RICHMOND - NORTH
RICHMOND - SAN PABLO
COMMUNITY

PATH TO CLEAN AIR

Community Emission Reduction Plan (CERP)
Community Steering Committee Meeting #13

April 25, 2022

Welcome


RICHMOND - NORTH
RICHMOND - SAN PABLO
COMMUNITY
PATH TO
CLEAN AIR

Today's Agenda

1. Roll Call
2. Welcome and Timeline Review
3. Approval of March 21, 2022, Meeting Minutes
4. Updates from Ad Hoc Groups
5. Air Pollution and Health Risks
6. Next Steps for Strategy Development
7. Environmental Justice Updates
8. Public Comment on Non-agenda Items and Next Steps

Timeline: Where are We Today?

Approval of March 21, 2022 Meeting Minutes

Public Comment

Updates from Community Description and Technical Assessment Ad Hocs

Community Description Ad Hoc co-leads: Nancy Aguirre

Technical Assessment Ad Hoc co-leads: Jeff Kilbreth

RICHMOND - NORTH RICHMOND - SAN PABLO COMMUNITY PATH TO CLEAN AIR

Public Comment

Air Pollution and Health Risks:

Partnering with Community: A multi-level approach to considering air pollution and health

Dr. Neeta Thakur, UC San Francisco

Neeta.Thakur@ucsf.edu

Partnering with Community: A multi-level approach to considering air pollution and health

Environmental Justice in Richmond, CA

Neeta Thakur, MD MPH
Neeta.thakur@ucsf.edu
@nthakurMD

Agenda

Health in Richmond

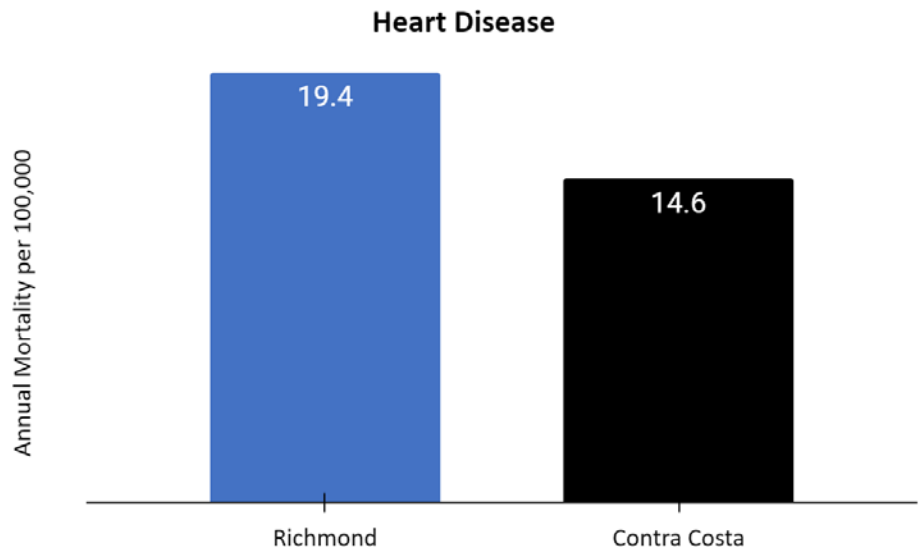
Social Determinants & Air Pollution

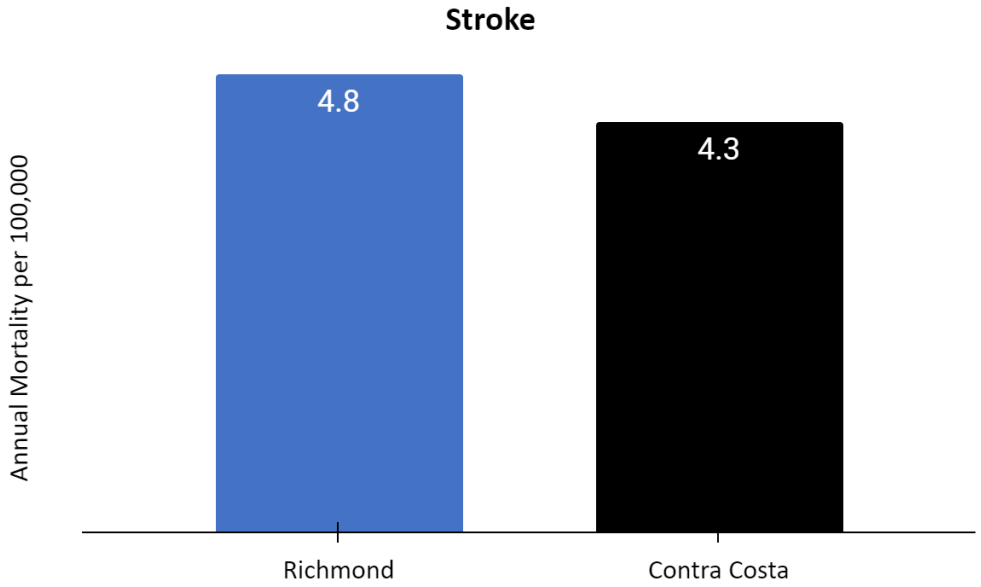
Air Pollution Health Effects

Partnering with Community

Health Disparities

Adults in Richmond are more likely to die from cardiovascular disease and stroke compared to other adults living in Contra Costa County



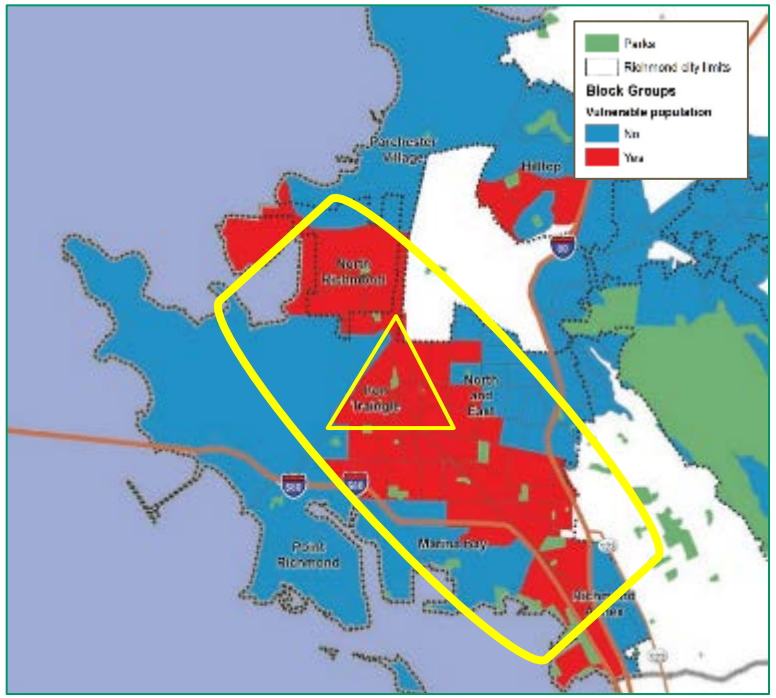


Health Disparities

Richmond/San Pablo: 1 in every 4 person has asthma  **25%**

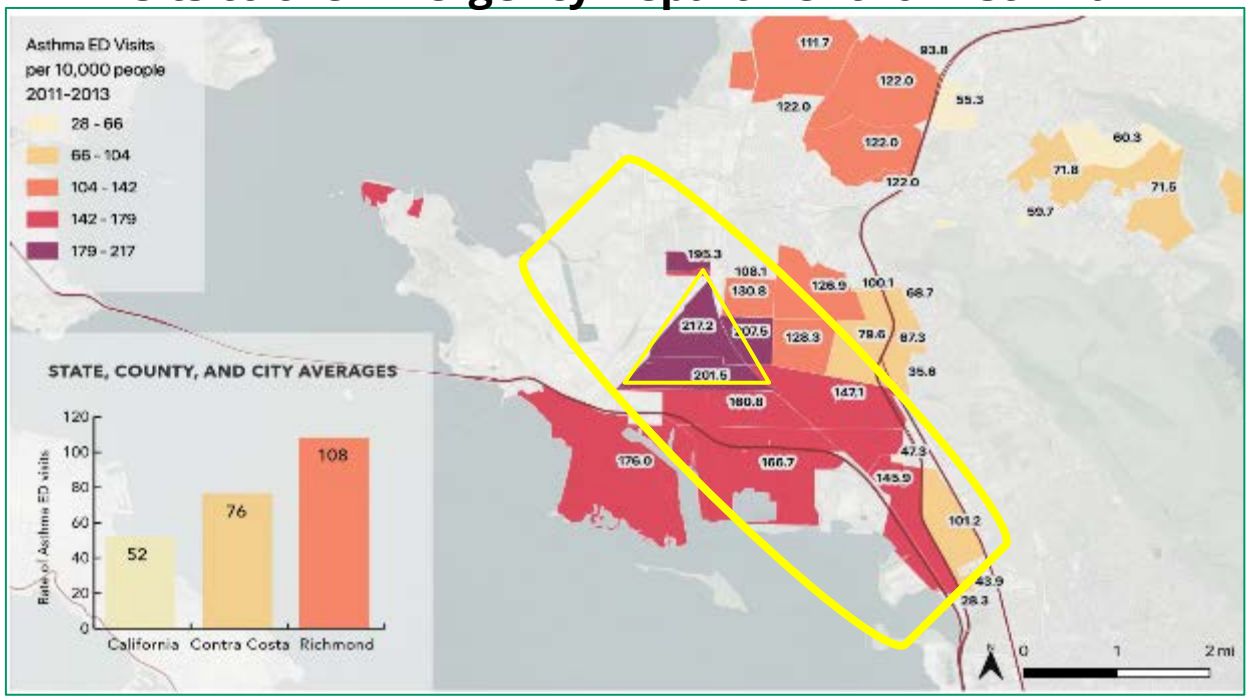
California: Only 1 in every 8 people have asthma  **13%**

