



# UPDATE FROM CDPH

*California Industrial Hygiene Council  
Professional Development Seminar  
December 3, 2024*

**Kristin J. Cummings, MD, MPH**  
**Occupational Health Branch**



# Agenda

- **Background on OHB**
  - History
  - Mission
  - Industrial Hygienists
- **OHB Activities**
  - Lead poisoning
  - Silicosis and engineered stone
  - Heat
  - Fatal injuries
  - Indoor air quality
  - Avian influenza



# California Occupational Safety and Health Act of 1973

*“...enacted for the purpose of assuring safe and healthful working conditions for all California working men and women...”*

- **Division of Occupational Safety and Health (Cal/OSHA)**
  - Develops and enforces standards
- **Occupational Safety and Health Standards Board**
  - 7 members appointed by Governor
  - Adopts, maintains, and revises standards
- **Occupational Safety and Health Appeals Board**
  - Resolves disputes arising out of enforcement



# CDPH's Occupational Health Branch



# CDPH's Occupational Health Branch





# Occidental Chemical Company

- Began operations in 1953
- Located in Lathrop (San Joaquin County)
- Manufactured fertilizers and ammonia
- Manufactured and formulated pesticides
- Mid-1970s: male workers and union concerned about infertility



THE LANCET, DECEMBER 17, 1977

## INFERTILITY IN MALE PESTICIDE WORKERS

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*University of California, Berkeley*

RONALD M. KRAUSS

*Endocrinology Service, Alta Bates Hospital, Berkeley*

SUMNER MARSHALL

*Department of Urology, Alta Bates Hospital, Berkeley, and  
University of California, San Francisco*

THOMAS H. MILBY

*Environmental Health Associates, Berkeley, California,  
U.S.A.*

**Summary** A number of cases of infertility were discovered among men working in a California pesticide factory. The suspected cause was exposure to the chemical 1,2-dibromo-3-chloropropane (D.B.C.P.). The major effects, seen in 14 of 25 non-vasectomised men, were azoospermia or oligospermia and raised serum-levels of follicle-stimulating hormone and luteinising hormone. No other major abnormalities were detected, and testosterone levels were normal. Although a quantitative estimation of exposure could not be obtained, the observed effects appeared to be related to duration of exposure to D.B.C.P.



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COMPARISON OF NON-VASECTOMISED D.B.C.P. WORKERS WITH VERY LOW (GROUP A) AND NORMAL (GROUP B) SPERM-COUNTS\*

Group	No. of subjects	Age (yr)	Exposure (yr)	Sperm-count ( $\times 10^6/\text{ml}$ )	F.S.H. (mI.U./ml)	L.H. (mI.U./ml)	Testosterone (ng/dl)
A	11	$32.7 \pm 1.6^\dagger$	$8.0 \pm 1.2^\ddagger$	$0.2 \pm 0.1^\S$	$11.3 \pm 1.8^\ddagger$	$28.4 \pm 3.3^\dagger$	$459 \pm 35$
B	11	$26.7 \pm 1.2^\dagger$	$0.08 \pm 0.02^\ddagger$	$93 \pm 18$	$2.6 \pm 0.4^\ddagger$	$14.0 \pm 2.8^\dagger$	$463 \pm 31$



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# Dibromochloropropane (DBCP)

- Pesticide used against nematodes that damage pineapples, bananas and other tropical fruits
- Suspected as cause of male infertility at Occidental Chemical Co.
  - Volume of DBCP used at facility
  - Relationship between exposure and sperm count
  - Experimental studies documented testicular toxicity in rodents



## Toxicologic Investigations of 1,2-Dibromo-3-Chloropropane

T. R. TORKELSON, S. E. SADEK, AND V. K. ROWE

*Biochemical Research Laboratory, The Dow Chemical Company, Midland, Michigan*

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## Toxicologic Investigations of 1,2-Dibromo-3-Chloropropane

In a larger experiment, 50-66 exposures to 12 ppm in 70-92 days were severely damaging to groups of 20 male and 20 female rats, 10 male and 10 female guinea pigs, 3 male and 3 female rabbits, and 2 female monkeys. In the male and female rats, 40 and 50% mortality occurred. Death of the rats was generally attributed to lung infections. The most striking observation at autopsy was severe atrophy and degeneration of the testes of all species. In the rats this was characterized by degenerative changes in the seminiferous tubules, an increase in Sertoli cells, reduction in the number of sperm cells, and development of abnormal forms of sperm cells.



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TOXICOLOGY AND APPLIED PHARMACOLOGY **3**, 545-559 (1961)

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# California's Response to DBCP

- Right-to-Know Law
  - Hazards of workplace substances
  - Access to personal medical records
- Centers for Occupational and Environmental Health (COEHs)
  - Teaching, research, and service
  - Northern and Southern UC campuses
- Hazard Evaluation System and Information Service (HESIS)
  - Provide early warning about toxic substances
  - Investigate new and unrecognized workplace hazards



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  - Beginning of the Occupational Health Branch



# Occupational Health Branch

- Hazard Evaluation System and Information Service (HESIS)
- Occupational Health Surveillance and Evaluation Program (OHSEP)
- Occupational Lead Poisoning Prevention Program (OLPPP)
- California Safe Cosmetics Program (CSCP)
- Emerging Workplace Hazards Unit (EWHU)



# **OHB's Mission**

**Promoting safe and healthy  
workplaces across California**



# Meet OHB's Industrial Hygienists

Justine Weinberg



Jennifer McNary



Jacqueline Chan



Kyle Peerless



Elon Ullman



Constancia Dominguez-Voong





# Lead Poisoning





## ADULTS

### Brain

Memory loss, lack of concentration, headaches, irritability, depression.

### Body

Fatigue, joint and muscle pain

### Cardiovascular

High blood pressure

### Kidneys

Abnormal function and damage

### Reproductive System

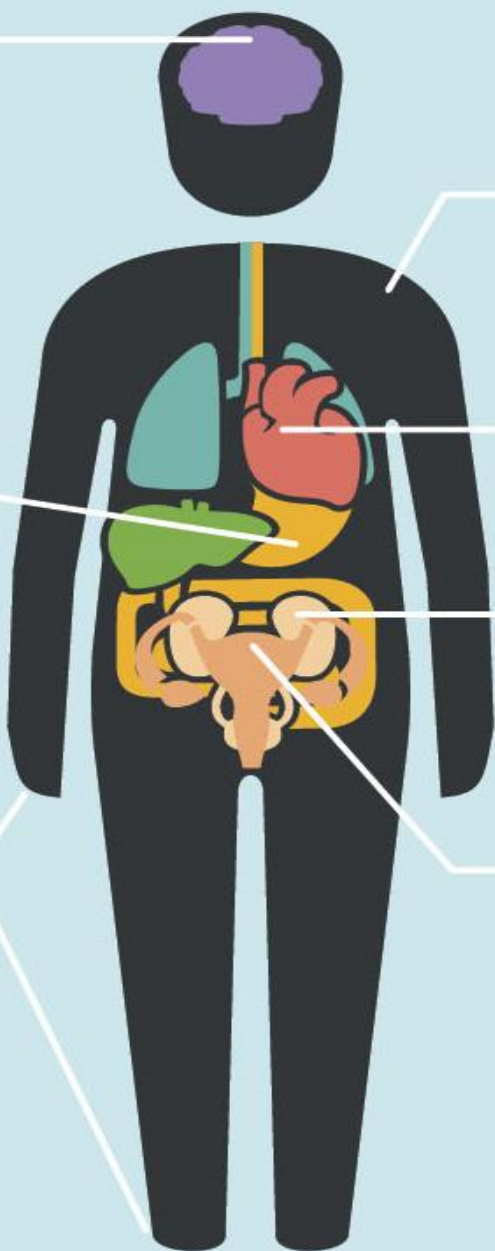
Men: Decreased sex drive and sperm count, and sperm anomalies. Women: Spontaneous miscarriage

### Digestive System

Constipation, nausea and poor appetite

### Nervous System

Damage including numbness and pain in the extremities



Exposure to high levels of lead can cause severe damage to the brain, blood and kidneys. Children under six are most at risk from lead poisoning. Even low levels of lead exposure have been found to permanently reduce cognitive ability and cause hyperactivity in children.

