

Socioeconomic and Environmental Disparities Across Playgrounds in the Greater New Orleans Area

Gabrielle White, Saheba Cuccia, MS, Adrienne Katner, DEnv, Daniel Harrington, ScD

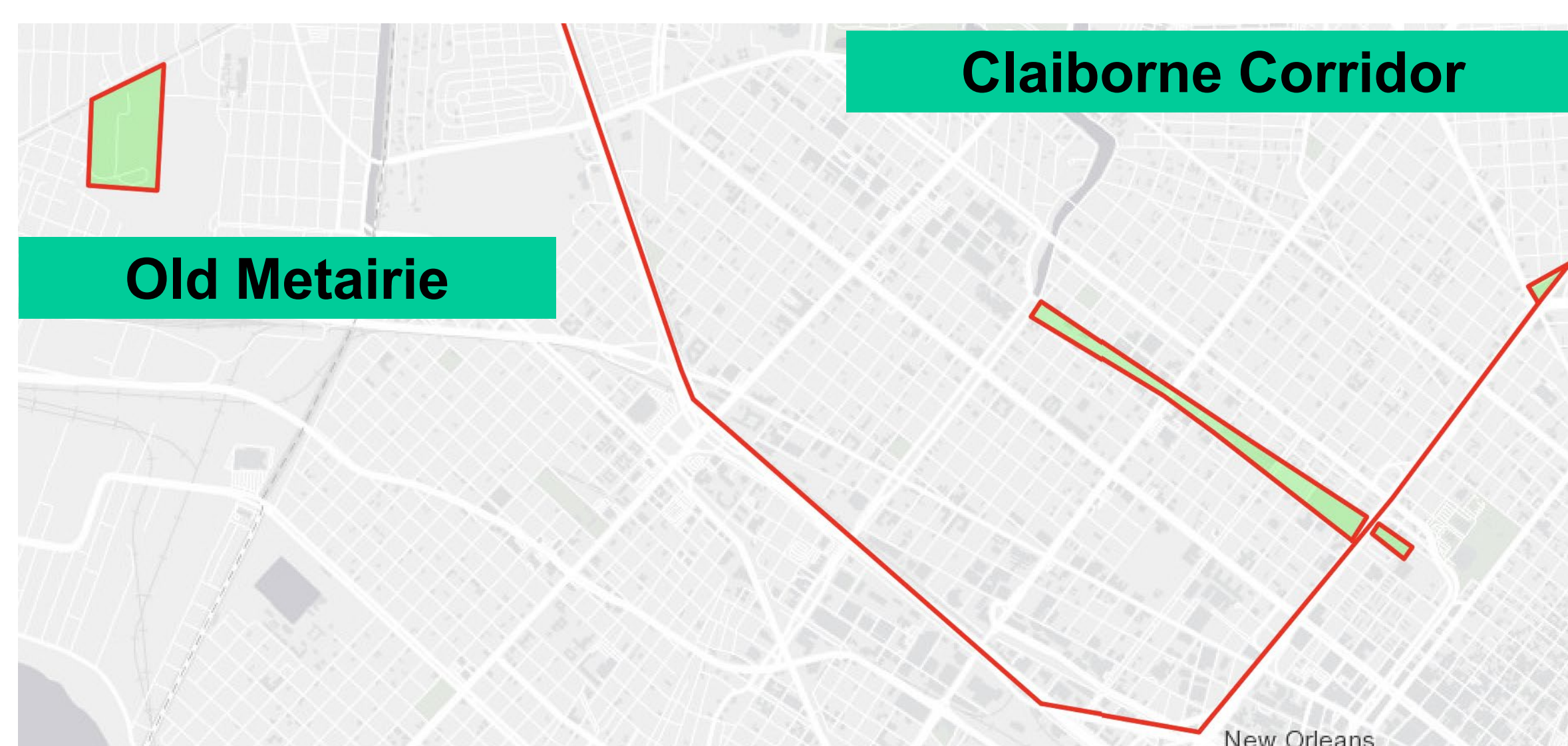


Introduction

- Socioeconomic disparities in the environmental quality of playgrounds are a widely recognized environmental justice problem across the US.
- In the Greater New Orleans area, little is known about the levels of pollution in public parks.
- This study quantified pollution risk factors for children at playgrounds in minority vs. non-minority neighborhoods in the Greater New Orleans area
- Levels of lead (Pb) in soil, and concentration of fine particulate matter (PM2.5), ozone (O3) and carbon monoxide (CO) in air were measured.
- Pollutant levels in a park in Old Metairie (Pontiff Park), a largely high-income non-minority area, were compared to those in parks throughout the Claiborne Corridor, a largely low income, minority area in New Orleans adjacent to the Claiborne Expressway (I-10)(Hunter's Field, Lemann Park, Lafitte Greenway).