Vulnerable Populations



Source:
UC Berkeley Othering and Belonging Institute, 2015

Visits to the Emergency Department for Asthma



Source:
City of Richmond Health in All Policies Report, 2020

A PUBLIC HEALTH FRAMEWORK FOR REDUCING HEALTH INEQUITIES
BAY AREA REGIONAL HEALTH INEQUITIES INITIATIVE

UPSTREAM → DOWNSTREAM

SOCIAL INEQUITIES

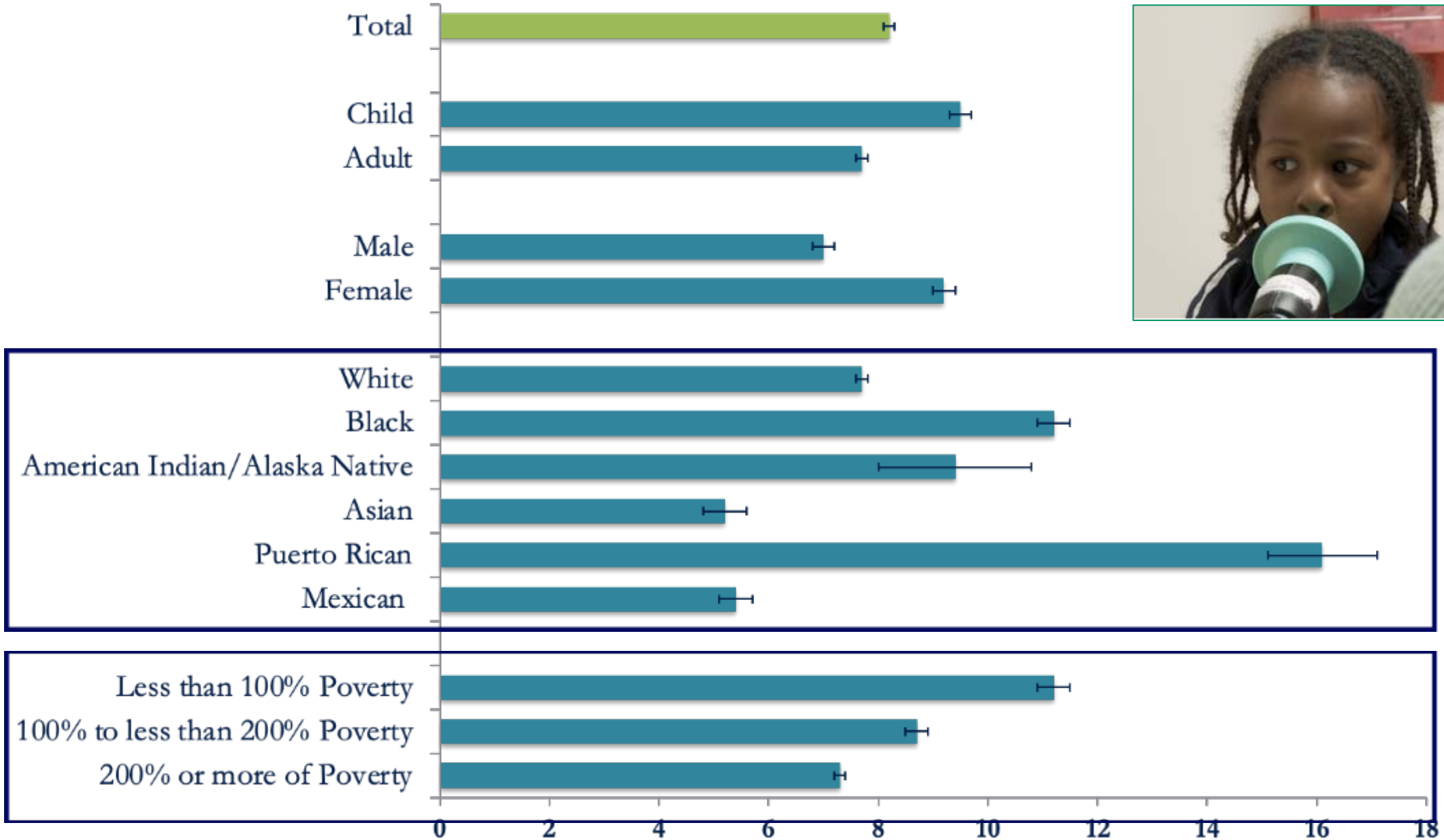
Class
Race/Ethnicity
Immigration Status
Gender
Sexual Orientation

Emerging Public Health Practice ← Current Public Health Practice

Conceptual Framework for How Social Factors Influence Health (https://www.barhii.org/)

Conceptual Framework for How Social Factors Influence Health (https://www.barhii.org/)

Conceptual Framework for How Social Factors Influence Health (https://www.barhii.org/)

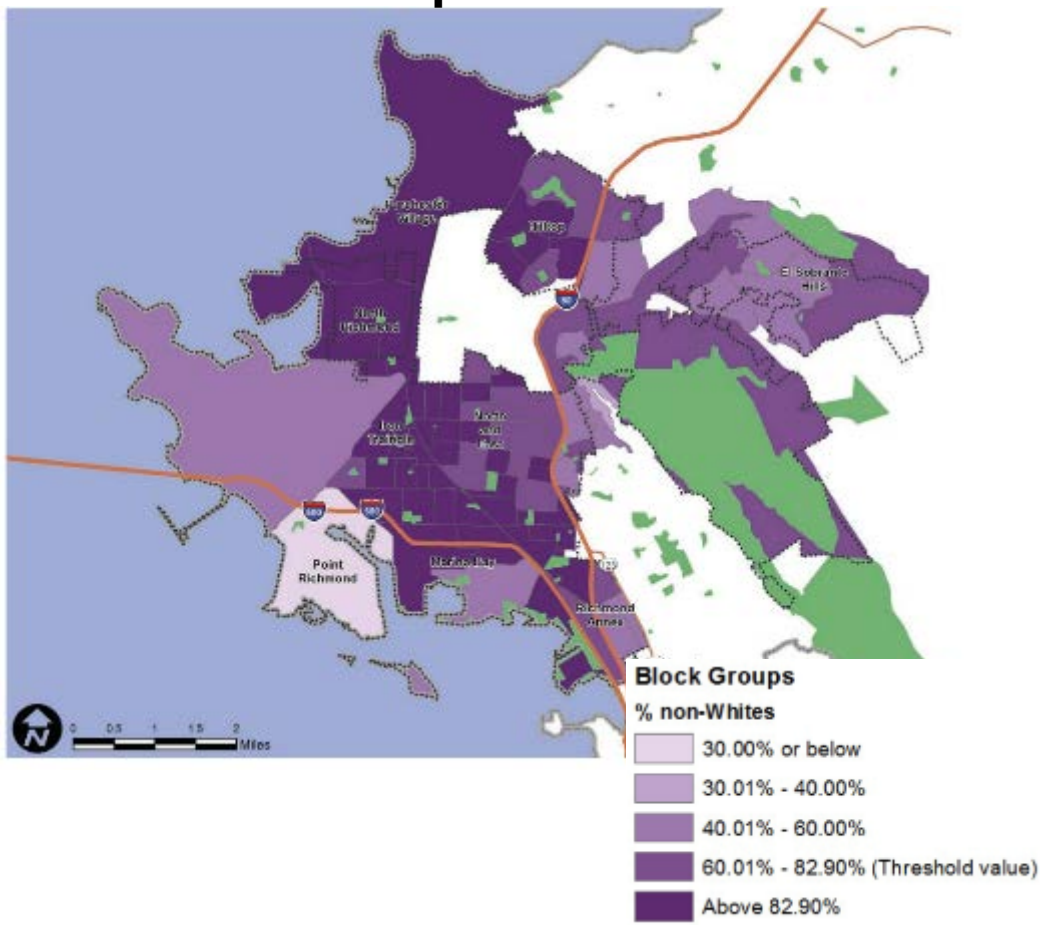


Current asthma prevalence, by age group, sex, race and ethnicity, poverty status, geographic region, and urbanicity: United States, average annual 2008-2010

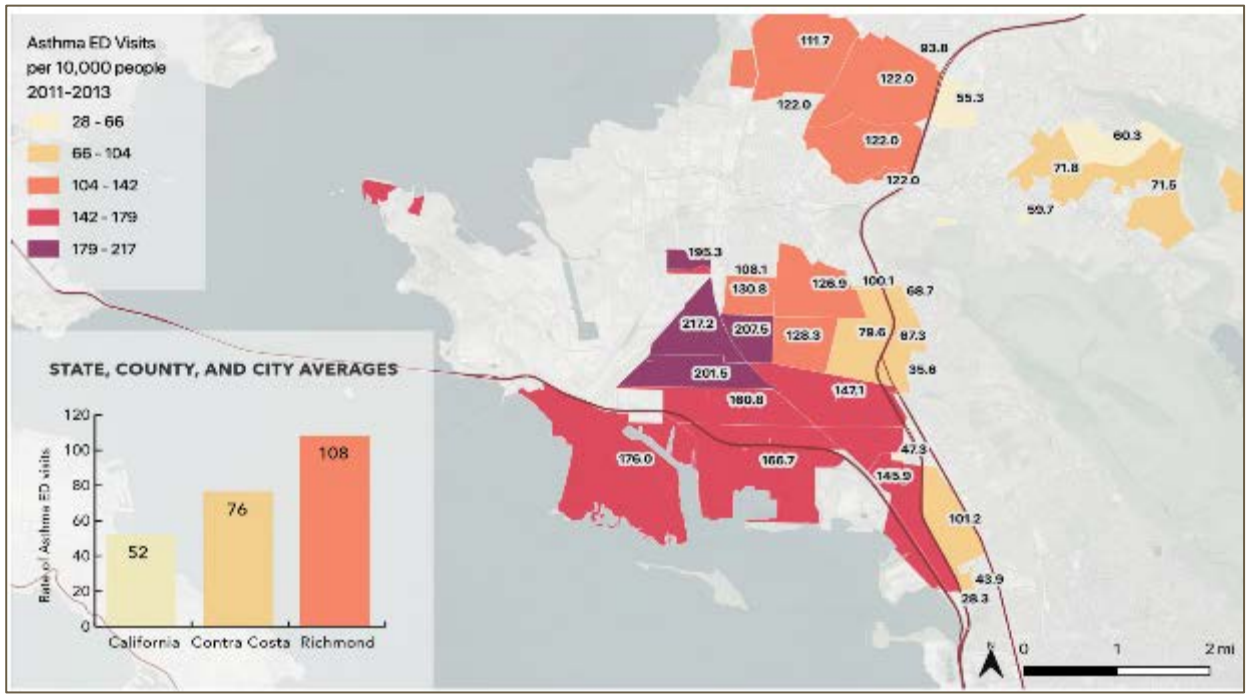
Asthma in Richmond, CA

A closer look….

