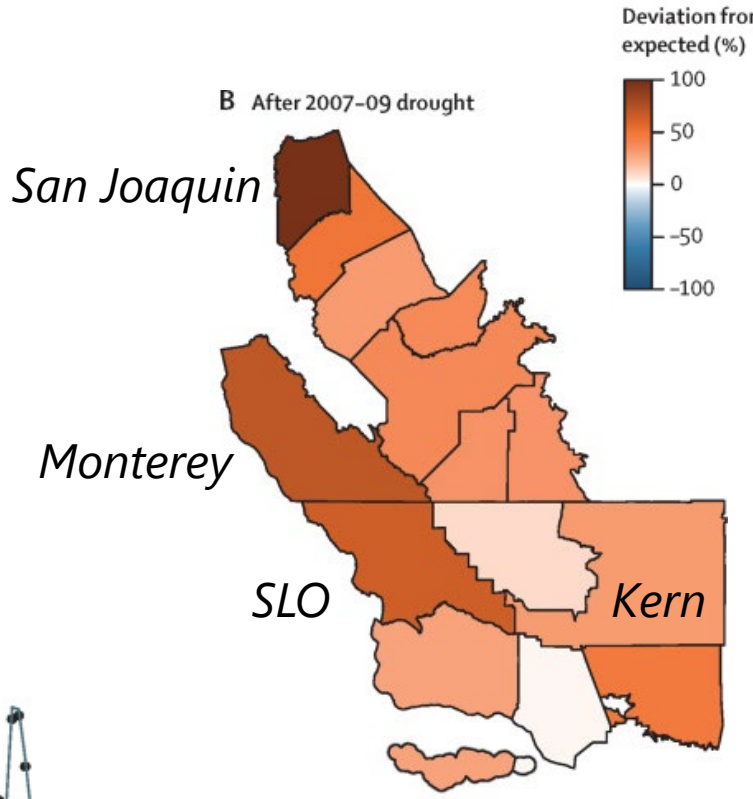
Natural disasters	Land cover	Air quality	Sociodemographic indicators

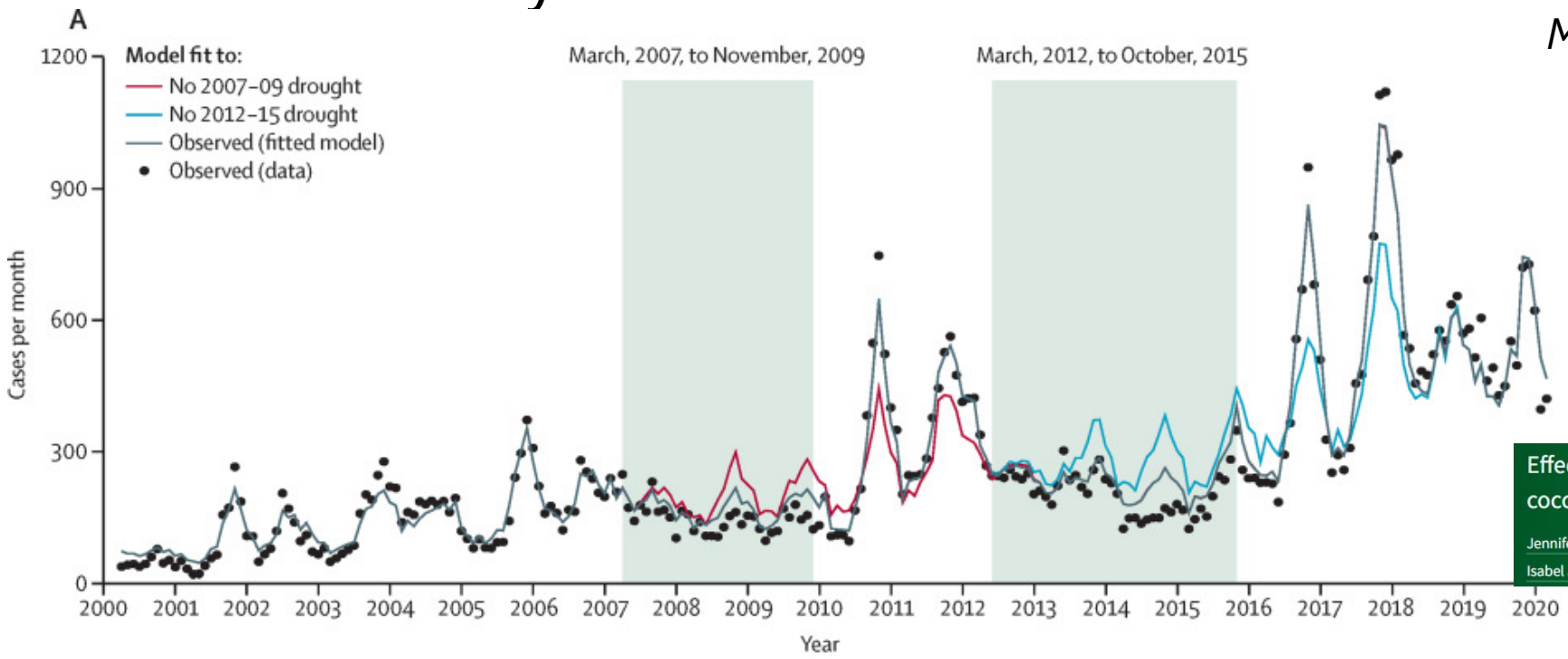
- NIH R01 grant (5 years)

