

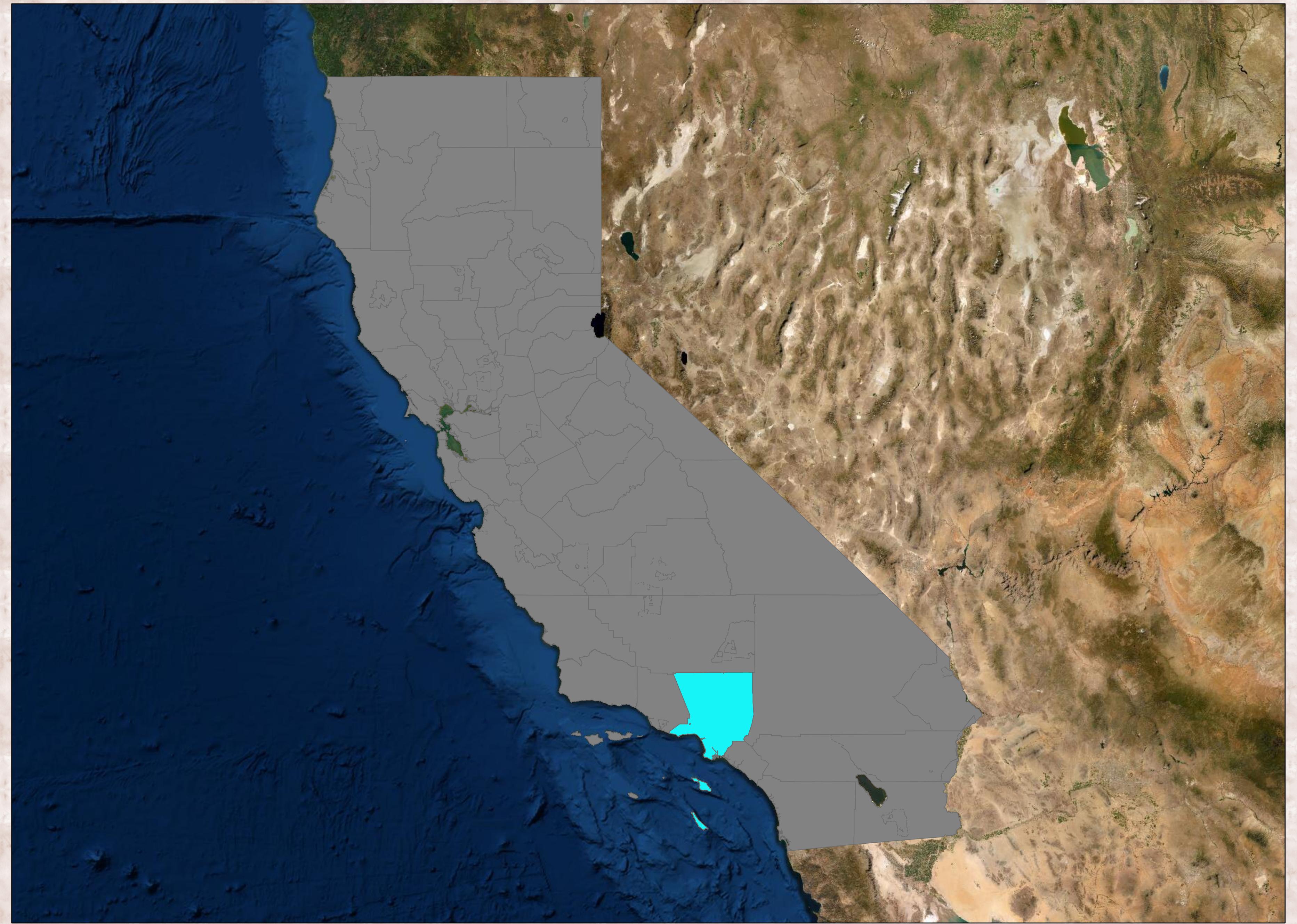
## Societal Disparities

Understanding the disparities in toxic exposure among subpopulation groups (e.g. social, ethnic and demographic) is one of the first ways to breakdown environmental injustice. With the current rise in awareness of social injustice and police brutality across the United States of America, there is need to investigate and bring to light all other inequalities with regards to health risk, social disparities and neighbourhood segregation. Using spatial methods, we assessed inequalities and identified “hotspot” areas in the city. Two primary pollutants were studied (ground water threats and hazardous waste) the results of which point to mean exposures being higher than average for people of colour, lower-income households, and the southern region. It was found that areas of high ground water threat incidence and hazardous waste coincide with hot spots for low birth weight and cardiovascular disease prevalence. This serves to highlight the importance of pollution control and better distribution of social goods. This information will help NRDC to initiate town hall meetings to gain signatures and consent to start the process of litigation and enforcing better regulations.

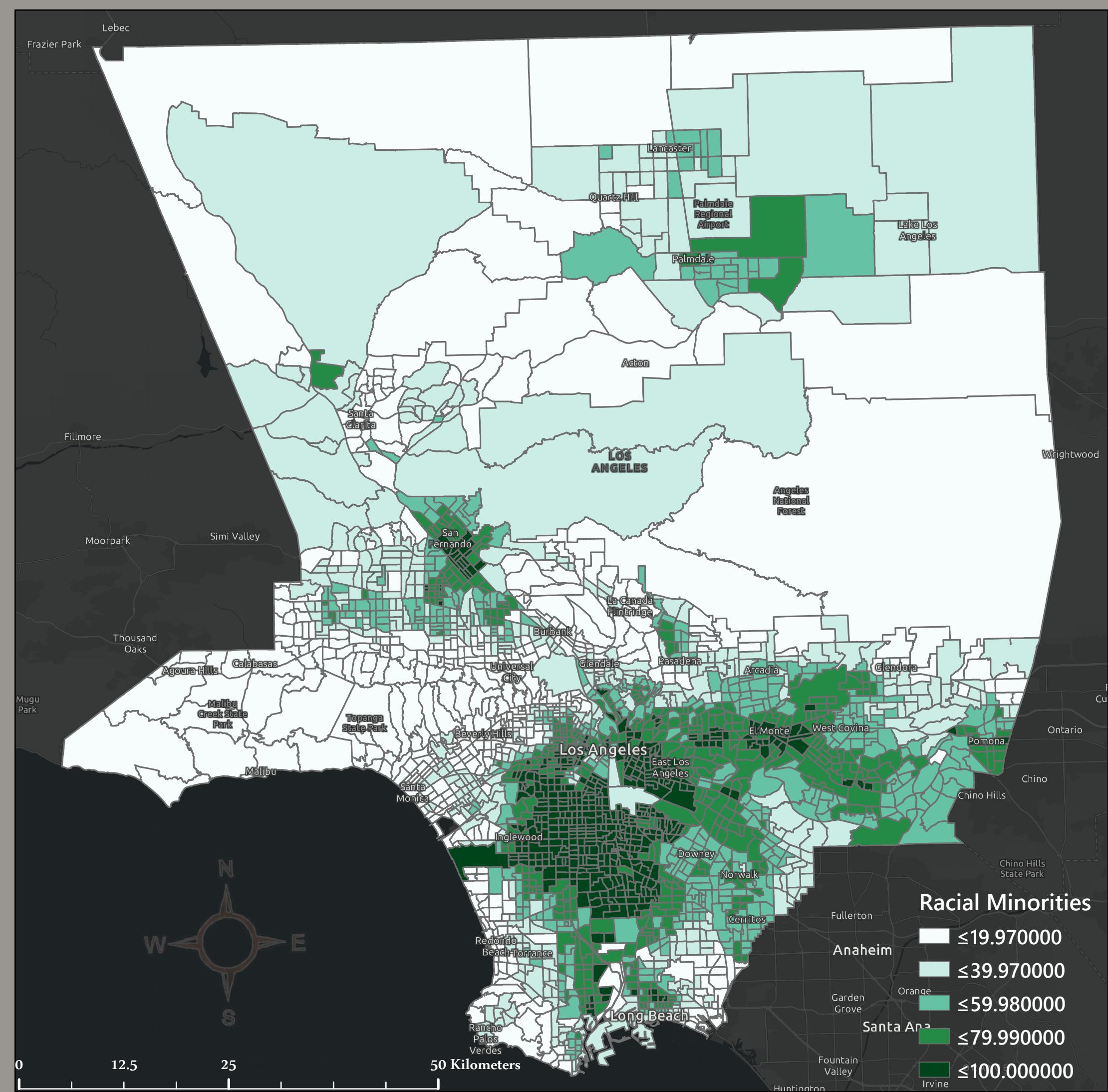
## Questions Considered

- 1) Is there a pattern of distribution across the study area for the racial minorities, median family income, and white population?
- 2) Do these local clusters share spatial similarities with the pollutants?
- 3) Do the clusters identified in Question 1 display some similarities to low birth weight and cardiovascular disease hotspots?