% Non-White Population



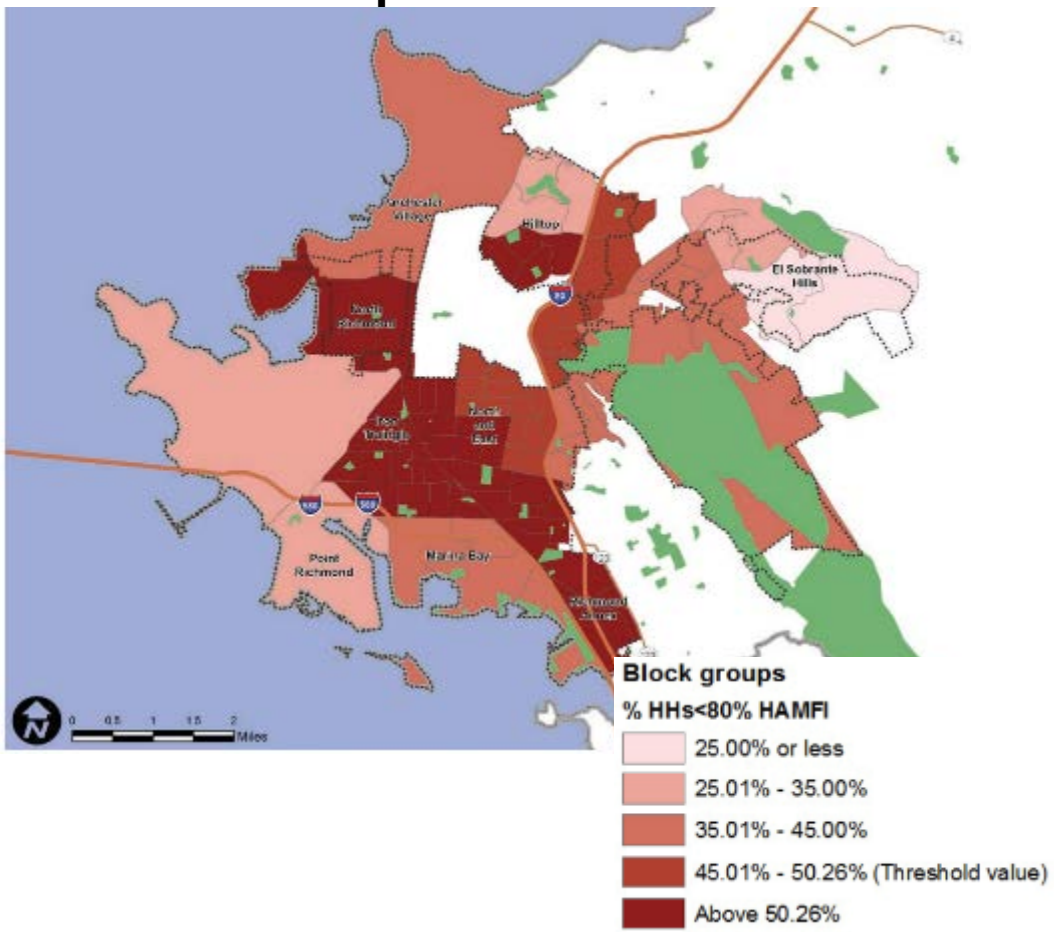
Visits to the Emergency Department for Asthma



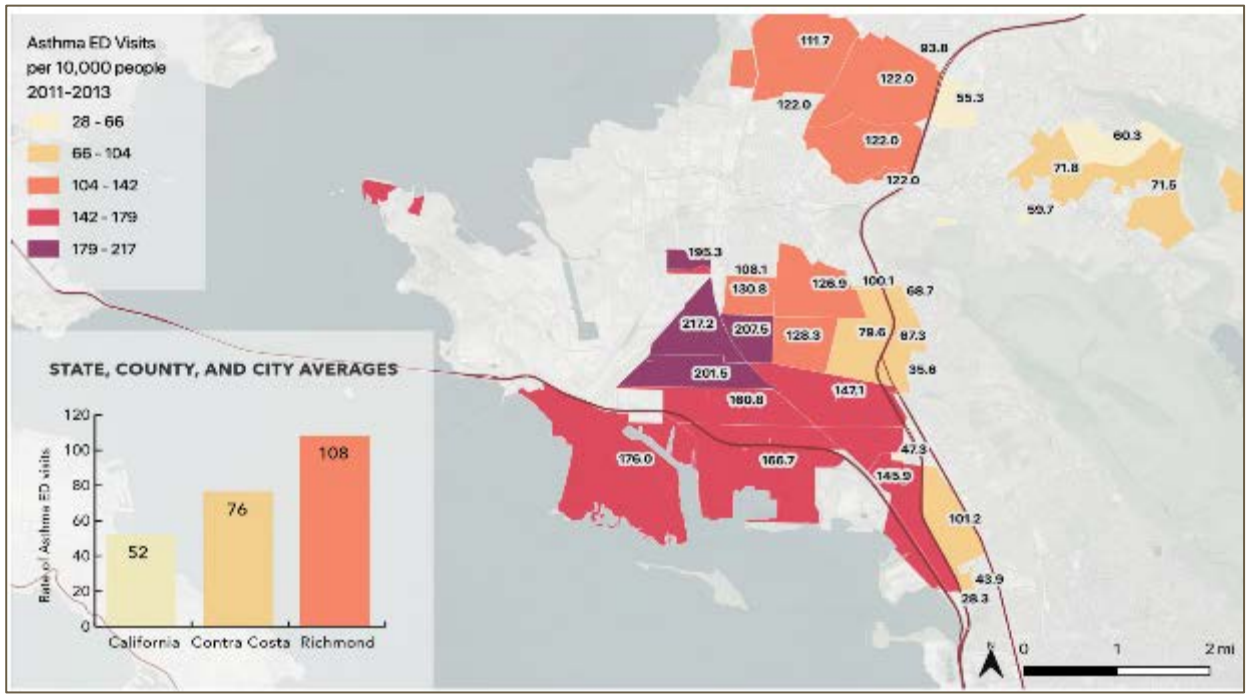
Asthma in Richmond, CA

A closer look….

% Low SES Population



Visits to the Emergency Department for Asthma

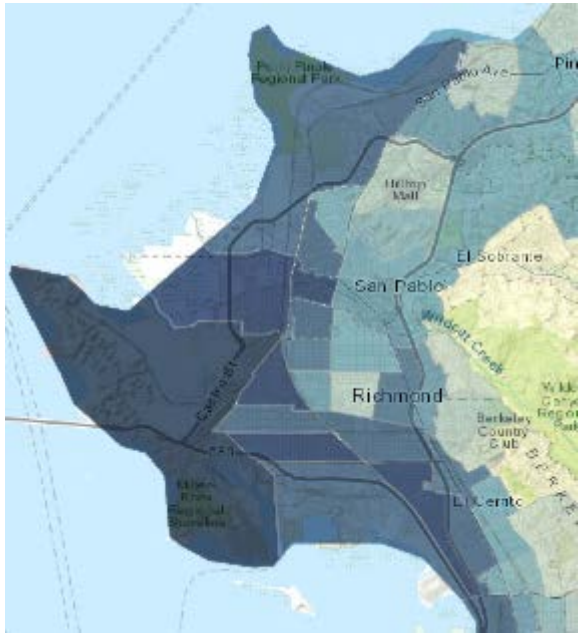


Belonging and Community Health Report Haas Institute

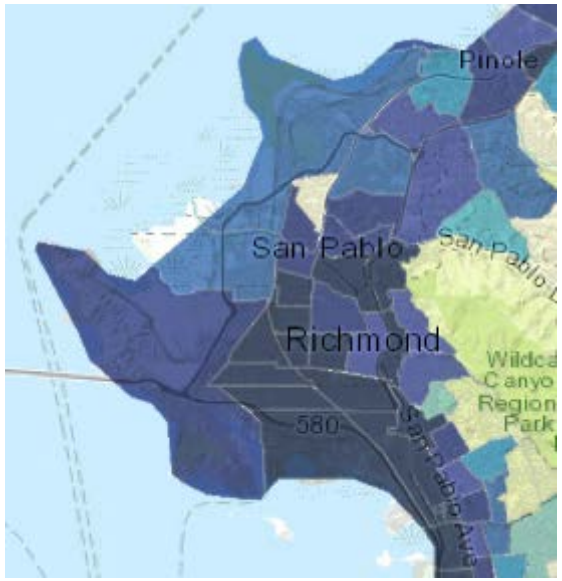
Asthma in Richmond, CA

A closer look….

Environmental Hazards (CES4.0)

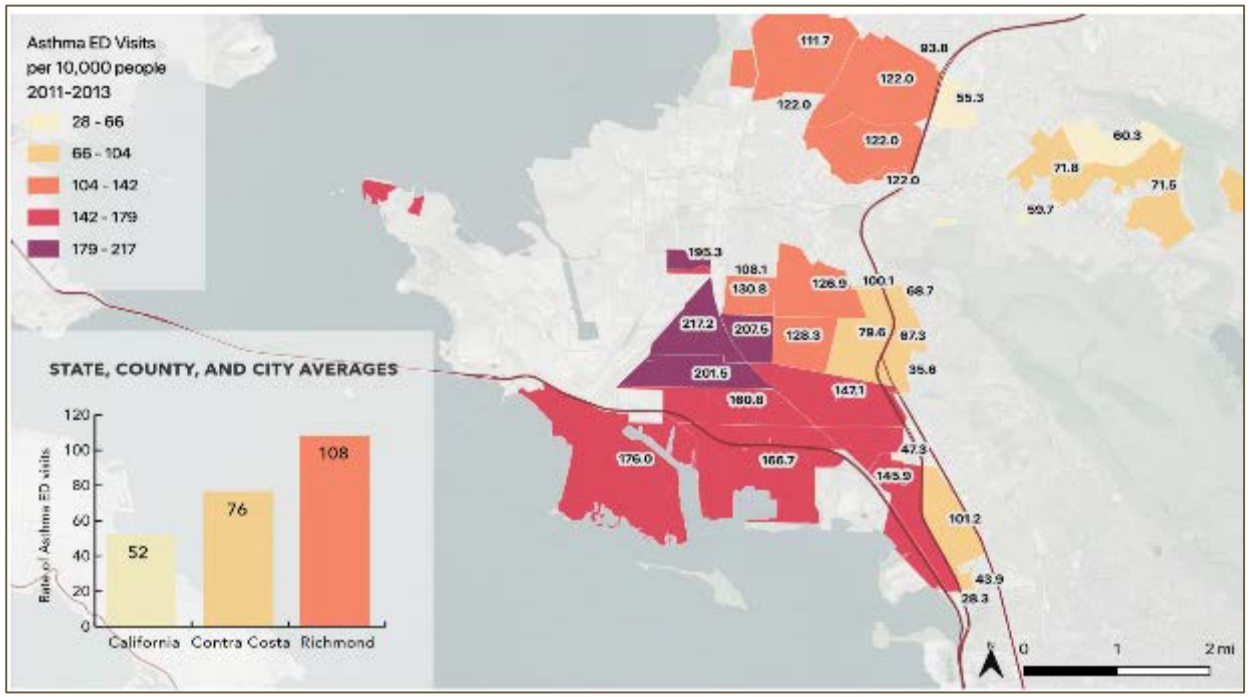


Pollution Hazard (summative)

