

Effects of 2019's Social Protests on Health System Services Utilization in Santiago, Chile

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Quantifying the effects of the October 2019 Chilean protests on health system services utilization in the Santiago metropolitan region using emergency consultation data as a proxy measure.

BACKGROUND

On October 18th, 2019, protestors gathered across Chile to call for structural changes related to social inequalities, rising costs of living, stagnant wages, and gender violence, as well as a new constitution¹. In several places, these protests resulted in the destruction of public and private infrastructure². The government responded by declaring a state of emergency and deploying the Chilean police, who utilized anti-riot shotguns and tear gas for crowd control². From October 18th to November 22nd, Chilean medical services treated over 11,000 injuries, but overall research demonstrates a lack of systematic evidence of the broader health effects of the Chilean protests³.

Despite the notorious impact of social protests on peoples' lives, there is little scientific evidence of their effects on patient utilization of health system services, and most of what we know comes from non-scientific media coverage^{4,5}.

METHODS & EQUATIONS

Time-series analyses were performed using daily emergency consultation and hospitalization data from August 1st to October 17th. The post-exposure period was defined from October 18th to December 31st.

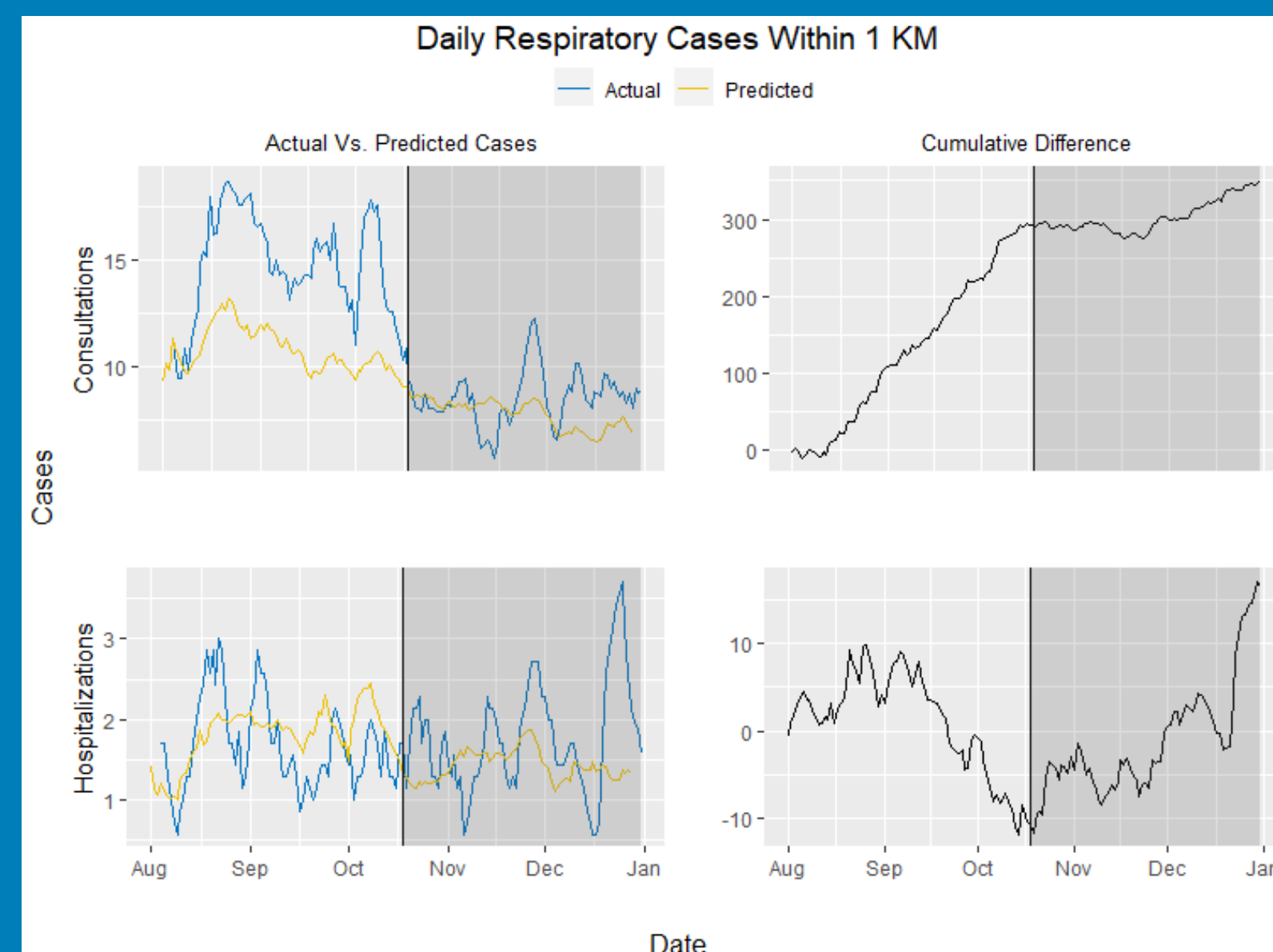
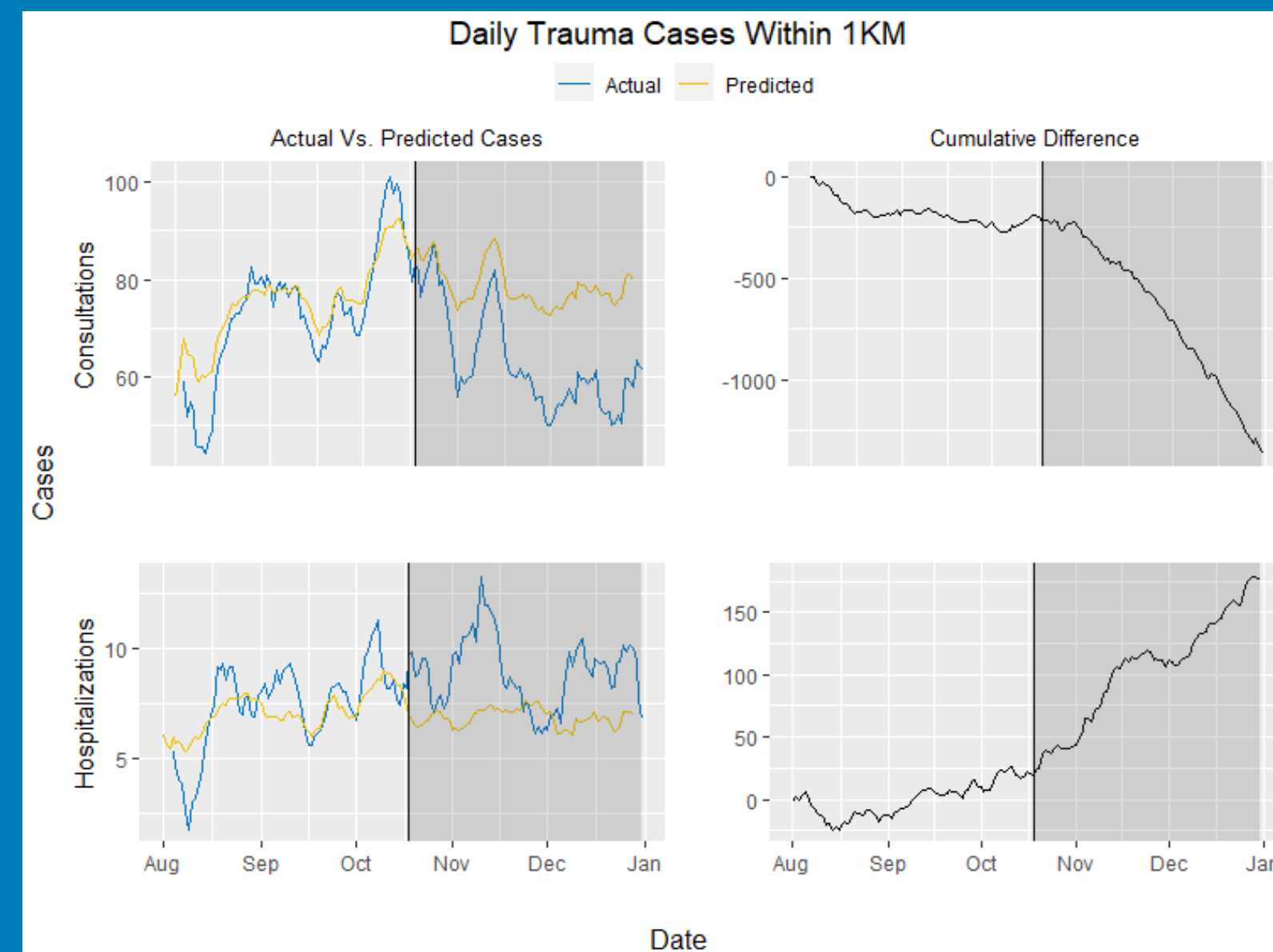
- Public data was pulled from the Chilean Ministry of Health and refined to isolate cases from age 15-64 within 1km & 3km of Plaza Baquedano – the focal point of the protests – in Santiago, Chile
- A negative binomial regression model was fitted to pre-exposure data from 2015–2018 to forecast daily case numbers (consultations & hospitalizations) in 2019 to predict what would have happened in the absence of October's social protests
- Predictions were compared to actual trauma and respiratory cases using T-Tests (T) and Mann-Whitney Tests (MW)
- Seven-day moving average plots were created to visualize actual vs. predicted case numbers and the cumulative difference during the pre- and post-exposure periods

