

MOBILITY & SOCIAL VULNERABILITY INDEX

a presentation by Render Mages

TEAM RENDER MAGES

**EXAMINING THE RELATIONSHIP
BETWEEN MOBILITY AND SOCIAL
VULNERABILITY INDEX DURING A
PANDEMIC**

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GOALS

- Explore the relationship between changes in mobility and social vulnerability score (SVI) in Austin, Texas
- Determine if this relationship is dependent on mobility restrictions

PROJECT PLAN

- Select the appropriate time period
- Compare how mobility is different from selected dates to other times
- Evaluate the relationship between SVI and Mobility
- Verify the evaluations to show a general pattern
- Review calculations to improve results

ROLES



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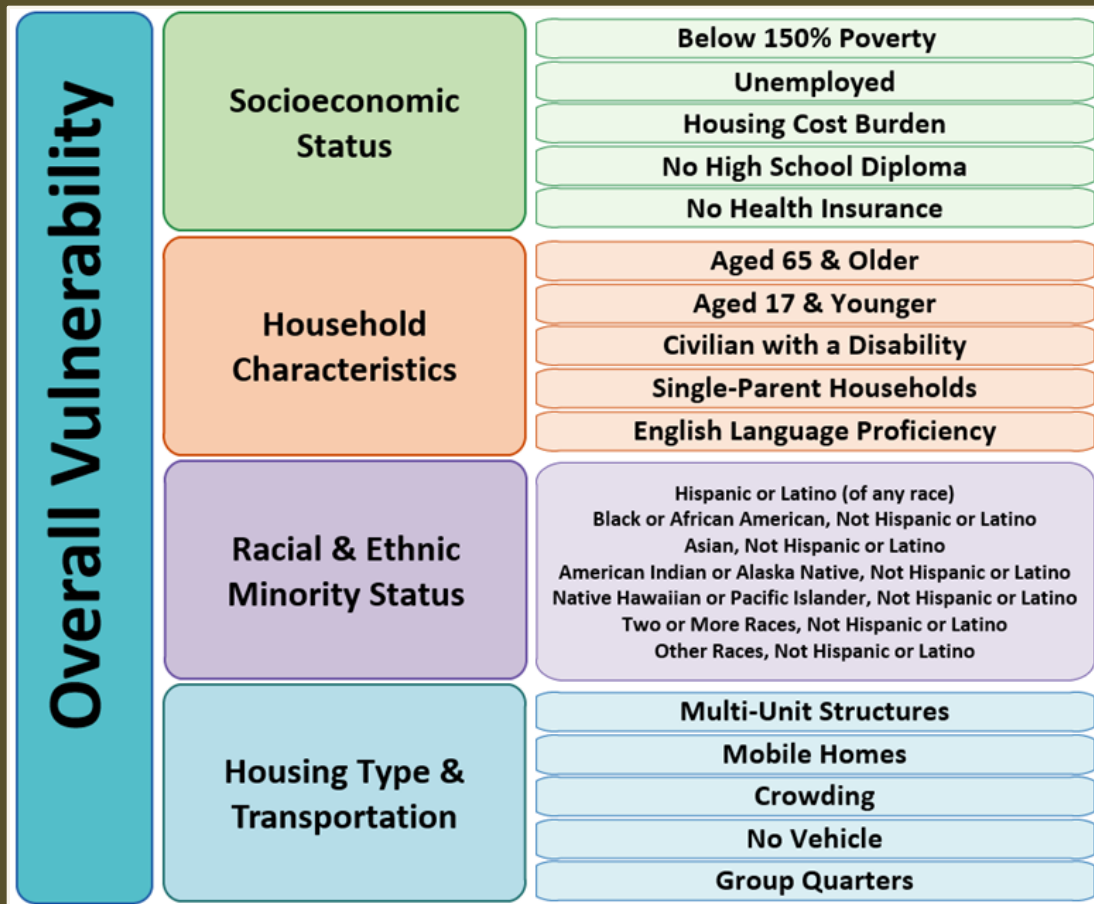


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Mentor



EMMA BUKOSWKI
Mentor

SOCIAL VULNERABILITY INDEX



Source: CDC/ATSDR Social Vulnerability Index (SVI), n.d.)