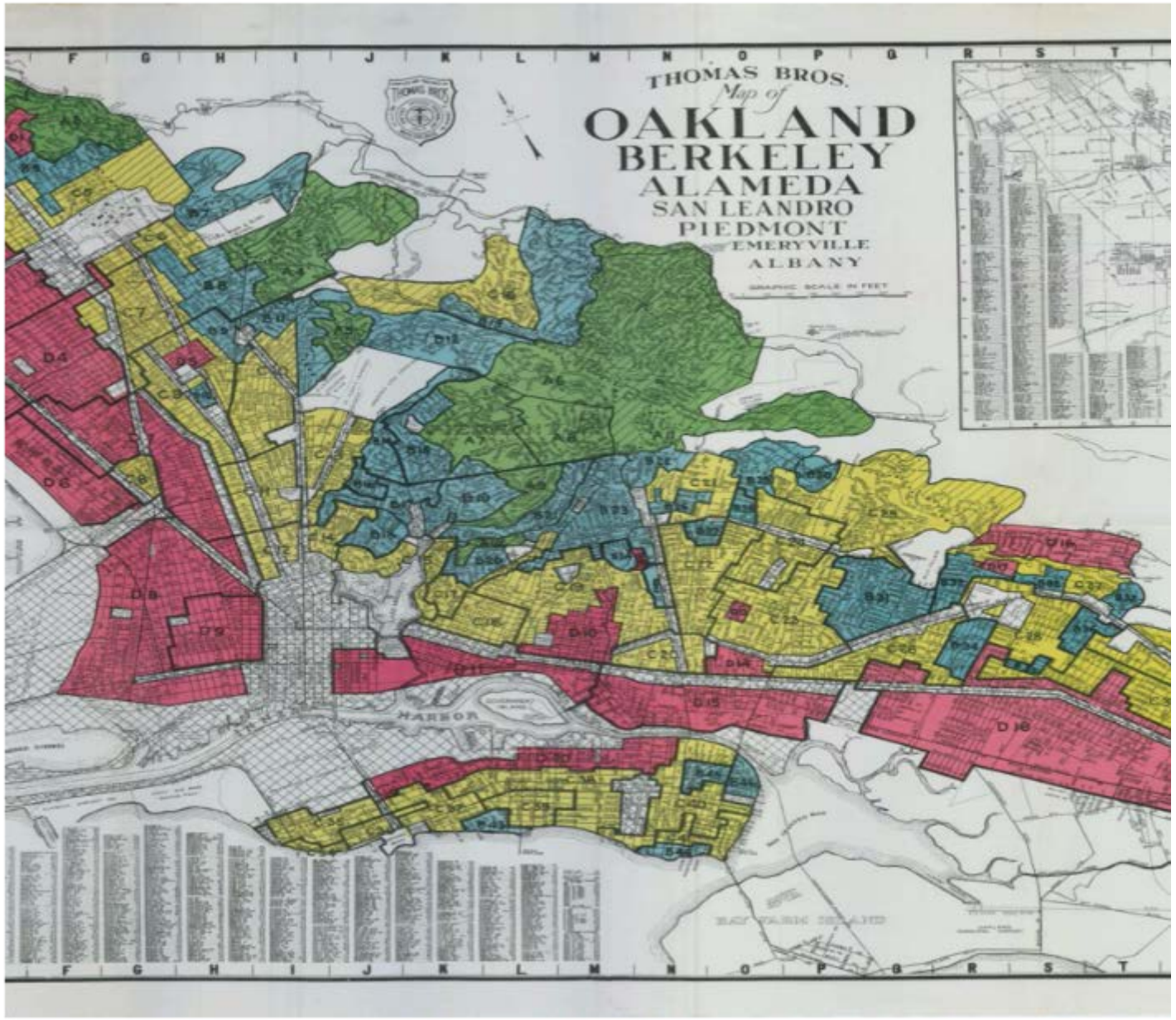


Diesel $PM_{2.5}$

Visits to the Emergency Department for Asthma



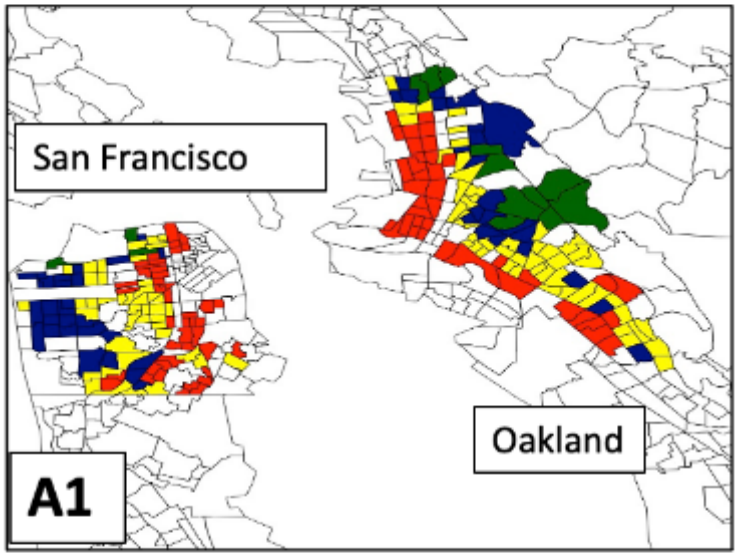
Social Disparities and **Pollution Hazards** occur in tandem…coincidence?



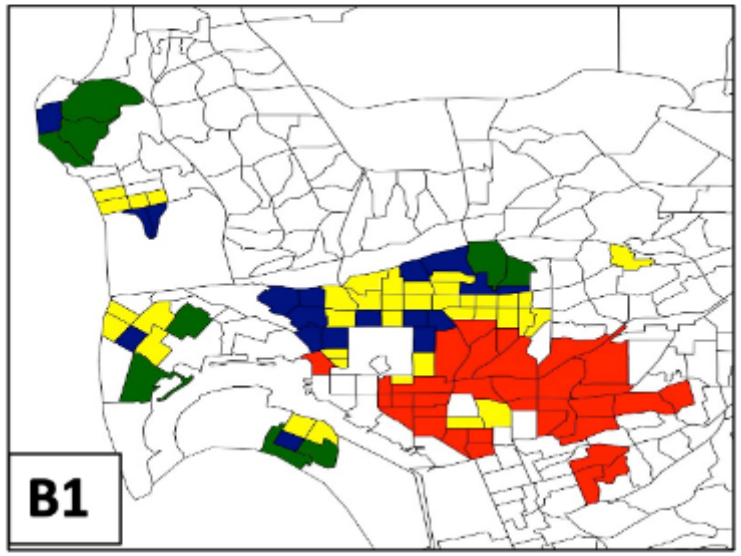
Historical Lens to How Neighbourhoods are Shaped

Nardone Lancet PH 2020

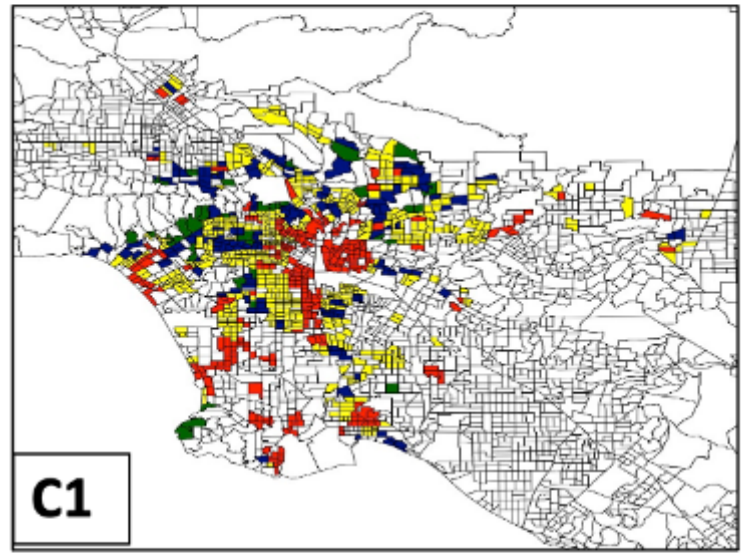
San Francisco-Oakland



San Diego



Los Angeles



Connection between redlining and exposures, including air pollution

	Grade A (n=64)	Grade B (n=241)	Grade C (n=719)	Grade D (n=407)	P-trend
Hispanic	10.9% (8.8)	27.6% (27.3)	46.5% (28.1)	55.5% (30)	<0.0001
Non-Hispanic Asian	12.2% (12.2)	15.8% (17.4)	14.9% (17.0)	12.9% (14.9)	0.070
Non-Hispanic Black	6.2% (16.1)	8.5% (16.2)	10.1% (12.5)	10.9% (13.7)	0.021
Non-Hispanic White	67.1% (22.6)	44.8% (28.4)	25.9% (26.6)	18.3% (21.9)	<0.0001
Percentage other	3.5% (1.0)	3.1% (1.5)	2.4% (1.5)	2.2% (1.6)	<0.0001
Percentage of poverty*	15.6% (9.4)	29.7% (17.2)	47.3% (19.9)	51.9% (19.9)	<0.0001
Mean $PM_{2.5}$ ($\mu g/m^3$)	11.1 (1.6)	11.0 (1.6)	11.5 (1.4)	11.4 (1.6)	0.0003
Mean diesel PM (kg/day)	22.6 (14.3)	27.8 (16.2)	29.8 (15.9)	39.7 (23.5)	<0.0001

Outdoor Air Pollution & Asthma

- Proximity to roads with heavy traffic may contribute to:
  - New onset (in children and adults)
  - Exacerbation (in children and adults)
  - Increased risk of ED visits and hospitalizations due to asthma (in children)
  - Black carbon (particulates), organic compounds and heavy metals from traffic pollution all contribute to asthma risk and severity

Slide from Dr. Radhakrishna (CCHS)

Sources: Salam, 2008. Lin, 2002. McConnell, 2010. Guamieri, 2014. Jerrett, 2008. Nishimura, 2013. Wilhelm, 2008. Rusconi, 2010. Shamasunder, 2018, Patel, 2009.