Methods

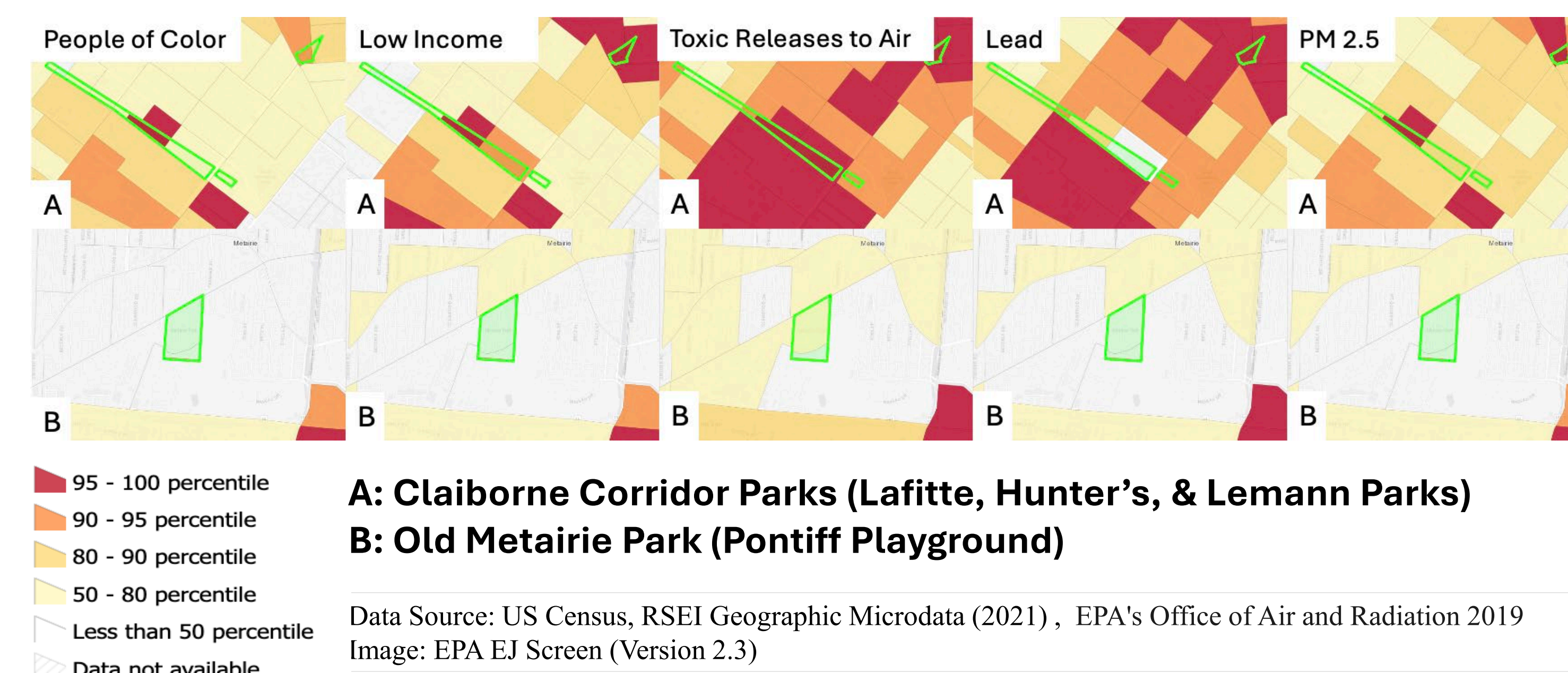
- Fine particulate matter (PM2.5), carbon monoxide (CO), and ozone (O3) concentrations were measured in ambient air at various locations throughout each park over a period of 30 minutes to 2 hours at each park between the hours of 10:00 am and 2:00 pm using the AirBeam sensor for PM2.5, and Aeroqual sensors for CO and O3
- Soil from the top 1-2 inches of surface were collected from play areas in each park and analyzed for lead (Pb) with a SciAps XRF.
- Sociodemographic, health outcome and other environmental hazard data were mapped using the US Environmental Agency's (EPA) EJ Screen
- Levels of environmental hazards were summarized by park and compared to standards using Microsoft Excel and Habitat Map.