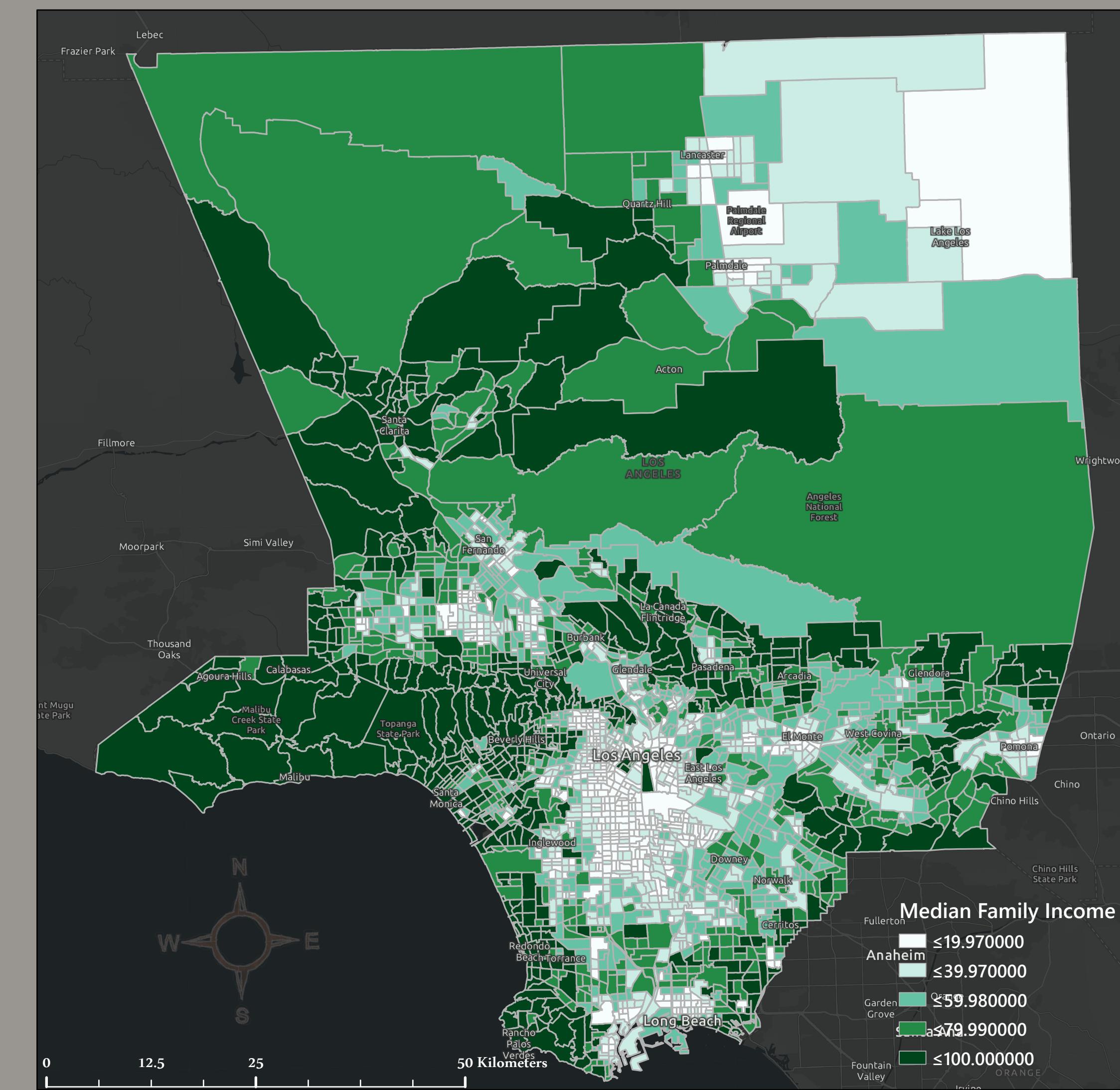
### LOS ANGELES COUNTY, CALIFORNIA



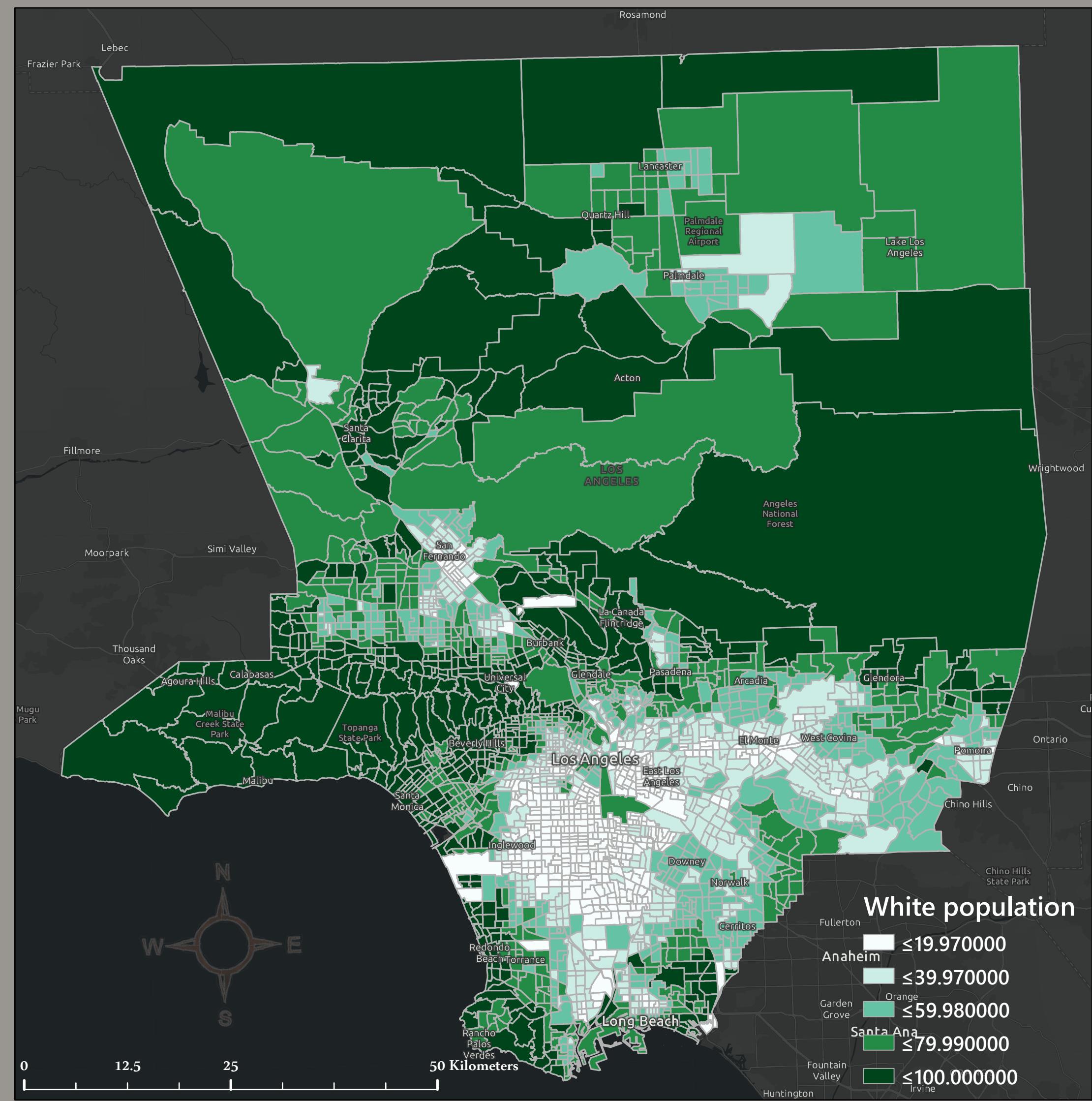
Racial Minorities



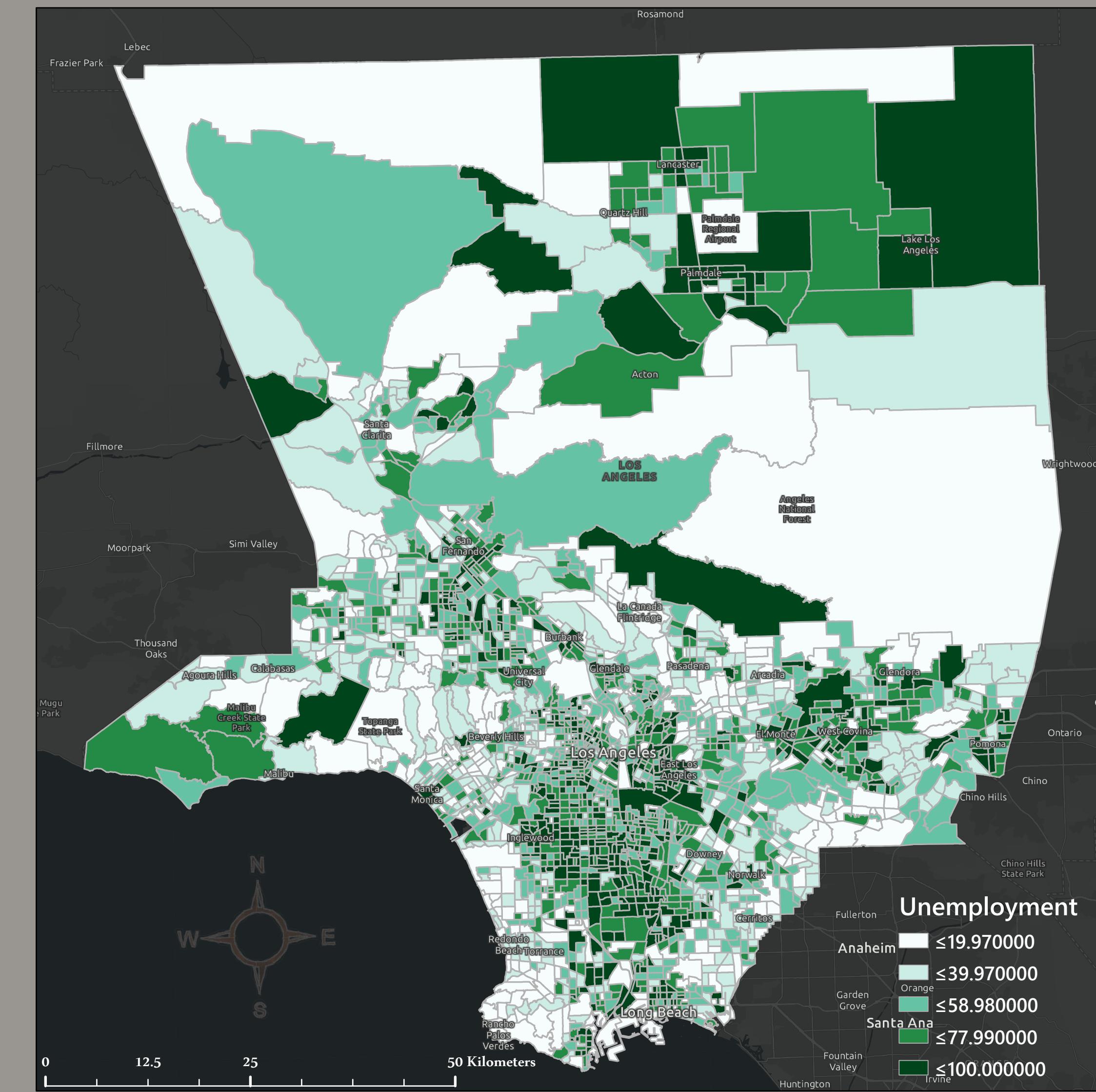
Median Family Incidence



White Population

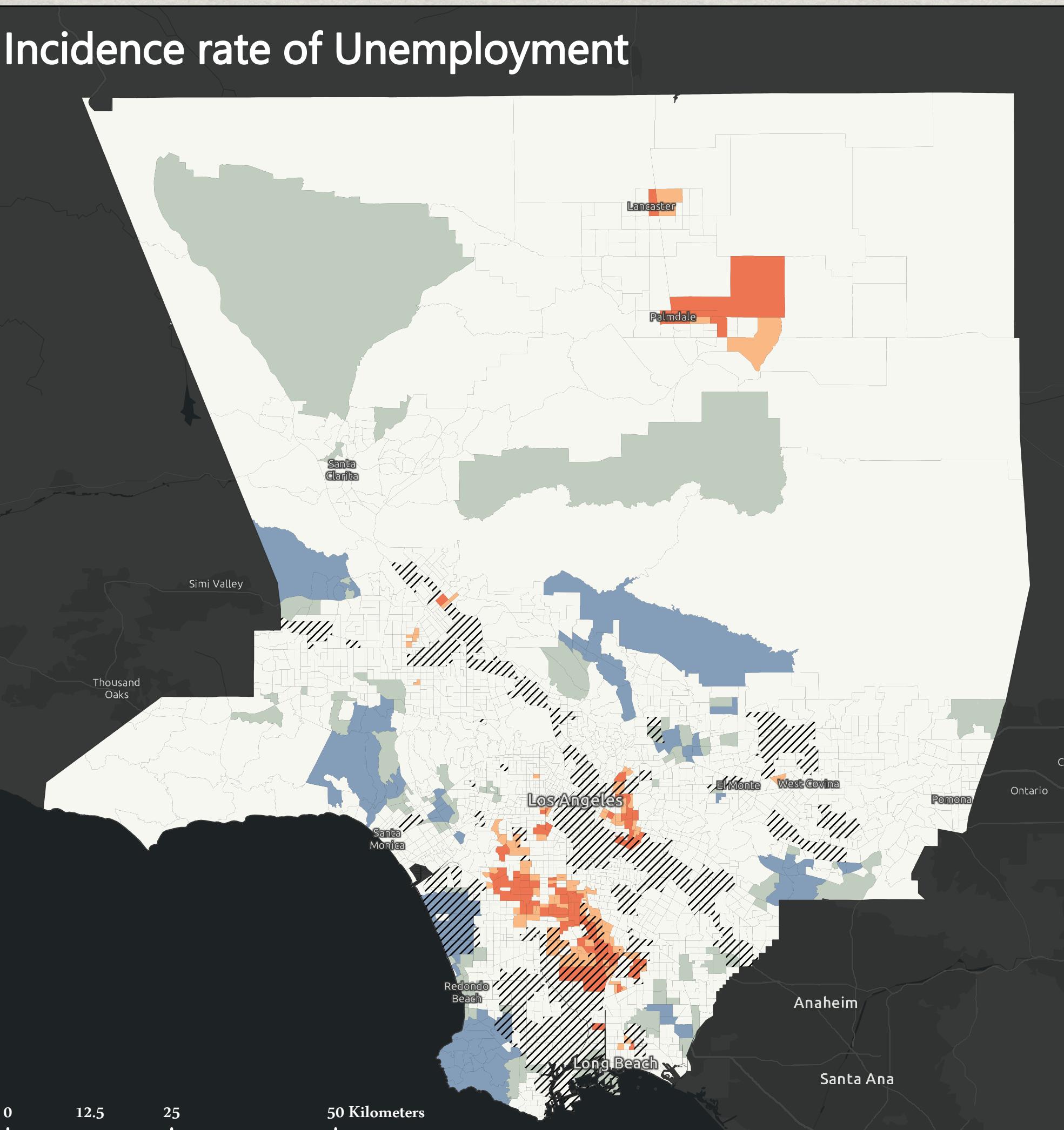
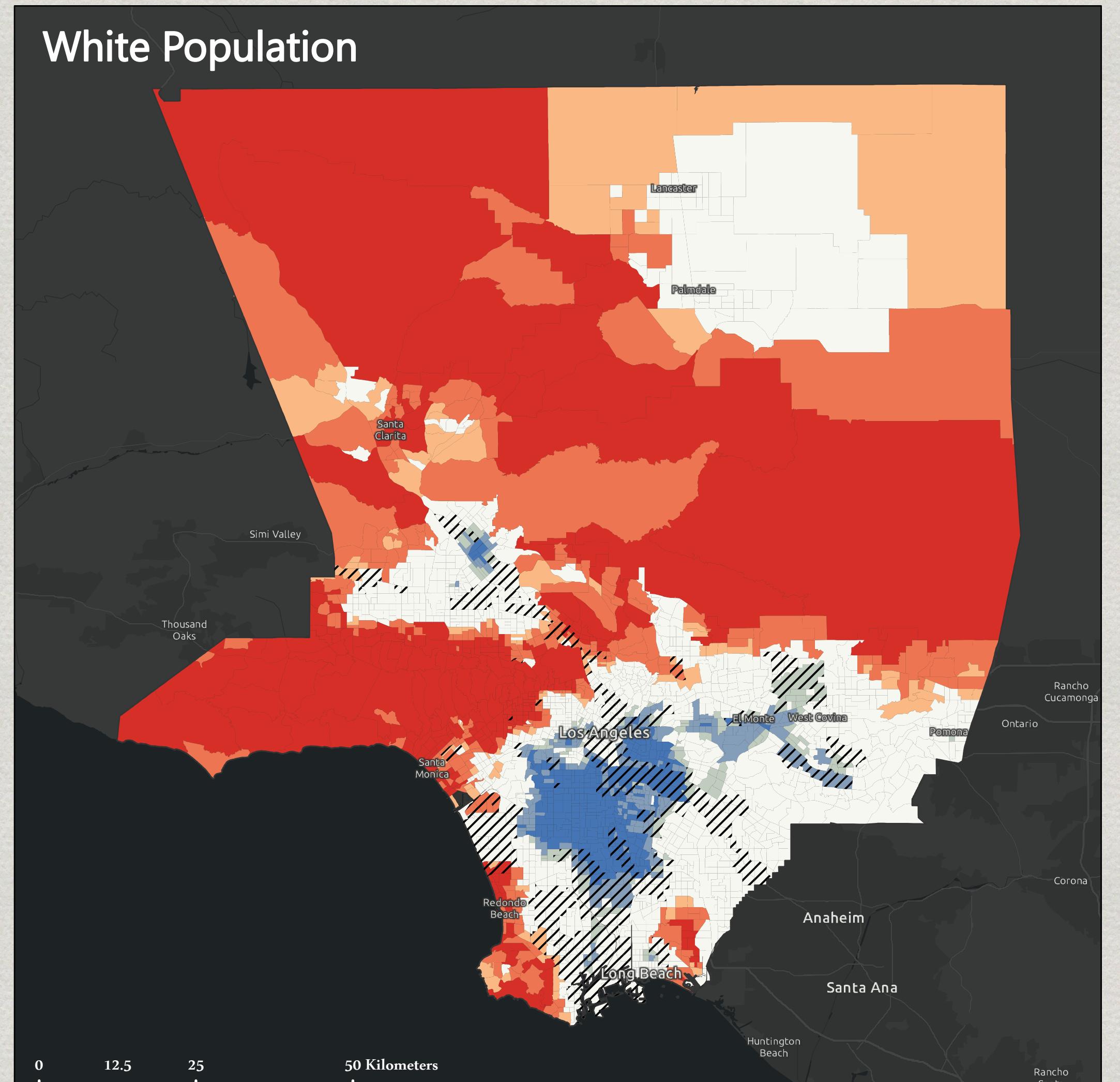
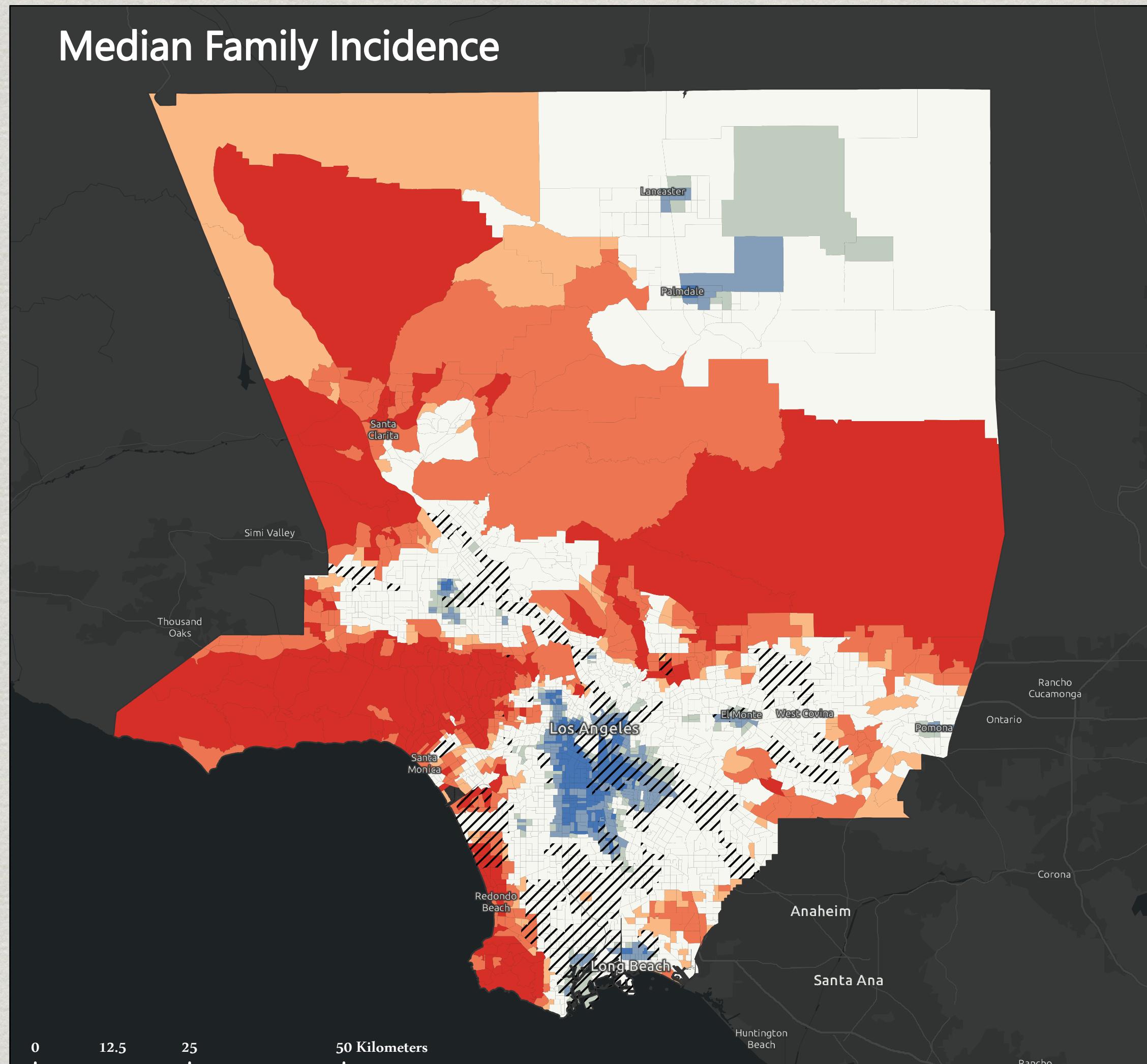
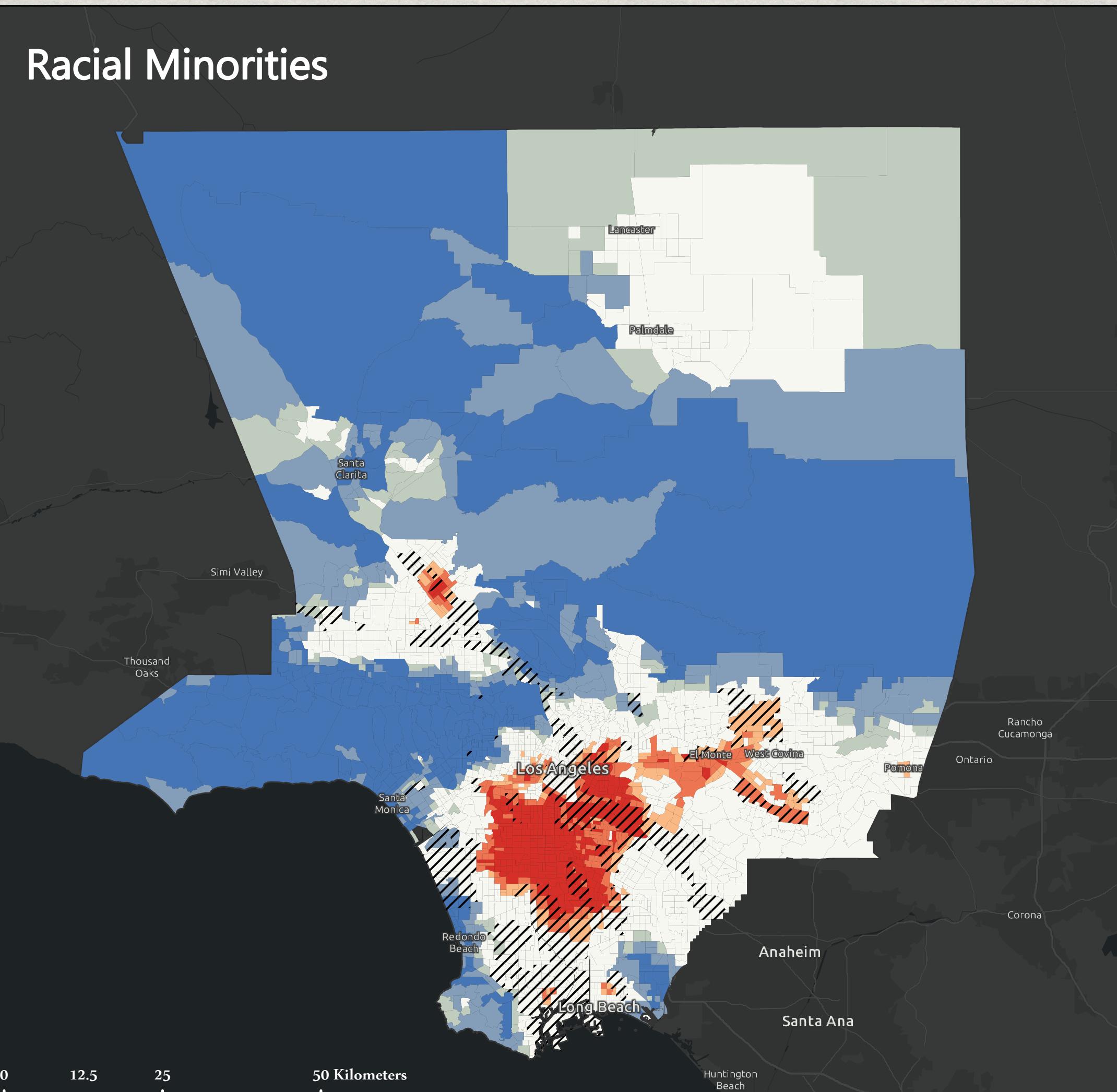


Incidence rate of Unemployment



The above maps show that racial minorities are concentrated at the southern area of LA county which corresponds with area with highest Unemployment rate. This same area (zip code) can be seen to consist of families with the lowest levels of Median Income and credits as well as have the least presence of white families. The summary shows the highest and the lowest count of the population that expresses each social measure by tract.

