



Pollution & Mental Health



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What is Air Pollution?



What is environmental justice?



Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. (United States Environmental Protection Agency)

- Environmental justice arose in the 1960s alongside the Civil Rights Movement.
- In 1968, Dr. Martin Luther King Jr. sparked the Memphis Sanitation Strike in Memphis, Tennessee.
- This was the first time African Americans mobilized a group in order to protest against unfair environmental conditions.



Mission Statement

Does pollution negatively affect your mental health?
How does this negatively affect the poor and
communities of BIPOC?



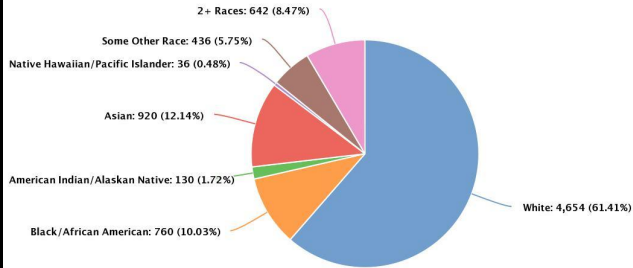
Our Vision

- **Who?** : Impoverished areas in Sacramento
 - **Specifically, Richards Blvd (95811)**
(high population of black and hispanic people, high pollution, high poverty levels)
- **Where?: Richards Blvd (large poc community and poverty levels are high)**
 - Compared to East Sacramento
(mainly white community and low poverty levels)



Population by Race

Zip Code: 95811

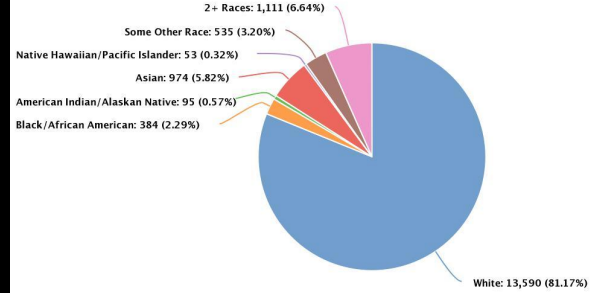


Claritas, 2021. www.behealthysacramento.org

19.31% Latino/Hispanic

Population by Race

Zip Code: 95819



Claritas, 2021. www.behealthysacramento.org

13.9% Latino/Hispanic

Families Below Poverty

Zip Code: 95811

186 Families
(19.54% of Families)

| | |
|---|--|
| County: Sacramento | State: California 863,311 Families |
| 38,775 Families (10.52% of Families) | (9.39% of Families) |

Families Below Poverty with Children

Zip Code: 95811

133 Families
(13.97% of Families)

| | |
|--|--|
| County: Sacramento | State: California 629,258 Families |
| 29,921 Families (8.12% of Families) | (6.85% of Families) |

Families Below Poverty

Zip Code: 95819

122 Families
(3.10% of Families)

| | |
|---|--|
| County: Sacramento | State: California 863,311 Families |
| 38,775 Families (10.52% of Families) | (9.39% of Families) |

Families Below Poverty with Children

Zip Code: 95819

67 Families
(1.70% of Families)

| | |
|--|--|
| County: Sacramento | State: California 629,258 Families |
| 29,921 Families (8.12% of Families) | (6.85% of Families) |

Our Vision

- What?
 - Inform the community members of the initiatives that are being placed.
 - Senator Bill 3000 was placed in 2016 in California in order to require counties and cities to incorporate EJ policies in their general plans.
 - Spread awareness among youth throughout local K-12 schools in the area via school assemblies, rallies, school activities.
 - Organize a collaboration effort with Sierra Research Inc./ California Department of Environmental Health/ Sacramento Department of Environment on how to find ways to minimize pollution in the area.
 - Organize community rallies in efforts to raise awareness on the effects of pollution on mental health
 - Rally for residents for free therapy sessions for those severely impacted by the pollution in their area.
- How?
 - Talk to your representatives
 - How to locate your reps. <https://www.house.gov/representatives/find-your-representative>
- Why?
 - Through informing people of the negative effects of the pollution from the industrial areas, residents of the area (young and old), will be empowered on how to deal with pollution, learning effective ways to combat pollution, campaigning against industrial areas in the region, and forcing them to keep the environment safe or leave in efforts in protecting their mental health.



Prevention



Primary: prevent issue before it occurs

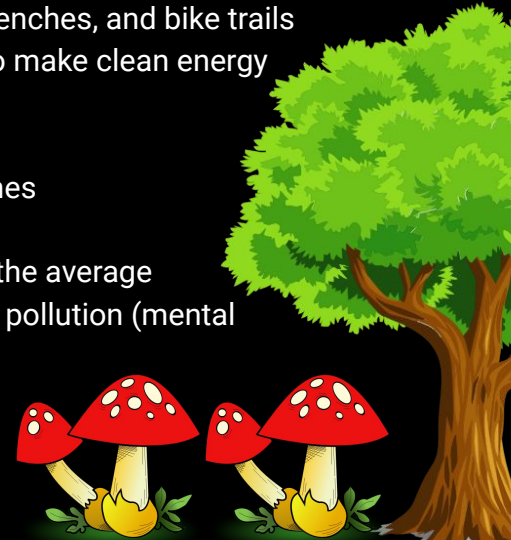
- Put POC, disadvantaged people in official positions of power to address the issues affecting THEIR community
- Develop sustainable and clean energy processes and products
- Accessible and low-cost hospitals and clinics offering services in all aspects of health in disadvantaged communities (especially common health issues in that particular community)