- Social Vulnerability Index Definition - a tool used to estimate the risk to lives and livelihoods within a community when faced with external stressors such as a natural disaster, pandemic, or human-caused disaster (*CDC/ATSDR Social Vulnerability Index (SVI)*, n.d.; Fox et al., 2023; Mah et al., 2023)
- SVI evaluates 16 social factors, including racial and ethnic minority status, unemployment, and disability, and groups them into four main themes. Each community is ranked per variable and for each of the four themes. Each community also receives an overall ranking (*CDC/ATSDR Social Vulnerability Index (SVI)*, n.d.).

MEAN SVI SCORES BY AREA OF CITY

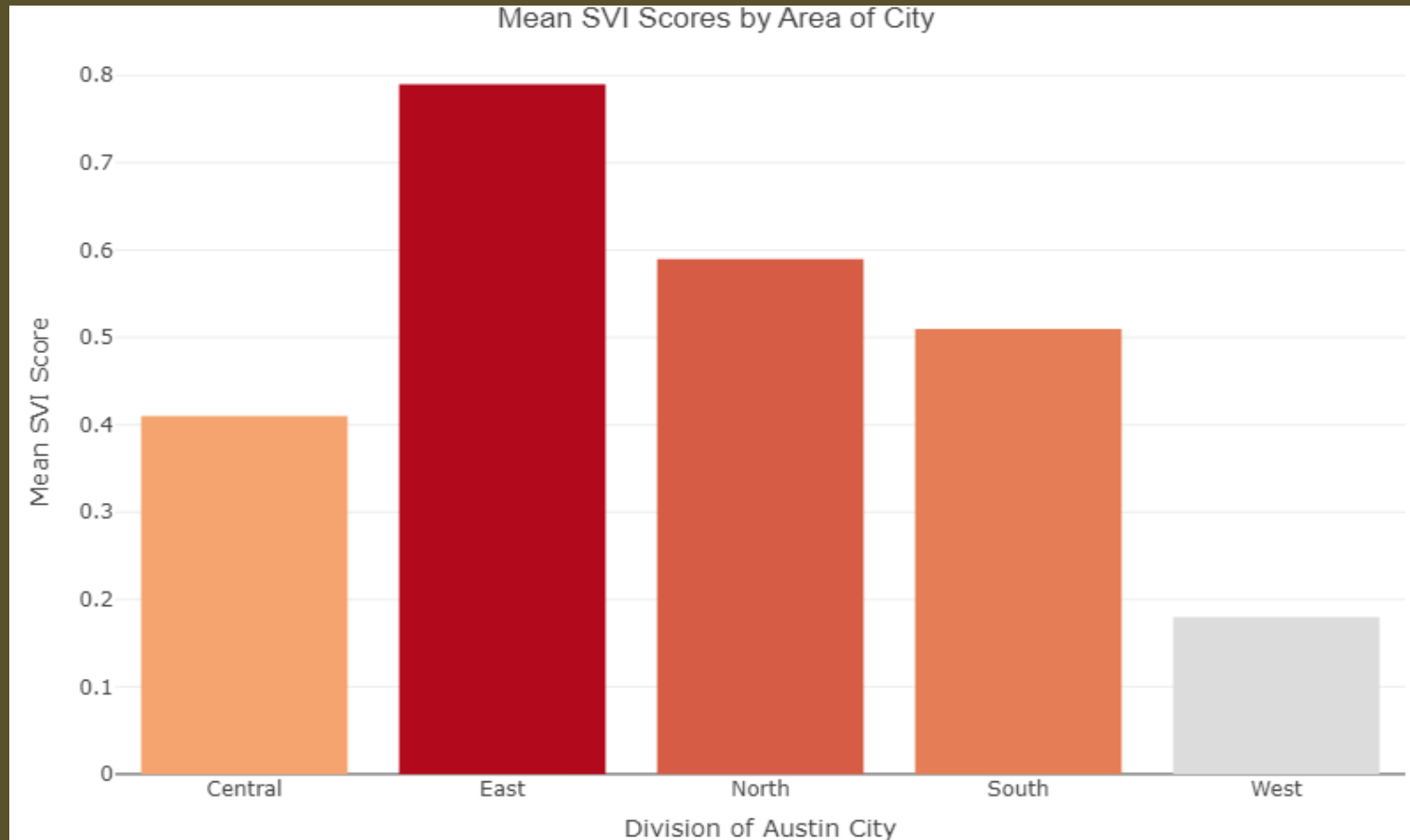


Figure 1: Mean SVI score by Area of City

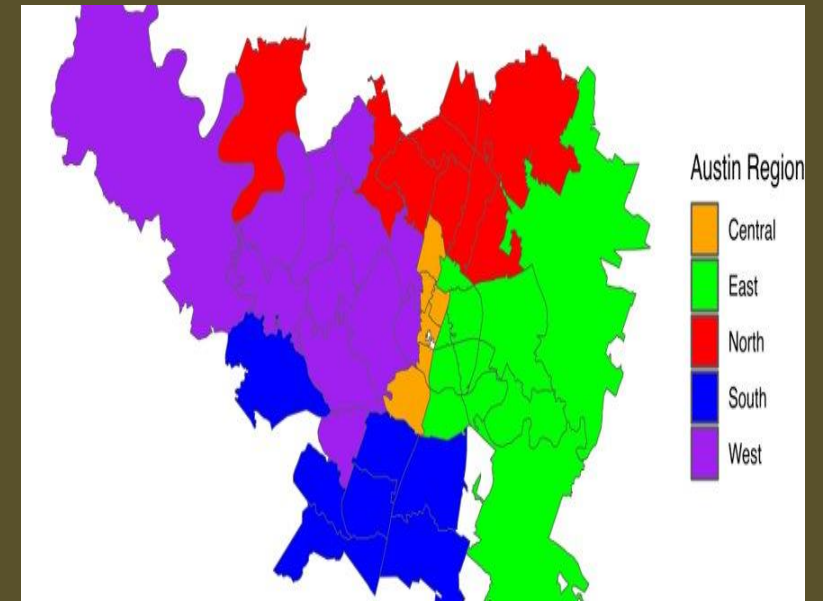
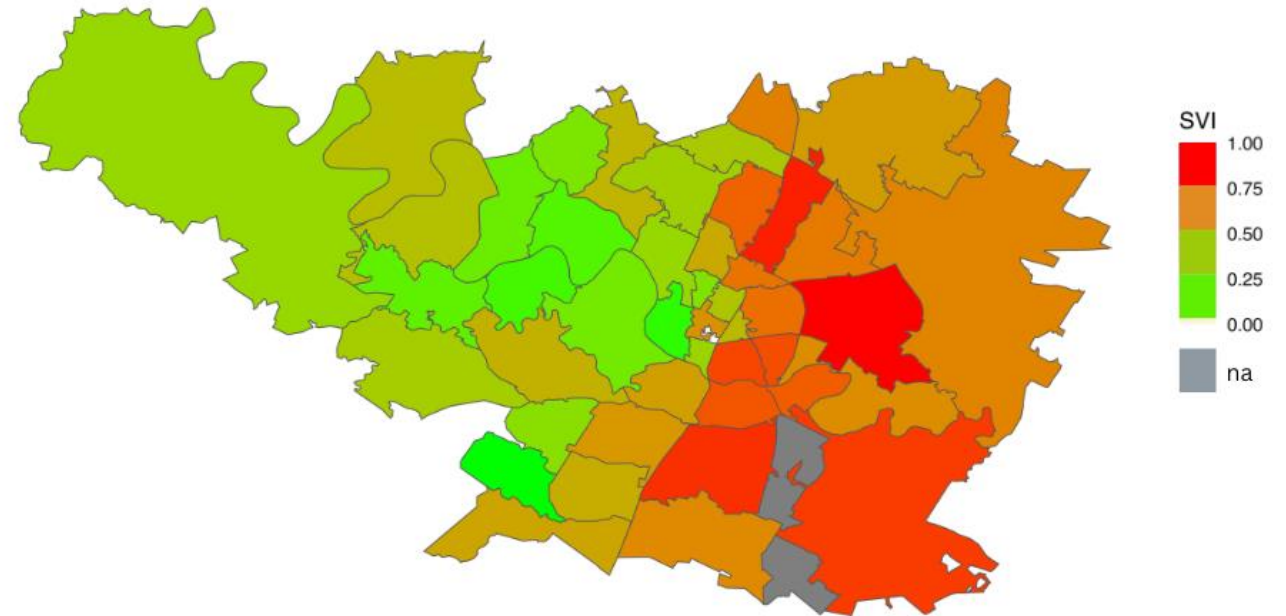