HEALTH IMPACTS OF AIR POLLUTION

- Impaired lung growth in children
- Increased asthma, coughs and bronchitis
- Impairment of brain development in babies and small children
- Low birth weight and adverse birth outcomes
- Heart attack and stroke
- Upper respiratory track irritation and infection
- Worsening of existing health problems in people with chronic disease

PEOPLE MOST SUSCEPTIBLE

Slide adapted with permission from Dr. Radhakrishna (CCHS)

Richmond Environment and Asthma Community Health **(REACH Study)**

- *Partnering with community to co-identify problems and co-develop interventions*

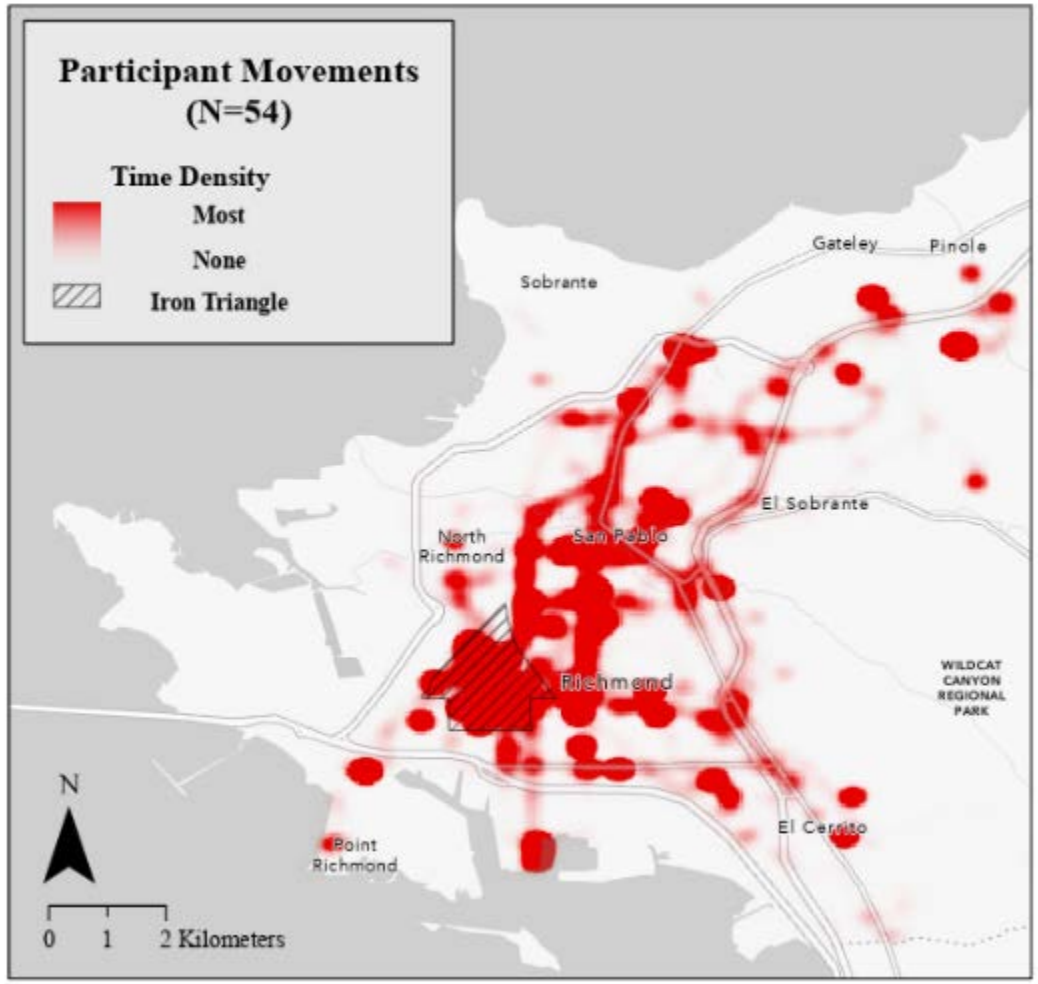
Where do people go?

70 children (half with and half without asthma)

GPS trackers for 2 weeks at two time points in the year (in and out of school)

54 with good data (i. e., held tracker for enough days)

Study Participants Time Weighted Movement Densities



How were community resources determined?

Went to our youth….

Empowering Partners

Youth Participatory Action Research (YPAR)

"Young people are trained to conduct systematic research to improve their lives, their communities, and the institutions intended to serve them"

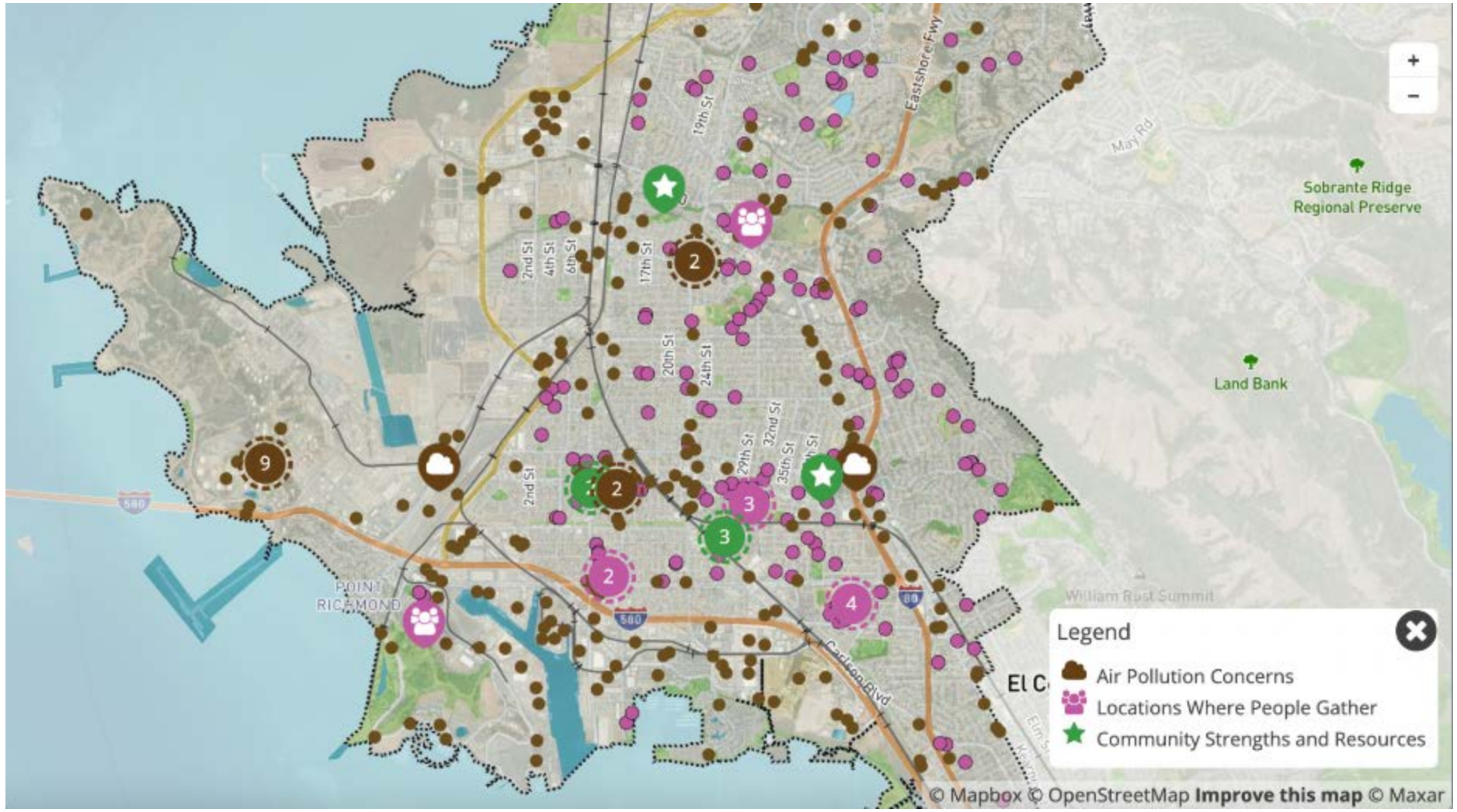
- YPAR Hub UC Berkeley

Social Pinpoint Survey

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

RICHMOND - SAN PABLO COMMUNITY PATH TO CLEAN AIR

Social Pinpoint Results: #OurVoice



167 community members of Richmond and San Pablo surveyed by Youth Researchers (total n=344)

Work completed by: Hector, Mario, Jocy, Manuel, Michelle

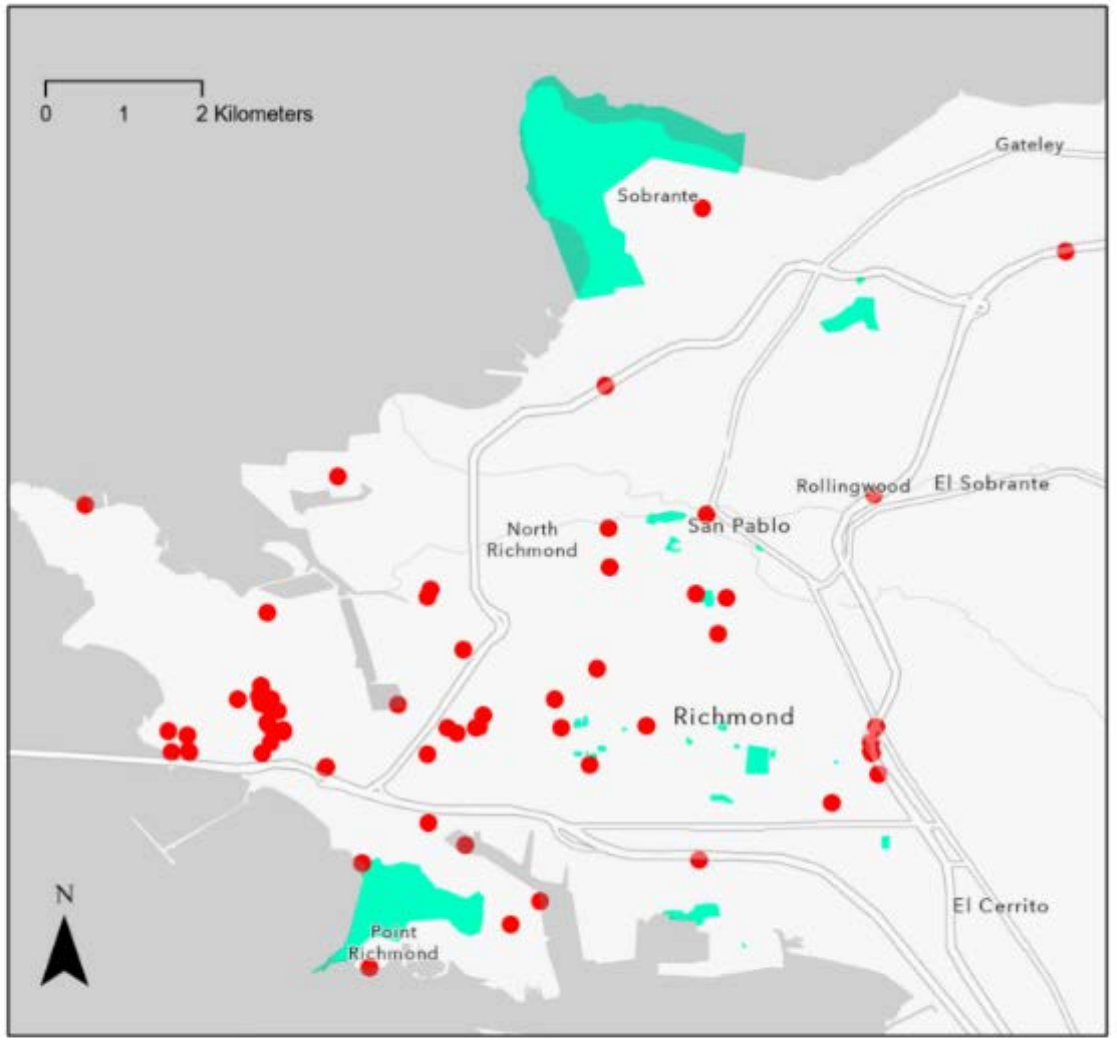
Child & Youth Resilience Measure (CYRM)

To what extent do the sentences below describe you? Circle one answer for each statement.