Secondary: reduce the impact

- Add more greenery to communities (parks, plants, etc) and things like sidewalks, benches, and bike trails
- Provide incentives to change to more clean energy like the electric vehicle rebate to make clean energy cars more accessible

Tertiary: soften impact of ongoing issue and lasting effects

- Develop more sustainable and clean processes and products to replace existing ones
- Mushrooms to absorb toxins in our soil and water like nitrate
- Ban certain vehicles or vehicle parts that release higher amounts of pollution than the average
- Offer low-cost clinics in the poor communities focused on health issues caused by pollution (mental health, asthma, lung cancer)



Issue at hand

- Air pollution is increasing the likelihood of symptoms of mental illnesses.
- Many types of pollution can potentially cause negative adverse health effects such as air pollution, sound pollution.
 - Kills 7 million people worldwide every year
 - 9/10 people breathe air that exceeds WHO guidelines containing high levels of pollutants, with low-and middle income countries suffering from the highest exposures.
- People of color and the poor disproportionately Exposed to Air Pollution (California Health Report)
- Higher Rates of mental health illnesses symptoms among those exposed to higher levels of traffic related air pollutants, nitrogen oxides, during childhood and adolescence.
- WHO estimates and reports that 90% of children around the world breathe polluted air at levels considered detrimental to health and development. (WHO)

Further questions

- Which pollutants may be most detrimental to mental health?
- How does it affect children vs adults?
- How to protect oneself, friends, family?



- **Sound pollution**

- Unwanted sounds can have a range of mental health effects
- Brain is always monitoring sounds for signs of danger, even during sleep.
 - As a result frequent or loud noise can trigger anxiety or stress
- People living with noise pollution may feel irritable, on edge, frustrated, or angry.
 - If the person feels like they can't control the noise in their environment it's impacts on their mental health intensifies.
- Environmental noise is also common cause of sleep disturbance
 - May experiences: difficult falling asleep, inability to stay asleep, and waking too early
 - Reduces the quality and depth of sleep and altering REM



Air Pollution and Mental Health

- Childhood exposure to air pollution, such as nitrogen oxides and fine particulate matter, is a risk factor for mental illness at age 18. It is less of a factor than family history, but equal to lead, according to a new study. The finding comes from a cohort of 2,000 twins born in England and Wales in 1994-1995 and followed to young adulthood.
- Found higher rates of mental illness symptoms among those exposed to higher levels of traffic-related air pollutants, particularly nitrogen oxides, during childhood and adolescence.
- African American, Latino, and Asian Californians are more exposed to more PM 2.5 pollution from cars, trucks, and buses than white Californians.
 - Particulate matter (PM) - air pollution from on road vehicles
 - 2.5 micrometers diameter- 20 times smaller than even fine human hair - increases in illness and death, primarily from heart and lung diseases
 - Fine particulate air pollution is responsible for the vast majority of the 3 million to 4 million annual deaths attributed to air pollution worldwide.

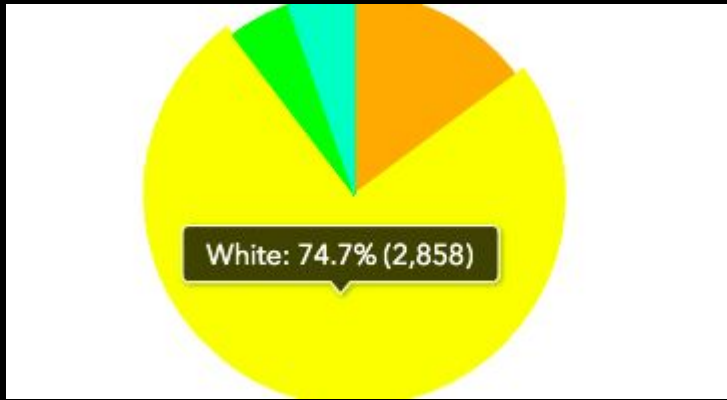


Cont. Quantitative Evidence

- Children already stressed from growing up as well as due to family instability, abuse or poverty may have an even higher risk of server or emergency mental health symptoms when air pollution levels rise even.
- Increases in PM 2.5, ozone, and nitrogen dioxide were all associated with increased ER visits, sometimes up to 5 days after initial exposure to that pollutant. (2020 study in [Toronto, Canada](#))
- For Adults: Long Periods of increased air pollution may be linked to a 17% rise in cases of Bipolar disorder, 6% in depression diagnoses, 20% increase in personality disorder diagnoses (2019 PLOS Biology)