## CHILDREN

### Brain

Behavior problems, lower IQ, hearing loss, learning disabilities

### Body

decreased bone and muscle growth

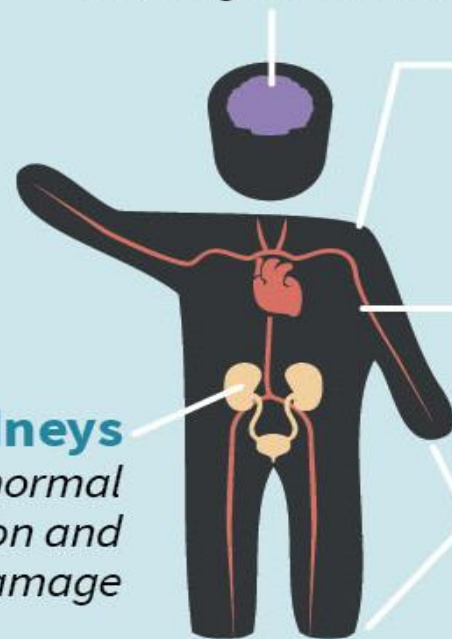
### Blood

Anemia

### Nervous System

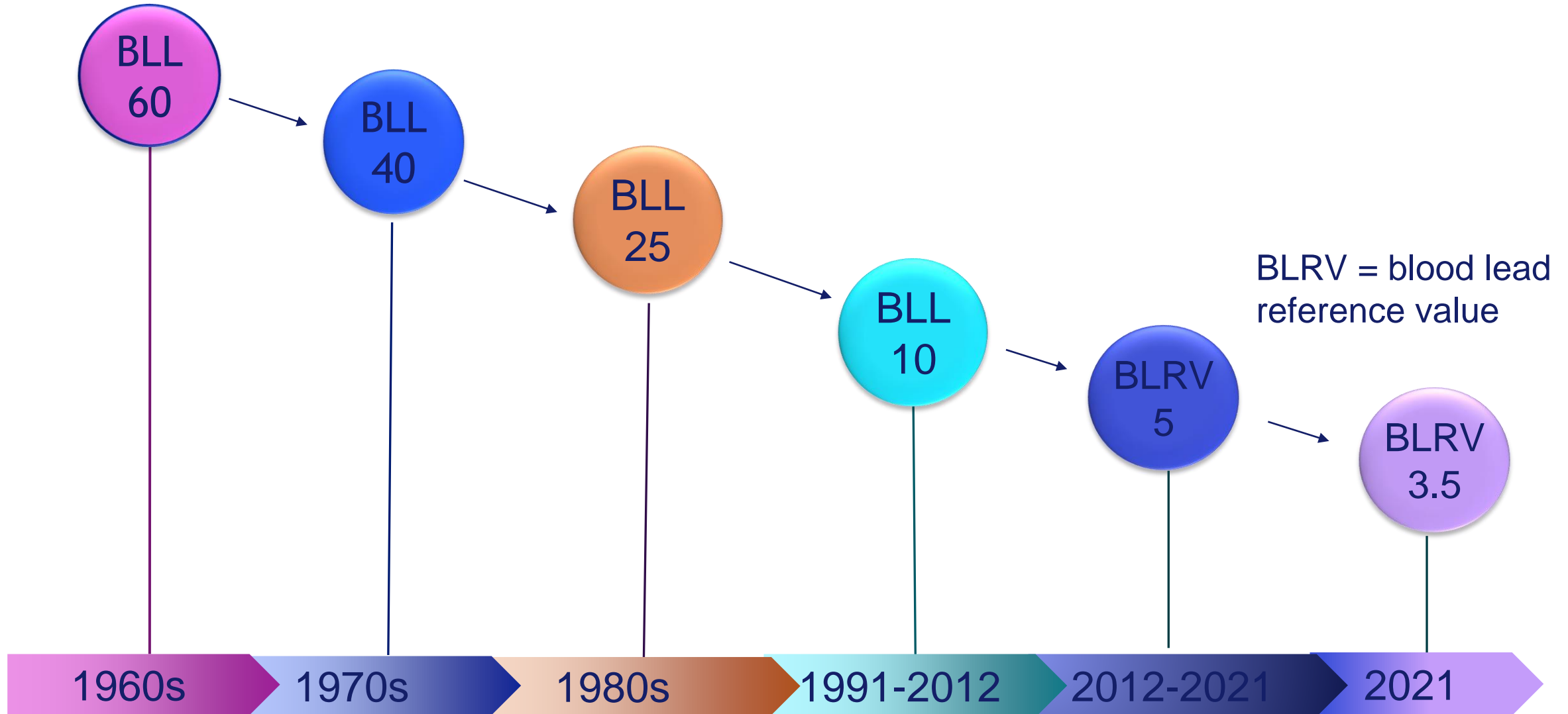
Damage

**Kidneys**  
Abnormal function and damage





# CDC Blood Lead Level (BLL) of Concern ( $\mu\text{g}/\text{dL}$ )





**Among adults with known lead exposures  
and BLLs of 10 µg/dL or more,  
~ 90% had occupational exposure**

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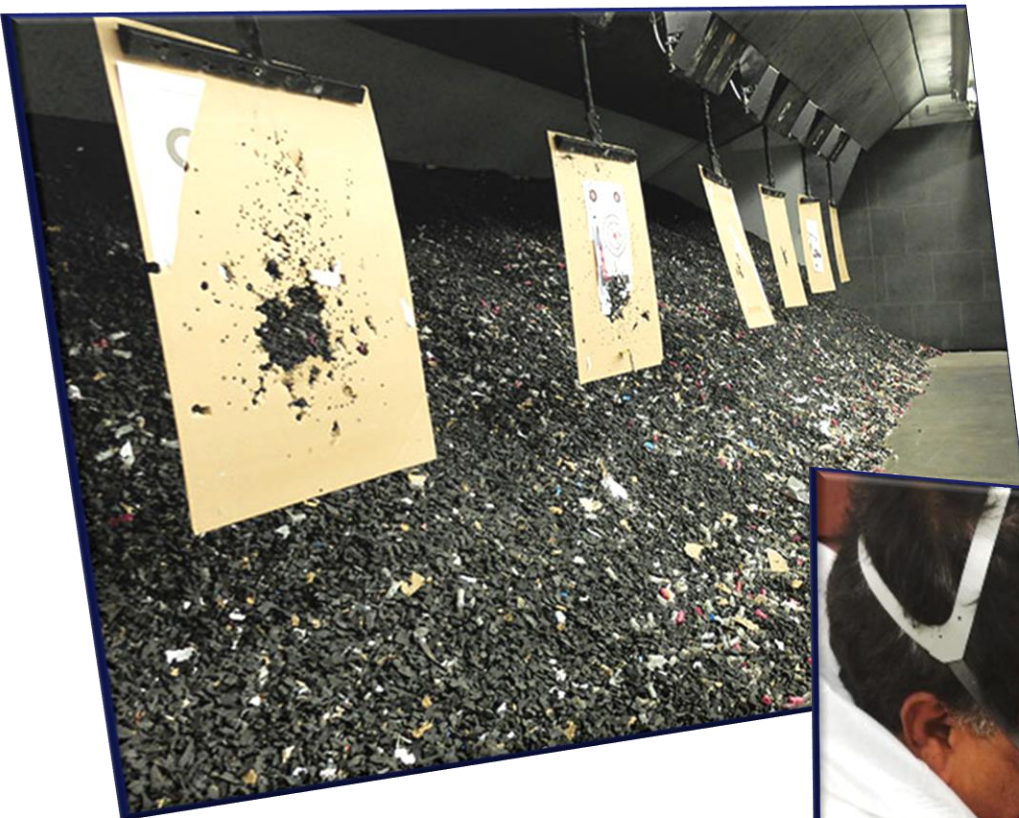
*(<https://www.cdc.gov/niosh/lead/data/index.html>)*



# Work Exposures

- Construction: Melt, weld, cast, cut, grind, solder lead-containing metal alloys (brass, bronze, copper), bridge repair, paint blasting/removal
- Recycling: batteries, scrap metal, electronics, cables
- Ceramics glazing
- Battery manufacturing
- Shooting ranges
- Home remodeling (built before 1978)
- Metal radiator repair







# Occupational Lead Poisoning Prevention Program (OLPPP)

- Established in 1991, supported by fees on employers
- Manages the California Occupational Blood Lead Registry
- Investigates work-related lead poisoning cases
- Provides information and technical assistance to employers, workers, physicians, and others
- Conducts projects to prevent and reduce lead poisoning in California workplaces
- Not enforcement



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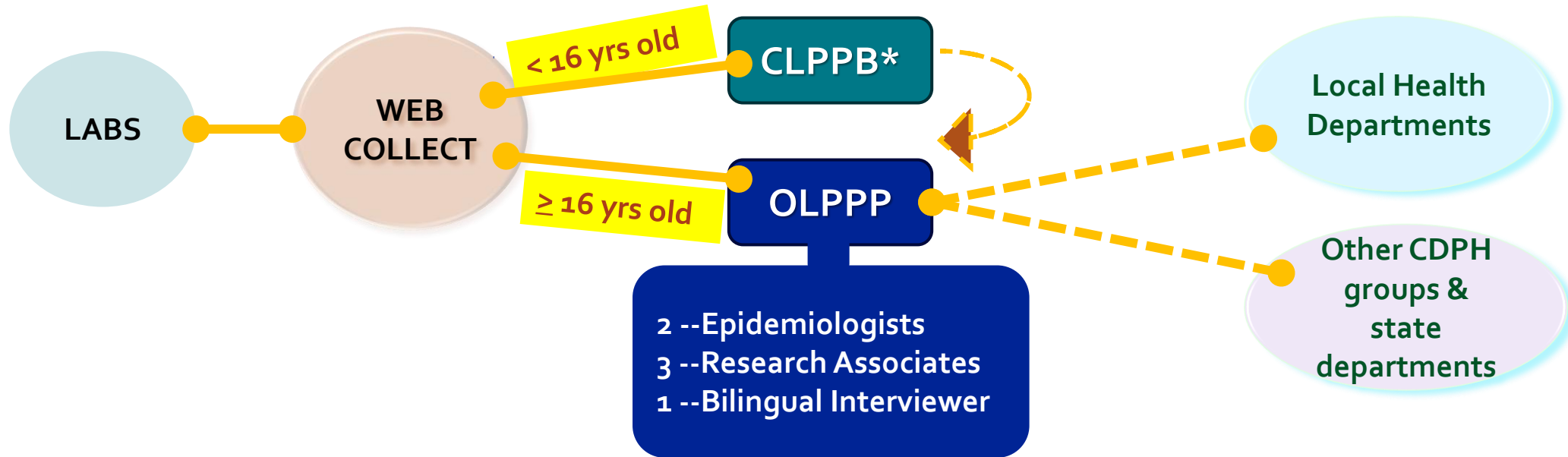
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# ELVIS = Elevated Lead Visual Information System