	Not at All	A Little	Somewhat	Quite a Bit	A Lot
1. I have people I look up to	1	2	3	4	5
2. Getting an education is important to me	1	2	3	4	5
3. My parent(s)/caregiver(s) know a lot about me	1	2	3	4	5
4. I try to finish what I start	1	2	3	4	5
5. I am able to solve problems without harming myself or others (for example by using drugs and/or being violent)	1	2	3	4	5
6. I know where to go in my community to get help	1	2	3	4	5
7. I feel I belong at my school	1	2	3	4	5
8. My family stands by me during difficult times	1	2	3	4	5
9. My friends stand by me during difficult times	1	2	3	4	5
10. I am treated fairly in my community	1	2	3	4	5
11. I have opportunities to develop skills that will be useful later in life (like job skills and skills to care for others)	1	2	3	4	5
12. I enjoy my community's traditions	1	2	3	4	5

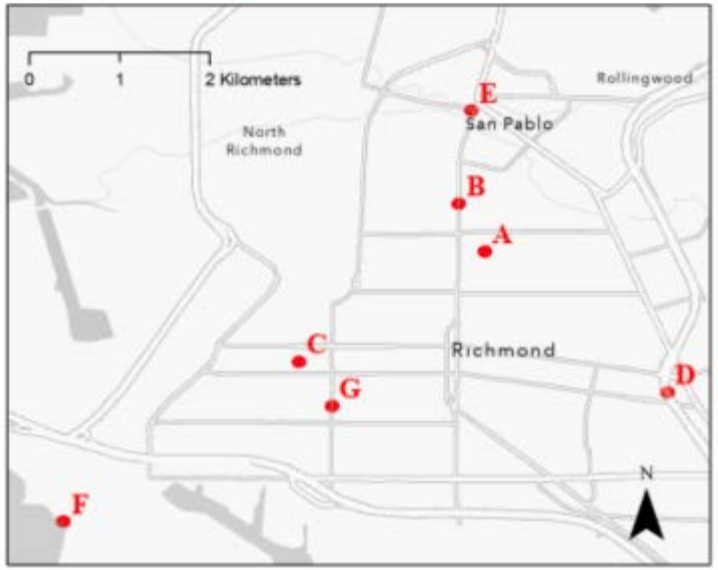
Results: Resources and Pollutants

Community Identified Pollution Sites and Strengths/Resources from “Path to Clean Air Project”



Work led by: Carlos Vera, 2022 YPAR Led, MPH candidate

Results: Where did youth spend time?



Time Spent	Community Resource	Resource Type	Pollution Site	Pollution Type
1	LifeLong William Jenkins	Clinic	A	Vehicle
2	Dover Elementary School	School	B	Gas leak
3	Richmond High School	School	C	Missing
4	Richmond Point	Park	D	Car smoke
5	St Mark's Catholic Church	Church	E	Pollution
6	Veterans Memorial Park	Park	F	Chevron
7	Prime Time Nutrition	Grocery Store	G	Trash/litter

Work led by: Carlos Vera, 2022 YPAR Led, MPH candidate

Results: Time spent & Resilience

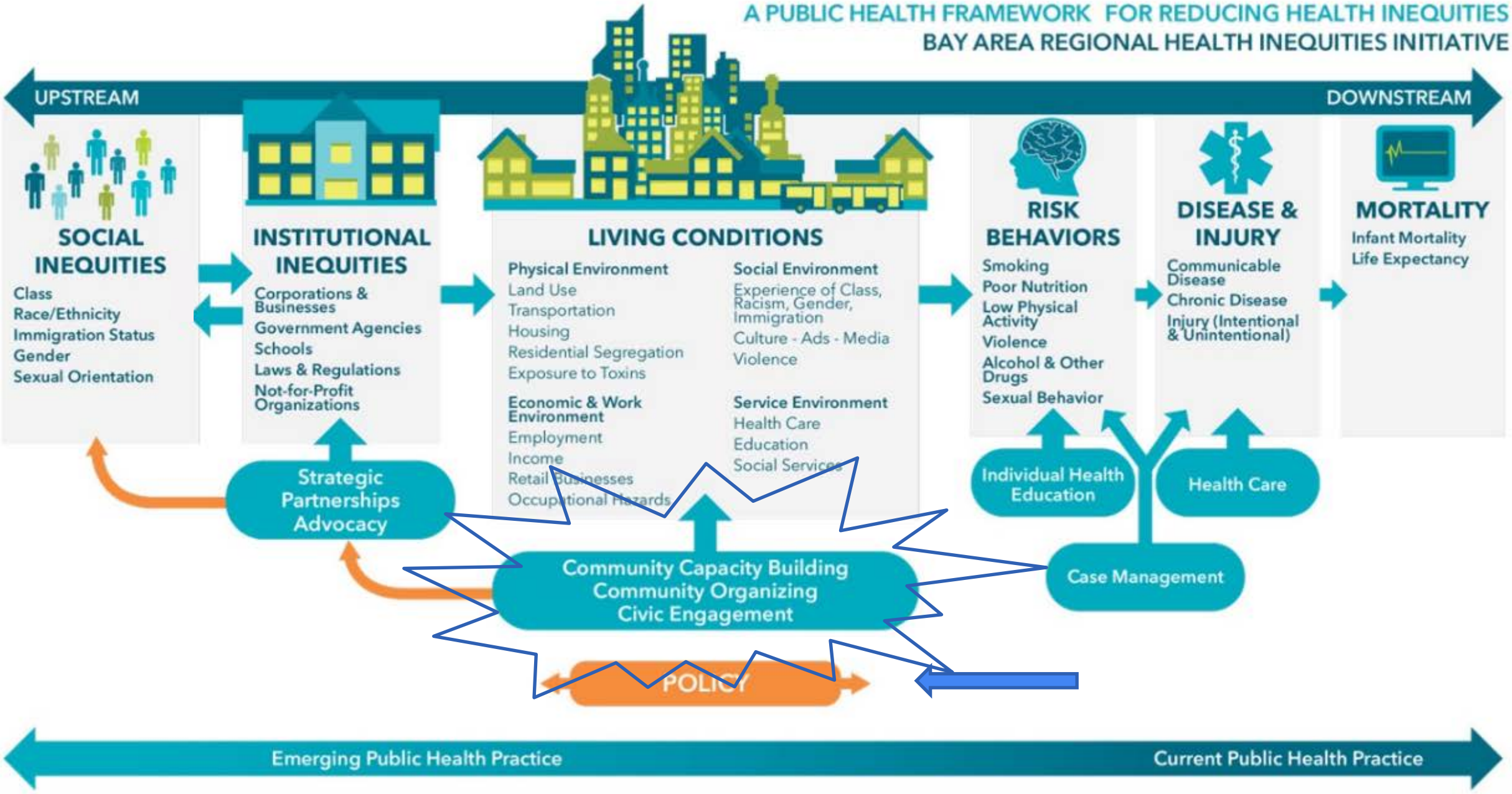
Youth spent significantly more time at community resources vs. perceived hazards in the community (~3% of their time vs. <1% of their time).

Spending more time at these community resources was associated with higher measured resilience.

Excluding Outliers +/- 3 SD (N= 50)

Variables	Coefficient ()	SE	P-Value
Prop. Time at Community Resource	0.061	0.029	0.044*
	R 2 = 0.082, F= 4.288, p < .05		

Work led by: Carlos Vera, 2022 YPAR Led, MPH candidate



Conceptual Framework for How Social Factors Influence Health (https://www.barhii.org/)

POLLUTION DOWN, LUNG HEALTH UP

Air quality in the Los Angeles basin, as measured in five cities by USC researchers, improved over two decades. That provided a more healthful environment for children's growing lungs.

AIR POLLUTION

Nitrogen dioxide

33%

Fine particles

47%

CHILDREN'S LUNGS

In 1998, nearly eight of 100 15-year-olds had significant lung deficits.

By 2011, only about 3 1/2 of 100 15-year-olds had significant lung deficits.

Source: USC Children's Health Study

USC Graphic by Molly Zisk

Slide from Dr. Radhakrishna (CCHS)

Questions

Air Pollution and Health Risk:

Increasing Our Understanding

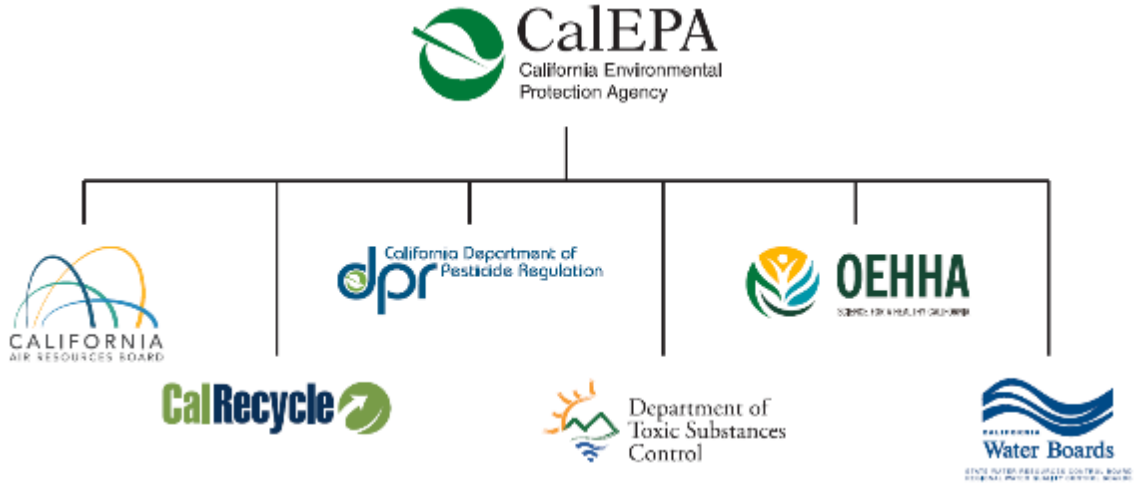
Lily Wu, Office of Environmental Health Hazard Assessment,
lily.wu@oehha.ca.gov