Map of park locations (highlighted in green)

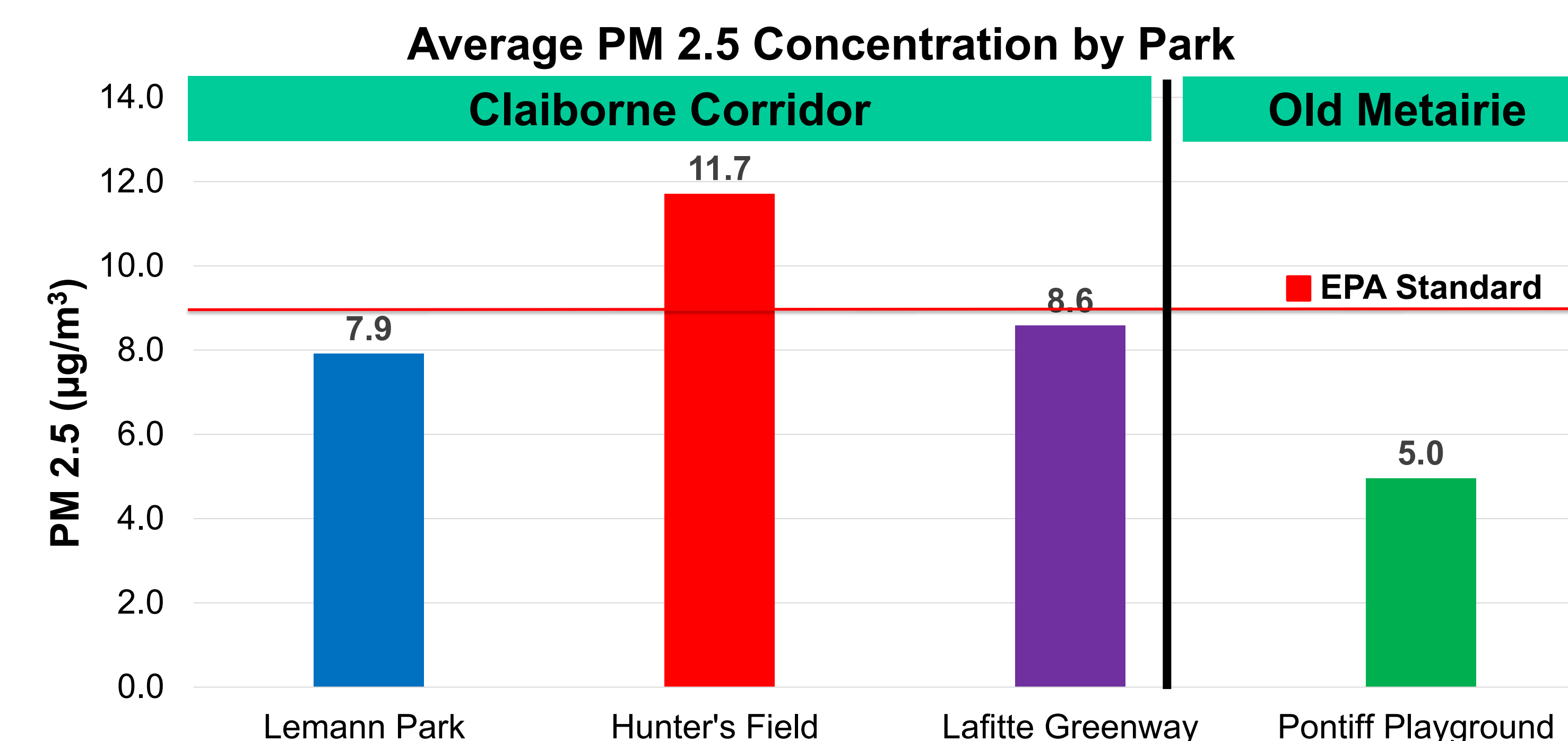
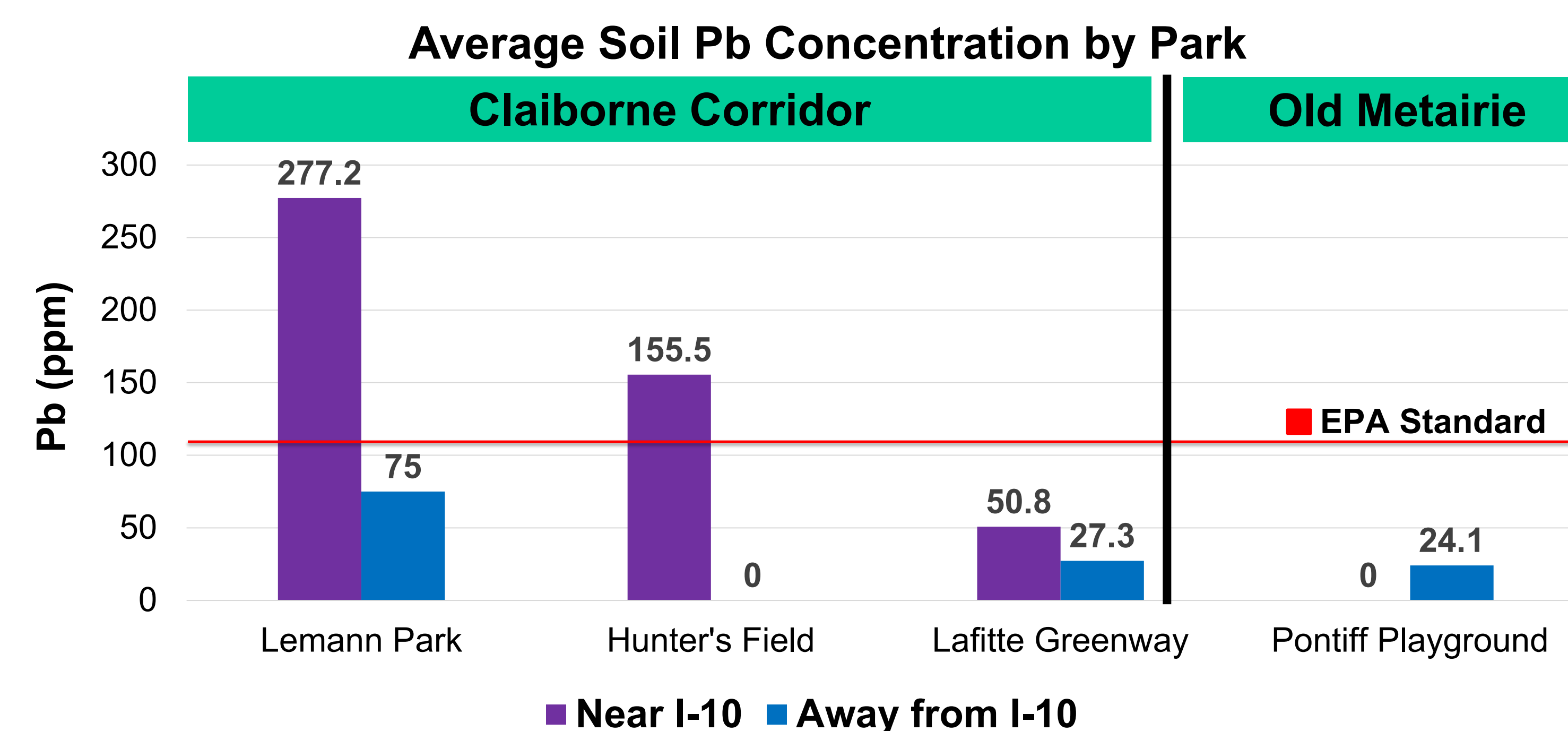
Results