*\*CLPPB = Childhood Lead Poisoning Prevention Branch*



**OLPPP receives ~ 60,000 to 70,000 BLL results per year**

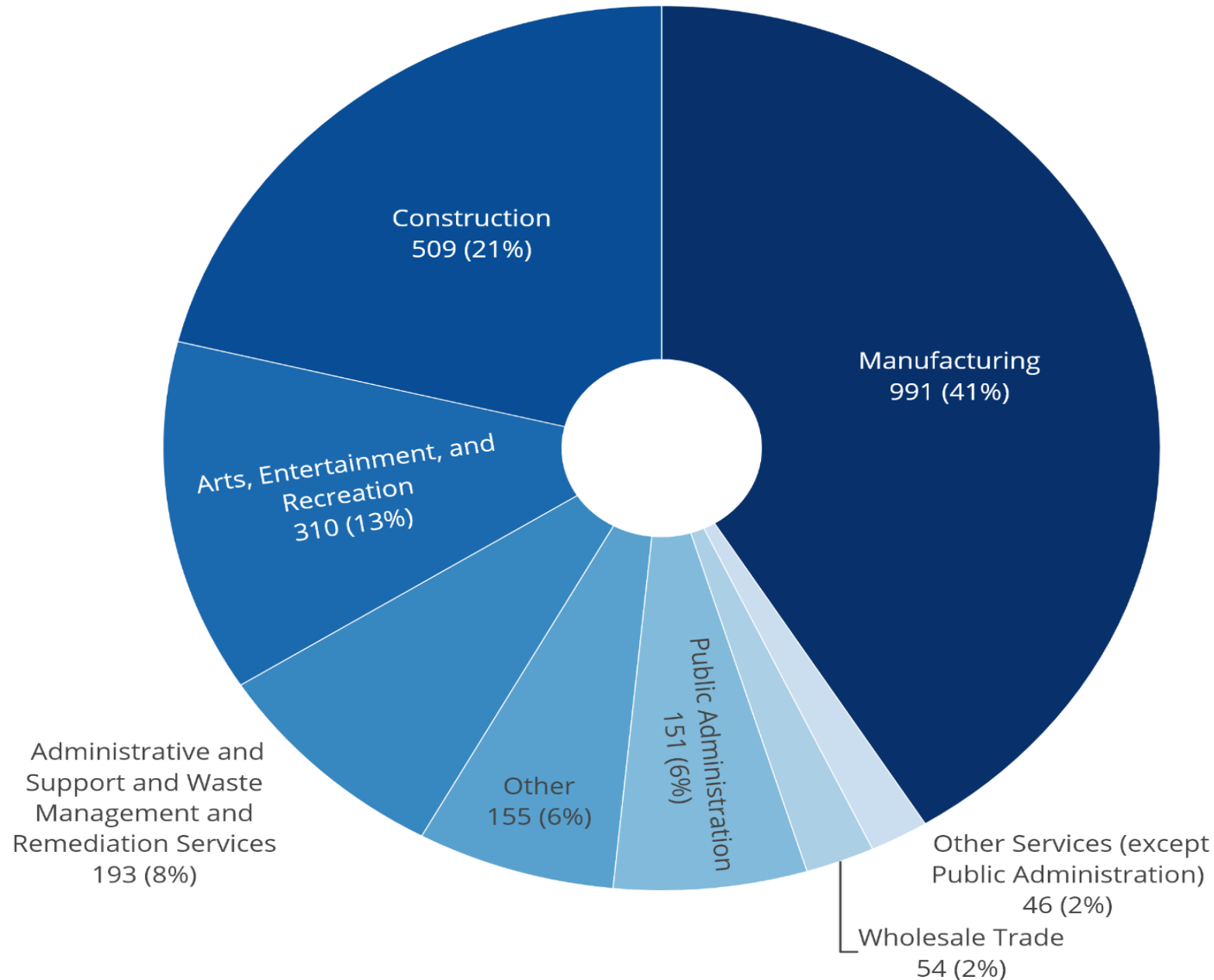


# Who are the workers?

- **Men! 96-97% of the California Occupational Blood Lead Registry**
- **Ages 20-59**
- **Hispanic**

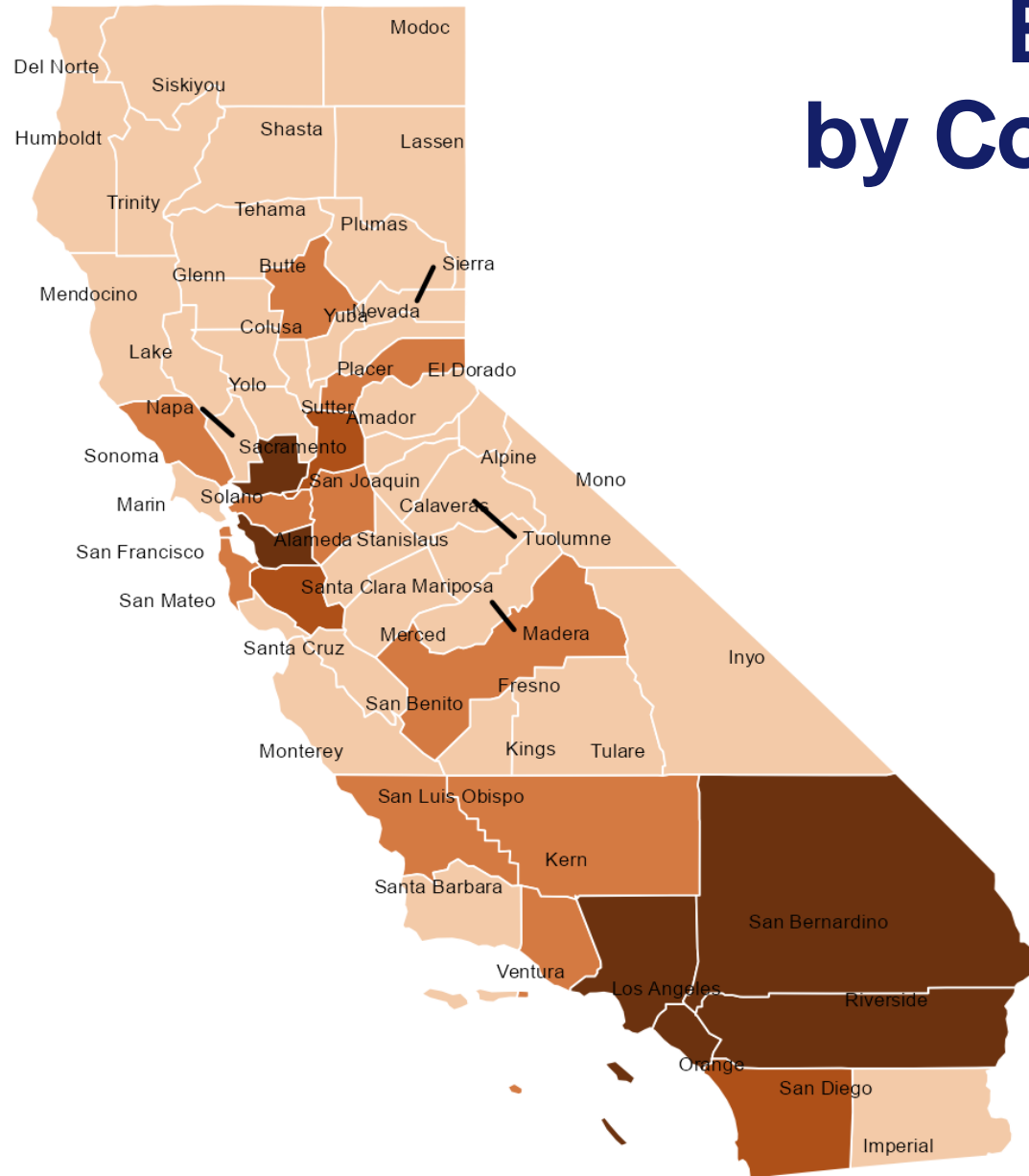


# BLLs $\geq 10$ $\mu\text{g/dL}$ , by Industry Sector (2019 – 2023)

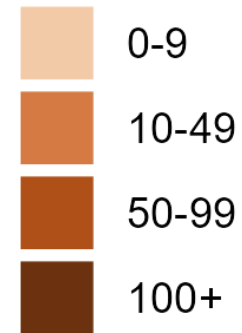




# BLLs $\geq 10$ $\mu\text{g/dL}$ , by County of Employment (2019 – 2023)

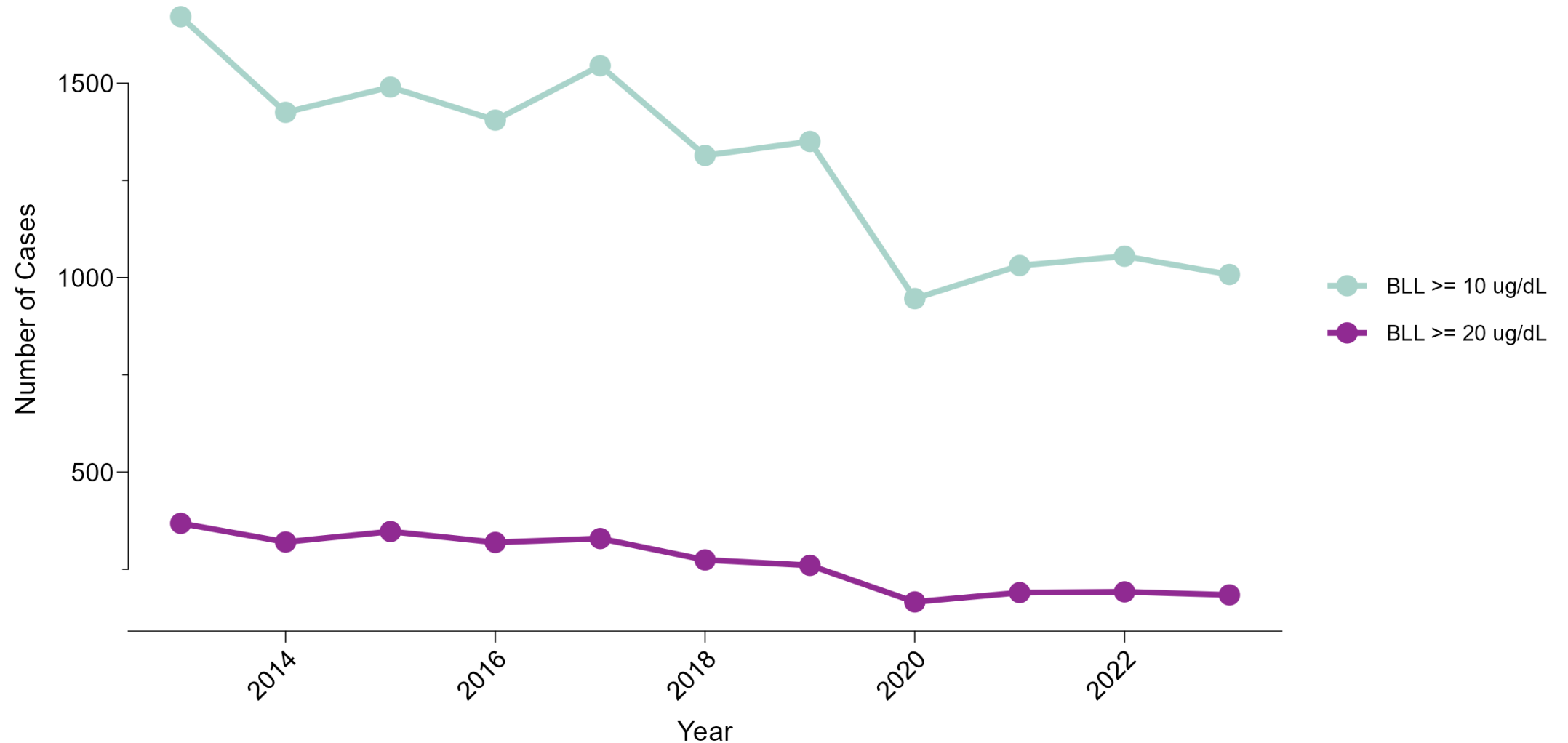


Number of Workers:



