Impact of Pandemic "Stay Home, Stay Healthy" Order on Traffic-Related Injury, Washington State

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14. ABSTRACT
The Washington State Department of Health Rapid Health Information Network (RHINO) program, with the support of a grant from the Washington Traffic Safety Commission, investigated the impact of COVID-19 pandemic travel restrictions on the burden of traffic injury in Washington State. The percentage of hospital visits attributable to traffic injury in the time frames preceding and directly after implementation showed a notable decline in the relative volume of visits for traffic injury compared to all other reasons for visit. Demographic differences between the two time frames, and time of day/day of week comparisons were also presented to illustrate additional impacts of the stay-at-home order.

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Impact of Pandemic "Stay Home, Stay Healthy" Order on Traffic Related Injury, Washington State

For the Washington State Traffic Safety Commission

By The Rapid Health Information Network Team of the Washington State Department of Health

The COVID-19 pandemic resulted in a range of executive actions taken to protect public health, including the "Stay Home, Stay Healthy" order, which required all Washingtonians to stay home unless pursuing an essential activity. This sharp restriction on travel, instituted on March 23, 2020, caused unusual traffic conditions in the state. Here, we sought to investigate the effect of the travel restriction on traffic related injuries using RHINO health encounter data, and whether any groups within the population were particularly impacted.

To measure the change in traffic injury burden before and after the travel restriction, we used the NSSP ESSENCE "All Traffic Related v2" query to capture motor vehicle, pedestrian, and bicycle or other wheeled transportation injuries in Washington state hospitals participating in the RHINO rapid healthcare encounter system. Visits that occurred between January 1, 2020 and March 22, 2020 were classified as "pre-stay home order" and visits occurring between March 23, 2020 and June 30, 2020 were classified as "post-stay home order". To examine whether severity of injuries changed in relation to the travel restriction, we separated visits by whether the patient was seen only in the emergency department ("not-severe") versus those that resulted in a hospitalization or death ("severe"). We excluded visits that were coded as "outpatient" patient class, since it is difficult to distinguish injuries sustained in the past, as opposed to our time frames of interest.

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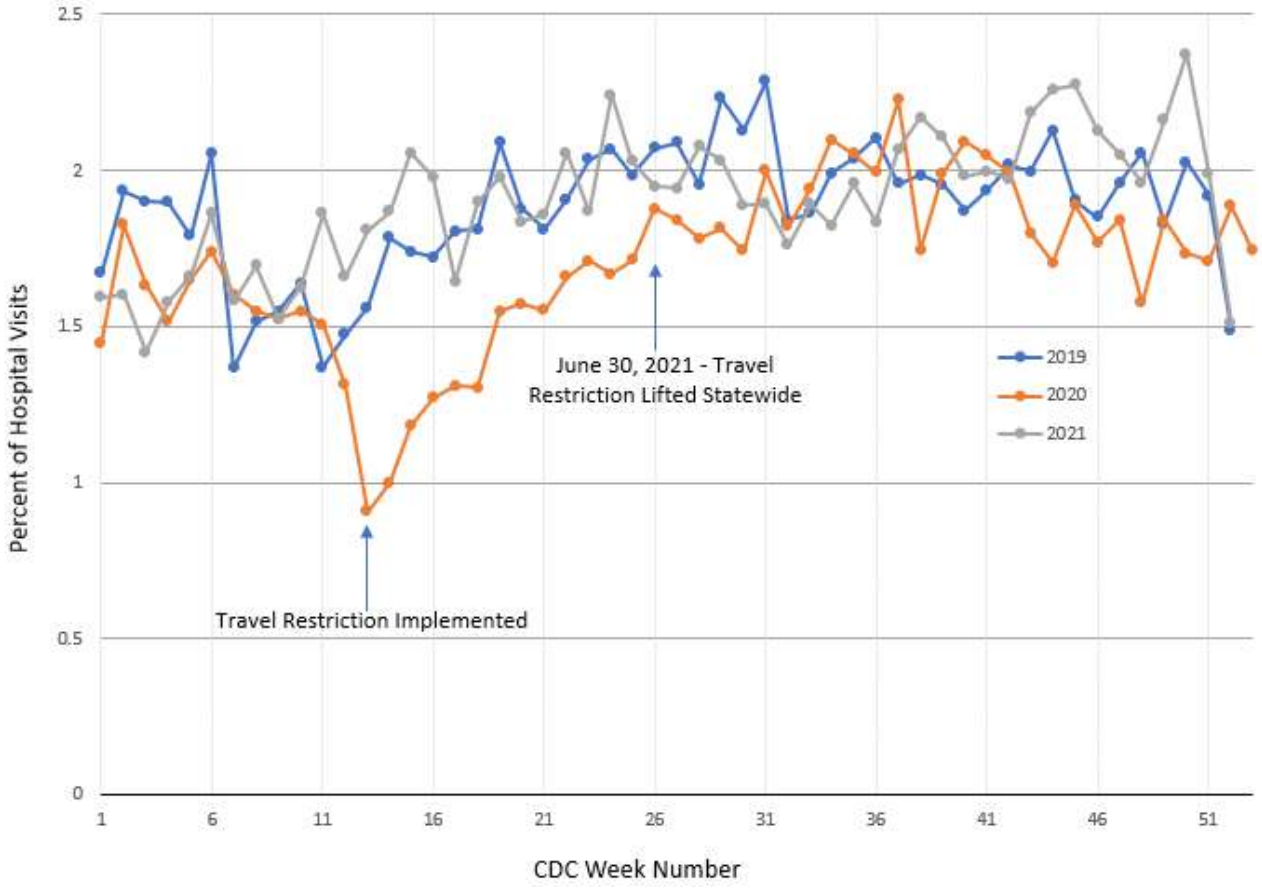
Time Trends

