

Pediatric Asthma Rates in San Diego and Imperial Counties: A Closer Look at the Effects of Climate Change

Karen Zaragoza, Nicholas Cardenas, Kortni Washington, Arley Bibiano & Xiangjie Liu,
B.S. in Public Health, UC San Diego, Herbert Wertheim School of Public Health

Background

- Early exposure to air pollutants increases the risk for asthma¹
- Climate change as a phenomenon has increased events that further air pollution, particularly through dust release²
- Imperial County's proximity to the Salton Sea allows scrutiny to the role of increased exposure air pollution in relation to pediatric asthma rates³
- Emergency room visits for asthma related issues for children are already higher than average for this region so a control is integral to determine if climate change has significantly impacted this rate⁴

Figure 1. Map of SB535 "disadvantaged Communities" for Imperial County Area

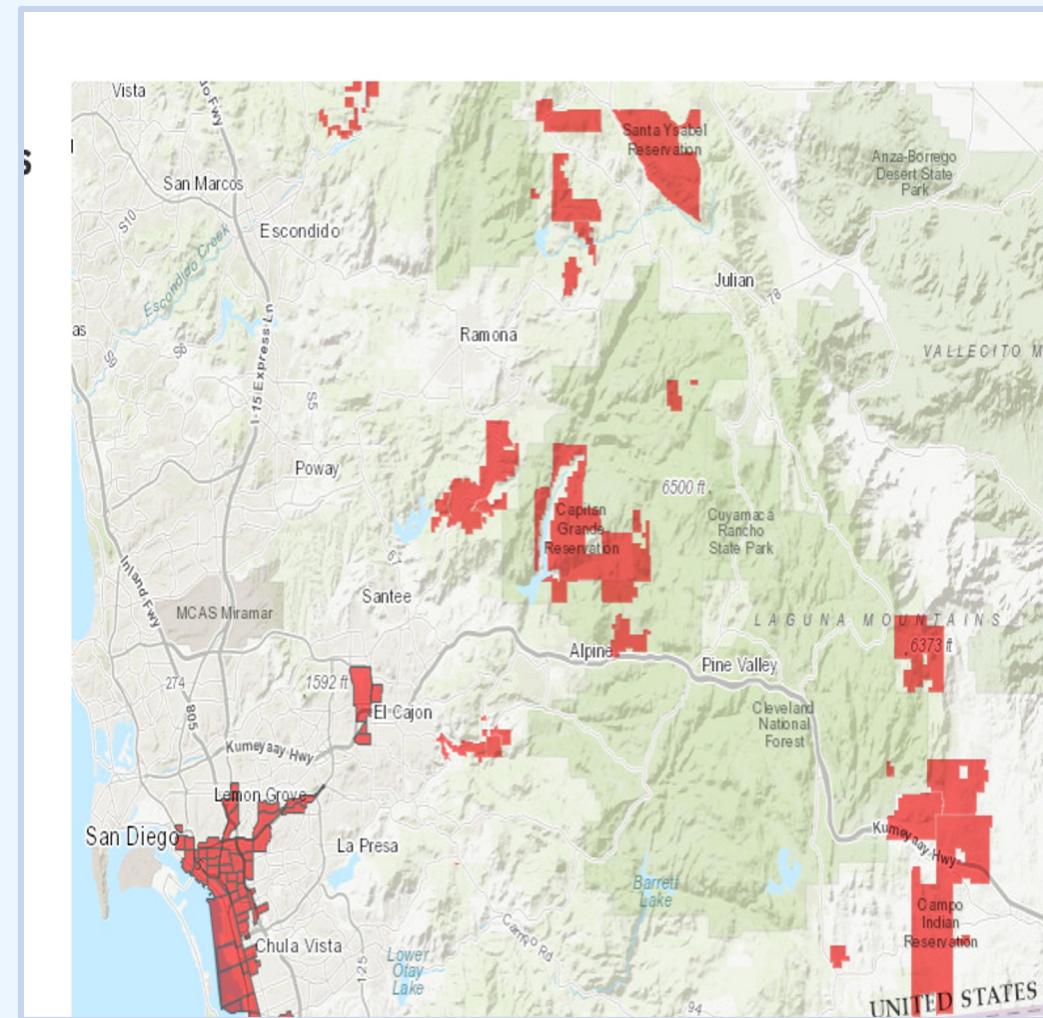
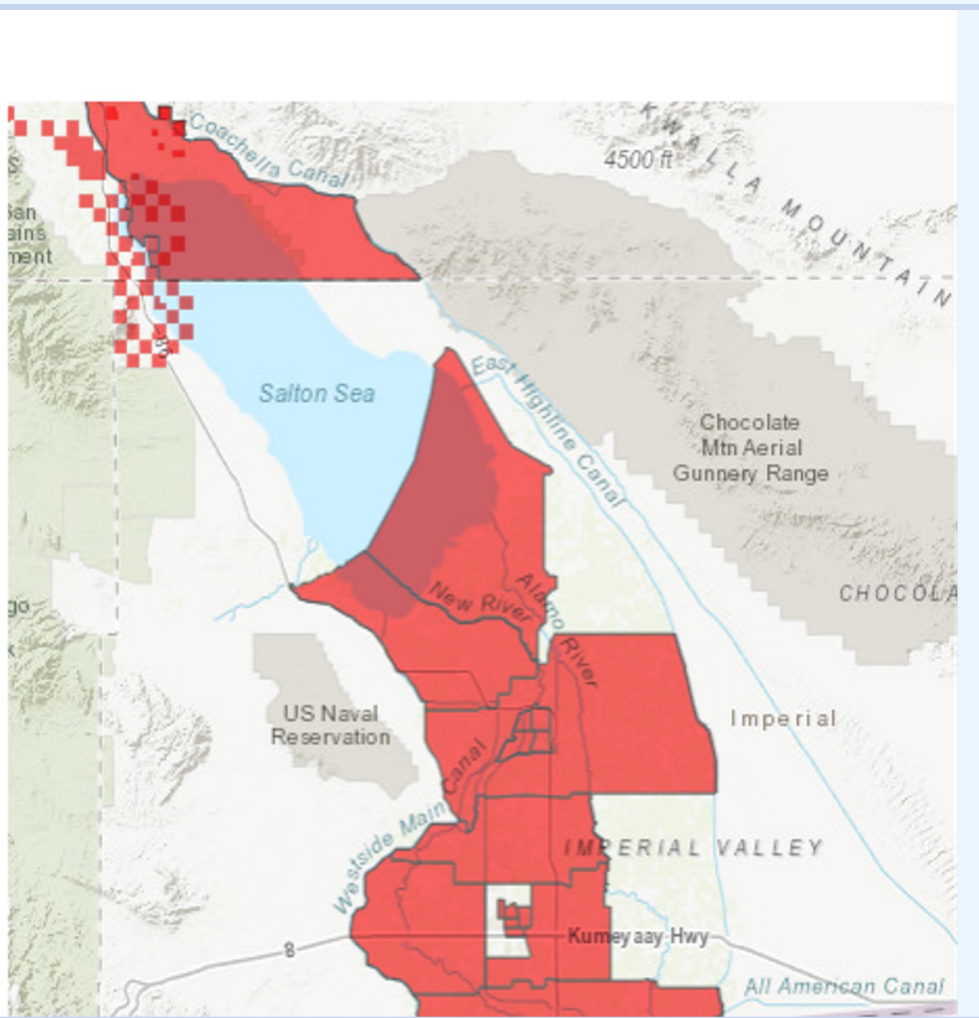