Sociodemographics & Toxic Release Estimates (EPA EJ Screen)



Air & Soil Monitoring Data

| Summary | Claiborne Corridor | | | Old Metairie |
|-------------------------------------|-----------------------|--------------------|----------------------|-----------------------|
| | Lemann Park | Lafitte Greenway | Hunter's Field | Pontiff Playground |
| Avg. (Std. Dev.) sample size | | | | |
| Soil lead (ppm) | 240.4 (158.6) n=11 | 42 (41.5) n=16 | 169.2 (176.9) n=9 | 24.1 (28.8) n=14 |
| PM2.5 (ug/m3) | 8.8 (0.7) n=57 | 9.6 (1.6) n=122 | 14.5 (6.7) n=70 | 2.0 (1.1) n=34 |
| Ozone (ppm) | 0.01 (0.06) n=54 | 2.4 (3.6) n=108 | - | 0.005 (0.006) n=69 |
| Carbon Monoxide (ppm) | - | - | 0.573 (1.4) n=85 | 0.03 (0.07) n=8 |



Summary & Comparisons to Health & Regulatory Standards

- Playgrounds in the minority neighborhood of Claiborne Corridor had higher pollutant levels compared to the playground in the non-minority neighborhood of Old Metairie.
- Average PM2.5, ozone, and carbon monoxide levels were higher in Claiborne Corridor parks vs. levels in Pontiff Playground.
- Soil samples taken near the interstate had consistently higher lead levels than samples taken in areas away from the interstate, which suggests that interstate traffic was the source.
 - Average soil lead levels in only two parks in Claiborne Corridor exceeded EPA's Soil Lead Standard (100 ppm)
 - The highest soil lead levels were in Hunter's Field (under I-10), where nine samples exceeded 100 ppm and four samples exceeded 400 ppm, with a maximum of 624 ppm.
 - Ozone levels in Lafitte Greenway were 2.4 ppm, exceeds EPA's annual average standard of 0.070 ppm.

Conclusions

- Based on our findings, children in minority Claiborne Corridor neighborhoods face disproportionately higher exposure to pollution than those in high income areas.
- Children are more susceptible to health effects from environmental pollutants.
 - For example, children with growing and developing lungs breathe in significantly more air per unit body weight than adults.
- Exposure to lead can result in neurodevelopmental disorders resulting in cognitive delays and behavioral problems
- Exposure to air pollution can result in health conditions such as asthma, and later life chronic diseases such as bronchitis, COPD, lung cancer, and heart disease.
- Federal, state, and local actions must be taken to remediate pollution and reduce exposure in these communities.