Supporting Rape Victims and Informing Policies with Spatial Data Science

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Motivation: some facts…

- Only ~**30%** of all sexual assault is **reported** [1]
- Around **35%** of all women have experienced **sexual assault** [2]
- The longer victims delay reporting of sexual assault, **the more unlikely the crime becomes to be reported** at all [3]
- Longer reporting delays make it harder to **catch, prosecute and convict perpetrators** and **provide victims with needed resources**

[1] RAINN. The Criminal Justice System: Statistics, 2014.
[2] Mumsnet. 'We Believe You' Campaign: Rape and Sexual Assault Survey, 2012.
[3] Iva A.E. et al. Predictors of delayed disclosure of rape in female adolescents and young adults. *European Journal of Psychotraumatology.* 2015.
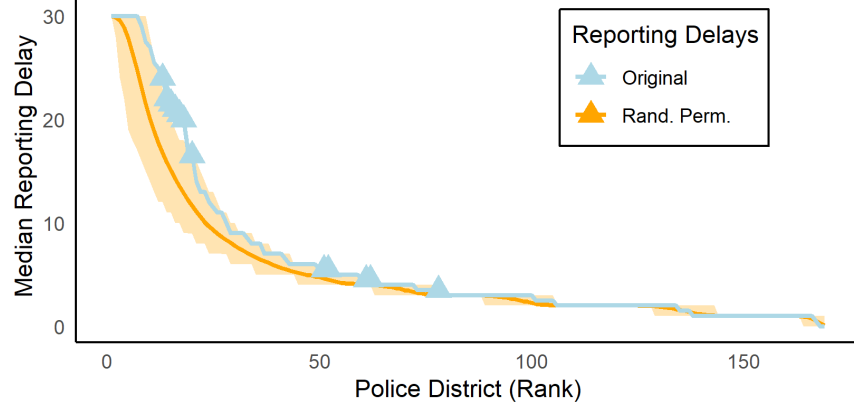
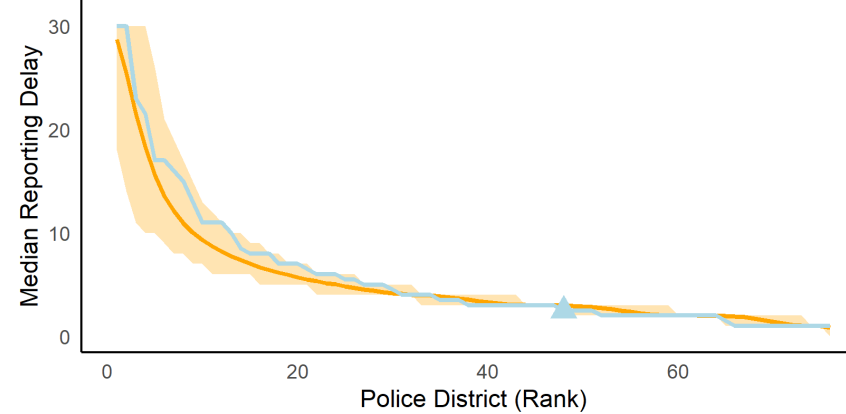# Are reporting delays correlated with crime prevalence?
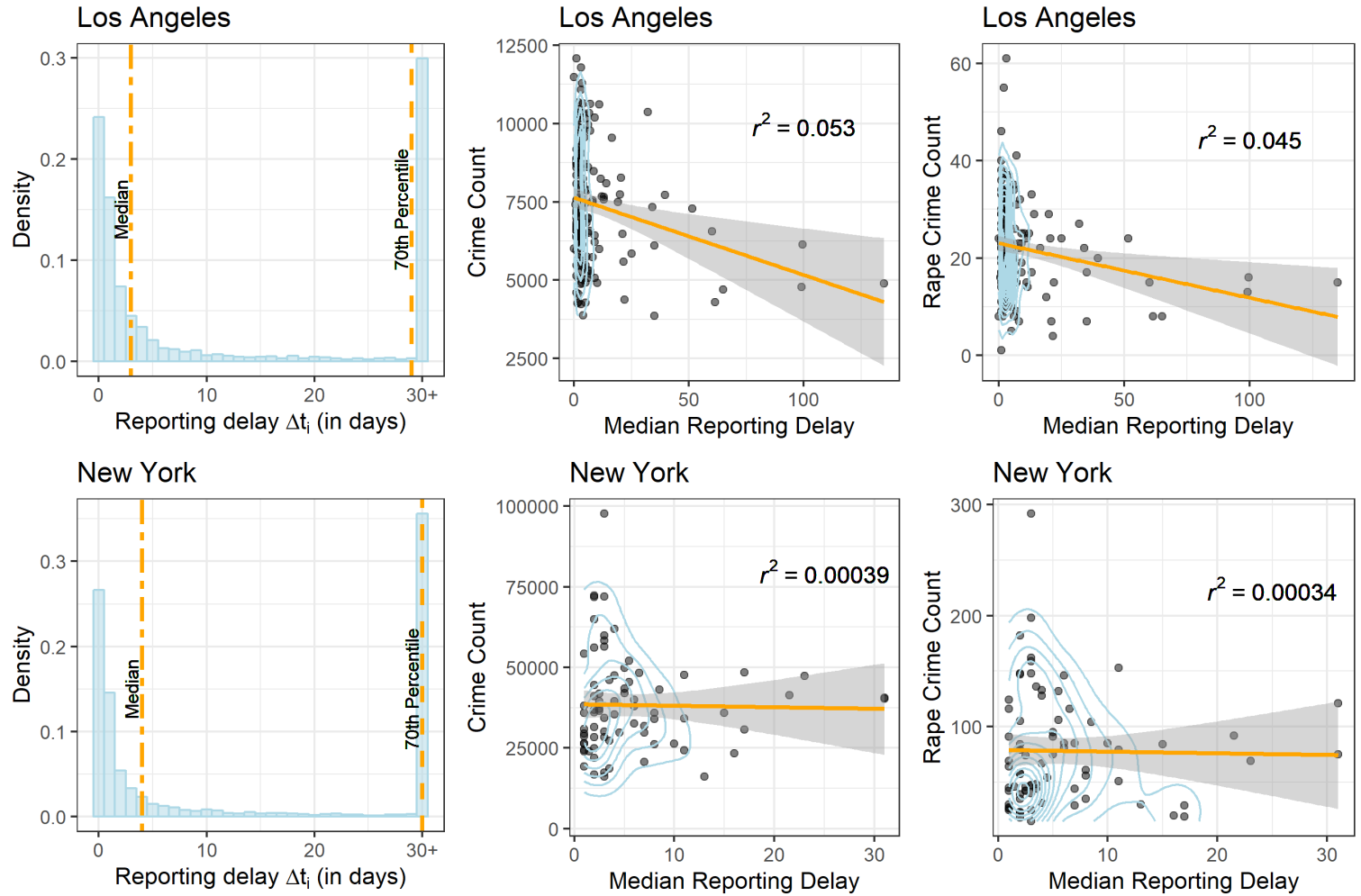
Most rapes get reported either **immediately** (within 24 hours) or after a **long time** (more than one month). **General crime prevalence** appears to be **unrelated**.
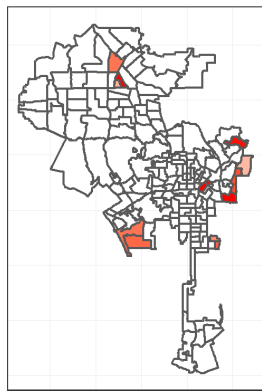
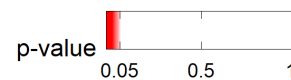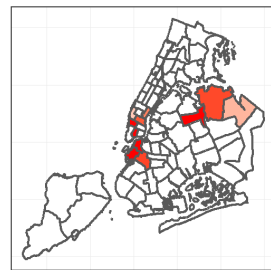# Are reporting delays spatially independent?