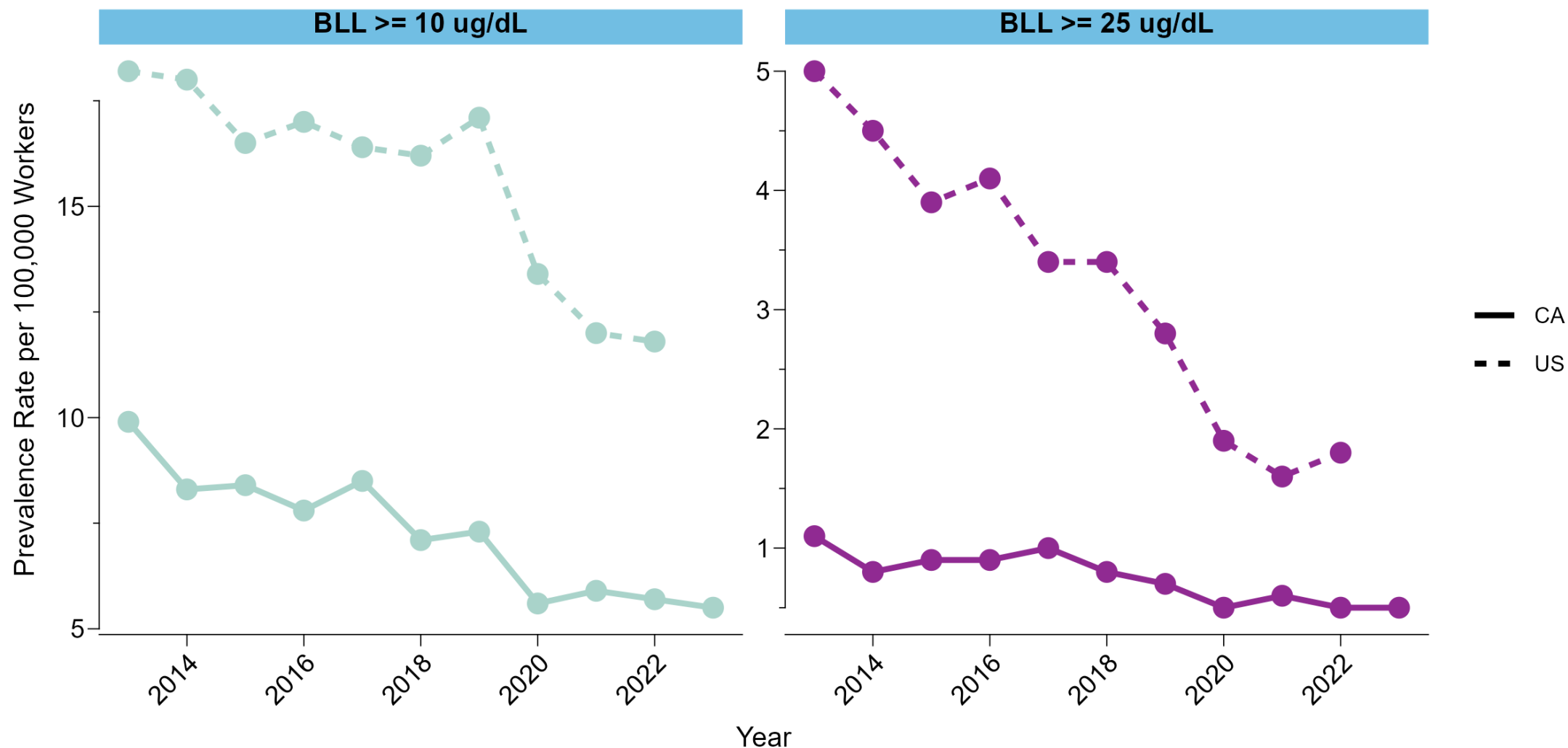


# Number of Workers with Elevated BLL, California (2013-2023)





# Prevalence of Elevated BLL, California and U.S. (2013-2023)



Source: US prevalence rates obtained from CDC NIOSH ABLES program



# Top 10 Industries BLL $\geq 20$ $\mu\text{g/dL}$ (2019 - 2023)

Industry	# of Employers	# of Workers
Shooting ranges	33	82
Remediation Services	17	31
Painting and Wall Covering Contractors	14	67
Glass Product Manufacturing Made of Purchased Glass	12	15
Police Protection	10	14
Storage Battery Manufacturing	6	53
Highway, Street, and Bridge Construction	6	16
Sports and Recreation Instruction	6	7
Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	4	17
Recyclable Material Merchant Wholesalers	4	11



# Coming Soon: Lead Standards Amendments

- February 5, 2024: Cal/OSHA Standards Board voted 5-2 to approve proposed amendments to the lead standards
- Regulations will be effective January 1, 2025
- This was a longstanding OHB priority dating back to more than a decade ago, when OLPPP recommended that Cal/OSHA revise its outdated regulations
- California's workers will be far better protected from lead exposures moving forward



# Lead Standards Changes - Highlights

- Lower air levels of lead (PEL = 50 → 10  $\mu\text{g}/\text{m}^3$ ; AL = 30 → 2  $\mu\text{g}/\text{m}^3$ )
- More frequent BLL testing
- More effective medical removal protections
- Stricter hygiene requirements regardless of air lead levels
- More stringent training requirements



# Silicosis and Engineered Stone









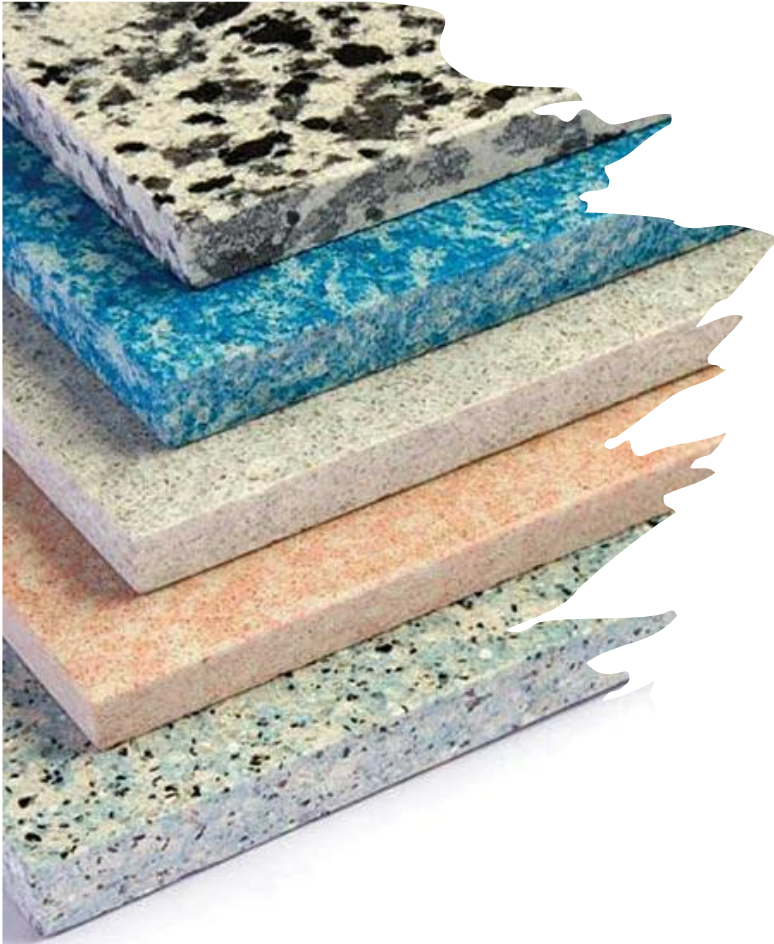
# Silicosis: Old Disease, New Risk

- Silicosis is a **severe, incurable** lung disease caused by inhaling silica dust particles.
- Engineered stone (artificial stone, quartz), material used for kitchen countertops, contains **especially high levels of silica (>90%)**.
- Workers who **cut and grind engineered stone** (stone fabricators) can be exposed to **hazardous levels of silica dust**.

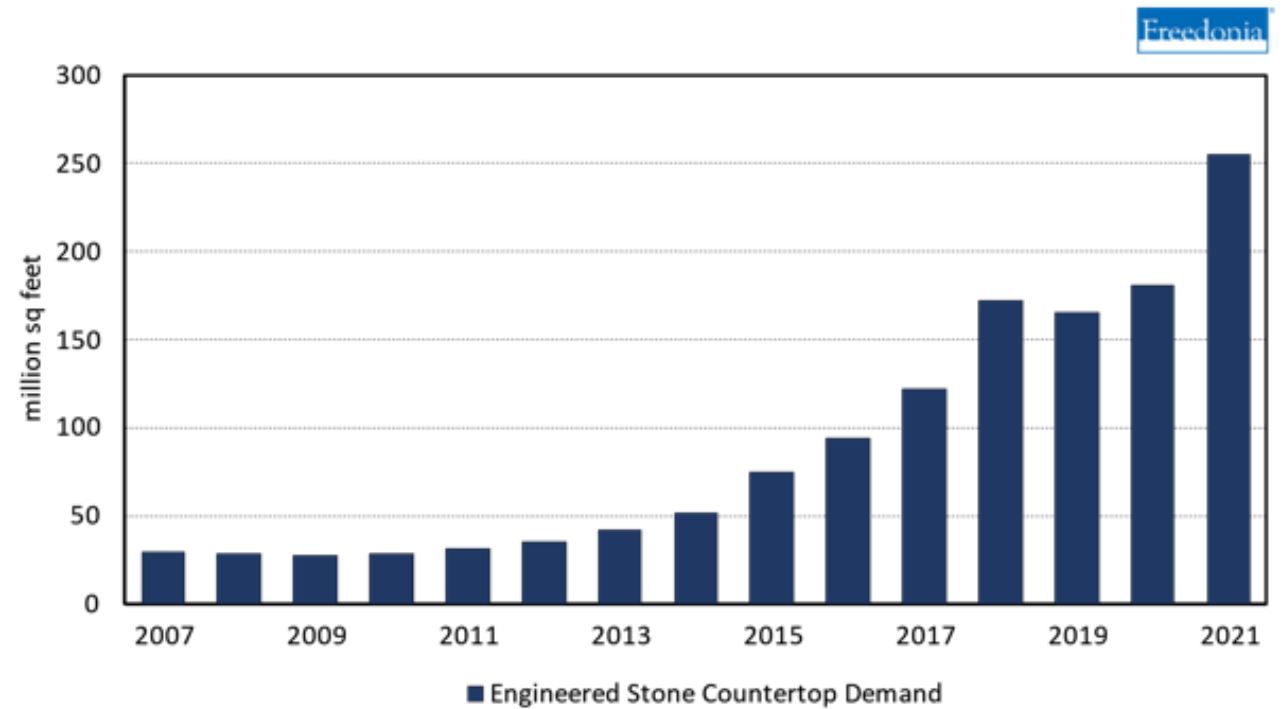




# Engineered Stone: Growing Demand



U.S. Engineered Stone Countertop Demand, 2007-2021 (million square feet)