Effects of precipitation, heat, and drought on VF, *Lancet Planetary Health*

WHY?

- Increases in VF rates following droughts
- Increases greatest in wetter areas
- VF likely to increase in incidence and expand in endemicity as climate extremes continue





Effects of precipitation, heat, and drought on incidence and expansion of coccidioidomycosis in western USA: a longitudinal surveillance study

Jennifer R Head, PhD • Gail Sondermeyer-Cooksey, MPH • Alexandra K Heaney, PhD • Alexander T Yu, MD • Isabel Jones, PhD • Abinash Bhattachan, PhD • et al. Show all authors

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10:30-12:45

Session 2: Current status of Valley fever surveillanc

Bridget Barker, Northern Arizona University

Moderator

Incidence of human disease
Mitsuru Toda, US Centers for Disease Control and Pre

Gail Sondermeyer-Cooksey, California Department of

Epidemiology of Valley Fever in Arizona
Shane Brady, Arizona Department of Health Services

The Future of Cocci

Soil mapping
Jennifer Head-Zhutenegger, University of California- E
Health

Effects of precipitation, heat, and drought on incidence and expansion of coccidioidomycosis in western USA: a longitudinal surveillance study

Jennifer R Head, PhD • Gail Sondermeyer-Cooksey, MPH • Alexandra K Heaney, PhD • Alexander T Yu, MD • Isabel Jones, PhD • Abinash Bhattachan, PhD • et al. Show all authors

In 2022, VF listed as CA climate change indicator

WHY?

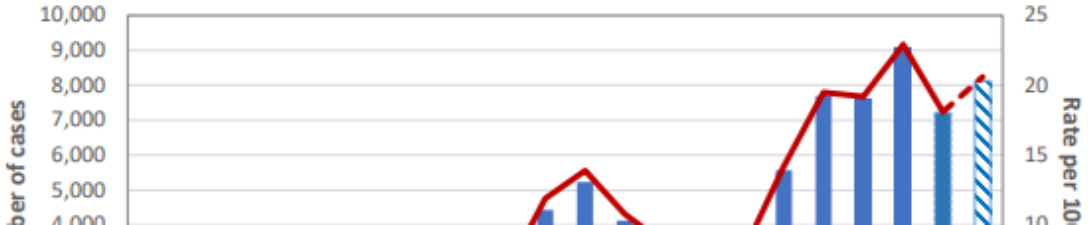
- California Office of Environmental Health Hazard Assessment

Indicators of Climate Change in California (2022)

VALLEY FEVER (COCCIDIOIDOMYCOSIS)

The incidence of Coccidioidomycosis, commonly known as Valley fever, has increased over the past 20 years. Valley fever is caused by inhaling spores of the Coccidioides fungus that is endemic in the soil in parts of southwestern United States, including California. The fungus usually infects the lungs, causing respiratory symptoms.

Figure 1. Valley fever cases and incidence rates by year of estimated illness onset in California (2001-2021*)



[2022 Report: Indicators of Climate Change in California | OEHHA]

CDPH Califo

DCDC Division of Communicable Disease Control

What are the challenges with addressing VF in California ?