Figure 2: Austin area divided into regions

SVI SCORE & RESOURCES

Figure 3: SVI by zip code in Austin, Texas. Increased color saturation indicates a higher SVI, which is associated with decreased community resilience when exposed to an external stressor.



JANUARY – DECEMBER 2019/2020

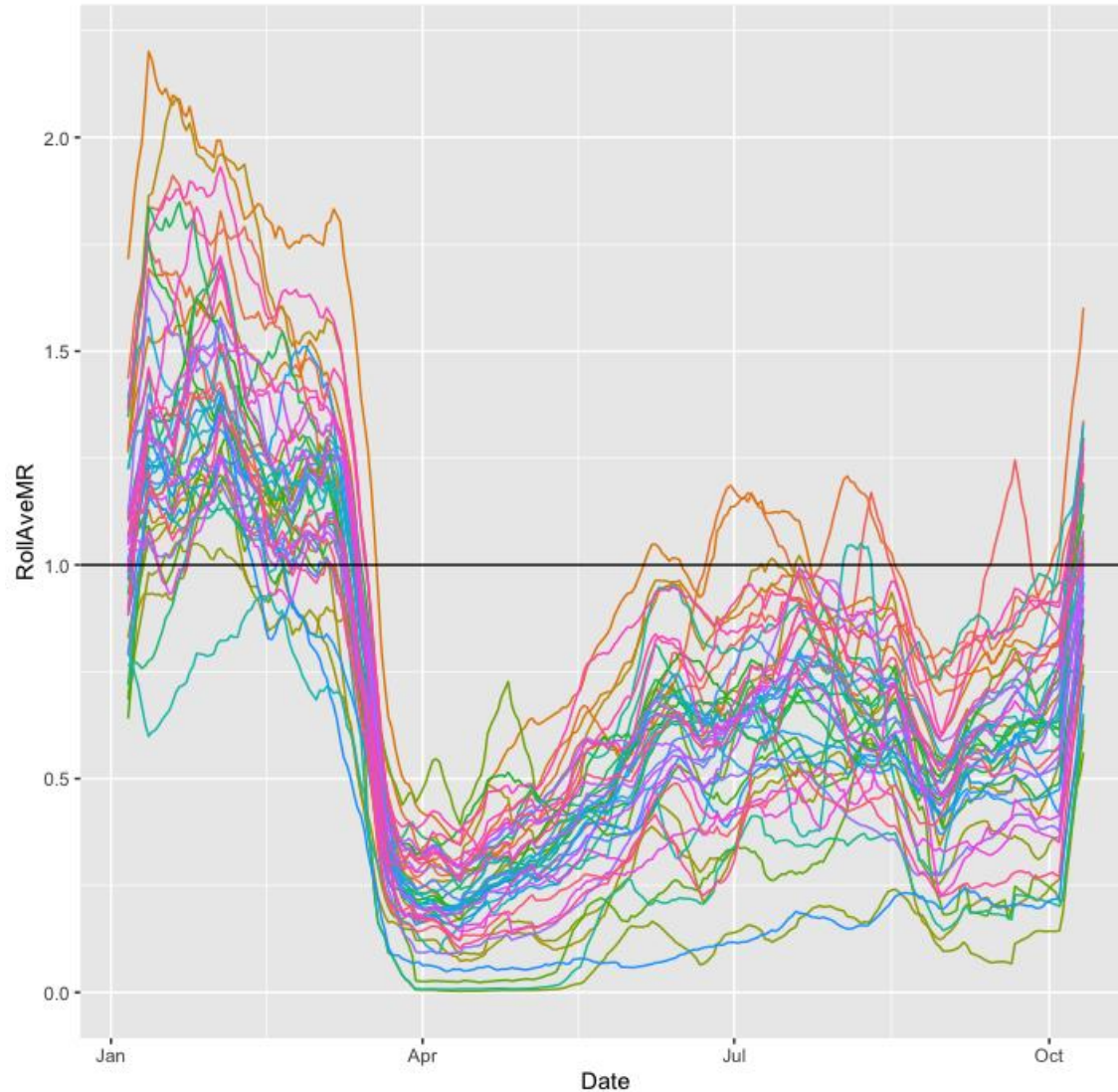
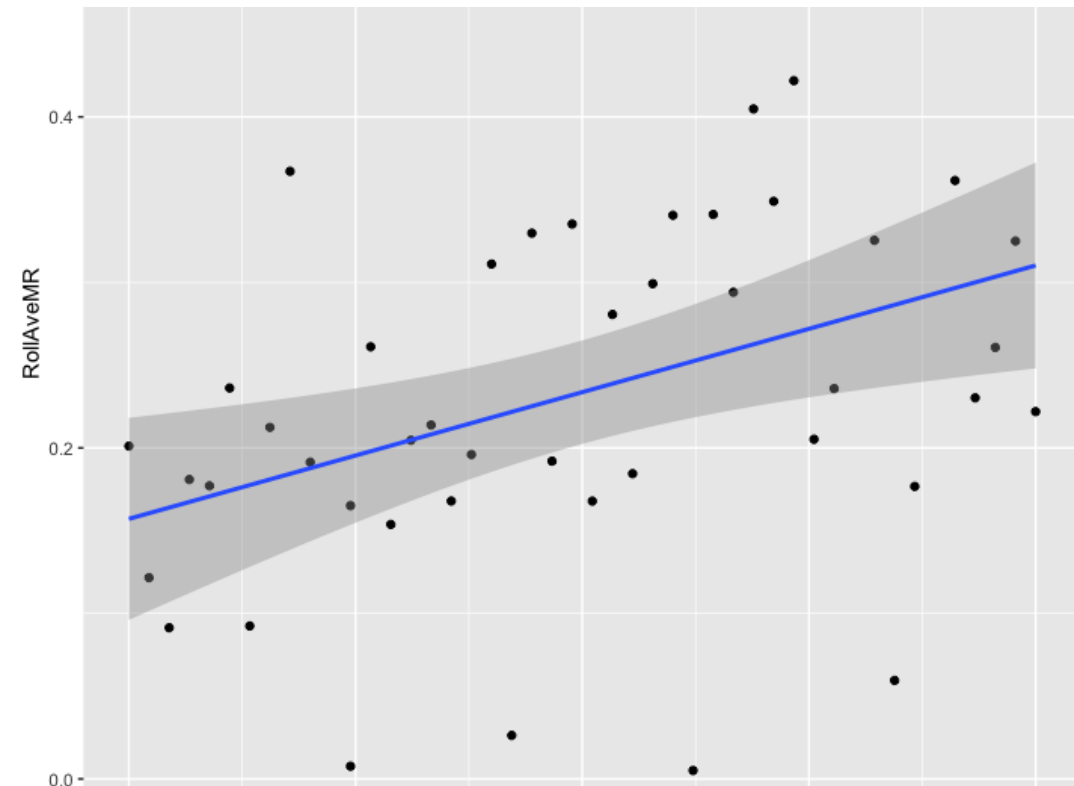