The impact of the governor's "Stay Home, Stay Healthy" proclamation is evident in the sharp drop in the percentage of visits captured in RHINO data by the All Traffic v2 query. Figure 1 displays the weekly percentage of visits at all Washington hospitals with an emergency department from 2019 through 2021. Overall visit volumes decreased during this period as well, so we chose to report the percentage of visits relative to all hospital visits to avoid overrepresenting the degree of change over time.

Following the low point observed in week 13 of 2020, the percentage of all traffic injury related visits steadily climbed to approximate the levels preceding the pandemic. By the final week of July 2020 (week 31 in Fig. 1), the percentage of visits for traffic injury appear to no longer be impacted by the governor's stay home order. For this reason, we chose the January 1 – March 22, 2020 and March 23 – June 30, 2020 windows for subsequent comparison.

Figure 1. Weekly percentage of all hospital visits attributed to all traffic related causes, 2019-2021



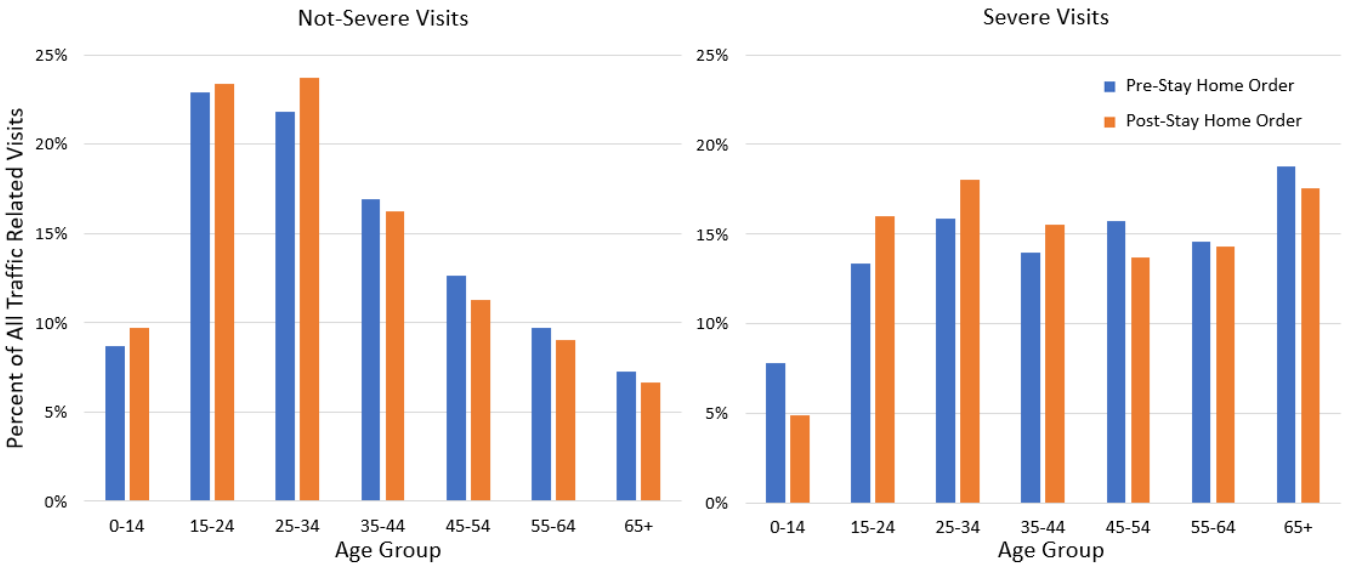
Demographics

By looking at the demographic breakdown of hospital visits in the time preceding the stay home order with the period immediately after, we aimed to find whether any groups of individuals were more or less likely to be injured in a traffic incident.

Age

Figure 2 shows some notable changes in the age distributions of those captured by the all traffic injury query in the pre-stay home and post-stay home order time periods. The age distribution of "not-severe" visits resulting in an ED-visit only did not change appreciably in the pre- and post-stay home order time frames, but the "severe" visits that resulted in an inpatient admission or death showed more dramatic changes.

Figure 2. Age Distribution of All Traffic Related Visits, Before and After Travel Restriction



In Table 1, the percentage of severe visits represented by each age group in the pre- and post-stay home time periods shows that the 0-14 year old age group saw the biggest change, dropping by over 37%, while the 45-54 year old group showed a near 13% decrease. Increases in severe visits post-stay home order were shown in the age groups spanning 15 to 44 years of age, with the most striking increase in the 15-24 year old group, at 20%.