Source: The Freedonia Group





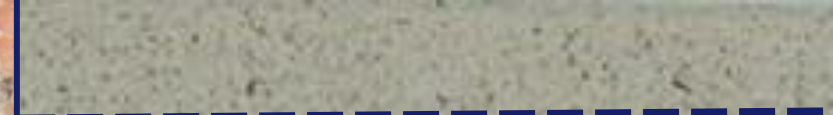
**<5% silica**

**Marble**



**~45% silica**

**Granite**

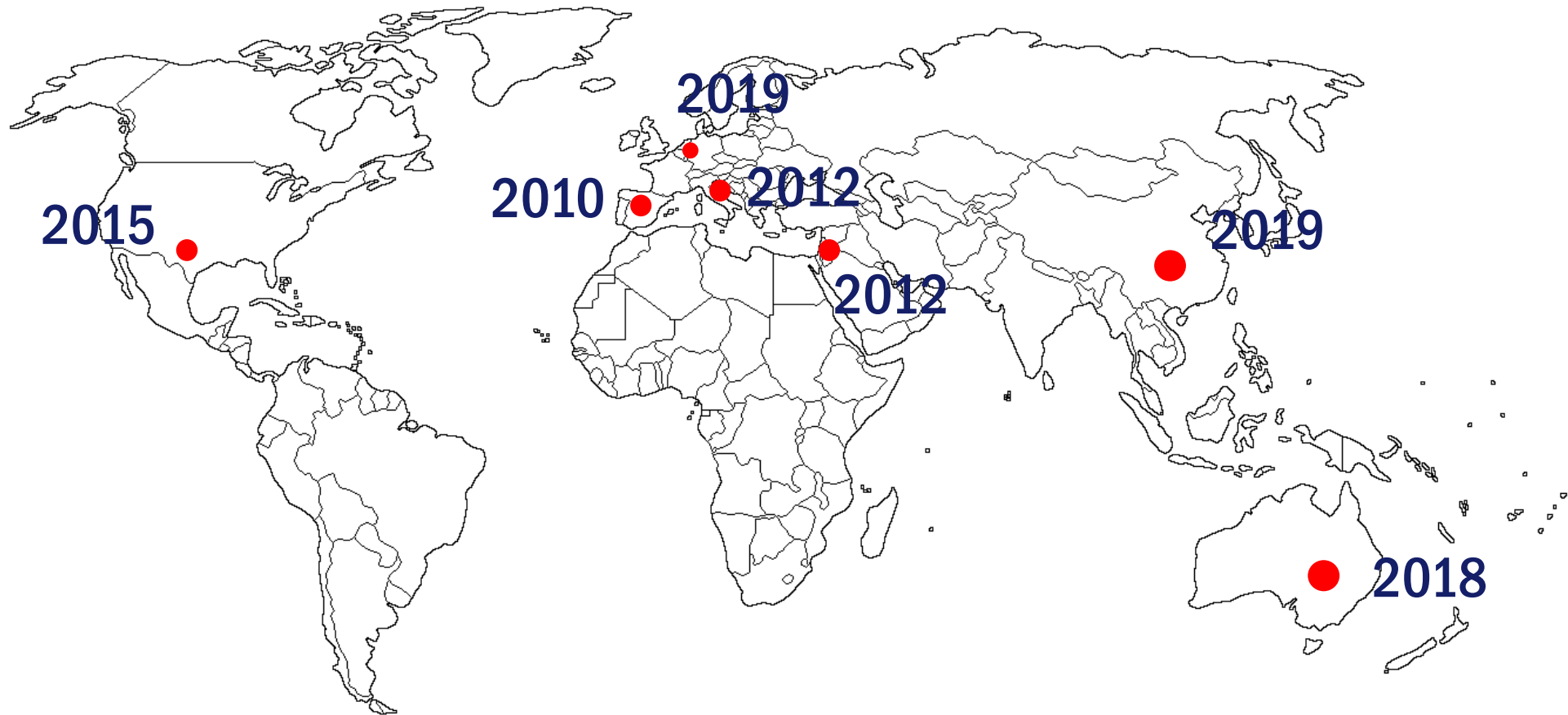


**>90% silica  
resins  
pigments**

**Engineered Stone**

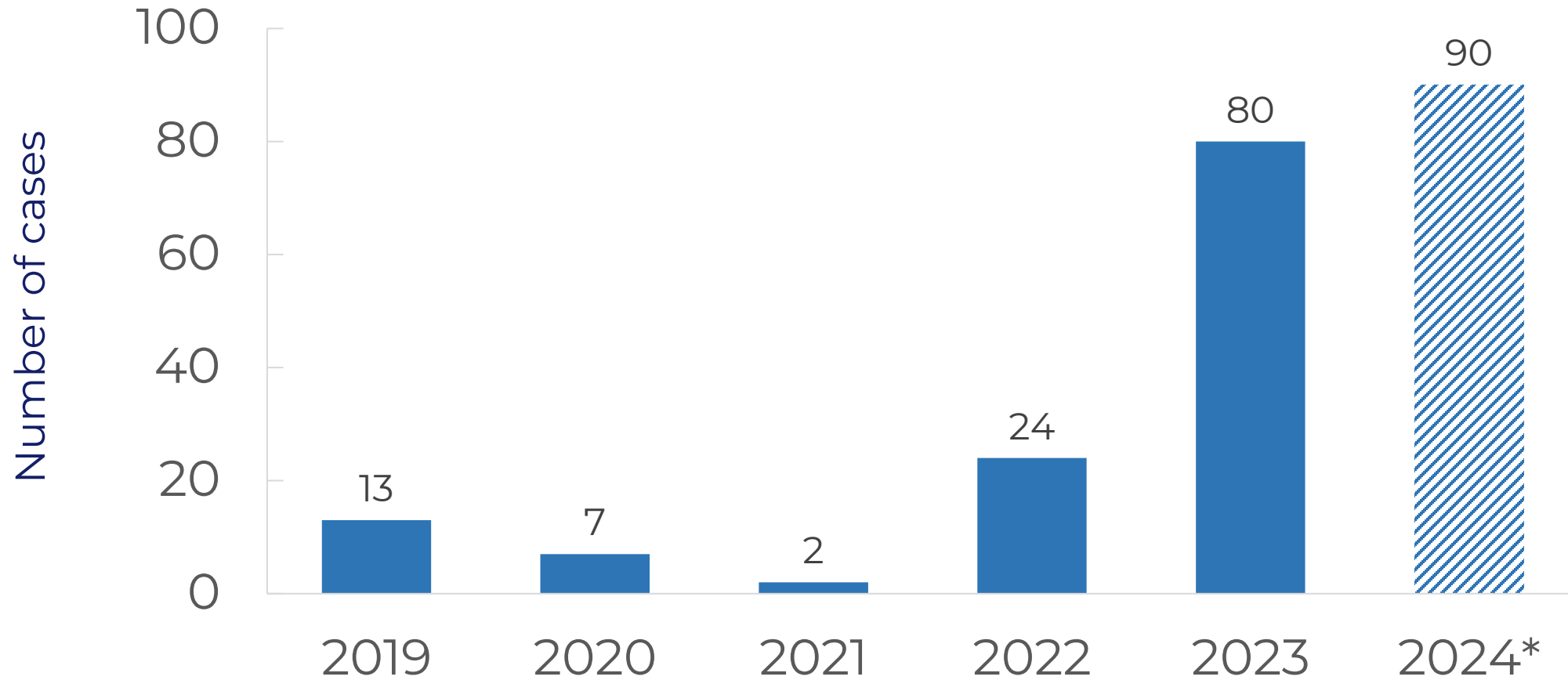


# Silicosis Related to Engineered Stone





# Cases Increasing in California

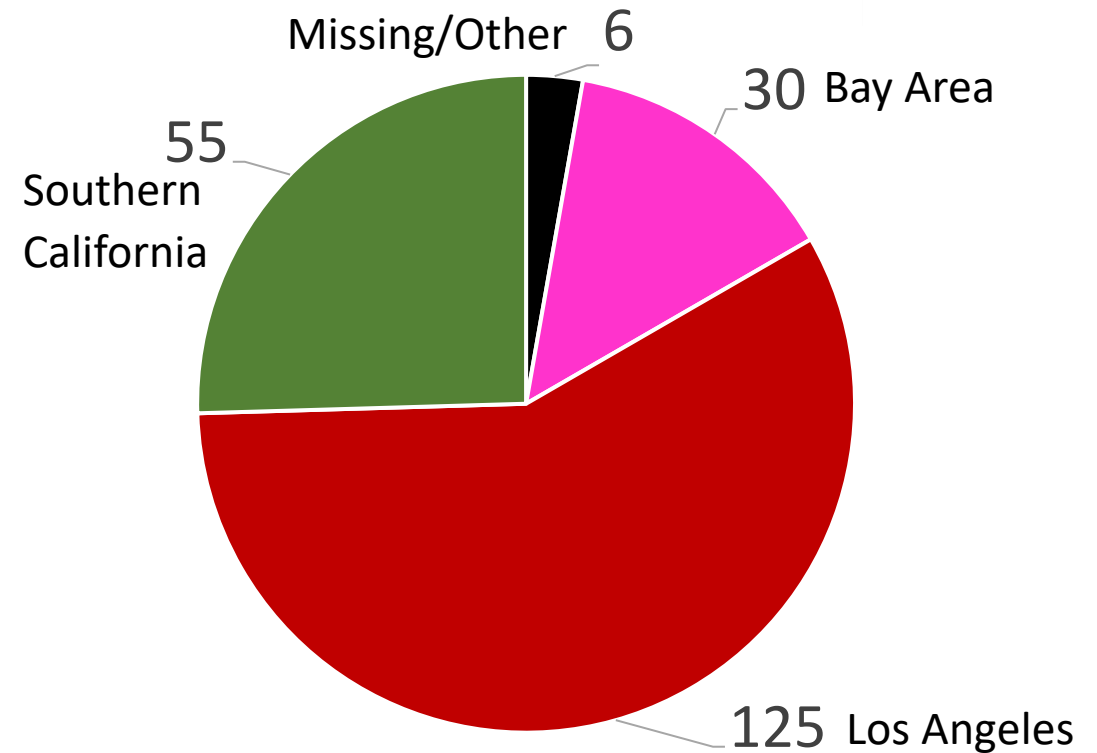


\* through 11/12/2024



# Young Immigrant Workers

- **216 fabrication workers with silicosis**
  - Many in their 30s and 40s
  - Almost all immigrants from Mexico & Central America
  - Often under/uninsured
- At least **14 deaths**
- At least **26 lung transplants**