HOW?

Major Valley fever activities at CDPH

- Case surveillance
- Enhanced surveillance
- Outbreak investigation
- Outreach

Major Valley fever activities at CDPH

- Case surveillance
- Enhanced surveillance
- Outbreak investigation
- Outreach

Limitations to routine surveillance

- Only have human data
  - No environmental (air, soil, climate) or animal (wildlife/veterinary) data
  - Don't know where *Coccidioides* exists in environment

- Limited data on reported cases
  - Residence, sex, age, race-ethnicity, lab tests

- Too many cases to conduct patient interviews/chart reviews
  - No clinical, diagnostic, treatment, outcome, occupation or exposure data

Limits CDPH's ability to understand and response to VF in CA and to tailor responses to different areas of endemicty

VF pilot patient interview project

- Received federal funding from CDC
  - Standardized phone interviews
  - 400-500 patients
  - First time collecting clinical, diagnostic, treatment, exposure, and outcome

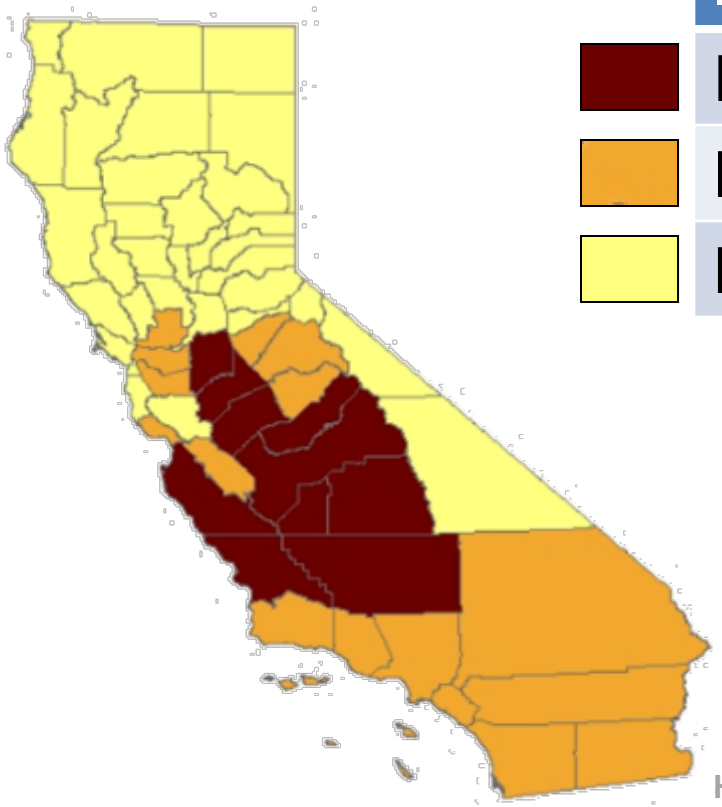
- Launched July 2022
  - Conducted >100 interviews
- Funding expires July 2023

Major Valley fever activities at CDPH

- Case surveillance
- Enhanced surveillance
- Outbreak investigation
- Outreach

Only 42% Californians estimated to be aware of VF

- VF questions Behavioral Risk Factor Surveillance System (BRFSS), 2016



Incident region	Heard of VF	VF exists where live
High	66%	25%
Moderate	35%	3%
Low	45%	

Hurd-Kundeti, G. Valley Fever (Coccidioidomycosis) Awareness - California, 2016-2017. *MMWR.*

VF awareness also a challenge among CA healthcare providers

- Valley fever might not be emphasized if training outside of CA/AZ
- It can look like a lot of other diseases
  - → Delayed diagnosis
  - → Inappropriate treatments
- It can be challenging to diagnose and manage
  - Infectious disease consultation

