

The Pathological and Economic Consequences of Houston's Air Pollution Catastrophe: A Youth's Perspective

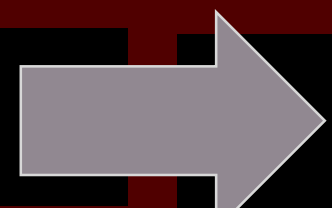


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Pollution in Houston

Houston has been in an air crisis since 1970, and its refineries and plants leak thousands of pollutants and over thirty million tons of carbon dioxide per year [1-2]. As of 2019, Houston does not have a goal to reduce emissions and is not doing enough to sustain a healthy population [2]. Transportation constitutes half of Houston's greenhouse gas emissions because Houstonians drive over 100 million miles every day combined [3]. The other half of Houston's emissions come from commercial and residential buildings. These emissions consist of harsh chemicals such as benzene, vinyl chloride, and butadiene; these chemicals have devastating effects on the human body after prolonged exposure [3]. Houston is currently considered the world's headquarter of the energy industry, and it employs nearly a third of the nation's jobs in oil and gas [4]; however, its oil and gas industry is known to have adverse health and economic effects on its citizens[1].



- **Direct Health Effects:** Lung cancer, Asthma, Autism, Cardiovascular diseases, Schizophrenia, Parkinson's, Alzheimer's, Cancer, Increased risk of stroke, Emphysema, Chronic Bronchitis, Deformities in offspring, Worsened Cystic Fibrosis, Miscarriage, Increase in insect transmitted diseases, Pneumonia, Chronic Obstructive Pulmonary Disease etc [5].
- Figure 2 shows Texas has a very high lung cancer rate.
- **Indirect Health and Safety Threats:** Carbon dioxide and methane react with compounds in the atmosphere results in the growing the ozone layer, thus causing global warming and high frequency of natural disasters. Victims often experience shortage of food, water, and shelter.

Health Impacts

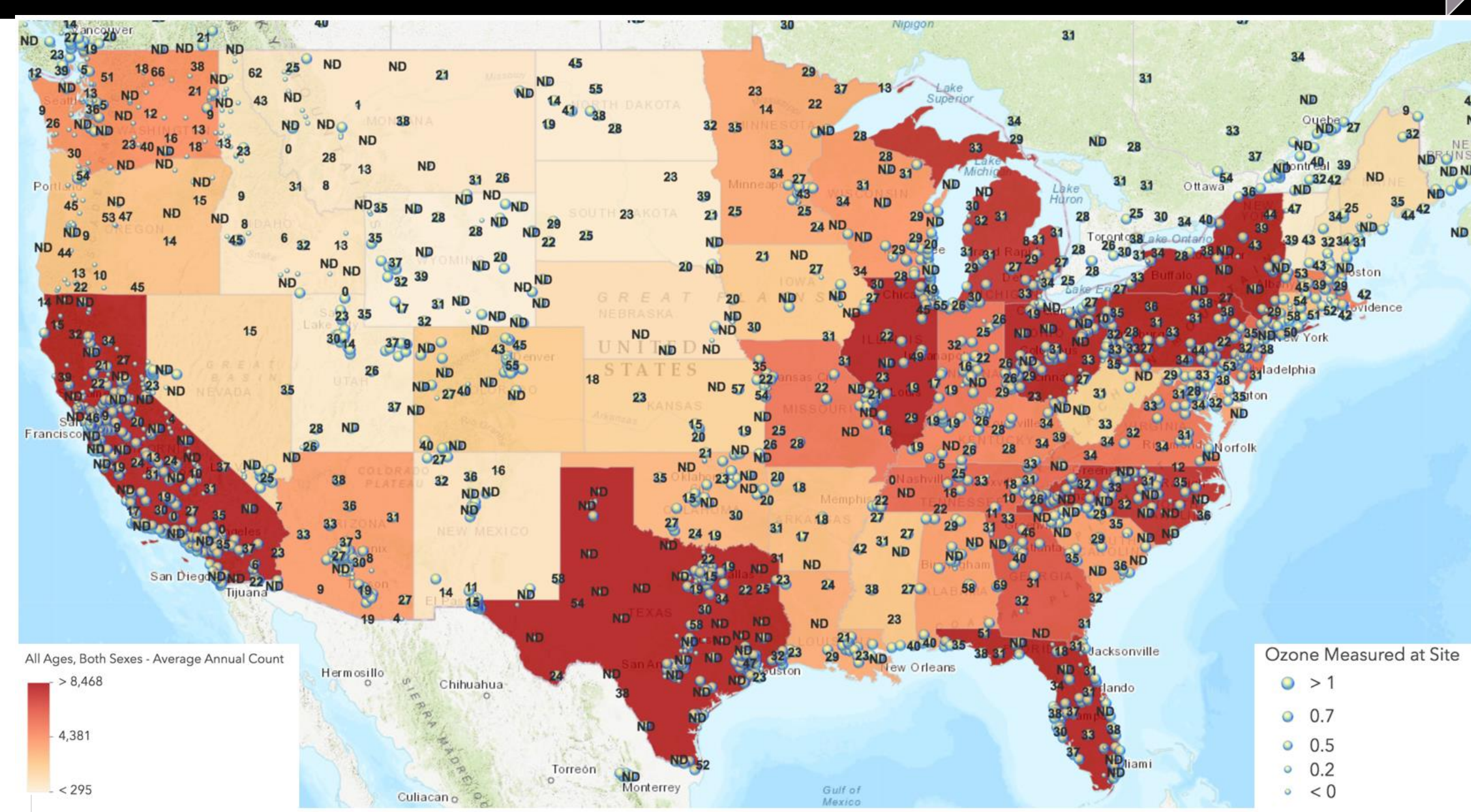


Figure 2. U.S State Lung Cancer Incidence Rates and Ozone Layer. Texas has one of the highest lung cancer incidence rates in the nation. As shown in the map, Houston has concerning concentrated cluster of ozone.



