

The Impacts of Pollution: An Analysis of the Association between Land Zoning, PM2.5, and Asthma



UC San Diego

Herbert Wertheim
School of Public Health and
Human Longevity Science

Rachel Arnold, Sergio Contreras, Calvin Fan, Yuwen Jiang, Julianne Mitchel
UC San Diego Herbert Wertheim School of Public Health and Human Longevity Science

INTRODUCTION

- Does your neighborhood's industrial and military land zoning affect asthma outcomes?
- Does land zoning impact particulate matter 2.5 (PM 2.5) air pollution?
- Is race associated with more industrial land zoning, pollution, and worsened asthma?

Barrio Logan is a Latino neighborhood with a high percentage of industrial zoning, and PM 2.5 air pollution. We compared it to the cities of Oceanside and Coronado which are similar geographically in relation to the ocean and military installments but have different zoning percentages and demographics. Previous studies show that air pollution and asthma rates vary by zip code¹.



¹ Environmental racism and asthma: Looking past barrio logan as a public health case study. (n.d.). Retrieved February 2, 2023, from https://libguides.ucsd.edu/environmental_racism_and_asthma.html

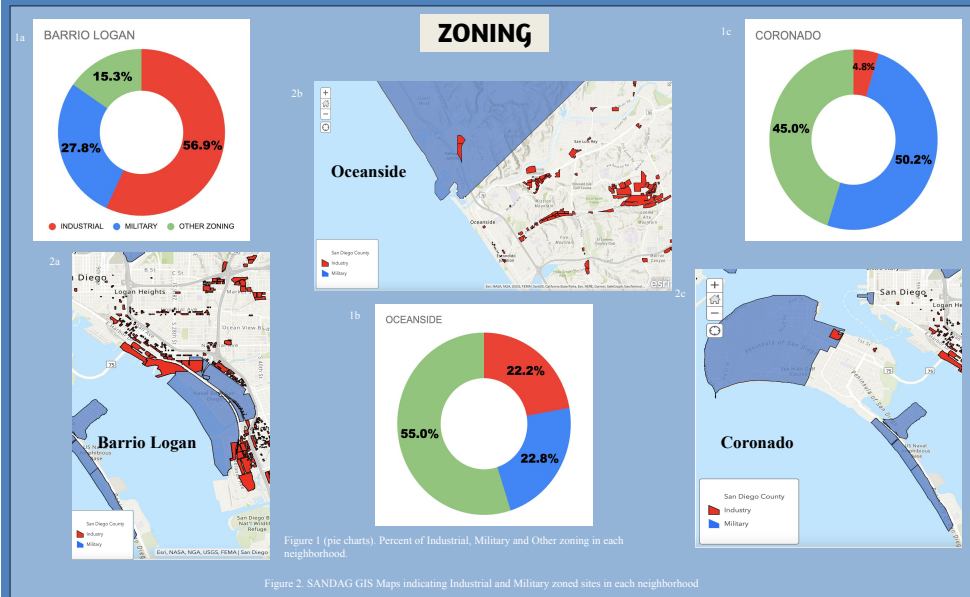
OBJECTIVE

To analyze three San Diego County neighborhoods for correlations between the amount of asthma-related emergency room visits and levels of particulate matter 2.5 (PM 2.5) with the amount of land zoned for industrial and military use

METHODS

- San Diego Geographical Information Source (SDGIS) and the San Diego Association of Governments (SANDAG).
- The data collected for ER visits in each zip code was obtained from the California government website.
- The final data point that was collected was for the concentration of particulate matter 2.5 (PM 2.5). This data point was retrieved from the non-profit organization, Union of Concerned Scientists.
- Maps and spatial representations of the data were created using Geographical Information System (GIS).
- Prevalence ratios were found with the exposure being neighborhood and the outcome being asthma-related ER visits.

RESULTS



RESULTS CONTINUED

- The prevalence of people who went to the ER for asthma among those who live in Barrio Logan was 3.7 and 2.6 times the prevalence of people who went to the ER for asthma among those who live in Coronado and those who live in Oceanside, respectively.
- People who lived in Oceanside were 1.4 times as likely to visit the ER for asthma than those who lived in Coronado.

CONCLUSION

- The study highlights the importance of effective land-use planning and air pollution control measures to mitigate the adverse health effects associated with industrial activities.
- Improving air quality could potentially lead to a decrease in asthma-related ER visits and improved respiratory health outcomes in these communities.
- Future research should explore the specific sources of PM2.5 emissions within industrial and military zones and their contributions to the observed air pollution levels and repeat this study in more cities and consider more possible confounding factors.



ER VISITS

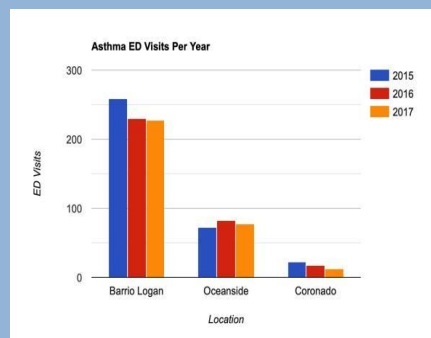


Figure 4. Asthma related emergency department visits in 2015, 2016 and 2017 in each neighborhood.

PM 2.5

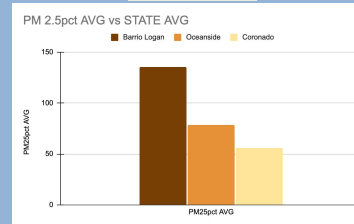


Figure 5(above). PM2.5 pollution levels in Barrio Logan, Oceanside and Coronado as a bar graph. Figure 6(below). PM 2.5 pollution levels based on state monitoring sites in Barrio Logan, Oceanside, and Coronado on a heat map.



POLICY IMPLICATIONS

This study suggests a need for regulatory interventions such as stricter industrial emissions limits and the zoning of industrial and military areas farther from residential zones.

ACKNOWLEDGEMENTS

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