95819



| Sensitive Populations | |
|------------------------|----|
| Asthma | 16 |
| Low Birth Weight | 5 |
| Cardiovascular Disease | 22 |

| Overall Percentiles | |
|---------------------------------------|----|
| CalEnviroScreen 4.0 Percentile | 2 |
| Pollution Burden Percentile | 19 |
| Population Characteristics Percentile | 1 |



| Environmental Effects | |
|-----------------------|----|
| Cleanup Sites | 23 |
| Groundwater Threats | 7 |
| Hazardous Waste | 29 |
| Impaired Waters | 52 |
| Solid Waste | 0 |

| Exposures | |
|---------------------------|----|
| Ozone | 45 |
| Particulate Matter 2.5 | 38 |
| Diesel Particulate Matter | 63 |
| Toxic Releases | 34 |
| Traffic | 5 |
| Pesticides | 0 |
| Drinking Water | 11 |
| Lead from Housing | 64 |

| Socioeconomic Factors | |
|-----------------------|----|
| Education | 5 |
| Linguistic Isolation | 2 |
| Poverty | 10 |
| Unemployment | 14 |
| Housing Burden | 4 |

95811

Census Tract: 6067005301 (Population: 1,462)

Exposures

| | |
|---------------------------|----|
| Ozone | 42 |
| Particulate Matter 2.5 | 39 |
| Diesel Particulate Matter | 86 |
| Toxic Releases | 56 |
| Traffic | 85 |
| Pesticides | 0 |
| Drinking Water | 11 |
| Lead from Housing | 82 |



Overall Percentiles

| | |
|---------------------------------------|----|
| CalEnviroScreen 4.0 Percentile | 98 |
| Pollution Burden Percentile | 97 |
| Population Characteristics Percentile | 92 |

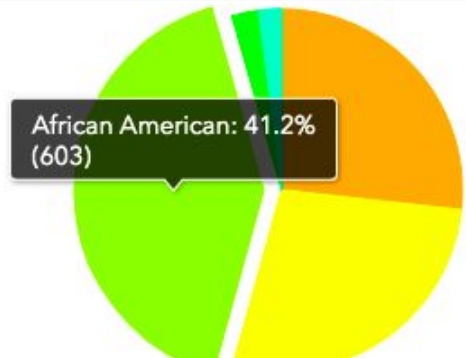
Sensitive Populations

| | |
|------------------------|-----|
| Asthma | 98 |
| Low Birth Weight | 100 |
| Cardiovascular Disease | 76 |

Socioeconomic Factors

| | |
|----------------------|----|
| Education | 66 |
| Linguistic Isolation | 7 |
| Poverty | 99 |

Census Tract: 6067005301 (Population: 1,462)



Effects on Humans

Short term effects

- Pneumonia
- Bronchitis
- headaches, dizziness, and nausea

Long term effects

- Death
- Lung cancer
- Respiratory diseases such as emphysema
- Damage to nerves, brains, kidneys, liver, and other organs
- Can cause birth defects
- Asthma
- Heart disease
- Lung disease



Health effects of pollution

Air pollution



Nerve damage
Lead

Particulate matter
Ozone

Volatile organic compounds

CO

SO₂
NO_x

Headache
Fatigue

Respiratory illness

Cardio-vascular illness

Gastroenteritis

Cancer risk

Nausea

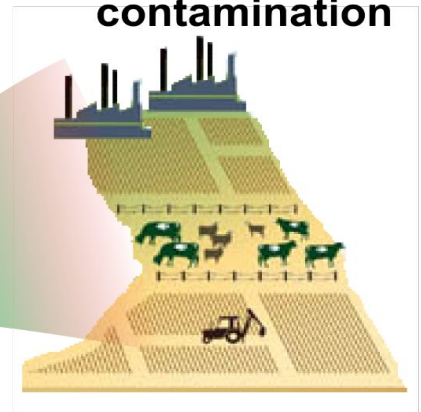
Skin irritation

Water pollution



- Bacteria
- Parasites
- Chemicals

Soil contamination



Pesticides

Effects on the Environment

- Air pollution can directly contaminate the surface of bodies of water and soils
- Sulfur dioxide and nitrogen oxide particles in the air can create acid rain when they mix with water and oxygen in the atmosphere
 - When acid rain falls to earth it can damage plants by changing soil composition; degrades water quality in rivers, lakes and streams, damages crops and cause buildings and monuments to decay.
- Muddy landscapes, poison soils, and waterways, or kill plants and animals.
- Lower income and BIPOC communities are more at Risk when exposed to pollution



Community Resources



- Environmental Justice Coalition for Water
 - Environmental and water justice advocate in Sacramento
 - Provides community service and volunteer work throughout Sacramento
- Senate Bill 1000
 - Requiring Environmental justice policies to be included in the community planning for disadvantaged communities
- UC Davis Center for Regional Change
 - UC Davis studies the environmental discrimination against disadvantaged communities
 - Raised money for better drinking water and pushed for Safe and Affordable Drinking Water Fund



UCDAVIS

Center for Regional Change

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THANKS

Do you have any questions?

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