Figure 2. Map of SB535 "disadvantaged Communities" for San Diego County Area



Objective

- To compare pediatric asthma rates and emergency room visits between San Diego and Imperial County and its association with air pollution

Methods

- A secondary data analysis was conducted utilizing the 2015 Department of Health Care Access and Information emergency department databases.⁵
- Additionally, we conducted two independent proportions Z-test and set our significance level $\alpha=0.05$ on the data obtained to analyze rates of pediatric asthma in Imperial County compared to San Diego County.

Results

- A rate of 140.1 (per 10,000) asthma-related emergency department visits were reported in Imperial County
- A rate of 62.1 (per 10,000) asthma-related emergency department visits were reported in San Diego County
- Modified data revealed a z-value of 2.3124 and a p-value of 0.02088.
- Females under the age of 18 in Imperial County reported a rate of 112.9 and San Diego County a rate of 48. A z-value of 1.3519 and a p-value of 0.17702 for this population were obtained.
- Males under the age of 18 reported rates of 166 in Imperial County and 75.3 for those who reside in San Diego County. A z-value of 1.919 and p-value of 0.05486 were found.

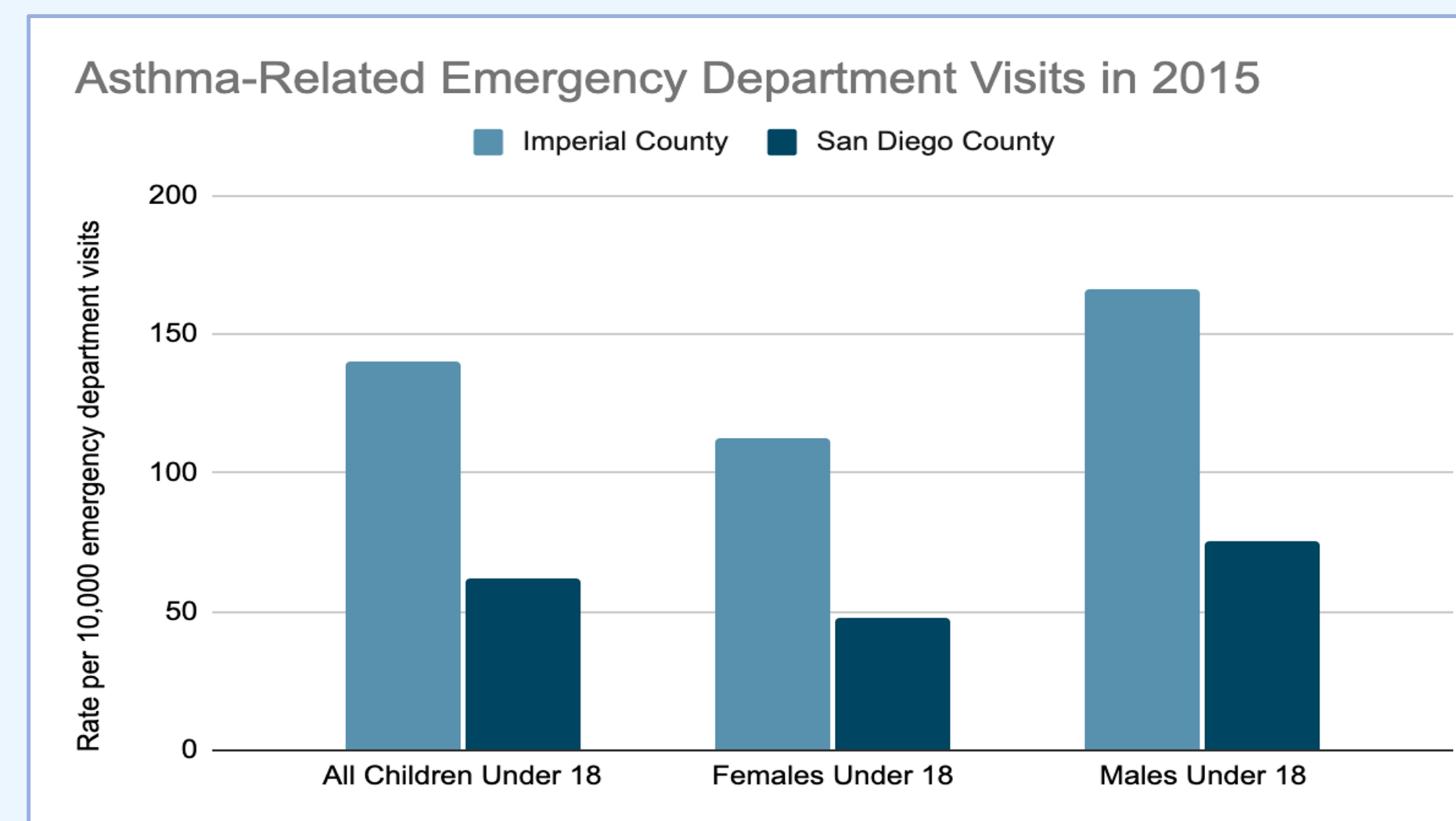


Figure 3. Asthma-related emergency department visits for residents under the age of 18 in the Imperial and San Diego Counties for the year of 2015.



Image 1. A child receiving nebulizer for an asthma attack (source: Google images).

LGHC Indicator Name	County	Strata	Strata Name	Numerator	Rate per 10,000
Asthma ED Visit Rates	Imperial	Total Pop.	Under 18 Years	737	140.1
Asthma ED Visit Rates	San Diego	Total Pop.	Under 18 Years	4616	62.1

Table 1. Asthma ED Visit Rates For Imperial and San Diego Counties by Total Population for Patients Under 18 for 2015

Conclusions

- Findings indicate disproportionately higher pediatric asthma emergency department visits in Imperial County
- There rates can potentially be attributed to climate change exposure of asthma inducing dust.
- Although not statistically significant, Males overall faced a higher increase in asthma-related activities in both counties.
- One limitation of the study that can be taken into consideration for future studies is lack of data on insurance status, a variable which could have an impact on asthma-related emergency room visits.

Policy Implications

- Pediatric asthma rates in Imperial County can be improved by investing more in pediatric health care facilities and improving the services offered by local clinics such as Clínicas de Salud del Pueblo⁶

References

1. Burbank, A. J., & Peden, D. B. (2018). Assessing the impact of air pollution on childhood asthma morbidity: how, when, and what to do. *Current opinion in allergy and clinical immunology*, 18(2), 124–131. <https://doi.org/10.1097/ACI.0000000000000422>
2. Marshall, J. R. (2017, September 21). Why emergency physicians should care about the Salton Sea. *The western journal of emergency medicine*. Retrieved May 25, 2022, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5654867/>
3. University of California - Riverside. (2021, June 23). Salton Sea aerosol exposure triggers unique and mysterious pulmonary response. *ScienceDaily*. Retrieved May 25, 2022 from www.sciencedaily.com/releases/2021/06/210623091233.htm
4. Marshall, J. R. (2017, September 21). Why emergency physicians should care about the Salton Sea. *The western journal of emergency medicine*. Retrieved May 25, 2022, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5654867/>
5. Let's Get Healthy California. (2019). Asthma ED Visit Rates (LGHC Indicator 07). Retrieved from <https://data.chhs.ca.gov/dataset/asthma-ed-visit-rates-lghc-indicator-07>
6. Taylor, Mac. (2018) The Salton Sea: A Status Update. Legislative Analyst Office. Sacramento, CA. <https://lao.ca.gov/Publications/Report/3879>.