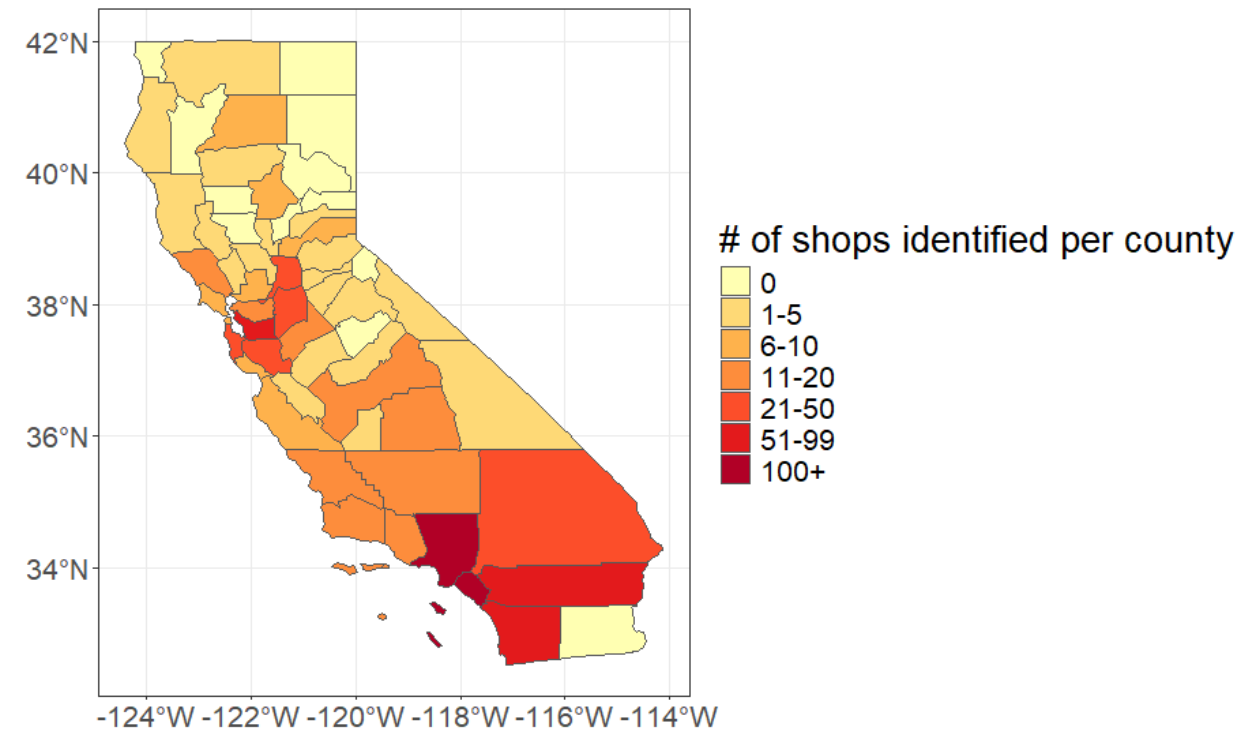


# The Tip of an Iceberg?

- >800 shops in California
- Silicosis prevalence estimates
  - 12% in one CA workplace
  - >20% in Australian screening programs
- Likely many unidentified cases

Engineered Stone Fabrication Shops in CA

as of 5/6/24





# New Cal/OSHA Regulations

NEWS

## California Fast-Tracks Rules to Protect Stonecutters From 'Horrible' Deaths



By Farida Jhabvala Romero Jul 22 Save Article



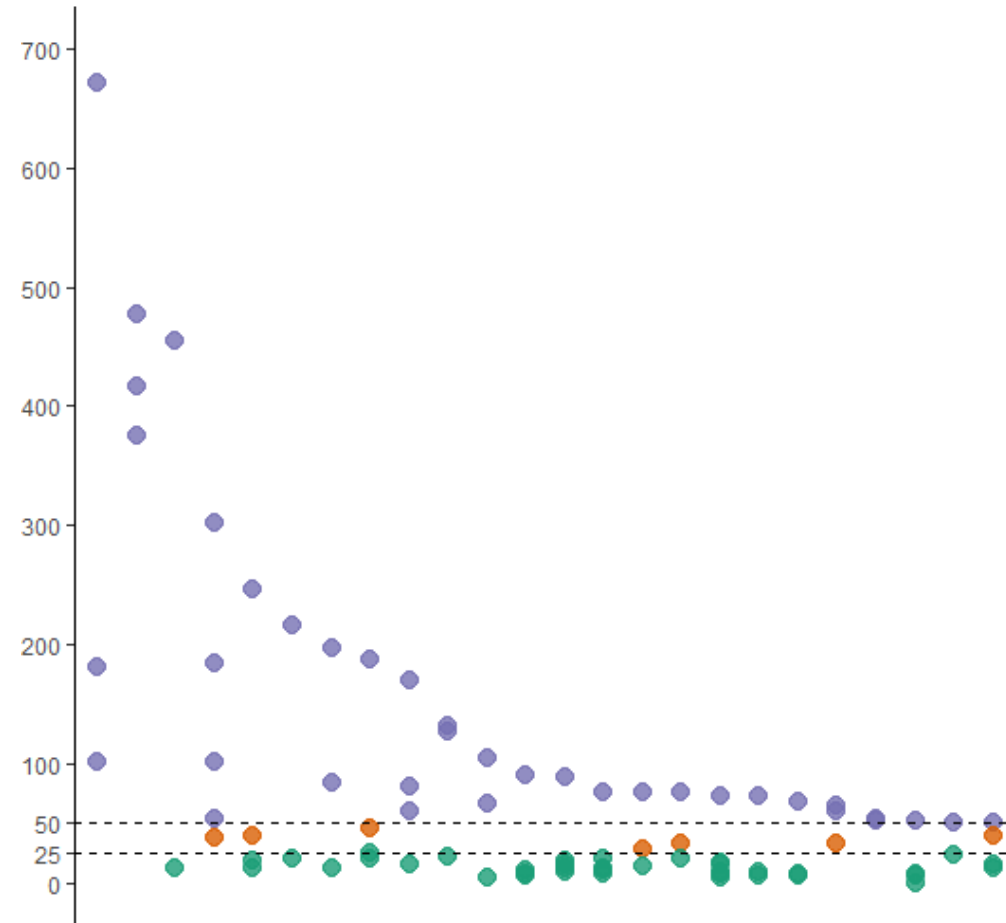
Leobardo Segura-Meza, 27, speaks to California workplace regulators via video on July 20, 2023, while his wife Mirian looks on. Segura-Meza, who requires an oxygen tank at all times to breathe, was diagnosed last year with silicosis after working for 10 years cutting engineered stone countertops. (From Cal/OSHA meeting screenshot)

- **Emergency Temporary Standard**
  - Bans dry cutting
  - Requires higher level respirator
  - Includes Order Prohibiting Use
- **Revised Permanent Standard**
  - Adds chest CT to medical screening
  - Requires all medical screening to be reported to CDPH
  - Vote on December 19<sup>th</sup>



# New Cal/OSHA Regulations

- **CDPH contributions**
  - Documented disease burden
  - Summarized inspection data
  - Served on Advisory Committees
  - Provided oral testimony





# Australia's Ban

- **July 2024:** ban on engineered stone
  - Manufacture
  - Supply
  - Processing
  - Installation





The background is a solid teal color. On the right side, there is a complex geometric pattern consisting of several lines that intersect at a central point, creating a star-like or web-like structure. The lines are of varying lengths and angles, extending towards the right edge of the frame.

# Heat



# Occupational Heat–Related Illness

- Exposure to heat and hot weather can cause heat related illness (HRI) among outdoor and indoor workers in non-air conditioned environments.
- Occupational HRI is a significant, but preventable source of illness, injury, and death.

Cal/OSHA has a new regulation [Title 8 CCR Section 3396](#) that mandates protections for indoor workers.



# Indoor and Outdoor Industries Affected by Heat, Many Low-wage

Workers exposed to extreme heat is a climate change and health equity issue



Food service



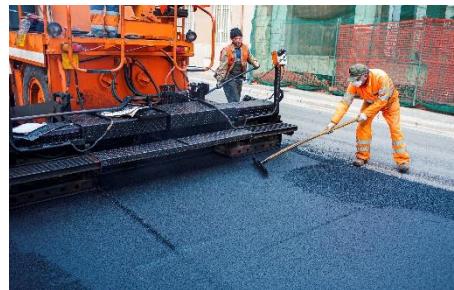
Agriculture



Warehouse



Construction



Asphalt



Package delivery



# The Worker HEAT Team

**Mission:** Protect California's high-risk workers from extreme heat

Debbie Shrem (Team Lead)

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(CSTE Fellow)

Bob Harrison  
(PH Med Officer)

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(Health Educator)

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Stella Beckman (Epidemiologist)





# Worker HEAT's Activities

Conduct occupational health surveillance & epidemiology

## Research

Data briefs, journal articles, data-driven interventions

Elevate the worker heat perspective

## Collaborate

Include the worker voice in Climate Change and Health Equity initiatives

Promote the indoor heat standard

## Educate

Develop social media campaign, partner with 3 UC labor centers



## Occupational Heat Surveillance & Epidemiology

- Publication of 2 data briefs
  - *Occupational Heat-Related Illness (HRI) Emergency Department Visits, California, 2016-2021*
  - *Occupational Heat-Related Illness among California Workers, 2000-2022*
- Support two Local Health Jurisdictions conducting worker heat syndromic surveillance

## OSHA Heat Standard

- Provide extensive CDPH Comments on OSHA Heat Standard



## Educational Materials

- Worker Resources in English and Spanish
- Webpage





# Fatal Injuries



# Fatality Assessment & Control Evaluation (FACE) Program

- 400+ workers die from occupational injuries in California each year
- California is one of seven FACE states funded by NIOSH
  - Investigates fatal occupational injuries
  - Identifies contributing factors
  - Provides recommendations that can be implemented
  - Develops prevention materials (fact sheets, tailgate trainings, videos)





