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# Living near Oil Refineries in TX

Does proximity to an oil refinery correlate with  
health and economic attributes of a neighborhood?

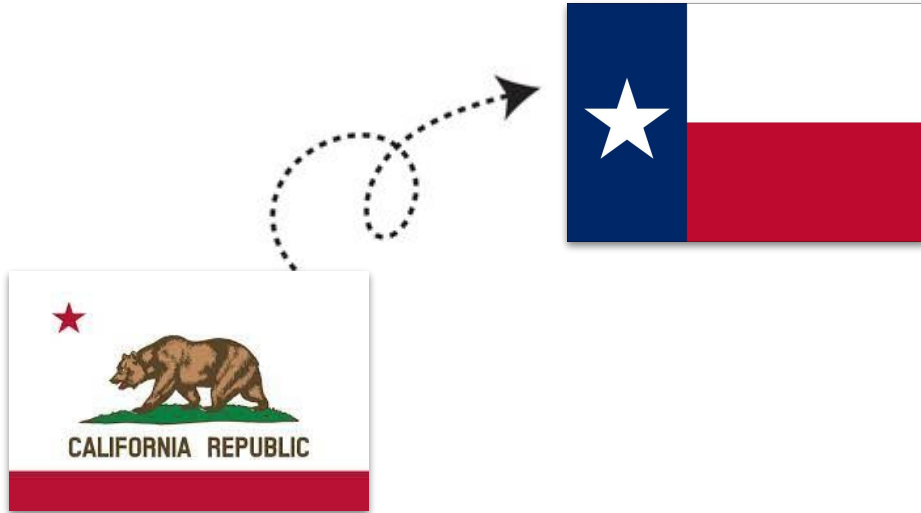
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# Problem Statement

The Smith family is relocating from California to Texas because the parents got new jobs in downtown Houston. They are unfamiliar with the area but have heard there are a lot of oil refineries in the Houston area. Some of the neighborhoods they are considering are close to oil refineries and they are wondering about the health and economic characteristics of those communities.



# Approach & Methods

- **Background Research**
  - CA Prop 65
  - Cancer Alley
- **Data Exploration & Gathering**
  - Government Data Sources ( CDC, EIA, EPA, ACS)
  - Census Geocode
- **Streamlit App**
- **Tableau**

