

# Impact of Asthma on COVID-19 Prognosis: Washington State

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## Background

Asthma has been suggested to be a risk factor for worse COVID-19 infection outcome<sup>3</sup>. While many studies have suggested a possible linkage between asthmatic symptoms and COVID-19 prognosis, a growing number of evidence indicated otherwise<sup>4</sup>.

Washington state (WA) is the place where the first COVID-19 case in the United States was reported in 2020. It is also a state with one of the most robust healthcare systems in the nation and with one of the highest prevalence of adult Asthma cases.<sup>2</sup> In this project, an analysis of demographic and ecological data was performed to assess the relationship between the prevalence of asthma and COVID-19 hospitalizations, and the presence of the mediating factors and racial disparities.

## Methods

The secondary data was collected from various resources including the COVID Tracking Project, CDC, Washington State Department of Health, and American Lung Association (ALA), and literature reviews of the pertinent studies were conducted.

## Results

The data collected from the COVID Tracking Project shows American Indians/Alaska Natives had the second-highest COVID-19 deaths and hospitalizations per 100,000 population following by the Hispanic/Latino population. It also indicated that there was a significant margin in COVID-19 cases, hospitalizations, and death between American Indians and Native Hawaiian/Pacific Islander (NHPI), NHPI being the population affected the most by COVID-19 infection and prognosis (Figure 2). The White population had the lowest cases, hospitalizations, and deaths per 100,000 population in WA. In 2020, the White population was about 57.68% of the total population of King County, while the Hispanic population and Non-Hispanic Non-white populations were 10.34% and 31.98%, respectively.<sup>6</sup>

The sample size adjusted COVID-19 hospitalization rate among NHPI was disproportionately higher than the rest of the population. NHPI were 2.67 times more likely to be hospitalized (Figure 2) and 2.65 times more likely to die from COVID-19 (Figure 3). Black population had the highest asthma attack rates followed by the AIAN and HHPI groups, according to CDC (Figure 5).

The distribution of the prevalence of the asthma in Washington state (Figure 6) was found not to be superimposing to the distribution of the COVID-19 hospitalizations (Figure 4).

## Cases per 100,000 people

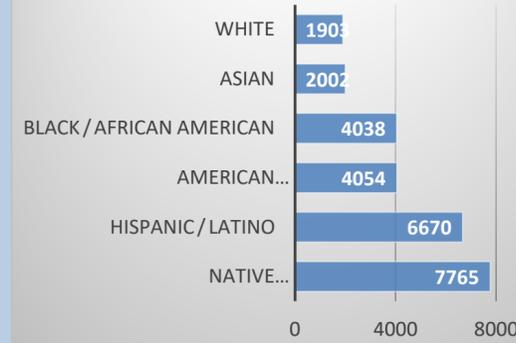


Figure 1. COVID-19 cases per 100,000 people in Washington State (source: The COVID Tracking Project)

## Hospitalization per 100,000 people

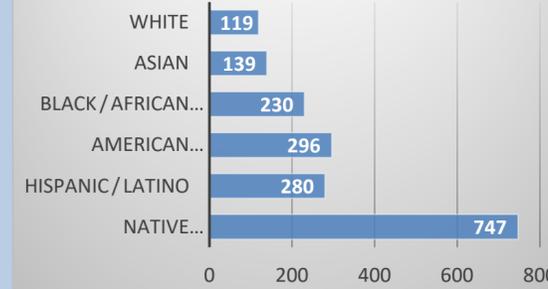


Figure 2. COVID-19 hospitalizations per 100,000 people Washington State (source: The COVID Tracking Project)

## Deaths per 100,000 people

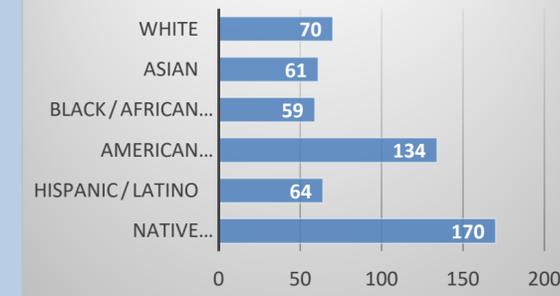


Figure 3. COVID-19 deaths per 100,000 people Washington State (source: The COVID Tracking Project)