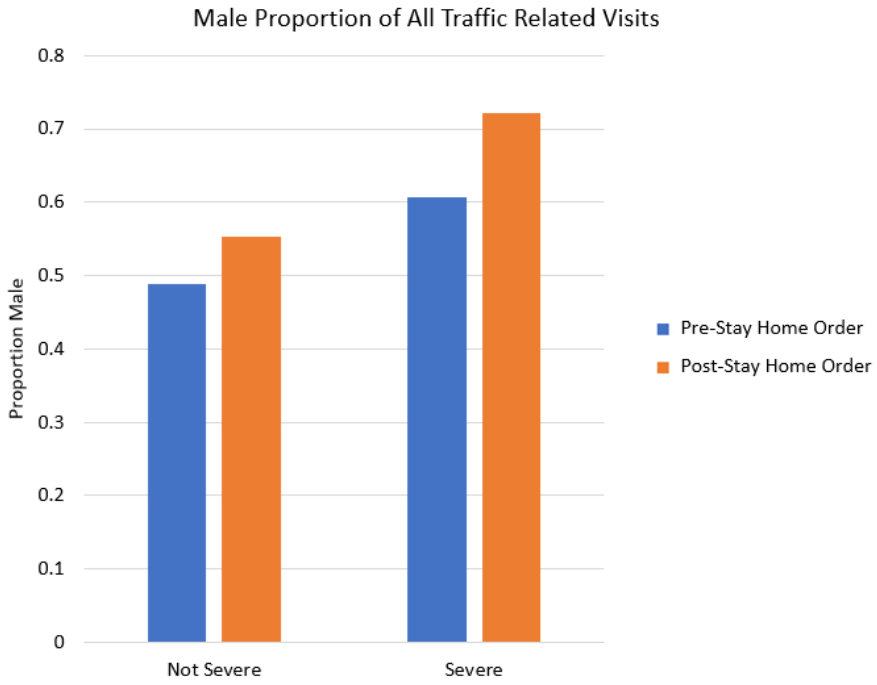
Table 1. Percentage of Severe Hospital Visits by Age Group, Pre- and Post-Stay Home Order, Washington State (January 1, 2020 – March 22, 2020 vs. March 23, 2020 – June 30, 2020)

Age Group	Pre-Stay Home Order	Post-Stay Home Order	Percent Change
0-14	7.8%	4.9%	-37.3%
15-24	13.3%	16.0%	20.1%
25-34	15.8%	18.0%	13.7%
35-44	14.0%	15.5%	11.2%
45-54	15.7%	13.7%	-12.8%
55-64	14.6%	14.3%	-2.1%
65+	18.7%	17.5%	-6.4%

Sex

Before the stay home order, males and females accounted for approximately equal proportions of not-severe visits, but as figure 3 illustrates, the male proportion grew from 49% to 55% in the post-stay home time period. Even more prominent is the change in severe visits, with the male proportion of these visits growing from 61% to 72%

Figure 3. Sex Distribution of All Traffic Related Visits, Before and After Travel Restriction, by Severity



Race and Ethnicity

No remarkable changes in the distribution of visits are evident in any race or ethnicity category, whether looking at severe or not-severe visits in the periods of interest before and after the stay home order.

Table 2. Percentage of Visits by Race-Ethnicity in Pre- and Post- Stay Home Order Time Periods, by Severity

	Percentage of "Not Severe" Visits		Percentage of "Severe" Visits	
Race-Ethnicity	Pre-Stay Home	Post-Stay Home	Pre-Stay Home	Post-Stay Home
American Indian/Alaska Native	1.5%	2.3%	3.0%	3.7%
Asian	5.2%	3.3%	5.5%	2.0%
Black or African American	10.8%	9.7%	3.8%	4.7%
Hispanic	14.6%	12.6%	10.7%	8.8%
Multiple Races	0.6%	0.6%	0.3%	0.0%
Native Hawaiian or Pacific Islander	1.3%	0.9%	1.1%	1.1%
Other Race	4.8%	4.1%	3.8%	4.5%
Unknown	2.0%	5.7%	1.3%	3.5%
White	59.3%	60.9%	70.6%	71.6%

Time of Day and Day of Week Trends

To visually display the weekday and time of visit, we plotted them into the heatmaps shown in figures 4 and 5. On the left in Figure 4 we can see the darker bands extending vertically every day of the week at earlier times of day than in the post-stay home order heatmap on the right. This is consistent with having fewer drivers on the road at times when commute volumes would be expected to be high.

Figure 4. Not-Severe Visits by Day of the Week, 2 Hour Periods, Pre- and Post-Stay Home Order

The heatmap in Figure 5 shows the visits related to severe traffic injuries to be more concentrated in the evening hours after the stay-home order. It also suggests a decrease in the frequency of severe visits on weekends in the post-stay home order time frame, with the darker regions from 14:00-18:00 (representing the 2:00 PM to 8:00 PM time window) on the left lightening on the heatmap to the right.

Figure 5. Severe Visits by Day of the Week, 2 Hour Periods, Pre- and Post-Stay Home Order