# Datasets

**2016 US Energy Information Administration:** oil refinery locations

**2017 EPA AirToxScreen:** air emissions data, ambient concentrations and health-effect results (cancer risk)

**2019 ACS Supplemental Nutrition Assistance Program (SNAP):** poverty levels

**2018 CDC Environmental Public Health Tracking Network:** cancer prevalence and life expectancy

**2017 EPA Toxic Release Inventory (TRI):** industrial facilities with toxic chemical releases

# Streamlit App (demo)



705 Luella Ave, 77536



3614 Ginger Ln, 77581



13531 Montaigne Dr, 77065

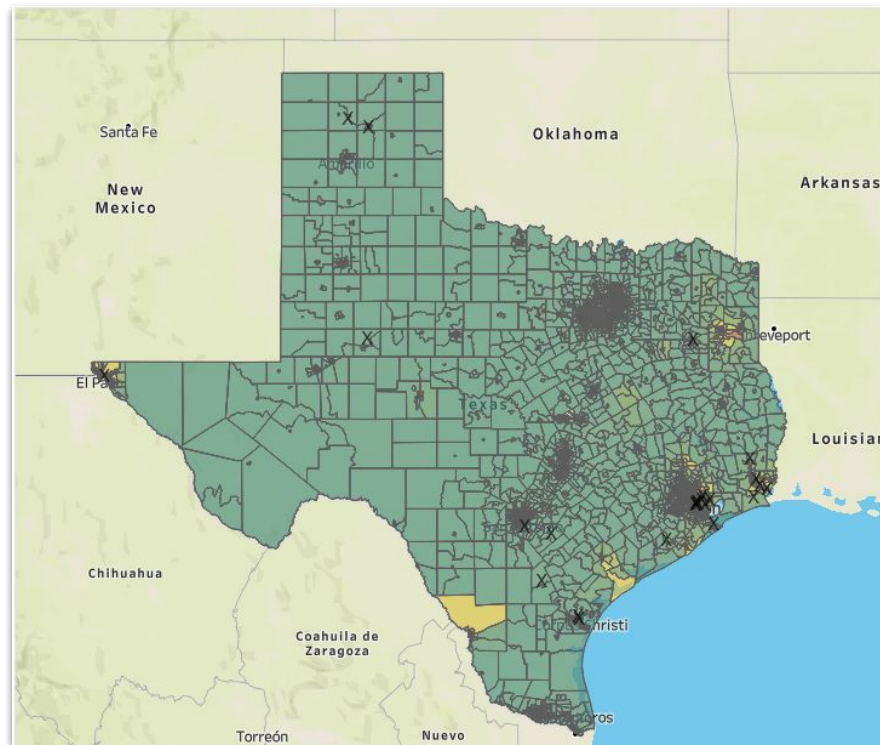


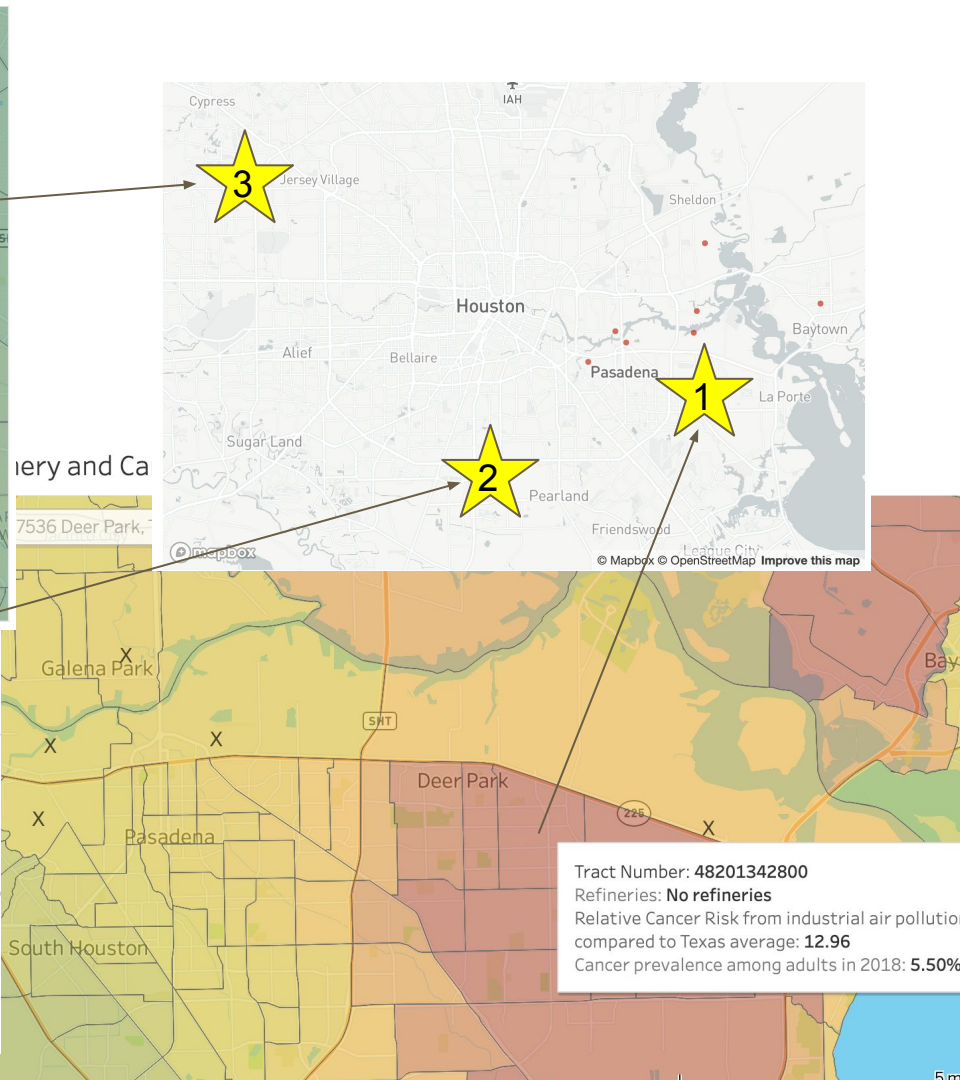
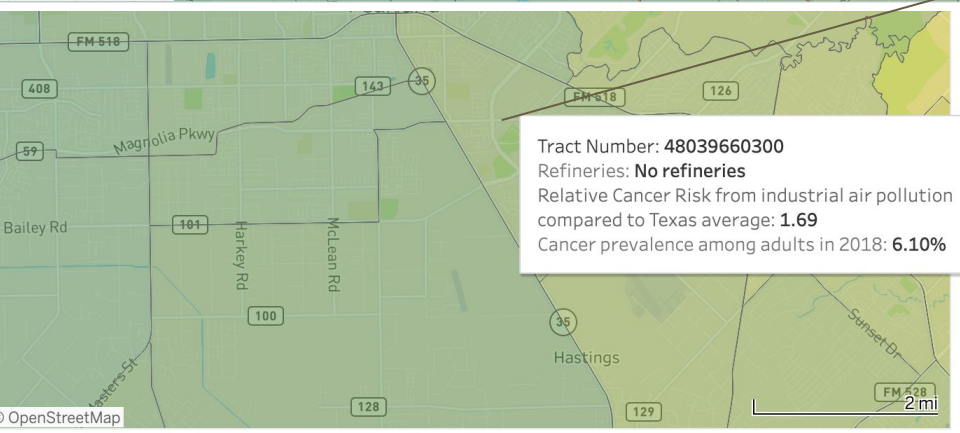
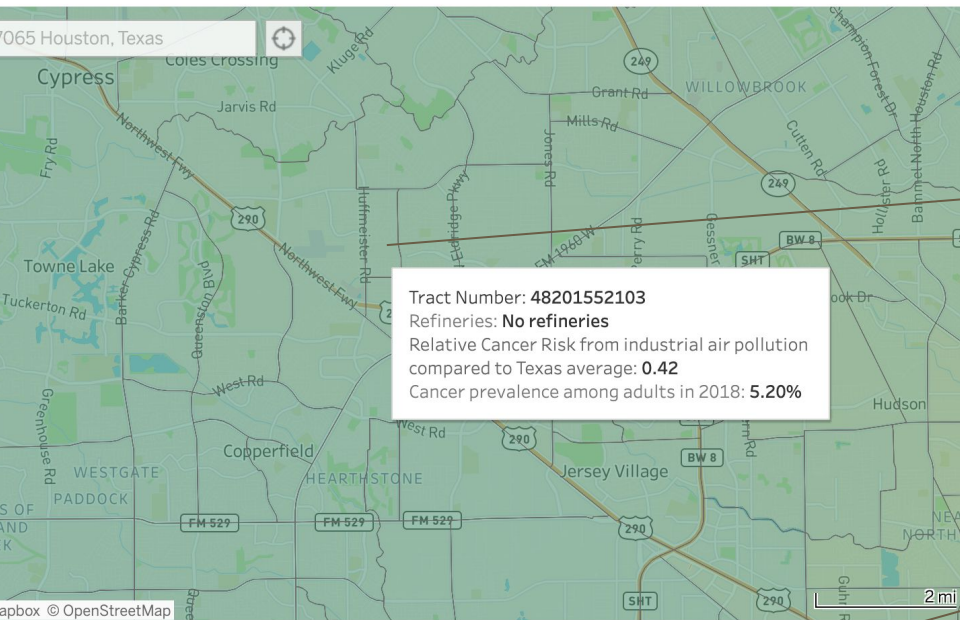
# Streamlit App (demo)