## Hospitalizations by County

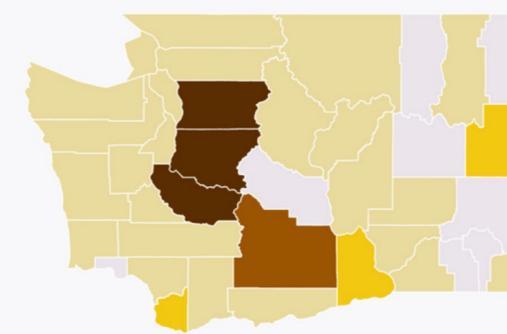


Figure 4. Map of COVID-19 Hospitalizations in Washington State (source: Washington State Department of Health)

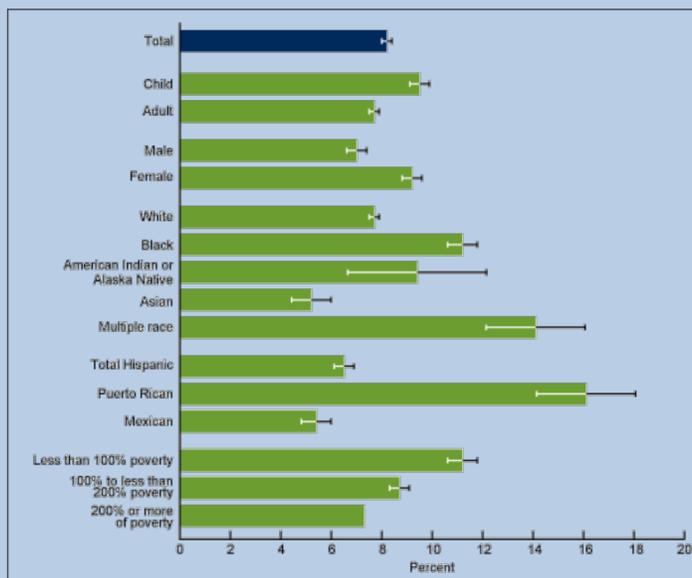


Figure 5. Current Asthma Attack Rates by races (source: CDC)

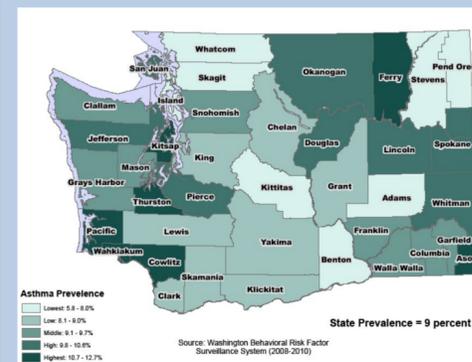


Figure 6. Map of Asthma Prevalence in Washington State. The King county, where highest Hispanic, NHPI, and AIAN populations are located, are not the county with the highest asthma prevalence, according to Washington State Department of Health report.

## Discussion

The Hispanic population of King County, WA was one of the most affected groups, with the second-highest COVID-19 incidence rate after the NHPI group and a slightly lower hospitalization rate than the AIAN group. Although it has been reported to be a group with a high prevalence of asthma, the age group of majorities of the COVID-19 cases among Hispanics fell within the age range in which Asthma complications are the lowest.

Black population was not the racial minority group mostly affected by the complications and poor COVID-19 prognosis, while asthma attack was shown to be most prevalent among the black population. This supports the evidence that asthma may not be the influential factor of poor COVID-19 prognosis.

Disproportionately higher cases of hospitalization from COVID-19 among the NHPI population alone suggests that there may be major mediating factors such as social determinants of health that significantly interfered with the access to adequate care or health insurance enrollment.

## Conclusion

The data indicates insufficient evidence of a correlation between asthma prevalence and COVID-19 hospitalization rate and failed to show a clear empirical association between prevalence of asthma and the worse COVID-19 prognosis within WA state population.

Lack of case and race-specific data were determined to be one of the limitations for this analysis. Considering the COVID-19 have disproportionately affected the racial minority groups, assessment on the impact of asthma on COVID-19 prognosis as well as extrinsic mediating factors warrants further studies.

Patients with moderate to severe asthma are recommended to take precautions recommended against COVID-19 infection.

## References

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