Economic Impacts

- An unhealthy workforce reduces work productivity.
- The costs of health care are built into the price of every American-built product and service. Reducing the number of preventable diseases caused by air pollution can indirectly lower the price of products [6].

Identifying Vulnerable Communities

We used the ArcGIS software to map the location of factories compared to low-income areas. The green stars represent the location of factories and the dark red areas represent the concentration of families with an income under \$25,000. Low-income areas seem to be in close proximity with factory locations. These people, who likely do not have health insurance, are at higher risk of disease, which results in reduced workdays. Additionally, a cluster of factories exist near the coast, creating a higher risk of coastal pollution.

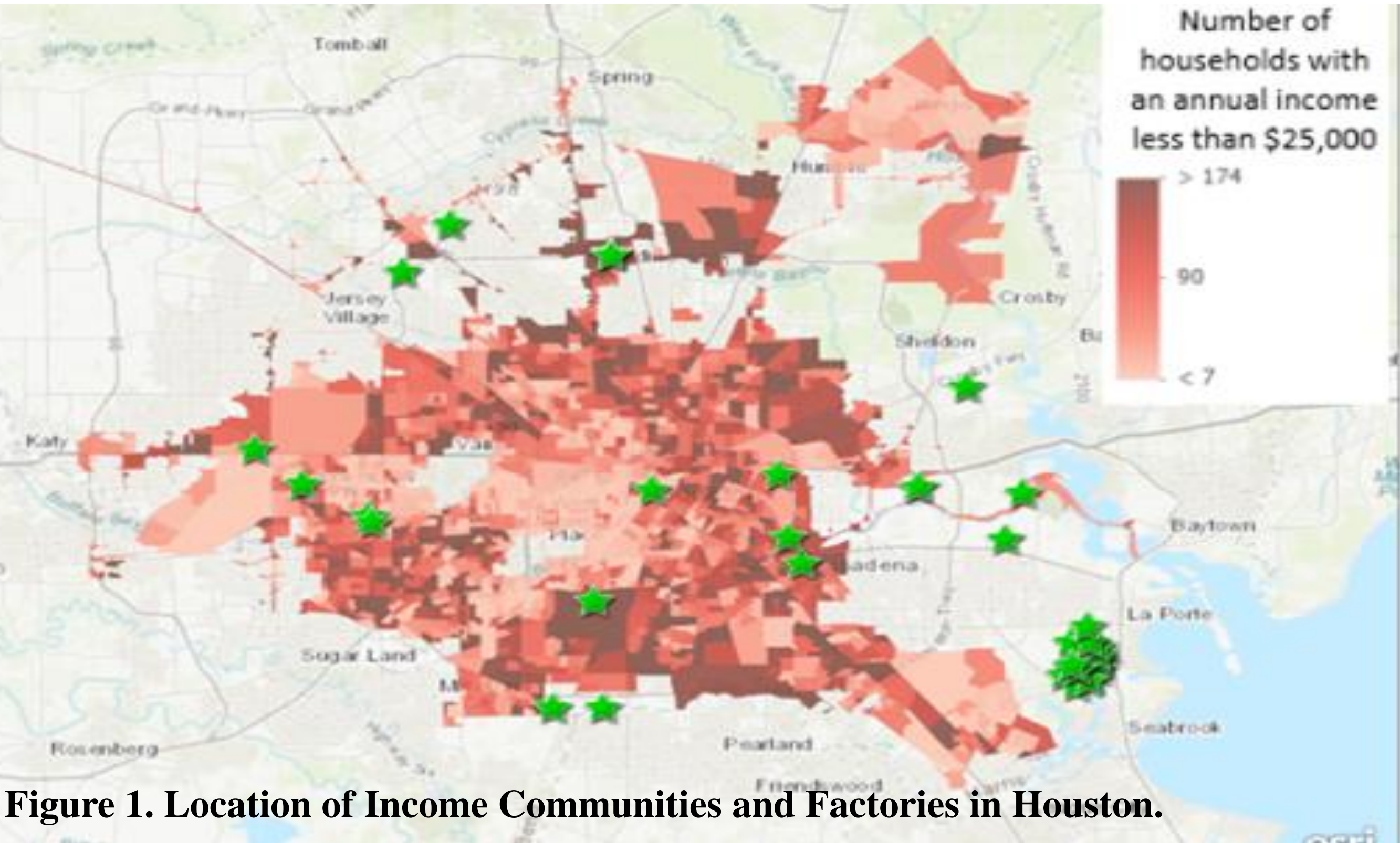


Figure 1. Location of Income Communities and Factories in Houston.

Discussions and Recommendations

Traffic Solutions

Houston can promote public transportation in low-income areas and encourage electric car usage in high-income communities.

Public Transit:

- Public transportation is cost-effective for people who cannot afford an efficient car.

Electric car encouragement techniques:

- Reducing or removing road tolls on energy-efficient cars: This is a way for Houston to reward people who contribute their money to benefit the air quality and environment. Favoring environmentally conscious people may encourage others to purchase energy-efficient cars.
- Add more electric car-charging stations: Adding these stations may encourage Houstonians to transition to electric cars.
- Promote electric car adoption by educating people about clean energy programs.

General Solutions

- Impose carbon/petrol tax: This will discourage people from using major pollutants and will also make people to pay the price of pollution.
- Use renewable energy: Renewable energy does not emit harmful chemicals and is a clean, realistic alternative to burning fossil fuels.
- Cut off wasteful spending to allot more funds to reducing pollution.
- Plant greenery to improve air quality.

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