# Tableau (demo)

- X indicates refinery
- Tooltip:
  - Census Tract Number
  - # refineries
  - Cancer Risk from Industrial Sources
  - Cancer Prevalence among adults
- Color schemes:
  - a. Cancer Risk from Industrial Sources
  - b. Cancer Prevalence among adults
- Additional Map:
  - # industrial facilities with toxic spills







# Limitations

- Pattern of higher cancer rates in census tracts near refineries has many exceptions
  - Tract 20105 in Georgetown, TX is 100 miles from the nearest refinery while cancer rates are 14.8 percent
- Time and length of exposure
- Cancer rates and economic health are influenced by multiple factors. We only looked at oil refineries and have not controlled for others.
  - Attributes of the residents- retirement communities might have higher cancer rates, younger families might be poorer

# Next Steps

- Modeling
  - Predicting the impact of a new refinery on the area's health and economic indicators.
- Incorporate other sources of pollution
  - Lots of the high cancer rate areas have other industrial facilities that pollute- not just refineries
- Consider additional years
- Expand beyond Texas
  - Specific climatic differences between states that can exacerbate or dampen air pollution effects<sup>[1]</sup>

[1]-[https://www.cdc.gov/climateandhealth/pubs/air-quality-final\\_508.pdf](https://www.cdc.gov/climateandhealth/pubs/air-quality-final_508.pdf)

# Sources

- <https://koordinates.com/layer/13284-us-petroleum-refineries/>
- <https://www.epa.gov/AirToxScreen/2017-airtoxscreen-assessment-results>
- <https://data.census.gov/cedsci/map?q=Official%20Poverty%20Measure&g=01000000US%241400000&y=2019&tid=ACSS T5Y2019.S2201&cid=S2201 C01 001E&vintage=2019&layer=VT 2019 140 00 PY D1&mode=thematic&loc=38.7098,-94.3102,z8.0000>
- <https://ephtracking.cdc.gov/DataExplorer/?c=11>
- <https://www.epa.gov/toxics-release-inventory-tri-program/tri-basic-data-files-calendar-years-1987-present>
- <https://pha.berkeley.edu/2021/04/11/refinery-pollutants-and-their-effect-on-public-health/#:~:text=These%20invisible%20fumes%20creep%20into,difficulty%20breathing%2C%20and%20blood%20disorders>
- <https://www.p65warnings.ca.gov/fact-sheets/petroleum-products-environmental-exposure-refineries#:~:text=Various%20chemicals%20in%20petroleum%20products,defects%20or%20other%20reproductive%20harm.&text=Acetaldehyd e%20may%20increase%20the%20risk,the%20development%20of%20the%20child>
- <https://www.propublica.org/article/welcome-to-cancer-alley-where-toxic-air-is-about-to-get-worse>

**Thank you! Questions?**