# Farm Laborer Struck by a Tomato Harvester



- 21 year-old farm laborer working as sorter on tomato harvester
- First time doing this work; overnight shift
- Found unresponsive in field
- Cause of death: multiple blunt force injuries



# Contributing Factors

- Operators and crew were not wearing appropriate reflective clothing
- Failure of supervisory personnel to inspect equipment and conduct a safety meeting at the beginning of the shift
- Inadequate communication between operator and crew on outset and during shift
- Inadequate training and instruction related to harvester equipment safety
- Inadequate lighting/illumination of the work area for night operations



# Recommendations

- Provide all employees working at night with appropriate reflective clothing
- Supervisors should inspect equipment and conduct a safety meeting at the beginning of the shift
- Develop SOP that include a system of communication between operator and crew, and accounting for personnel
- Provide training and instruction on harvester equipment safety
- Install high-intensity LED lighting on all tomato harvesters
- Improve visibility for harvester operators (windshield wipers, side mirrors, wired remote cameras)





**Palm Tree Trimming**



**Worker Drownings**



**Solar Installation**



**Wood Chippers**



**Landscaping & Tree Trimming**



**Firefighting**



# Indoor Air Quality (IAQ)



# Why IAQ?

- COVID-19 pandemic served to highlight importance of indoor transmission through the air
- Ventilation/filtration can have big impact on ability of virus to “build up” and be inhaled by others in indoor environments






# Why IAQ?

- We spend most of our lives in indoor environments
- Poor IAQ can lead to:
  - Communicable disease spread
  - Decreased productivity & performance
  - Breathing harmful outdoor pollution/wildfire smoke
  - Chemical exposures (off gassing)



# Field Visits / Publications

JAMDA 25 (2024) 105195

 **JAMDA**  
journal homepage: [www.jamda.com](http://www.jamda.com)

Original Study-Brief Report

## Indoor Air Quality Assessments in 10 Long-Term Care Facilities during the COVID-19 Pandemic, California, 2021–2023

Kyle Peerless MPH \*, Elon Ullman MS, Kristin J. Cummings MD, MPH, Juliet Stoltey MD, MPH, Erin Epton MD, Janice J. Kim MD, MPH, Jane D. Siegel MD

California Department of Public Health, Richmond, CA, USA

**Check for updates**

**Keywords:**  
COVID-19  
indoor air quality  
inhalation exposure  
nursing homes  
public health  
ventilation

**ABSTRACT**

**Objectives:** This study aimed to assess indoor air quality (IAQ) in long-term care facilities (LTCFs) in California during the COVID-19 pandemic and evaluate their implementation of IAQ best practices described by public health authorities to control respiratory pathogen transmission via inhalation.

**Design:** This observational study conducted IAQ assessments in a convenience sample of LTCFs to gather qualitative data on the implementation of IAQ best practices. The design included 5 pilot visits to develop a standardized method of data collection and then systematic data collection at 10 facilities.

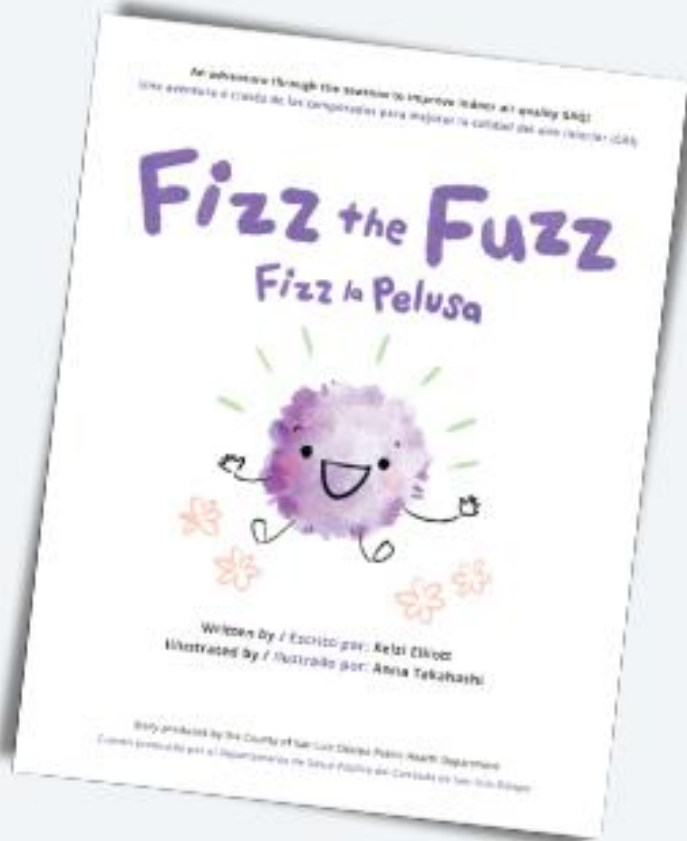
**Setting and Participants:** The study focused on 10 LTCFs across California, chosen from facilities that responded to flyers advertising free IAQ assessments. Some of the facilities had previously experienced COVID-19 outbreaks affecting residents and staff.

**Methods:** State health department industrial hygienists performed site visits to collect data on each facility's heating, ventilation, and air-conditioning (HVAC) system operation, outdoor air introduction,





# IAQ Community Education Grant



- Created new CDPH grant program to fund innovative IAQ education projects in CA
- “Fizz the Fuzz”: first ever children’s book focused on IAQ (San Luis Obispo Co.)



# IAQ Training Modules

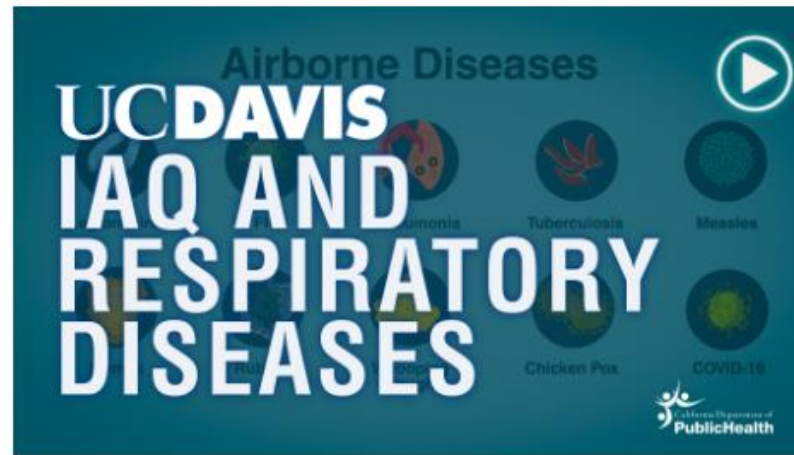
## Breathe Easy

Improving Indoor Air Quality

We've created simple video lessons to help you manage your building's indoor air quality.



Indoor Air Quality Basics



IAQ and Respiratory Diseases



Strategies and Methods for IAQ Assessment



# Avian Influenza





# A Brief History of Avian Flu A(H5N1)

- 800+ detections of **A(H5N1)** in **humans** reported from over 20 countries since 2003
- Avian influenza A (H5N1) viruses, especially those of clade 2.3.4.4b, continue to **diversify genetically** and **spread geographically**
  - 2020: A(H5N1) viruses widely circulate in Europe
  - Late 2021: Crossed into Canada
- Since 2022, a **broader range of wild bird species** has been infected globally
  - Causing harmful ecological consequences and mass die-offs in some species
  - The situation with **wild mammals** is also worrying, with some species suffering significant mortality events



# U.S. Human Cases of Avian Influenza A H5N1

55 confirmed human case detections in U.S. (As of 11/22/24)

- 10 following poultry exposure (CO)(9) and (OR)(1)
- 11 following poultry exposure (WA) - same clade as in dairy cows, but different genotype (D1.1)
- 33 following exposure to infected dairy cows
  - TX(1), MI (2), CO (1)
  - **28 in California**
  - 2 with no immediately known animal exposure (MO and CA) detected via enhanced flu surveillance

- All human cases in farmworkers have had mild illness
  - Many limited to conjunctivitis
  - Some with fever +/- other mild symptoms
- Dairy cattle and 2024 human cases:
  - Clade 2.3.4.4b virus, B3.13 genotype
- No evidence of person-to-person spread in US
- Current risk to general public: **Low**
- Priority/focus: Agricultural workers, especially those who work with dairy or poultry

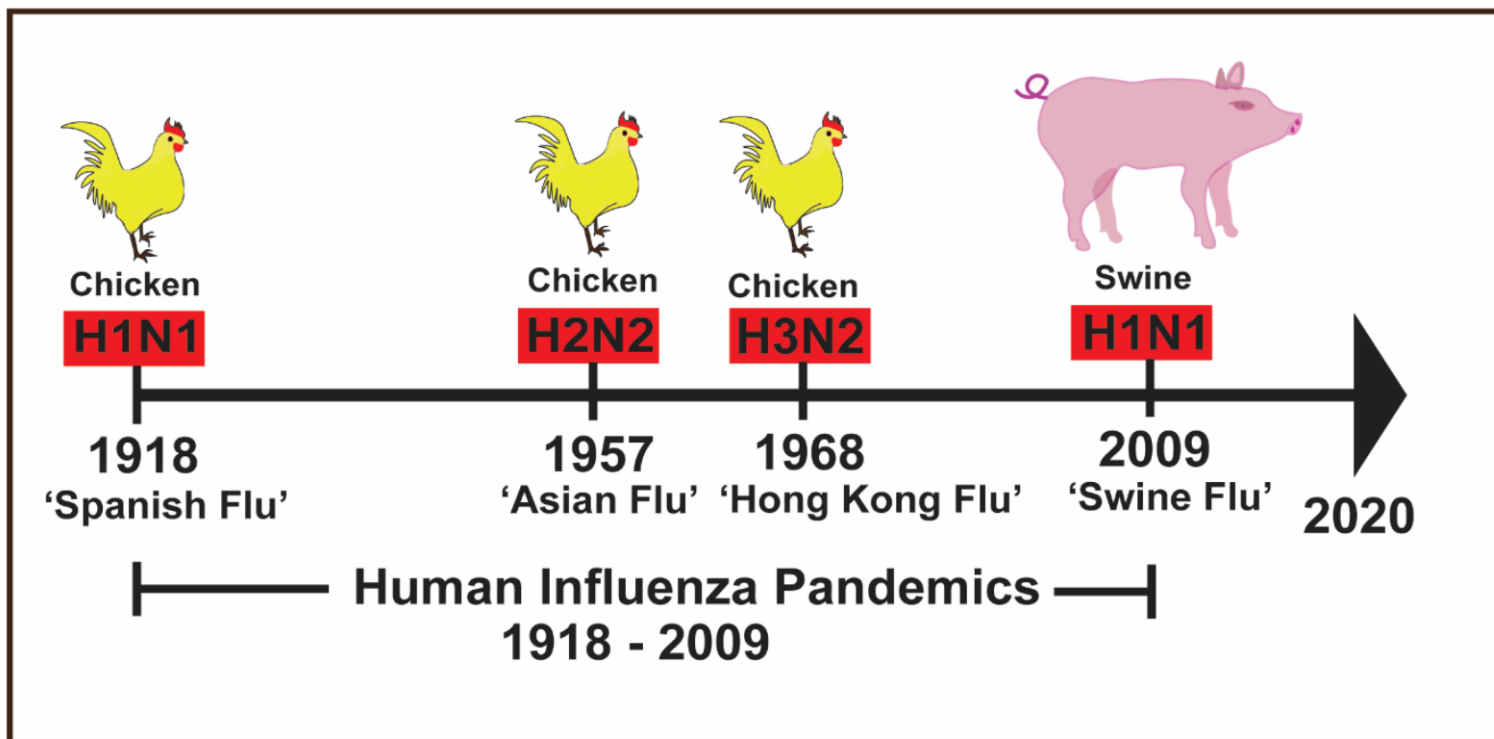
<https://www.cdc.gov/bird-flu/situation-summary/index.html>