## Hazardous Waste and Hot spots analysis of Vulnerable communities

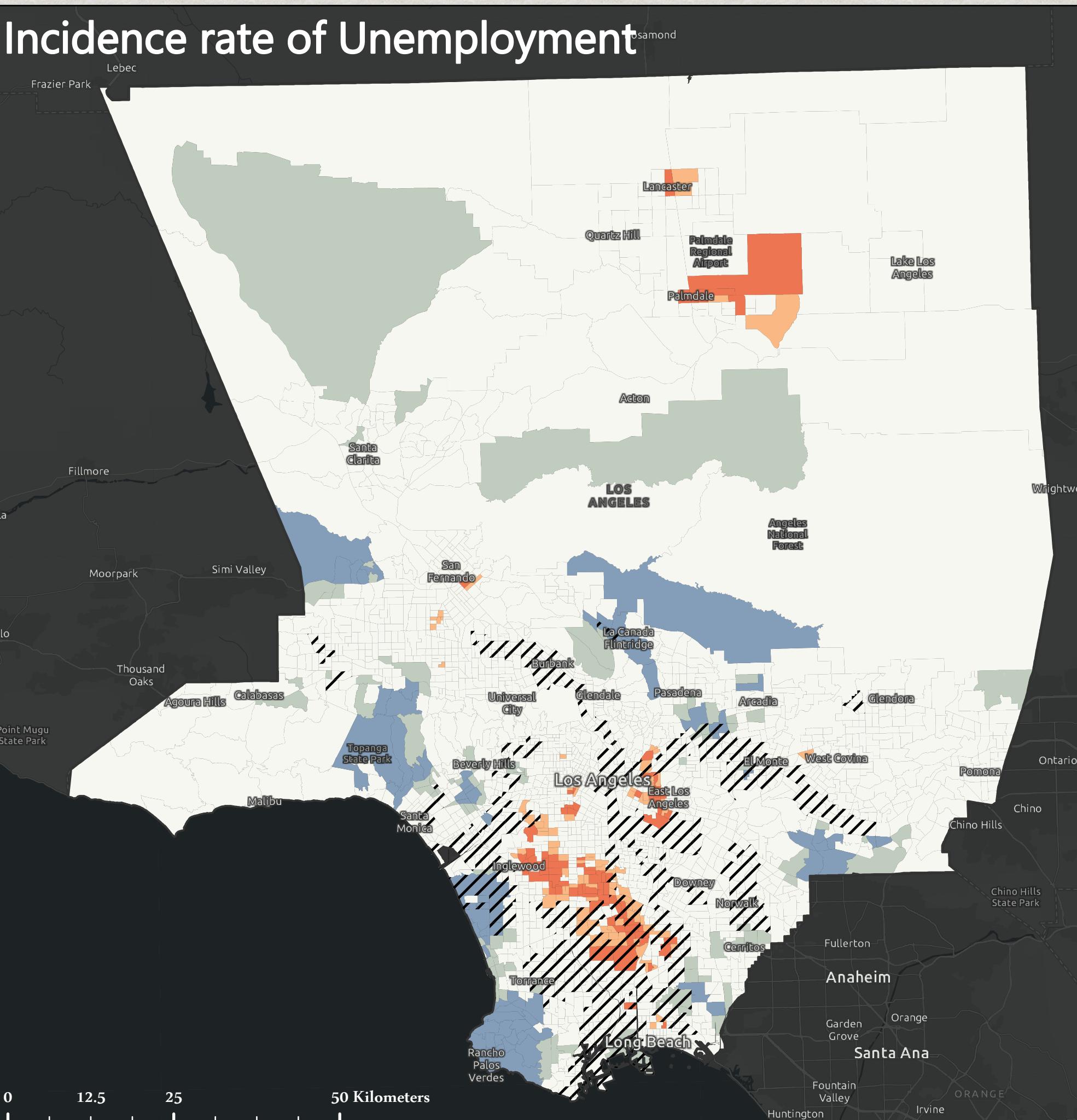
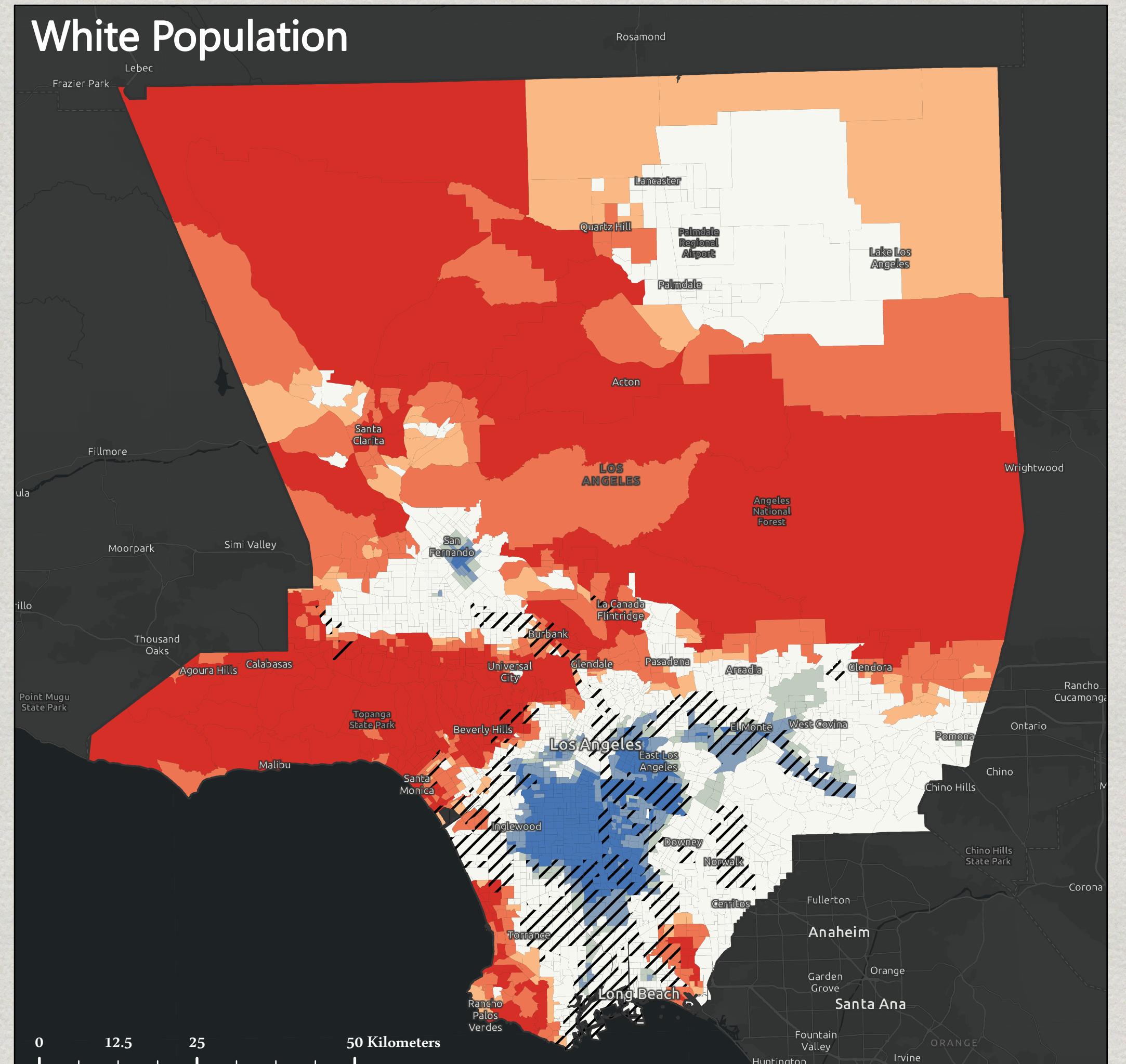
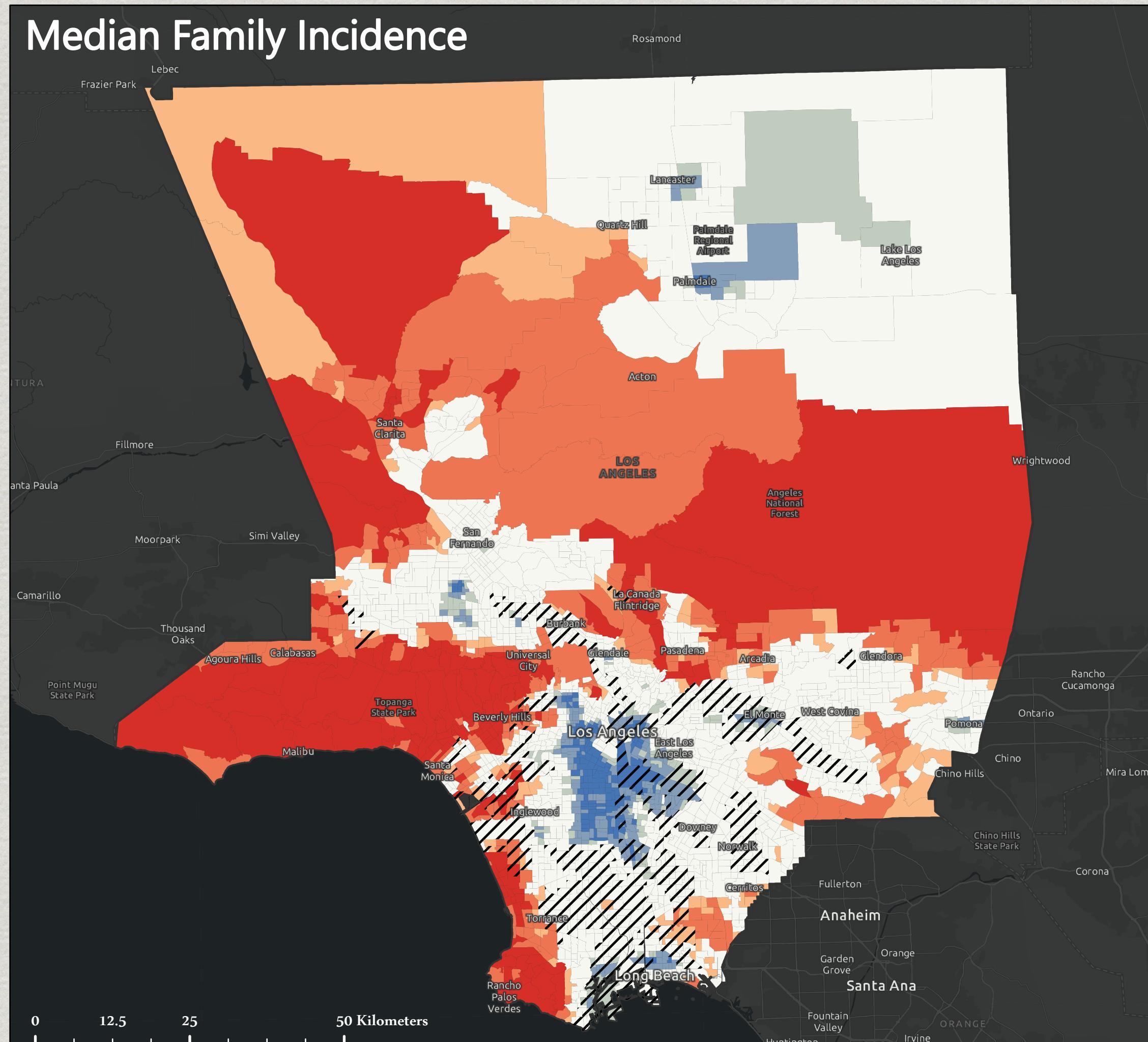
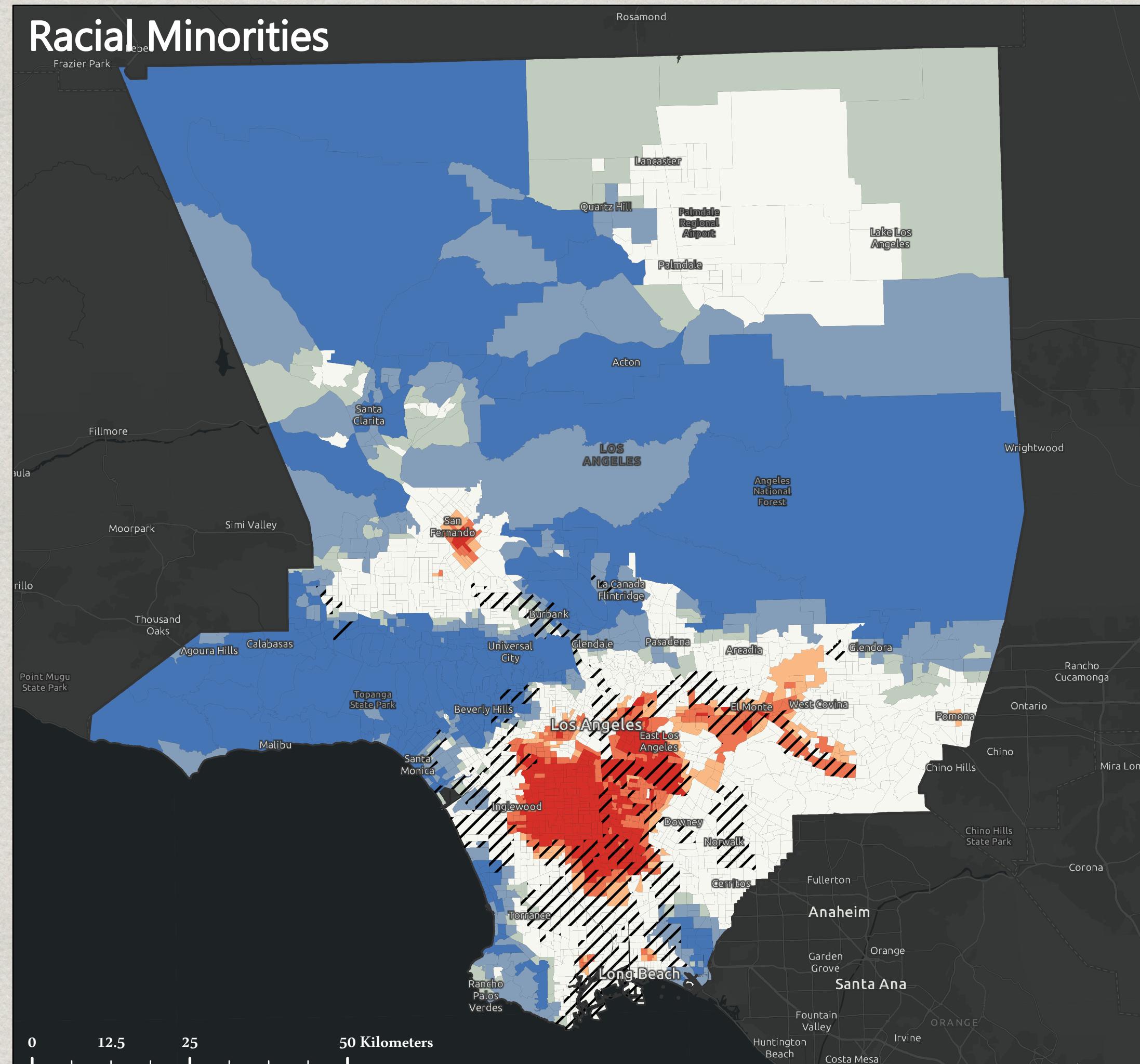