Low awareness among providers and public

2018 Budget Act (SB840), $2M to CDPH to raise awareness of VF statewide

- Hired professional media firm to lead evidence-based VF awareness campaign

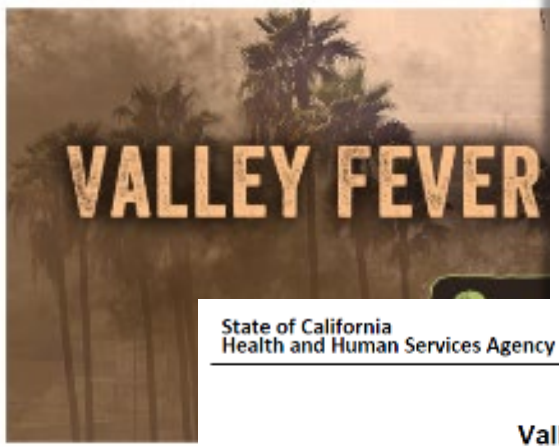
New webpage	Paid media on web	Patient testimonials	Valley fever animation video	Materials for patients in provider offices
Packets for key community organizations	Billboards	Radio and TV segments	Outreach for workers	New healthcare provider CME

CDPH has developed evidence-based materials

California Department of PublicHealth

Home | Programs | Center for Infectious Diseases | Division

COCCIDIOIDOMYCOS



contraer la Fiebre del Valle?

La mejor manera de reducir el riesgo es evitar aspirar suciedad o polvo en lugares donde la Fiebre del Valle sea común.

A continuación se indican algunas recomendaciones de sentido común que pueden ayudar:

Cuando hace viento afuera y hay polvo en el aire, sobre todo durante tormentas de polvo.

- Quédese adentro, y mantenga las puertas y ventanas cerradas.
- Mientras vaya manejando, mantenga cerradas las ventanas del auto y utilice la función de "recirculación" del aire acondicionado si está disponible

Para más información sobre la Fiebre del Valle, contacte a su departamento de salud local o visite los siguientes sitios Web (en inglés):

https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Coccidioidomycosis.aspx

http://www.cdc.gov/fungal/diseases/coccidioidomycosis/index.html

Para el ajuste apropiado de una máscara o respirador N95.

http://youtu.be/0d_RaKdqeck

Lo que necesita saber sobre la **Fiebre del Valle** en California

State of California
Health and Human Services Agency

California Department of Public
Division of Communicable Disea

Valley Fever Fact Sheet

What is Valley fever?

VALLEY FEVER

Coccidioidomycosis or "cocci"

e you had a cough, fever, or painful eathing for more than two weeks?

YOUR DOCTOR ABOUT VALLEY FEVER

Valley fever is caused by a fungus that lives in soil or dirt in some areas of California. an get it by breathing in dust where the fungus grows.

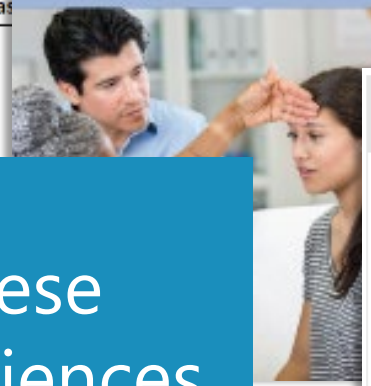
NE can get Valley fever. Even healthy people and pets.

who spend time in dirt or dusty areas where the Valley ngus grows may be at more risk of getting infected.

eople have more risk of getting very sick if infected and y need to be hospitalized, such as:

60 years and up
ant women
with weak immune systems

THINK VALLEY FEVER



If you have these symptoms for more than a week:

Information for Health Professionals

- Valley Fever: A Training Manual for Primary Care Professionals (PDF) - *University of Arizona Valley Fever Center for Excellence, March 2019*
- Valley Fever: Timely Diagnosis, Early Assessment, & Proper Management - *U.S. Centers for Disease Control and Prevention (CDC)* (Free online CME)
- Update on Coccidiodomycosis in California (PDF) - *California Medical Board Newsletter, Winter 2017*
- Coccidioidomycosis Information for Health Professionals - *CDC*
- Coccidioidomycosis: Focus on Occupational Health Issues (Free online CME)