What we are going to cover in this presentation:

- What is the Office of Environmental Health Hazard Assessment (OEHHA)?
- The relationship between air pollution and health
- Improve understanding with community-specific concerns
    - Emissions ≠ Exposure ≠ Health (effect)

Office of Environmental Health Hazard Assessment (OEHHA)

Support other agencies by evaluating potential health risks of environmental hazards

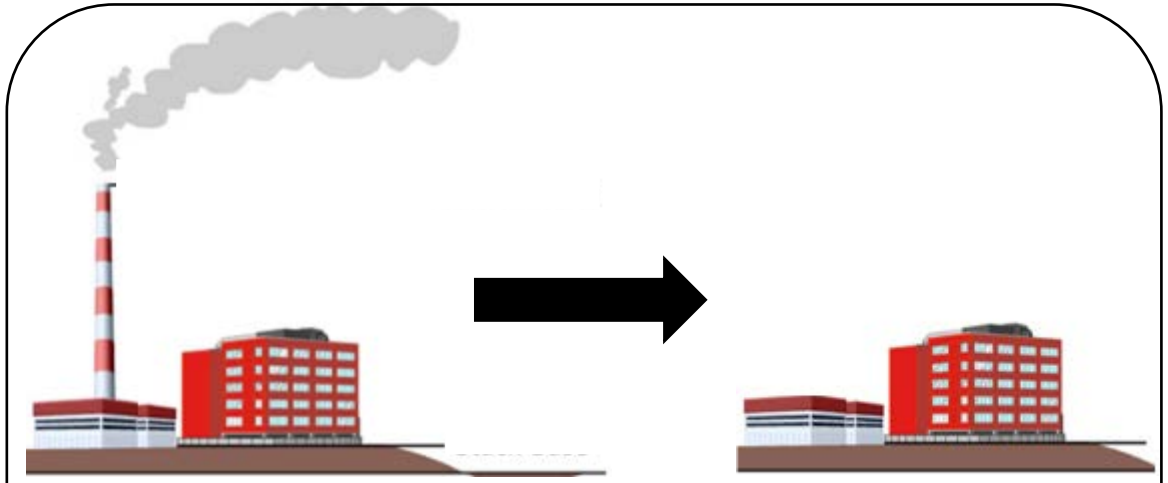


- OEHHA collaborates with CARB to identify, address, and make progress on community health concerns
  - Industrial sources of air pollution
    - Stationary sources
      - ✓ Oil/refinery-related, waste/recycling/metal scraps facilities, landfill, Port
    - Mobile sources

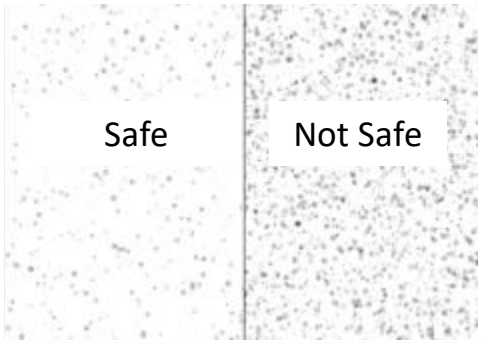
OEHHA's role in AB 617

Addressing/assessing health benefits of emission reduction practices in community emission reduction plans

Input on health risks from different chemical exposures

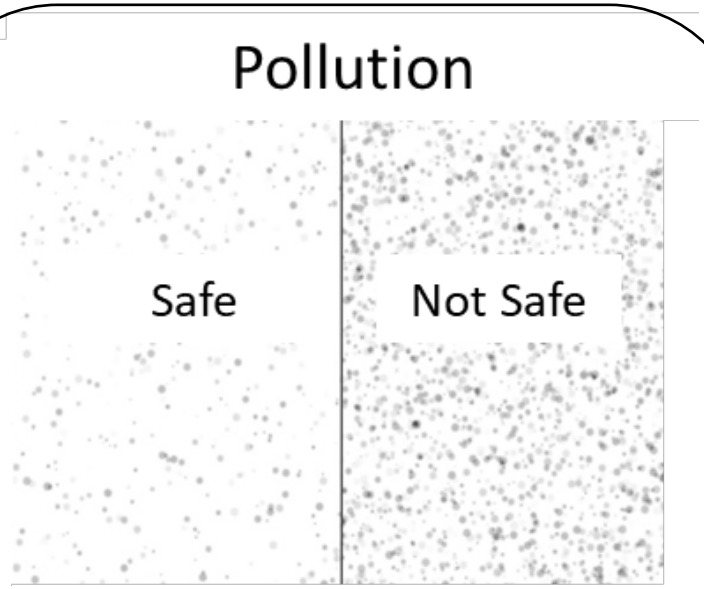


Input on health benefits from reducing pollution



Develop Health Guidance Values (HGVs) for chemicals of concern

Health Effects



OEHHA develops Health Guidance Values (HGVs) for chemicals of concern

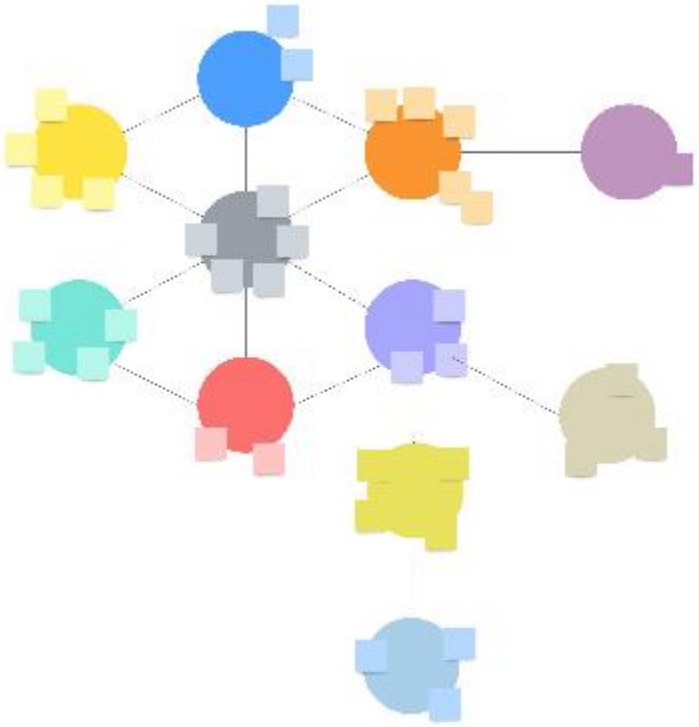
For Example

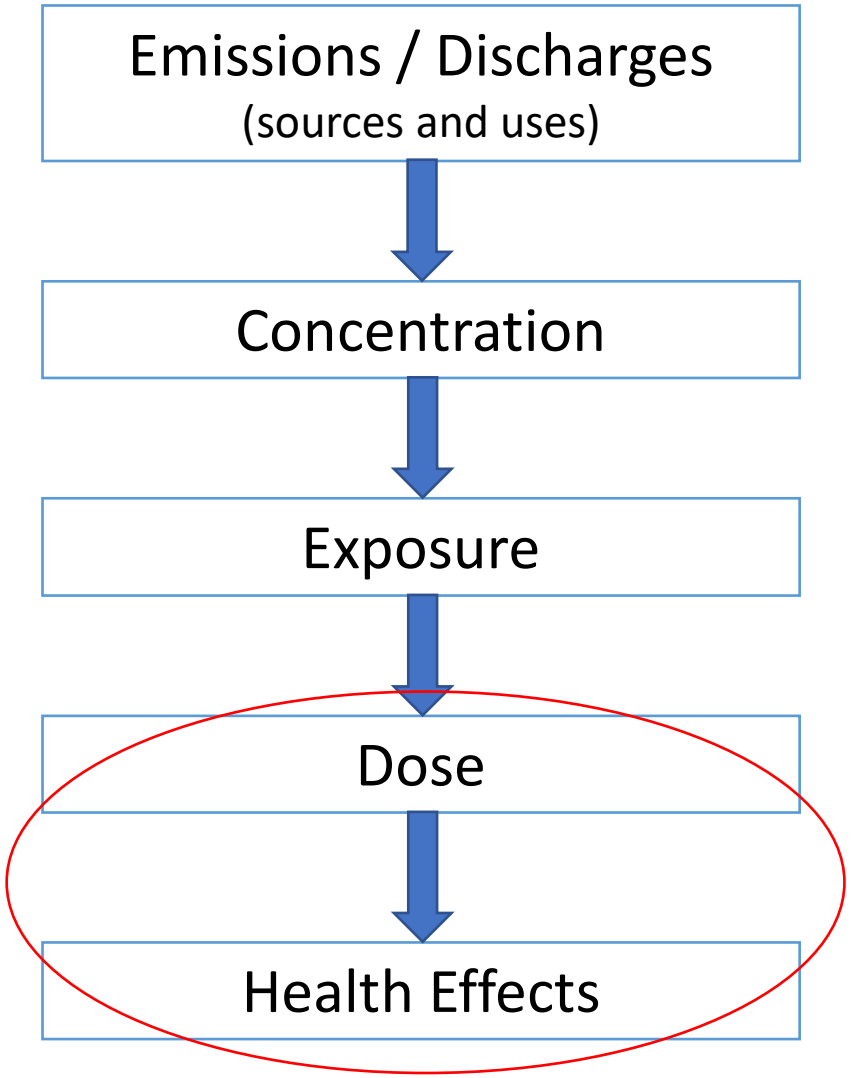
OEHHA developed HGVs for Diesel Exhaust Particulate

To prevent health effects

OEHHA has health guidance values (HGVs) for some chemicals

General Considerations for Assessing Public Health Risk



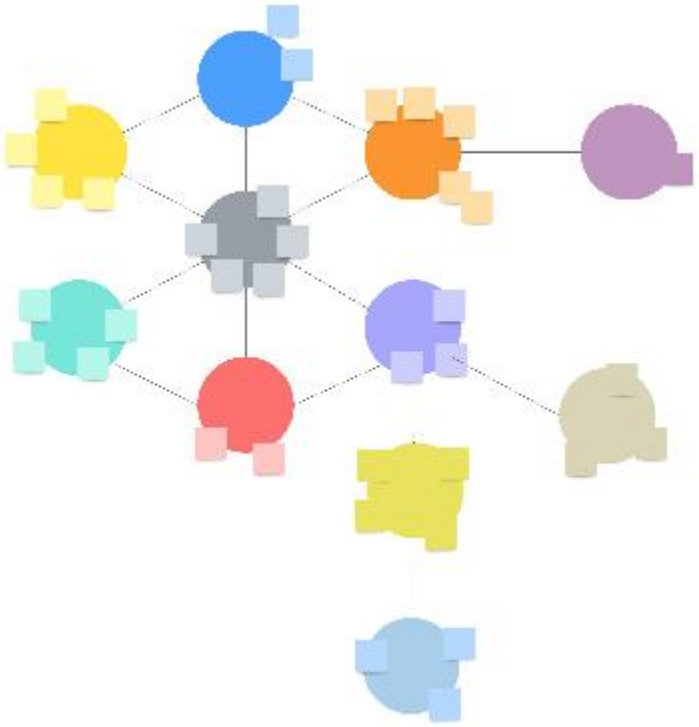


- Factors considered by risk assessors to identify potential health effects from release of chemicals in the environment.