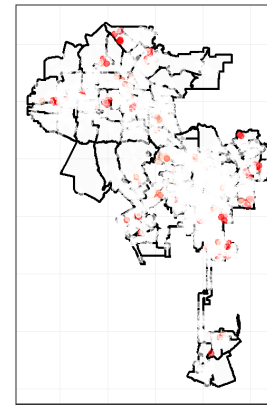LA: Spatial permutation test

NY: Spatial permutation test

Reporting Delays
- Original
- Rand. Perm.

LA: spatial autocorrelation of p_j^{day}

NY: spatial autocorrelation of p_j^{day}

LA: spatial autocorrelation of Δt_i


p-value
0.05   0.5   1

Reporting delays show **global** and **local spatial autocorrelation** patterns.

There are at least **two possible explanations** for the observed spatial correlations:

Underlying *social dimensions* (e.g. ethnic and socio-economic differences)

Underlying, true *spatial process* (e.g. contagious spread in attitude towards rape reporting)

Machine Learning approach: Predicting the time it takes to report rape
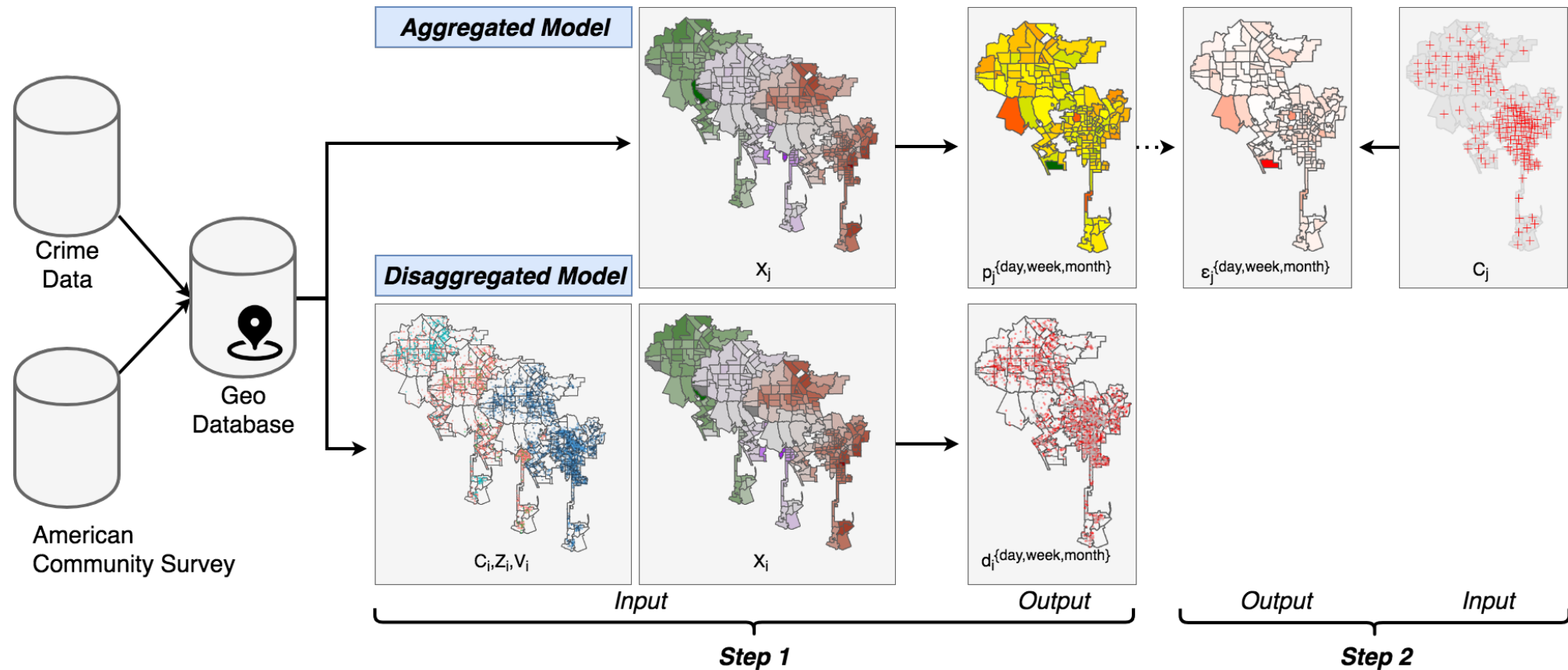
Impact

→ Shedding light on the **complex and noisy process of rape reporting** leveraging geo-aggregated data and machine learning techniques

→ **Identifying vulnerable communities** (areas) and **populations** (individuals)

→ **Informing policy making and intervention efforts** from community policing to legislation

Thank you!

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Paper

Poster

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