BUT challenging to get these materials to intended audiences

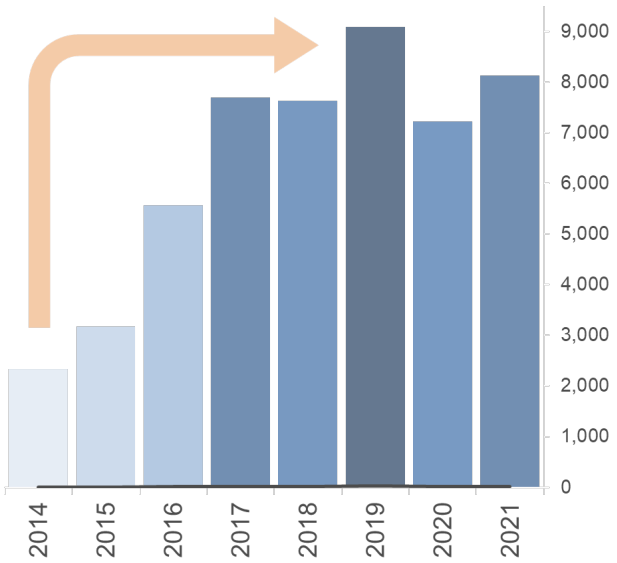
When and where do people get Valley fever?