Community members are exposed to many different pollutants from different sources.

https://ww2.arb.ca.gov/introduction-community-air-quality

General Considerations for Assessing Public Health Risk



Emissions / Discharges
(sources and uses)

Concentration

Exposure

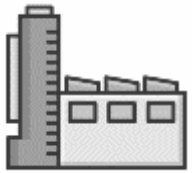
Dose

Health Effects

Emissions: How are they organized?

Source Sectors

Stationary Point Sources w/Permits



Refineries, power plants, gas stations, autobody shops

Stationary Area Sources

Fireplaces, water heaters, consumer products

On-Road Mobile

Cars, trucks, buses

Off-Road Mobile

Ships, aircraft, rail, construction equipment

Emission "Buckets"

- Petroleum Refining
- On-road/Freeway
- Auto Body
- Port
- Rail
- Etc.

Informing Key Issues

Community-Identified Air Pollution Concerns

Social Pinpoint

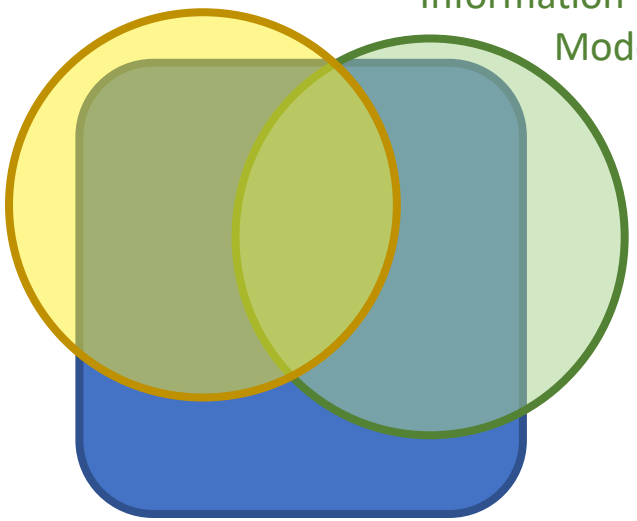
Monitoring Plan Development

Air Quality Complaints

Technical Assessment for a Key Issue

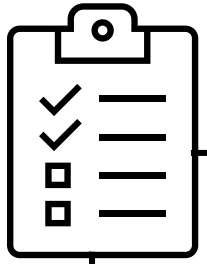
Information from Measurements

Information from Modeling



Air Pollution Issue of Concern

Inform



Insights
on key air issues

Strategies
to Reduce Pollution Emissions and Exposure

Setting **targets** and tracking **progress**

Steering Committee Questions and Discussions

Panel Question and Answer

Dr. Ori Tzvieli, Public Health Officer | Contra Costa Health Services

Lily Wu, Toxicologist | Office of Environmental Health Hazard Assessment

Dr. Neeta Thakur, MD, MPH | UCSF

Dr. Omoniyi Omotoso, MD | Sutter Health

Public Comment

Next Steps for Strategy Development

Kelly Malinowski, Senior Environmental Planner

kmalinowski@baaqmd.gov

Outline

- Where we've been:
  - Gathering Community Concerns
  - Menu of Potential Air District Strategies
  - Technical Assessment Findings
- Where we're going:
  - Remaining Technical Assessment Findings
  - Menu of Partner Strategies
  - Pivoting from Problems to Solutions
  - Defining our Key Issues
  - Developing Strategies
- Discuss next steps for Strategy Development

RICHMOND - NORTH RICHMOND - SAN PABLO COMMUNITY PATH TO CLEAN AIR

Where We've Been: Air District Strategies

- Menu of potential Air District Strategies (February 2022):
  - Regulations
  - Permitting
  - Enforcement
  - Incentives
  - Further Study
  - Education and Outreach

RICHMOND - NORTH RICHMOND - SAN PABLO COMMUNITY PATH TO CLEAN AIR

Where We've Been: Technical Assessment Findings

- How Measurements and Modeling Help Develop a CERP (Jan 2022)
- Insights from Modeling and Measurements, Part I (March 2022)
- Compliance and Enforcement Findings 2019-2021 (March 2022)

Where we're going:

- Insights from Modeling and Measurements, Part II (May 2022)

RICHMOND - NORTH RICHMOND - SAN PABLO COMMUNITY PATH TO CLEAN AIR

Where We’re Going: Partner Strategies

- Menu of potential Partner Strategies (May 2022)
  - City of Richmond Planning
  - City of San Pablo Planning
  - Contra Costa County Planning
  - Contra Costa County Health Services
  - California Air Resources Board (CARB)

RICHMOND - NORTH RICHMOND - SAN PABLO COMMUNITY PATH TO CLEAN AIR

Where We're Going: Pivoting from Problems to Solutions

- In May, we'll finish hearing about insights about our problems from measurements and modeling, and
- We've heard about the Compliance and Enforcement findings,
- We are pivoting from learning about problems, to developing solutions to problems, and
- We are focusing on our main community concerns

RICHMOND - NORTH RICHMOND - SAN PABLO COMMUNITY PATH TO CLEAN AIR

Where We're Going: Developing Strategies

- Resources to support Strategy Development
- Specific potential strategies for Air District and Partner Implementation, for example:
  - Rules
  - Enforcement actions
  - Incentives
  - Further Study
  - Education and Outreach
  - General plan and zoning updates

RICHMOND - NORTH RICHMOND - SAN PABLO COMMUNITY PATH TO CLEAN AIR

Where We're Going: Next Steps?

- Now that we have this additional information, what should we do next?
  - 2nd presentation on strategies (with detail)?
  - Longer meetings/workshops with entire CSC?
  - Break into 2-3 groups to take up 1-2 community concerns each to develop strategies?

RICHMOND - NORTH RICHMOND - SAN PABLO COMMUNITY PATH TO CLEAN AIR

Steering Committee Questions and Discussions

Public Comment

Standing Environmental Justice Updates

Public Comment

Next Meeting

- Our next Steering Committee meeting will be on Monday, May 16th, 2022 from 5:30 p.m. to 8:00 p.m. Agenda topics will include:
  - Insights from Modeling and Measurements, Part II
- Path to Clean Air - Steering Committee Meeting Format Survey
  - https://www.surveymonkey.com/r/SGP2WFK

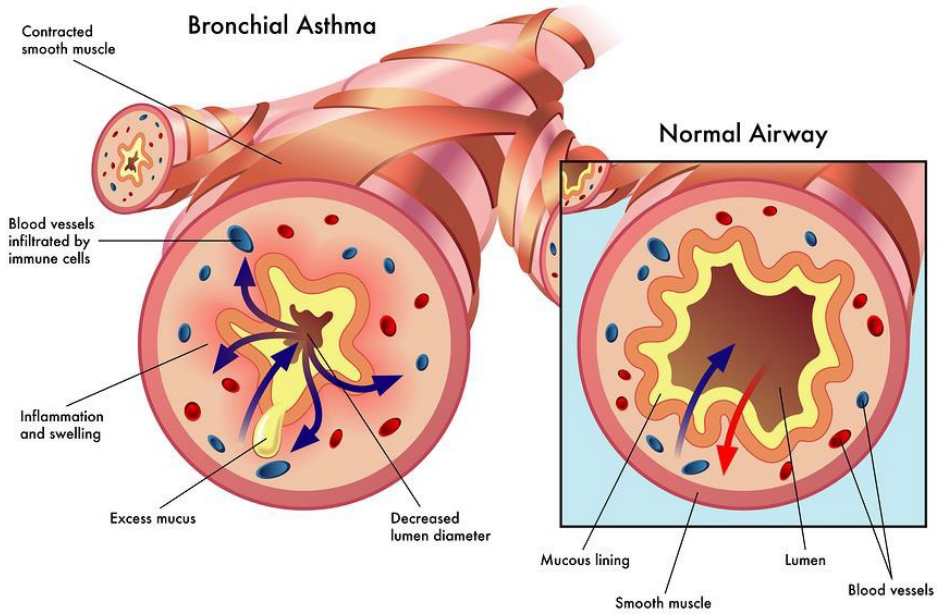
Public Comment on Non-Agenda Matters

Supplementary Slides

Outdoor Air Pollution & Health

Particulate air pollution, including smoking, wild fires and point source or motor vehicle exhaust, lead to impairment of lung function, an effect that occurs in a few minutes.

1. Stressed Lung triggers the brain and heart raising blood pressure
2. Inflammation triggers vessel damage and clotting
3. Air Sac (alveoli) damage decreases lung function and increases risk of heart/lung disease and infections



Sources: CDPH 2019

Air Pollution & Adverse Birth Outcomes

1. Low Birth Weight
2. Pre-term Birth
3. Small for Gestational Age

Meta-analysis showed very mild effect size
(CO, NO2, NOx, O3, PM2.5, PM10, or SO2)

Still controversial

Sources: Shah and Balkhair, 2011; Nieu- wenhuijsen et al., 2013; Pedersen et al., 2013. Guo et al 2019)

Outdoor Air Pollution and Asthma

- Proximity to roads with heavy traffic may contribute to:
  - New onset (in children and adults)
  - Exacerbation (in children and adults)
  - Increased risk of ED visits and hospitalizations due to asthma (in children)
  - Black carbon (particulates), organic compounds and heavy metals from traffic pollution all contribute to asthma risk and severity

Sources: Salam, 2008. Lin, 2002. McConnell, 2010. Guamieri, 2014. Jerrett, 2008. Nishimura, 2013. Wilhelm, 2008. Rusconi, 2010. Shamasunder, 2018, Patel, 2009.

Outdoor Air Pollution and Asthma

- Proximity to point sources of pollution may contribute to asthma severity:
  - Risk of asthma attack is associated with residing near a grain mill (odds ratio (OR) = 1.35), petroleum refinery (OR = 1.44), asphalt plant (OR = 1.23), or power plant (OR = 1.28) (all p's < 0.05).
  - Residence near major air emissions sources (>100 tons/year) increased asthma attack risk by 108% (p < 0.05).

Sources: Am J Epidemiol. 2007 Apr 15;165(8):927-35. Epub 2007 Feb 17.