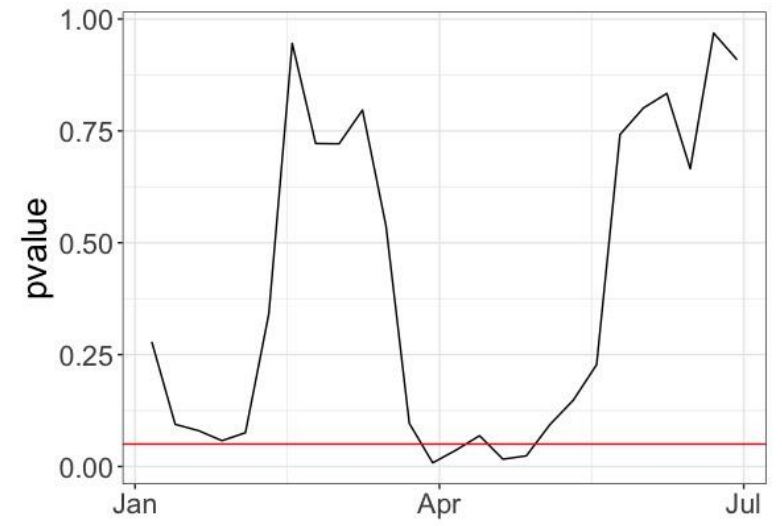
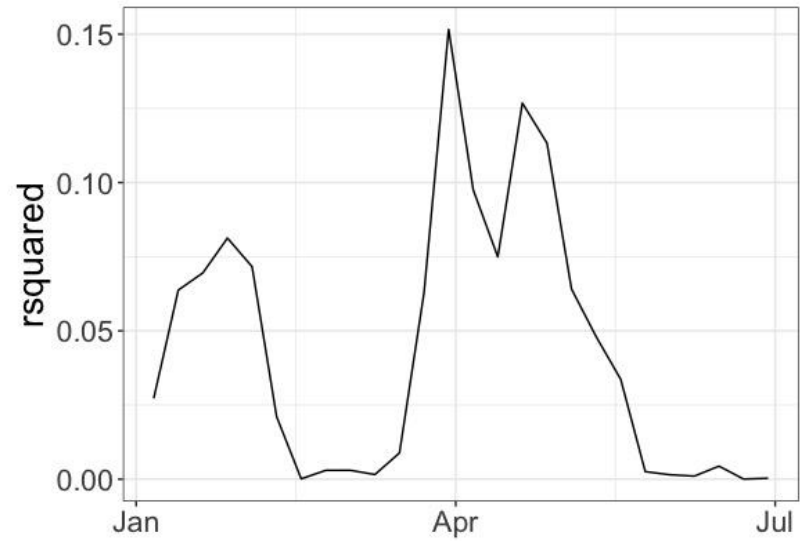
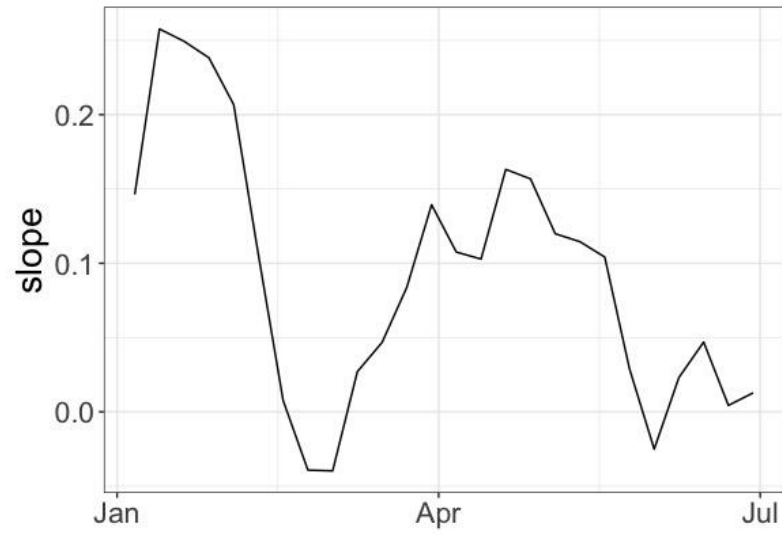
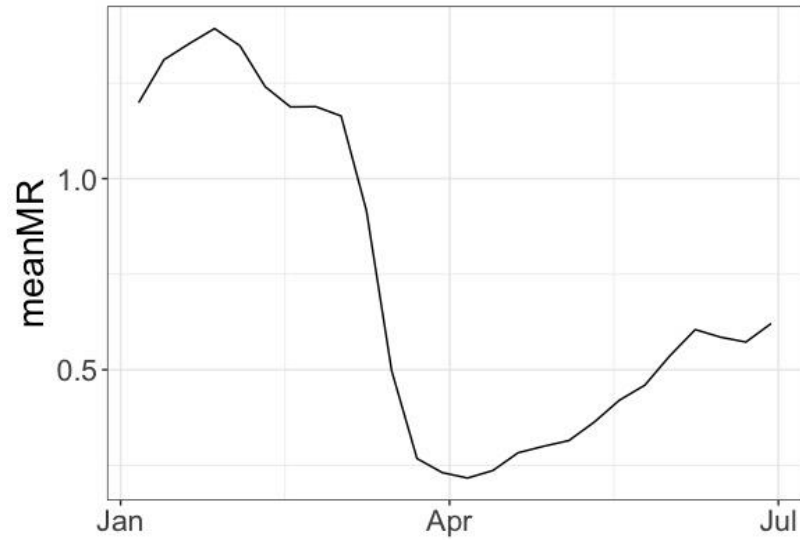