**Hot spots Analysis**

- Cold Spot - 99% Confidence
- Cold Spot - 95% Confidence
- Cold Spot - 90% Confidence
- Not Significant
- Hot Spot - 90% Confidence
- Hot Spot - 95% Confidence
- Hot Spot - 99% Confidence

▨ Concentration of hazardous Waste

## Ground water threats and Hot spots analysis of Vulnerable communities



**Hot spots Analysis**

- Cold Spot - 99% Confidence
- Cold Spot - 95% Confidence
- Cold Spot - 90% Confidence
- Not Significant
- Hot Spot - 90% Confidence
- Hot Spot - 95% Confidence
- Hot Spot - 99% Confidence

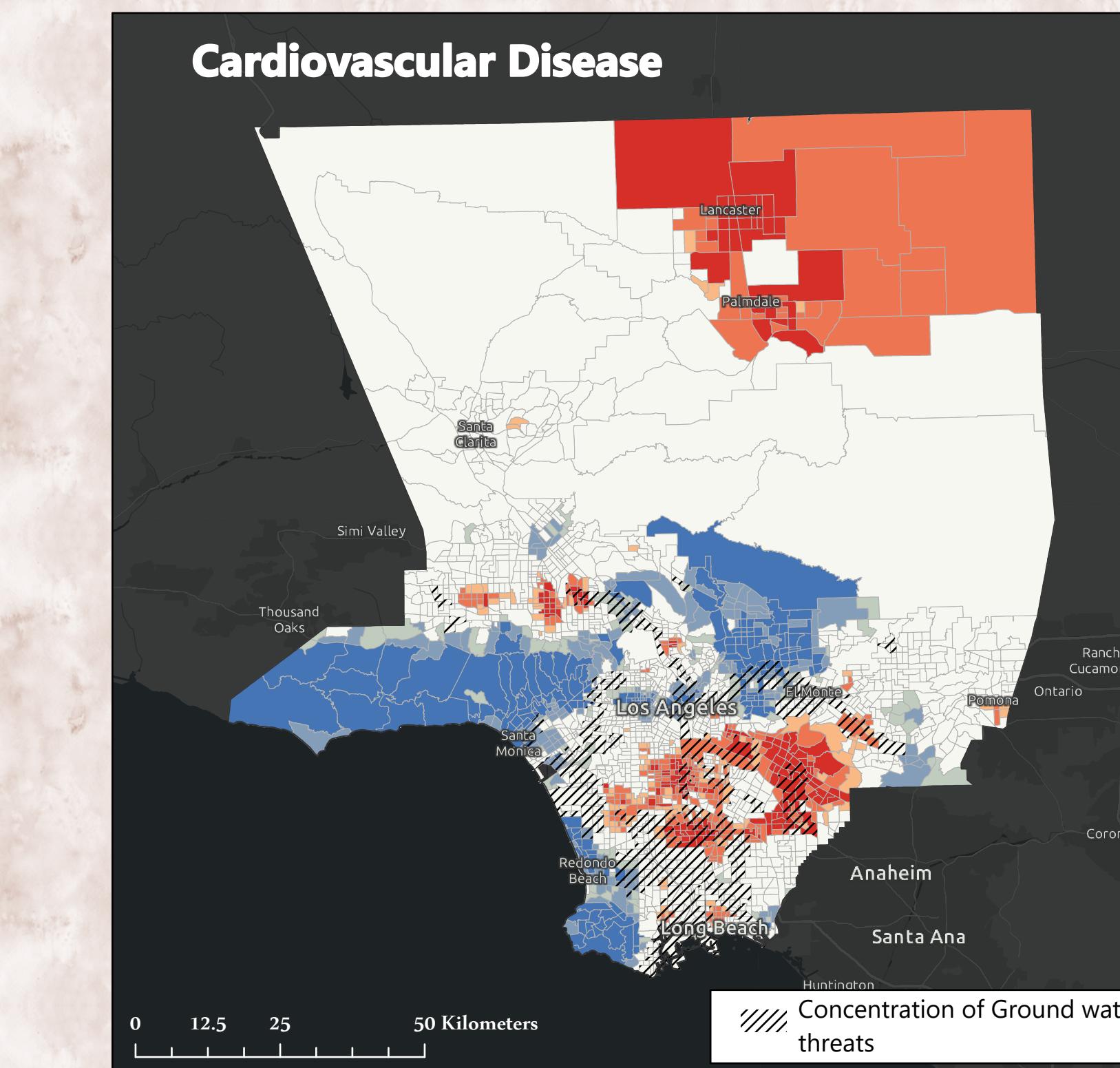
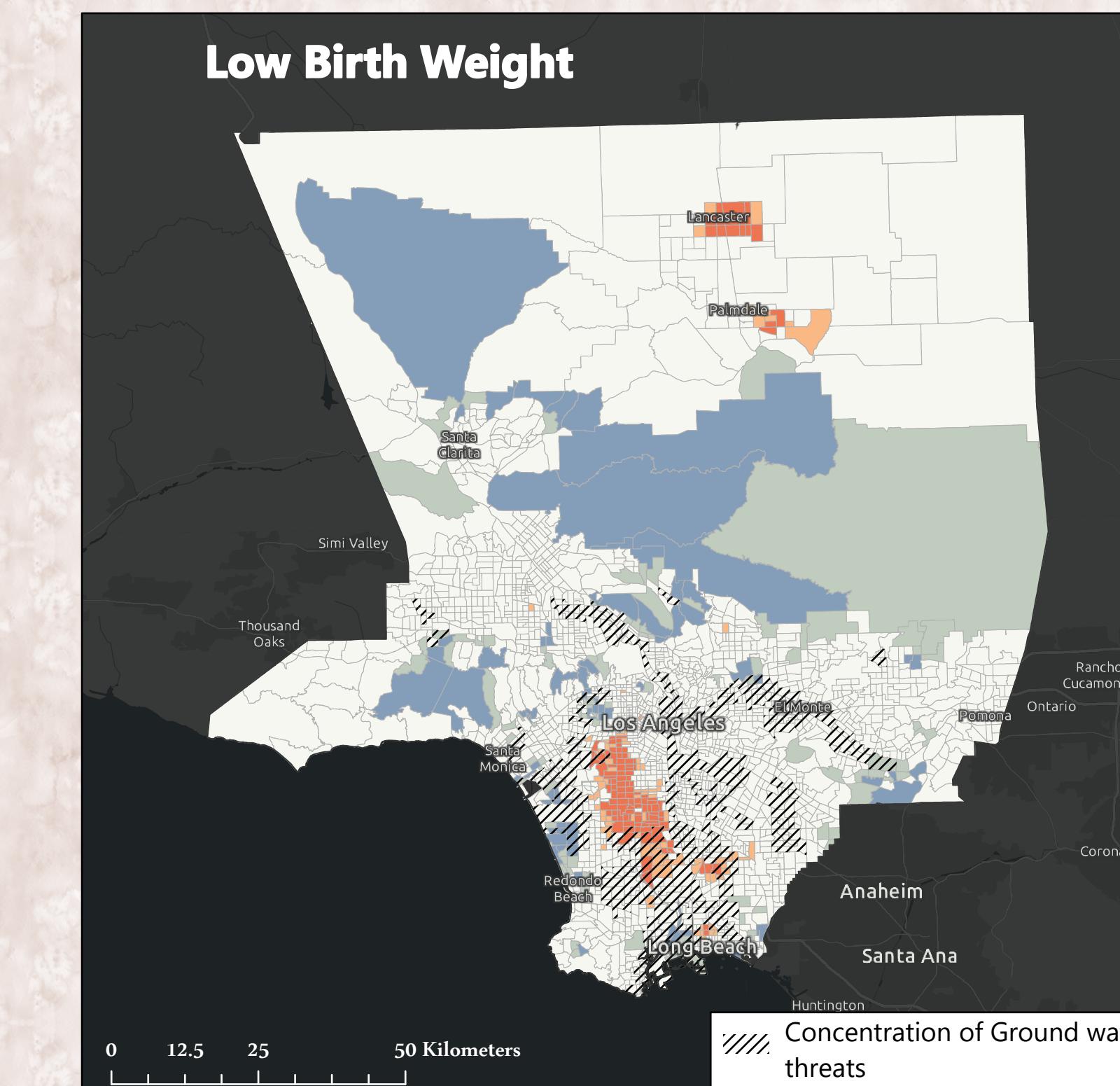
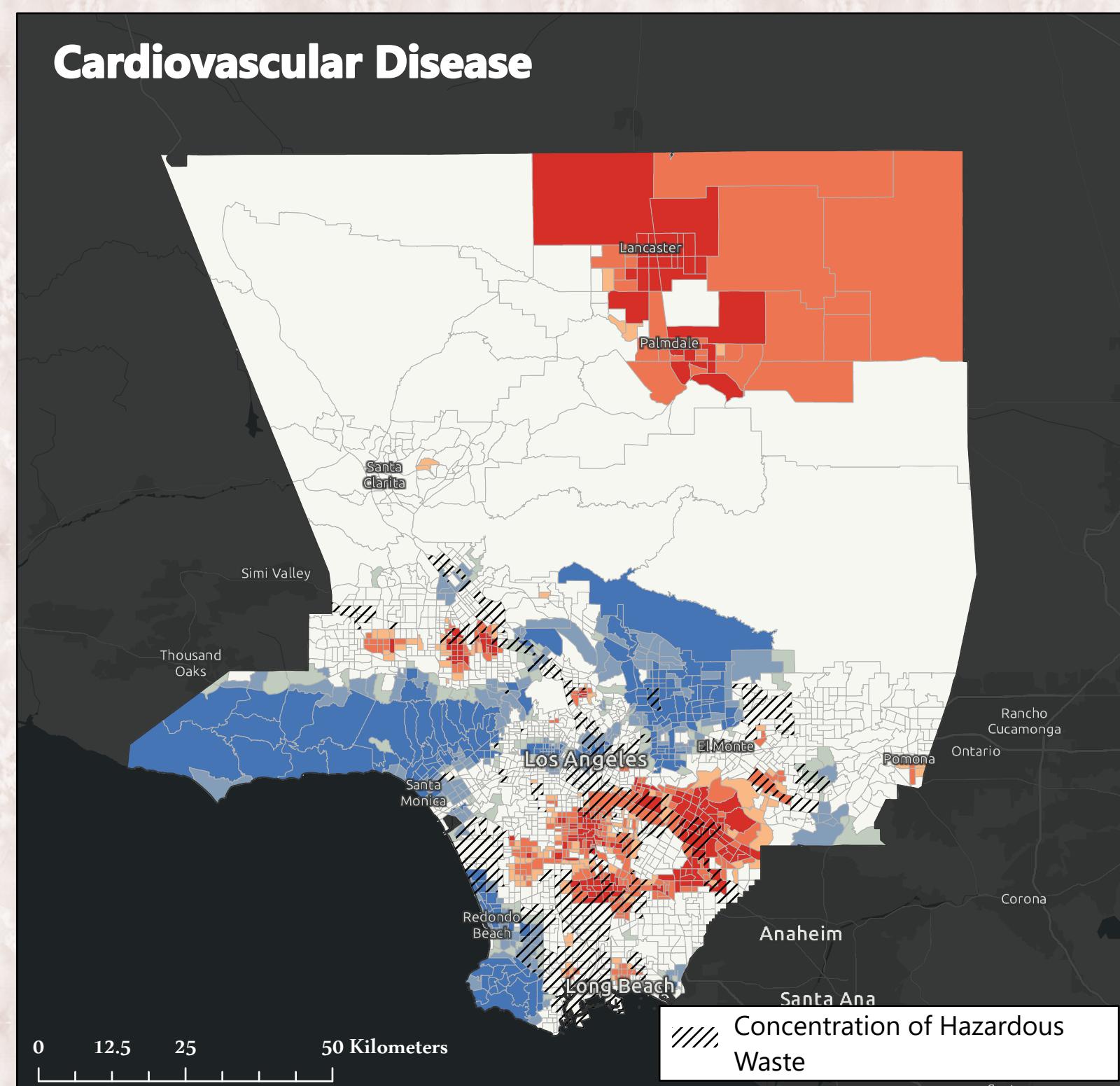
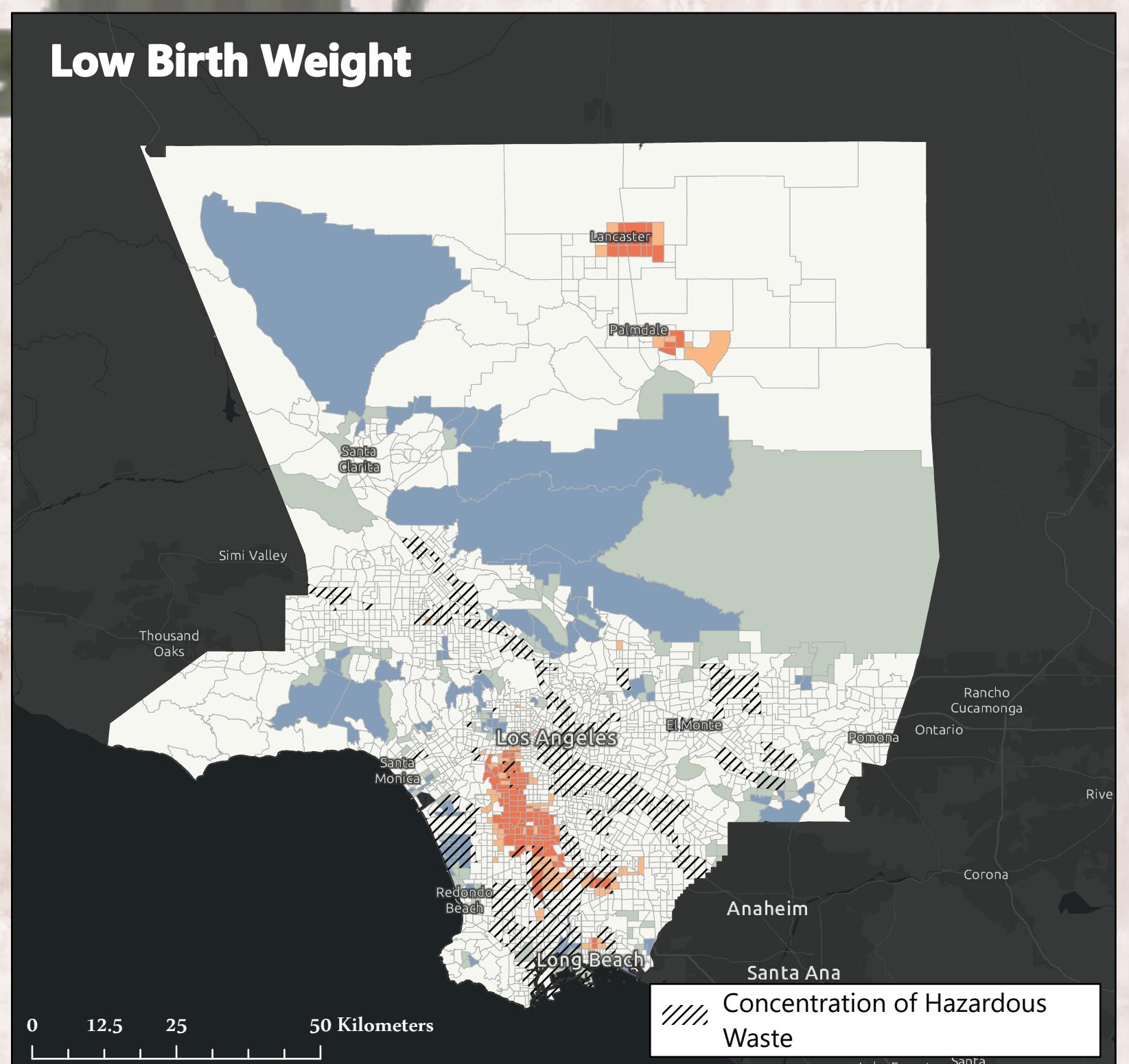
▨ Concentration of Ground water threats