CDPH California Department of Public Health

VF challenges in CA for public health to address

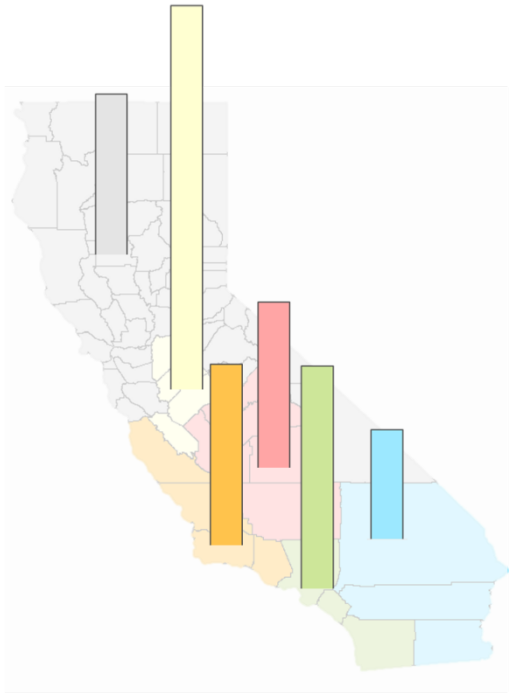
Track increasing rates

~ 300% increase 2014-2019
Keep increasing with climate change



Monitor potentially expanding range

Largest increases outside of highest incidence region

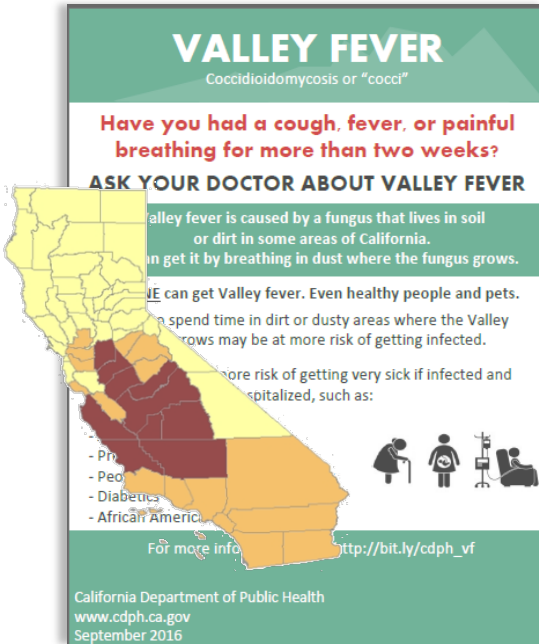


Better describe VF burden and who impacted

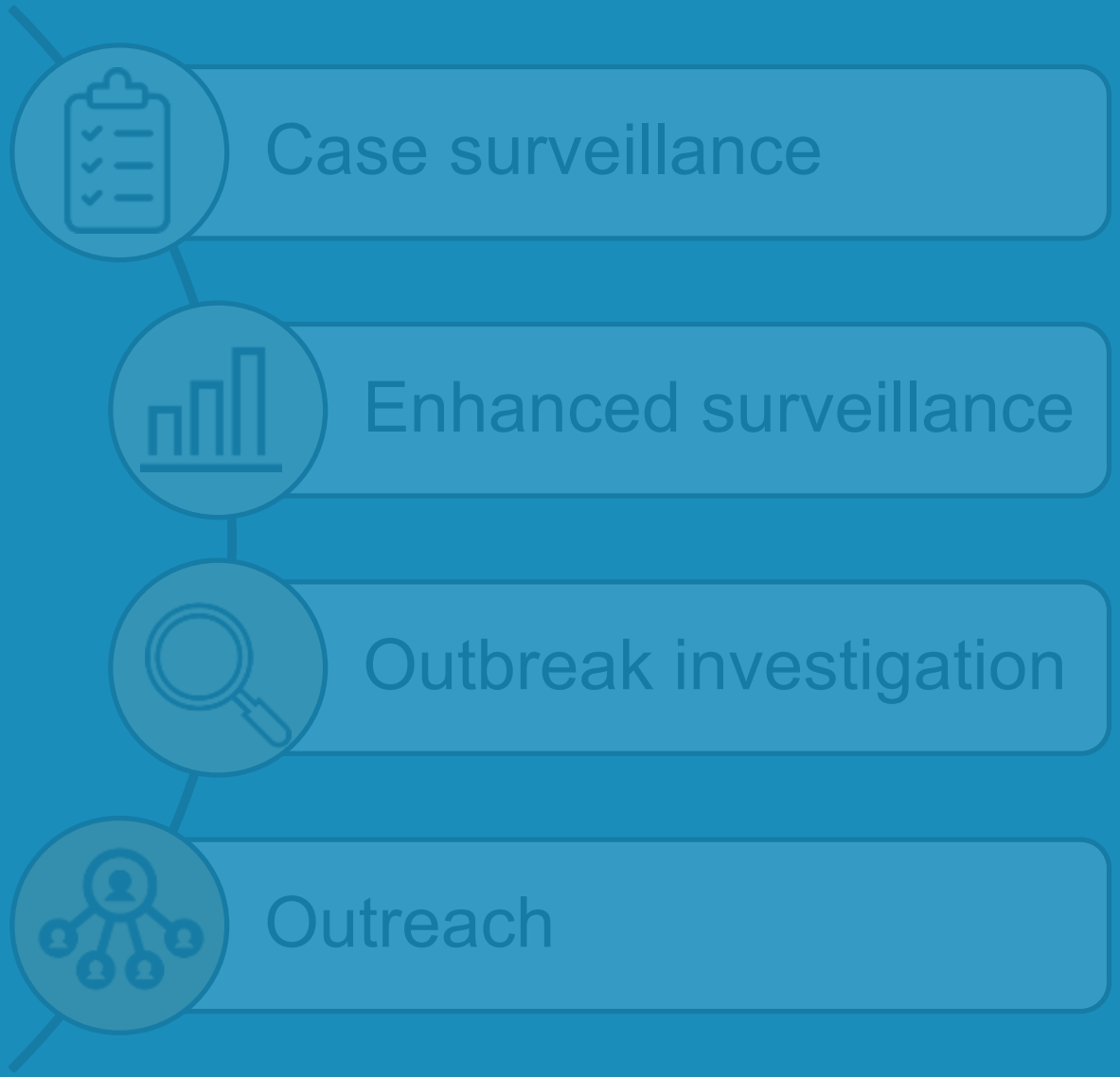
7000-9000 annual cases
>1000 hospitalized annually
High risk in certain groups

Increase awareness

Get developed messaging to public, providers, and legislators



Some challenges better addressed by partners



- Clinicians
- Academics/researchers
- Private organizations
- Laboratories

Some challenges better addressed by partners

- Diagnostics
  - Can be difficult to order and interpret
  - Faster turnaround (point-of-care)
- Treatment/management
  - Effective, affordable treatments
  - Clear, simplified management guides
- Prevention
  - Lack effective prevention
  - Difficult to avoid dirt/dust
  - Recommended prevention methods in high-risk settings challenging (wearing respirator, wetting soil)

How to address VF moving forward?

- CDPH Infectious Diseases Branch
- CDPH Occupational Health Branch
- CDC Mycotics
- CA local health departments
- CA clinicians and laboratories

Thank you to NASEM and the organizers of this workshop!

For more information, please visit our webpage at:

gail.cooksey@cdph.ca.gov

Media inquiries to: CDPHpress@cdph.ca.gov