Figure 4: Mean mobility ratio by zip code from January to October 2020. Austin declared a state of emergency on March 6, 2020, and a stay-at-home order was issued on March 24, 2020. This is demonstrated as the sharp decline in mobility ratio across all zip codes, noting that some zip codes experienced increased mobility restriction compared to others.

2020 DATA AND CHARTS

Figure 5: Linear regression of mean Mobility Ratio by SVI score for the week of April 6, 2020. This indicates that more vulnerable zip codes (high SVI) had higher mobility than less vulnerable zip codes (low SVI) during this week.

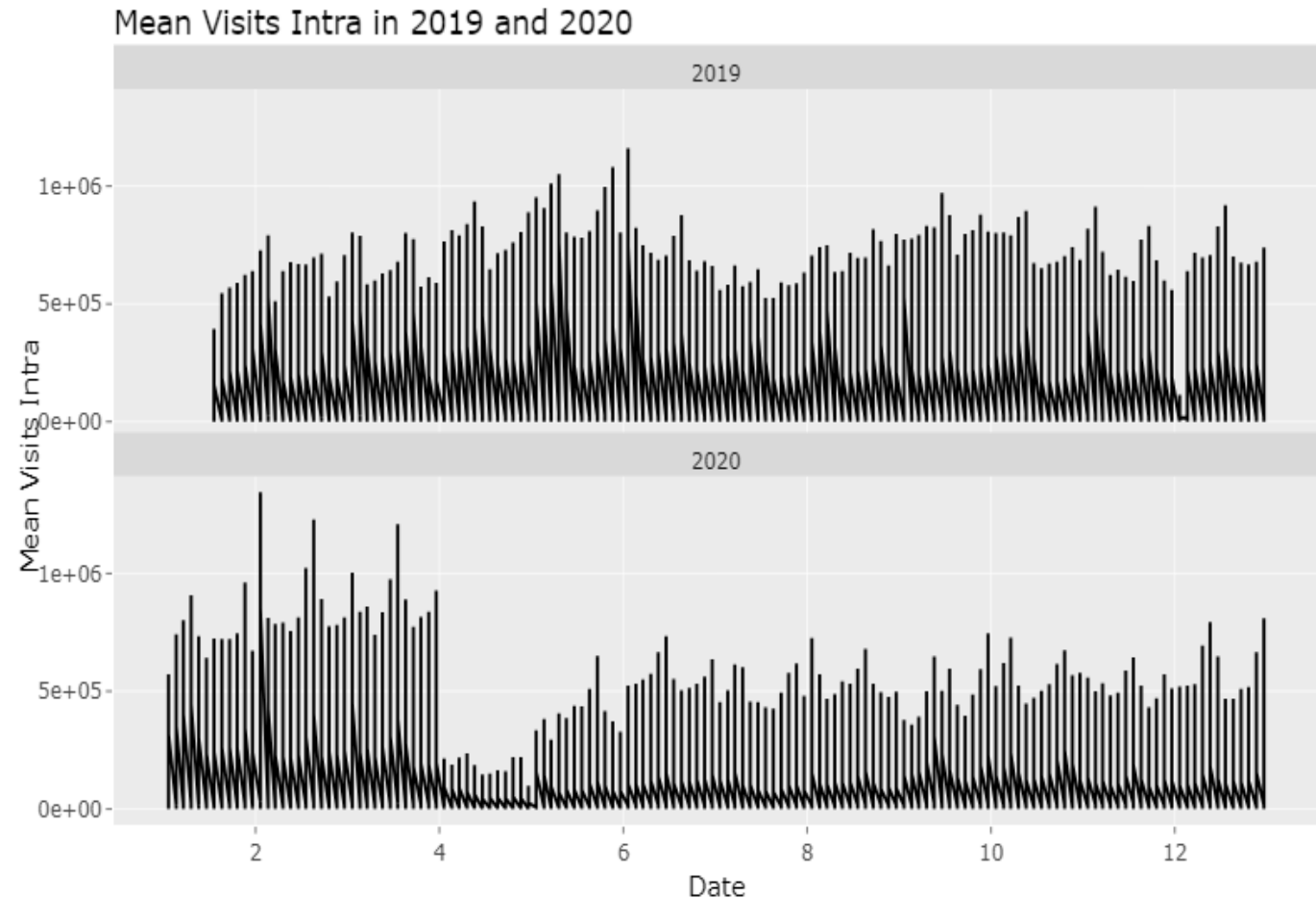




PLOTS OF COEFFICIENTS

2019 & 2020 DATA

As expected, mobility dropped considerably in 2020, especially between April and May, when the COVID-19 restrictions set in



BASED ON OUR CALCULATIONS, FOR THE MONTH OF APRIL, 2020 THERE IS A STATISTICALLY SIGNIFICANT CORRELATION BETWEEN MOBILITY AND SVI, WHICH IS DEPENDENT ON MOBILITY RESTRICTIONS. FURTHER ANALYSIS IS NEEDED TO DETERMINE IF THIS CORRELATION WAS CONSISTENT DURING