Difference (Tables): $\bar{x} = \frac{\sum_{i=1}^n A_i - P_i}{n}$

Cumulative Difference (Figures): $\sum_{i=1}^n ((A - P)_{i-1} + (A_i - P_i))$

- A = Actual Cases
- P = Predicted Cases
- n = Number of Days in Exposure Period

FIGURES



TABLES

Post-Exposure Cases Within 1KM of Plaza Baquedano							
Case Type	Difference	Conf Low	Conf High	P-Value	% Diff	% Conf Low	% Conf High
Trauma Consultations	-15.47	-20.76	-10.19	4.71E-10 (MW)	-19.74	-26.49	-13.00
Trauma Hospitalizations	2.09	1.19	2.98	2.32E-04 (MW)	30.45	17.33	43.56
Respiratory Consultations	0.71	-0.14	1.55	0.10 (T)	9.19	-1.77	20.15
Respiratory Hospitalizations	0.36	-0.02	0.73	0.59 (MW)	25.10	-1.54	51.73

Post-Exposure Cases Within 3KM of Plaza Baquedano							
Case Type	Difference	Conf Low	Conf High	P-Value	% Diff	% Conf Low	% Conf High
Trauma Consultations	-0.63	-7.02	5.77	0.35 (MW)	-0.54	-6.09	5.01
Trauma Hospitalizations	2.79	1.77	3.81	4.82E-07 (T)	32.33	20.53	44.13
Respiratory Consultations	-3.56	-4.74	-2.37	3.69E-08 (T)	-21.49	-28.67	-14.32
Respiratory Hospitalizations	1.04	0.60	1.47	2.83E-05 (MW)	55.92	32.57	79.28

RESULTS

- Within a 1km radius in the post-exposure period, trauma consultations decreased in average by 19.74% (P<0.001) while hospitalizations increased by 30.45% (P<0.001)
- Within a 3km radius in the post-exposure period, trauma hospitalizations increased in average by 32.33% (P<0.001), respiratory consultations decreased by 21.49% (P<0.001), and respiratory hospitalizations increased by 55.92% (P<0.001)
- In the pre-exposure period, actual vs. predicted respiratory consultations within 1km, respiratory hospitalizations within 3km, and trauma consultations within 3km demonstrated significant differences (P<0.001, P=0.048, P=0.004, respectively)

DISCUSSION

This study demonstrates that shifts in patient utilization of emergency services occurred in response to widespread social protests. Generally, consultations decreased after the onset of the social protests while hospitalizations increased, suggesting a reduction in emergency service utilization and an increase in the severity of cases presenting to the hospital.

These preliminary results will be complemented with additional strategies to match weekly differences in actual vs. predicted cases with peak protest dates and to quantify whether shifts in trauma and respiratory cases were similar to those observed for other causes of emergency service utilization.

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