<https://www.cdc.gov/bird-flu/situation-summary/mammals.html>



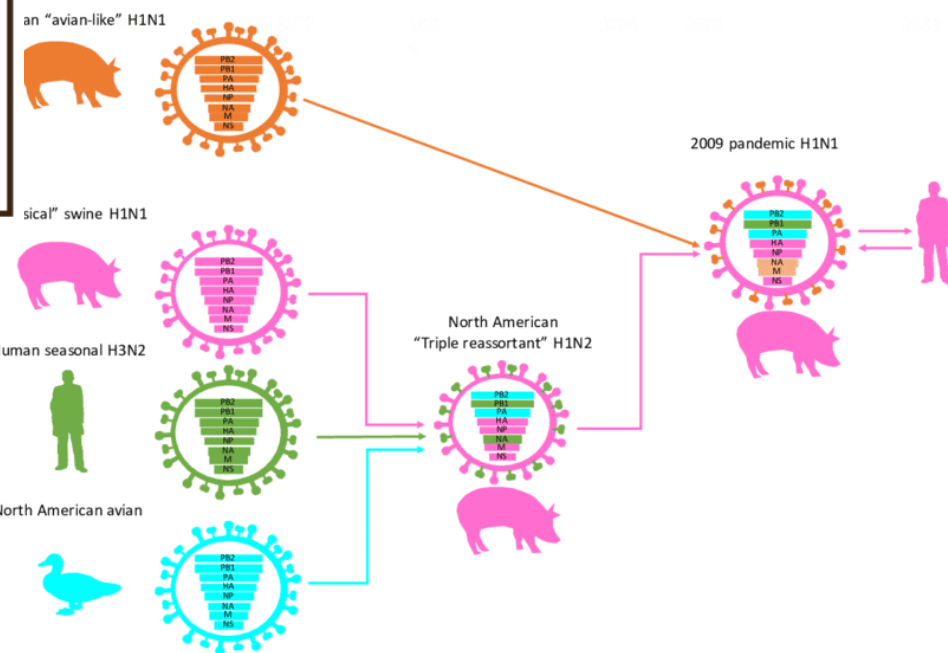


# What would increase concern for humans?



Mutation shift to novel influenza:

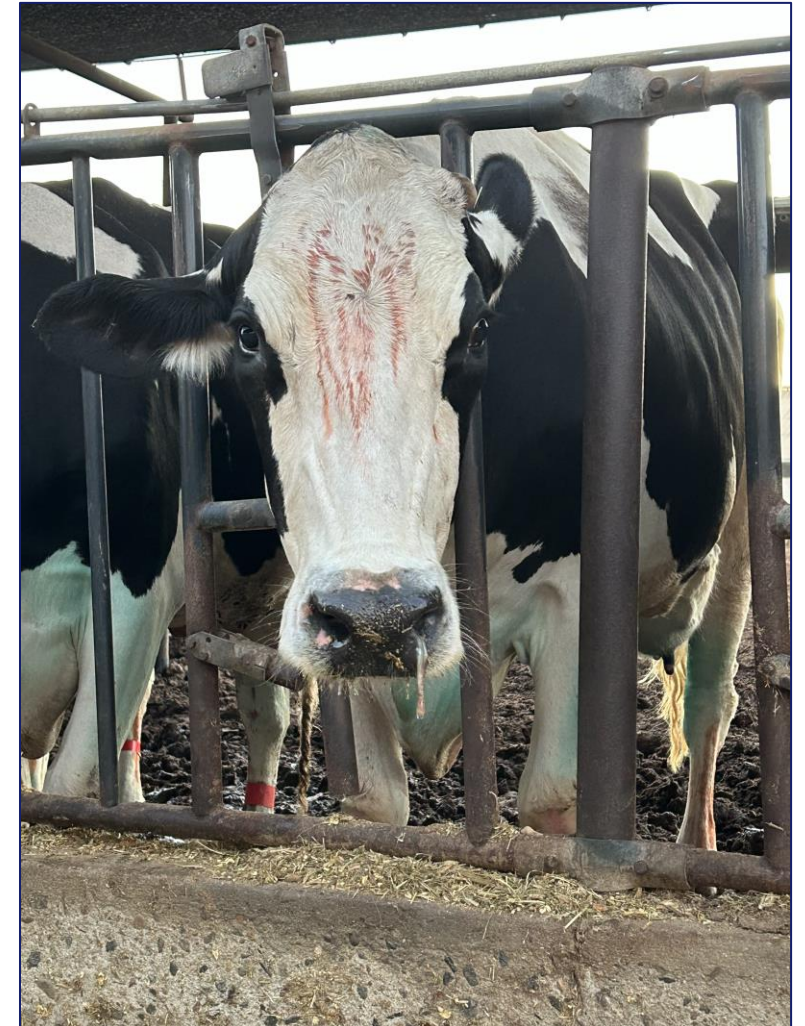
- resistance to anti-flu medications
- human to human transmission
- increased severity of disease





# H5N1 Detections in Dairy Cows and Poultry in California

- There are ~1,000 dairy farms in California with >1.7M cows
  - 200 herds in Tulare County alone
- The first three California dairy farms with infected cows were identified August 30, 2024
- As of 11/22, H5N1 had been confirmed in
  - dairy cows in more than 400 dairy herds
  - 66 commercial poultry producers
  - 30 backyard flocks(since start of outbreak in 2022)





# Managing Affected Herds (CDFA)

- Symptomatic cows are tested and affected herds are monitored clinically
- After ill cows have recovered, herds are tested weekly
  - After 3 consecutive negative tests, herds are released from quarantine
- When infected cows are identified, all dairies within a 10 km radius of the affected farm are tested weekly
- Testing of barn cats and peri-domestic wildlife is also occurring
- Support for financial impacts on producers is provided





# Occupational Exposure Risks: Poultry and Dairy Farms

## Modes of transmission

- Direct contact
- Indirect Contact
- Splashing
- Ingestion (Eating/drinking)
- Inhalation

## Work activities with higher occupational exposure risk:

- Feeding, caring for infected birds
- Handling live or dead birds
  - Depopulating birds
  - Handling or disposal of carcasses
- Cleaning and Disinfecting contaminated surfaces, bedding
- Handling eggs, feed, or other materials
- Working with dairy cattle (milking, cleaning pens, providing care, handling live or dead cows)
- Others



# CDPH Recommended Personal Protective Equipment (PPE) for Dairy Workers

- When in contact with or around infected dairy cows
  - Milking
  - Working in hospital pen
  - Feeding calves colostrum
- When handling raw milk
- When cleaning areas with the virus
- **Wash hands often and do not touch eyes while working**
- **Wear:**
  - Eye protection (e.g., goggles or face shield)
  - N95 or higher-level [NIOSH-approved respirator](#)
  - **Gloves**
  - Coveralls
  - Apron, if needed
  - Head covering
  - Boots or shoe covers





# CDPH and Local Health Departments (LHDs) Coordination

- Monitor workers for symptoms associated with avian influenza
- Provide recommendations for patient testing and treatment, if needed
- If exposed person becomes ill, coordinate/collect specimens for testing
  - Many local public health labs and the CDPH lab can do H5 testing
  - If avian influenza is suspected, the LHD should be contacted immediately so appropriate and timely testing at a public health lab can be arranged
- If person tests positive for A(H5), monitor household and close contacts for symptoms associated with avian influenza



# Key Takeaways

- The general public health risk of H5N1 infection is low – BUT staff who work directly with wild birds, poultry, and dairy cattle have the highest risk of exposure
- Seasonal influenza vaccination and PPE use can help protect staff
- If an employee develops symptoms after exposure to animals infected with H5N1, **notify the local public health department immediately.**
- **Stay home when sick;** Take the flu anti-viral medicine (such as Tamiflu) if recommended. It works best when taken sooner.
- More information available at:  
<https://www.cdph.ca.gov/Programs/CID/DCDC/pages/Bird-Flu.aspx>





# Contact CDPH/OHB

Subscribe to our Newsletter  
Occupational Health Watch



- **Toxic chemicals**
  - Workplace Hazard Helpline: (866) 282-5516
- **Lead**
  - Workplace Lead Info Line: (510) 620-5740
  - Email: [OLPPP-Registry@cdph.ca.gov](mailto:OLPPP-Registry@cdph.ca.gov)
- **Silica**
  - Email: [silicosis@cdph.ca.gov](mailto:silicosis@cdph.ca.gov)
- **FACE Program**
  - Email: [face@cdph.ca.gov](mailto:face@cdph.ca.gov)
- **Avian Influenza**
  - Email: [CDPHGPInquiries@cdph.ca.gov](mailto:CDPHGPInquiries@cdph.ca.gov)
- **Occupational Health Watch Newsletter**
  - <https://www.cdph.ca.gov/Programs/CCDCPHP/DEODC/OHB/Pages/OHWArchive.aspx#>



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**Laura Styles**

**David Wambui**



# OHB is hiring!

- **Health Program Manager I**
- **Research Scientist II (Physical/Engineering Science) x 2**
- **Research Scientist III (Epidemiology/Biostatistics)**
- **Research Data Analyst II**



# Questions?

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