THE ENTIRE TIMEFRAME IMPACTED BY COVID-19. WE ALSO SHOWED AREAS OF HIGH VULNERABILITY INDEX ARE REGIONAL IN AUSTIN, WITH HIGHEST VULNERABILITY NOTED IN AREAS THAT ARE HISTORICALLY DISADVANTAGED. HOSPITAL FACILITIES ARE ALMOST EXCLUSIVELY LOCATED ON AREAS OF LOW VULNERABILITY.

CONCLUSIONS

FUTURE WORK

WE DID SHOW A SIGNIFICANT POSITIVE CORRELATION FOR THE WEEK OF APRIL 6TH, 2020 BETWEEN MOVEMENT AND LOW SVI SCORE. FURTHER ANALYSIS IS NEEDED TO DETERMINE IF THIS CORRELATION WAS CONSISTENT DURING THE TIMEFRAME IMPACTED BY COVID-19. WE ALSO SHOWED AREAS OF HIGH VULNERABILITY INDEX ARE REGIONAL IN AUSTIN, WITH HIGHEST VULNERABILITY NOTED IN AREAS THAT ARE HISTORICALLY DISADVANTAGED. HOSPITAL FACILITIES ARE ALMOST EXCLUSIVELY LOCATED ON AREAS OF LOW VULNERABILITY.

COMMUNITY IMPACT

FUTURE RESOURCE ALLOCATION SHOULD FOCUS ON IMPROVING EQUITY OF DISTRIBUTION ACROSS ALL REGIONS OF AUSTIN, WITH PARTICULAR FOCUS ON AREAS OF HIGH VULNERABILITY INDEX.

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THANK YOU

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