The relationship between median family income and concentration of hazardous waste and groundwater threats is nonlinear according to this study. However, from the spatial analysis, it is evident that higher pollution threats are found in impoverished communities (Median Family Income < \$70,221). The most affluent communities have the economic and political power to oppose the siting of such facilities in their own neighbourhoods and can move to less affected areas. In these studies, however, race is still strongly associated with the locations of hazardous facilities. Median Family Income and White population hotspots are similar and do not coincide with the hazardous waste and ground water pollution.

Discrimination against minorities in the housing market (segregation) can be emblematic of a number of factors that tend to make minorities more vulnerable to such contaminants. Therefore, the sense of ethnicity, rather than ethnicity itself, can be viewed as a risk factor. Hazardous waste facilities in minority areas are have fewer regulatory compliance and greater leniency in the case of environmental justice. These areas are known as sacrifice zones (zones where the land has been permanently impaired by either economic divestment or environmental damage), and it is almost a given that where they are situated and how they operate are out of sight and out of mind for the affluent.

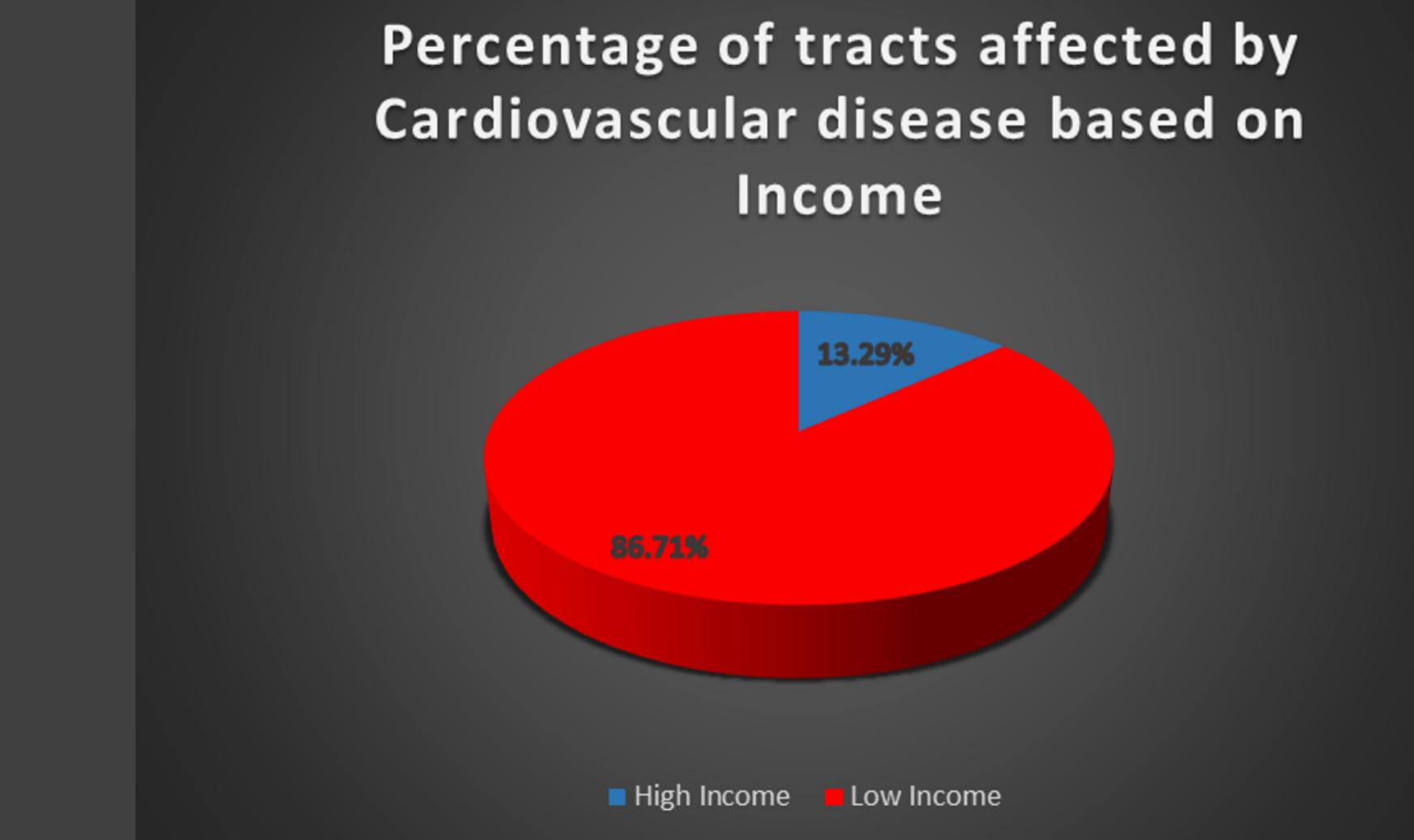
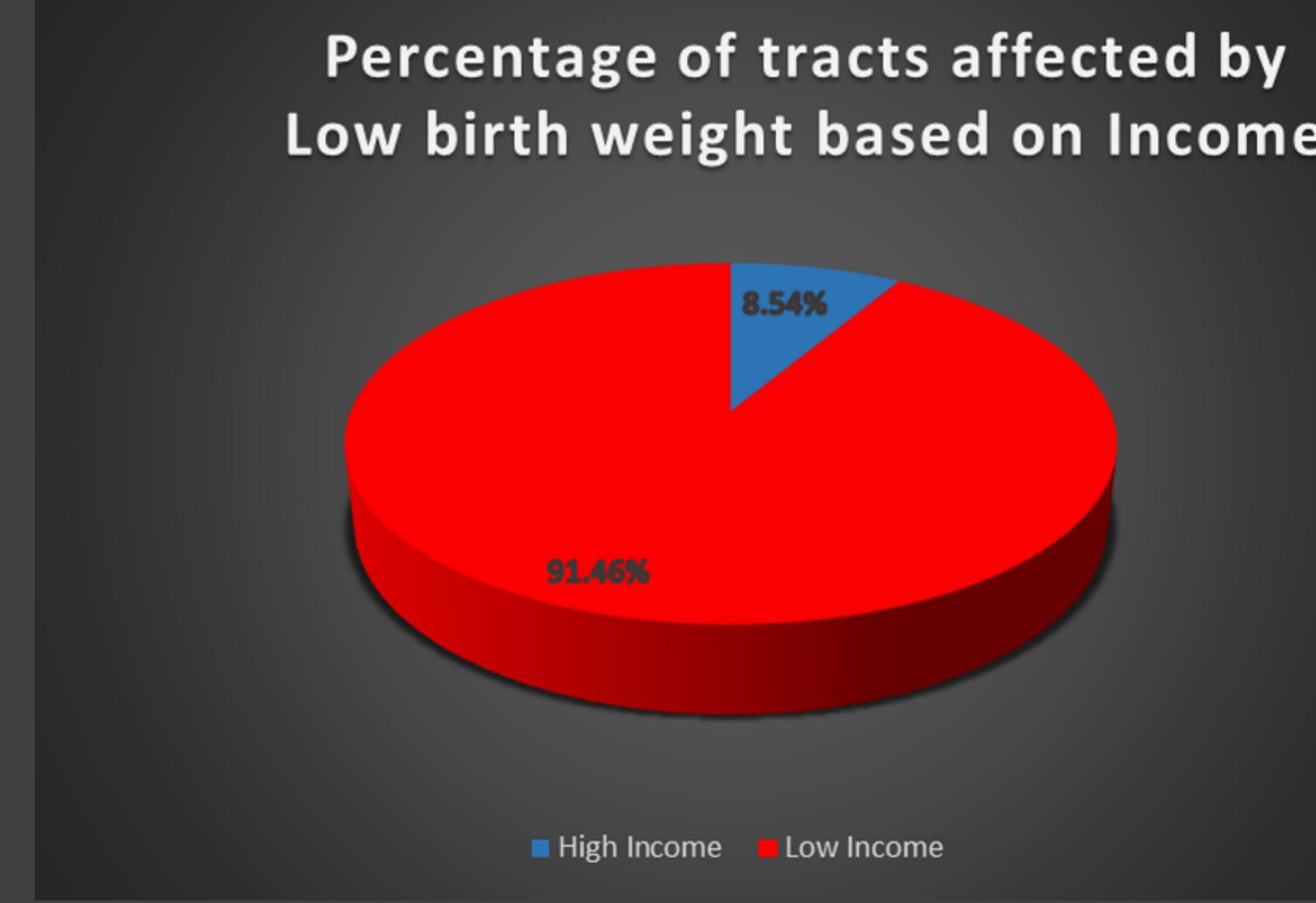
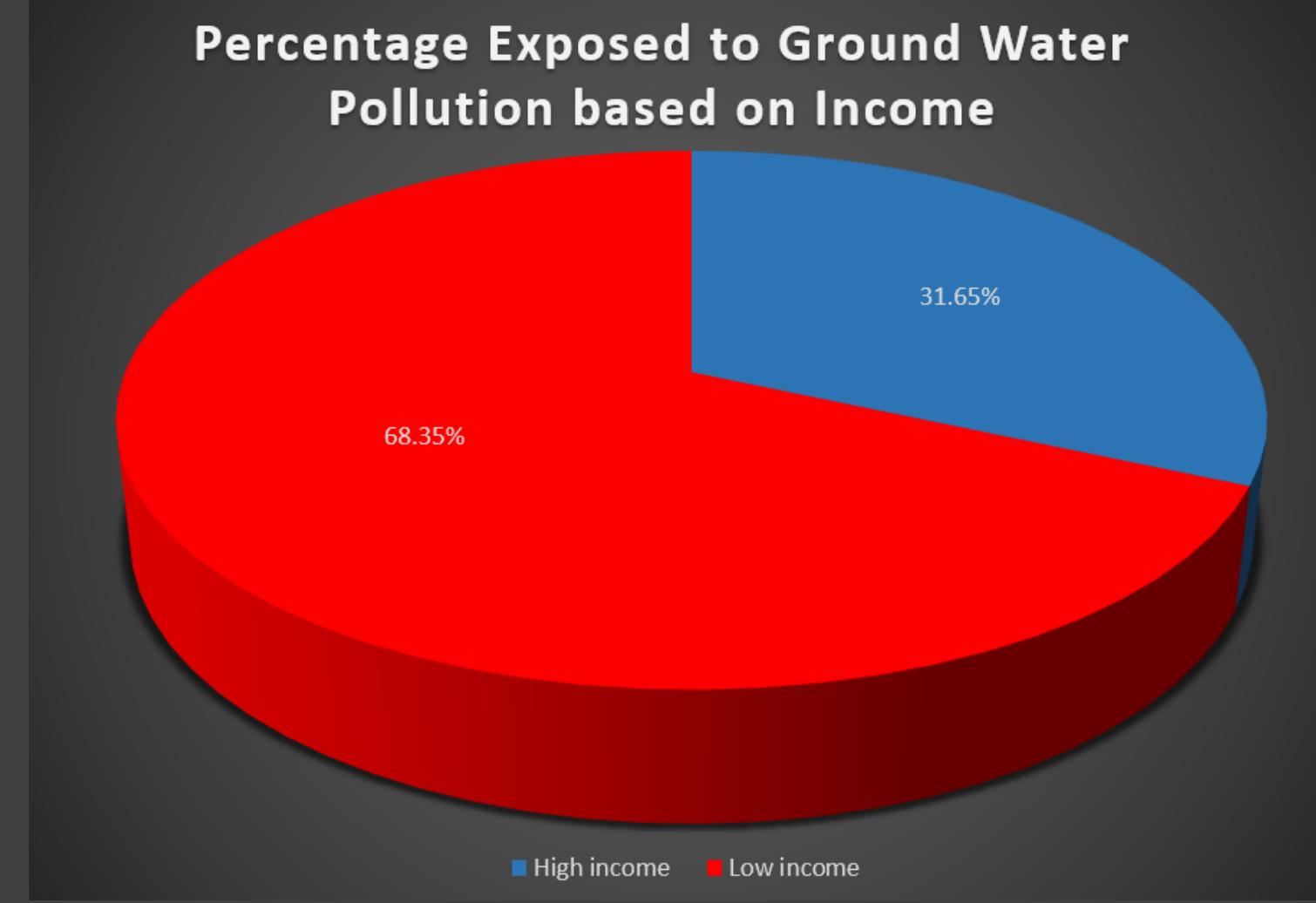
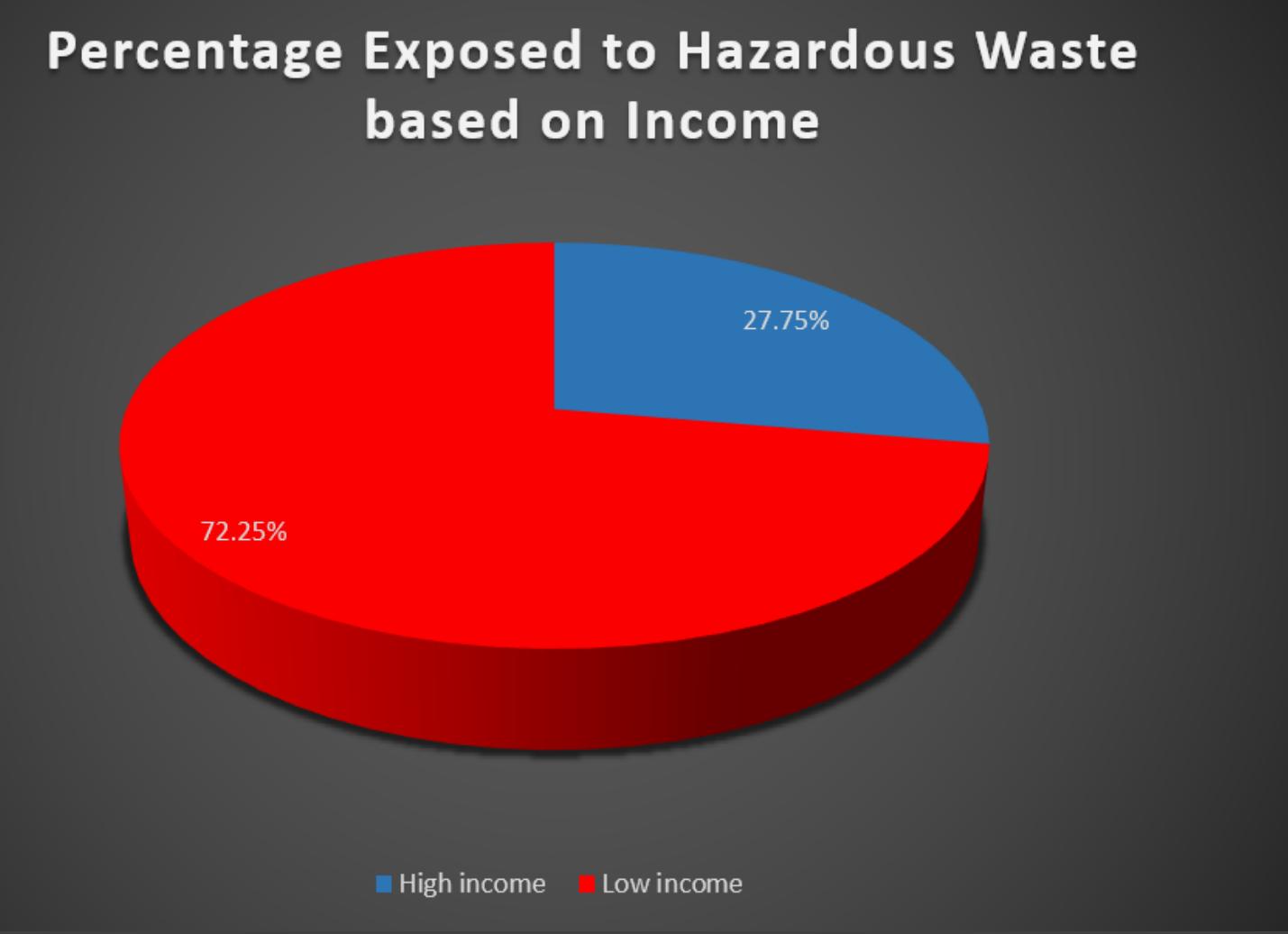


# Prevalent Rate of Low Birth Weight and Cardiovascular disease

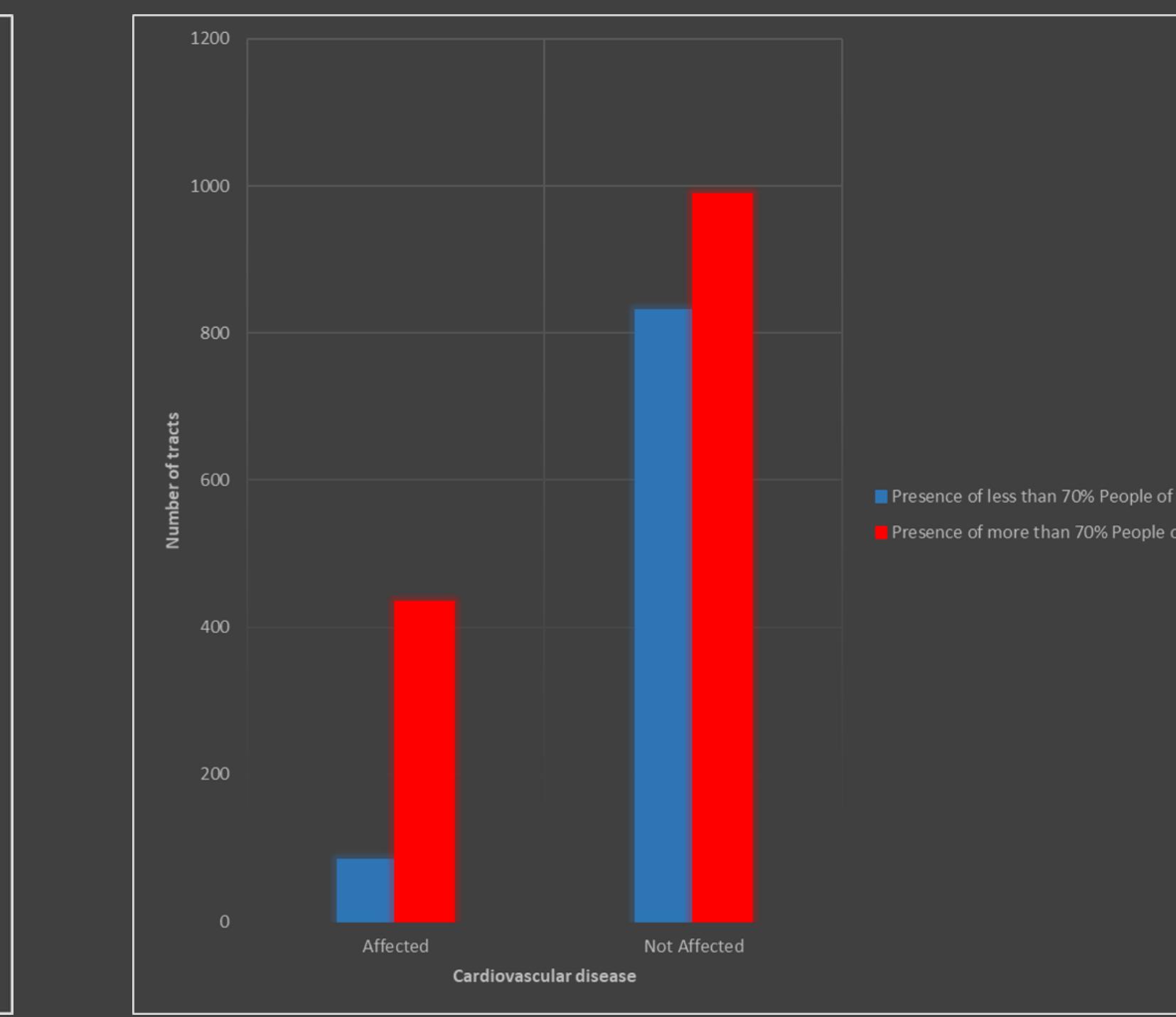
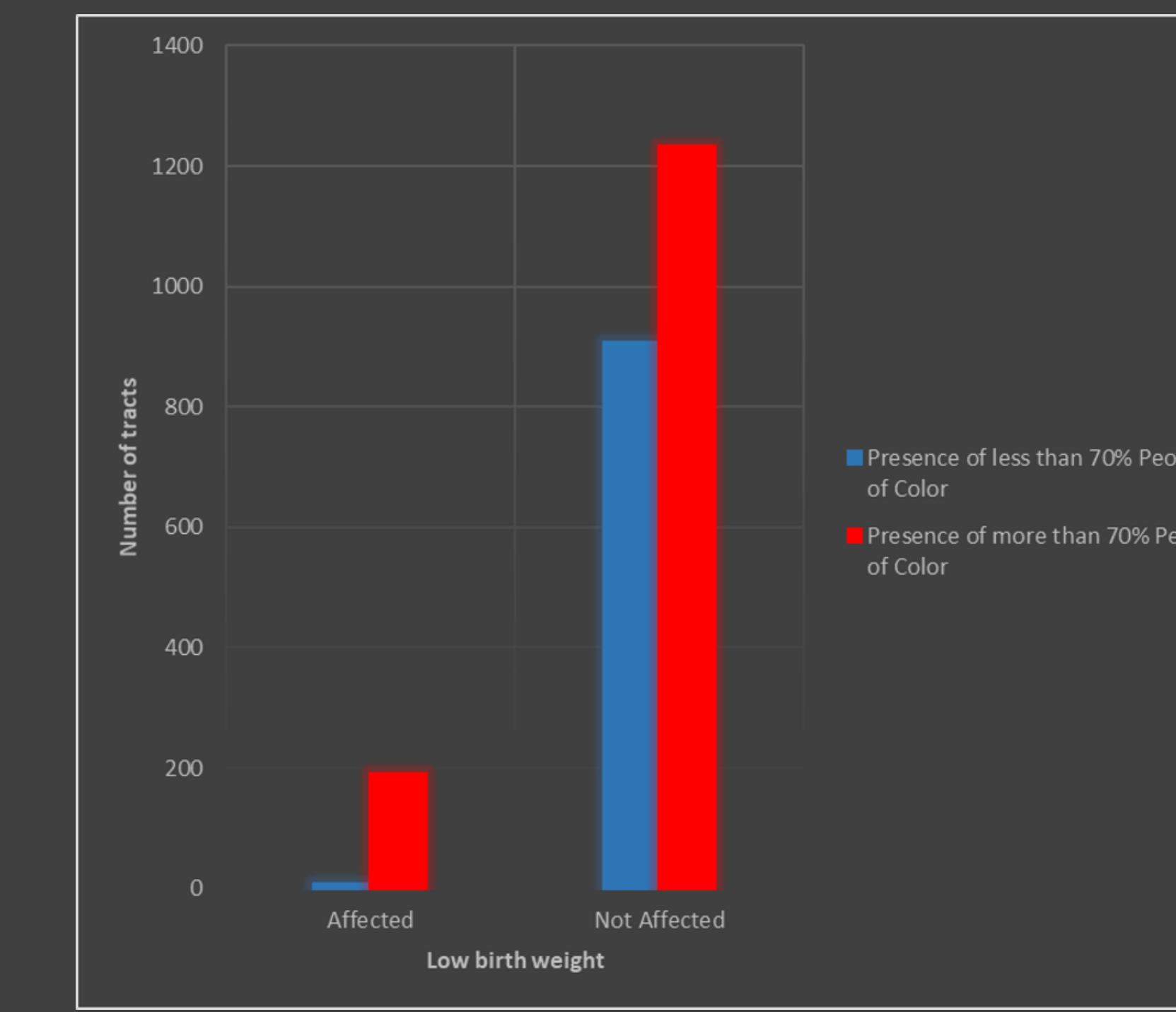
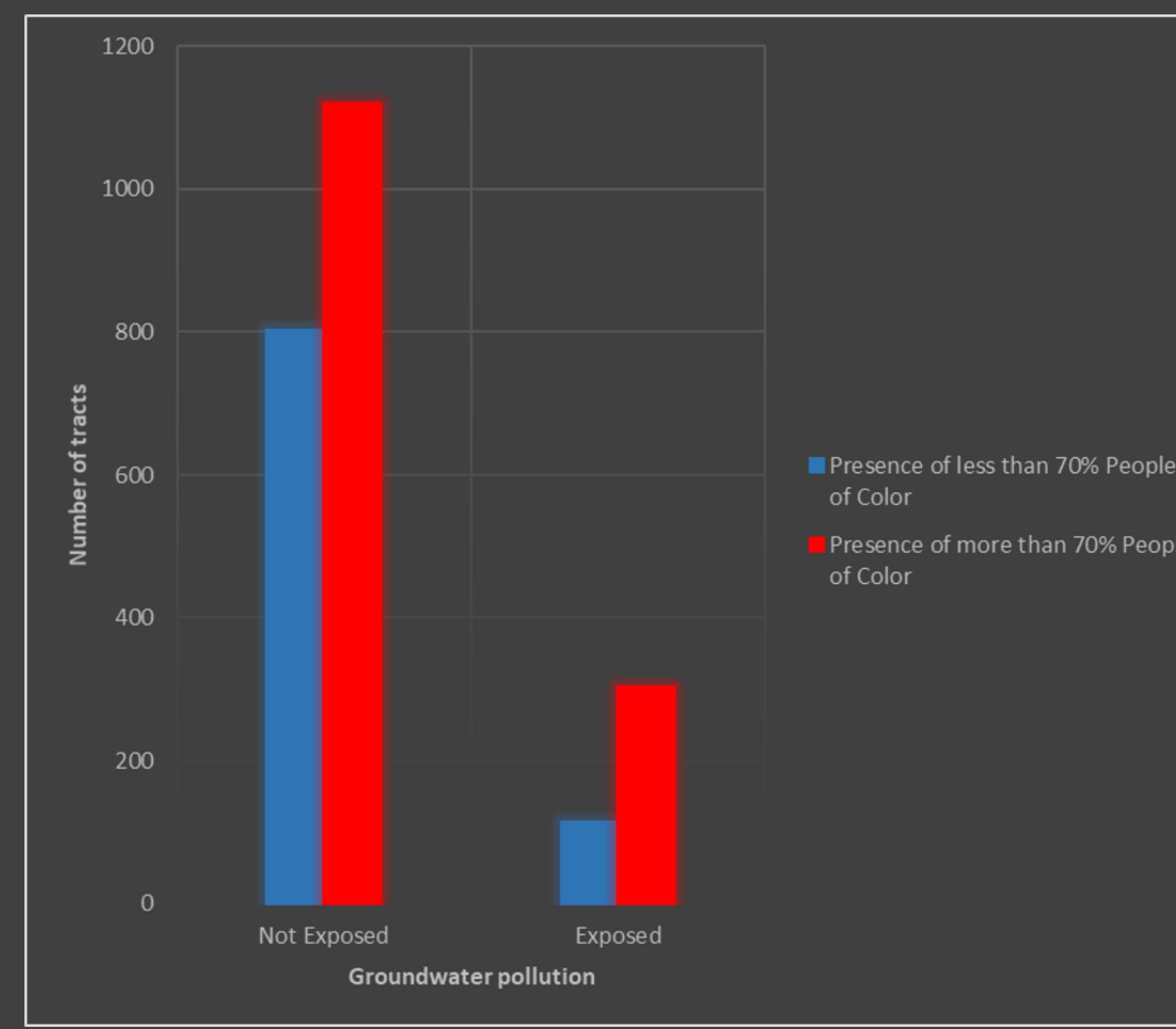
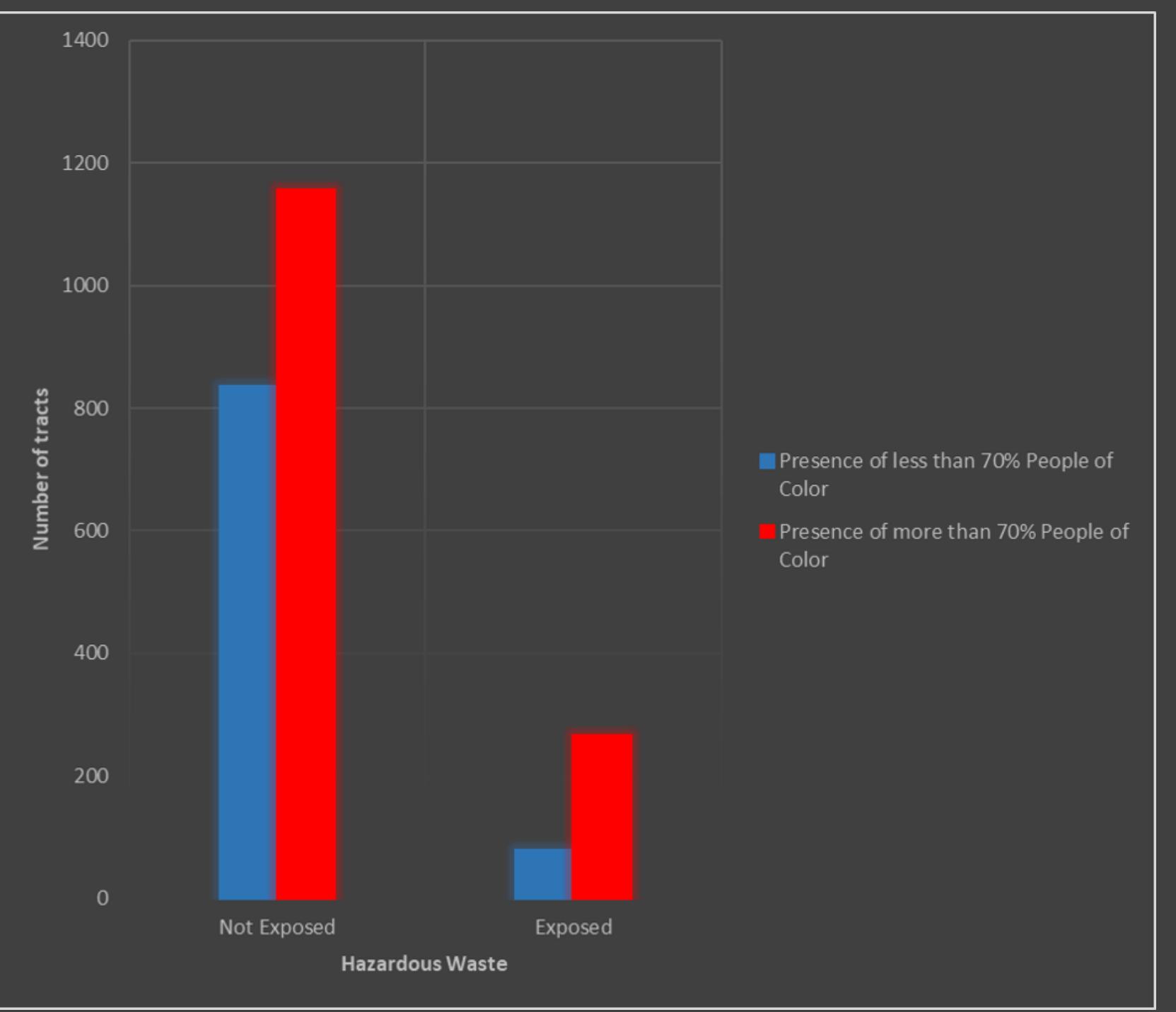
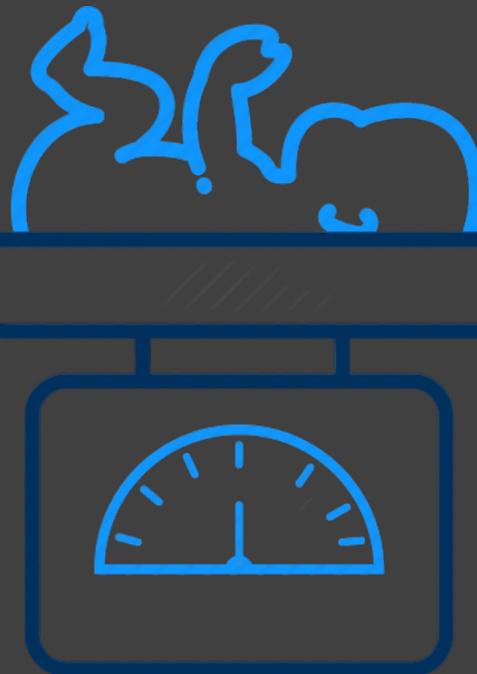


**Hot spots Analysis**

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- Cold Spot - 90% Confidence
- Not Significant
- Hot Spot - 90% Confidence
- Hot Spot - 95% Confidence
- Hot Spot - 99% Confidence



From the pie chart, we can observe that low-income families are the most exposed to both hazardous waste facilities and ground water threats. Additionally, you can see that these communities are also the most areas with the highest case of low birth weight as well as highest rate of emergency department visits for heart attacks.



These bar chart shows those exposed to hazardous waste facilities and groundwater threats. Within these charts, in tracts that are affected, the racial background was visualized. About 77.17% of tracts inhabited predominantly by People of Color are exposed to hazardous waste while 72.90% of tracts in People of Color neighborhoods are exposed to ground water threats. It was also found that 95.98% of these classes coincided with areas of low birth weight and 83.82% coincided with areas of high emergency department visits for heart attacks.