**Social distancing effects on the environment**

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**Background**

In response to the COVID19 pandemic, governments are enacting social distancing guidelines to slow the spread of the virus. This study investigates the environmental impact of social distancing with a focus on air quality effects. Due to social distancing, there has been a decline in motor vehicle and airplane transportation, both major carbon producers as they rely on fossil fuel combustion.

Nitrogen dioxide (NO2) is a byproduct of burning fossil fuels such as from emissions from cars, trucks, buses, power plants, and airplanes. It forms through a two-step process[[1]](#footnote-1). At elevated temperatures during combustion, N2 is oxidized forming an intermediate, nitric oxide (NO) – (eqn 1). In an oxygen-rich environment, nitric oxide further oxidizes to NO2. (eqn 2)

O2 + N2 → 2 NO (1)

2 NO + O2 → 2 NO2 (2)

Elevated levels of NO2 are known to cause respiratory problems for individuals, particularly those with asthma.

**Data**

This study examines the following question:

Is there a difference in NO2 concentration levels since social distancing measures started?

Air quality data were collected from the WA Dept of Ecology.

<https://fortress.wa.gov/ecy/enviwa/>

Specifically, concentration values from March 2019 and March 2020 were compared to see if they difference were statistically significant.

Null hypothesis:

Ho = There is no difference in NO2 values between March 2019 and March 2020.

Alternative hypothesis:

Ha= NO2 values are comparatively less during March 2020.

1. https://en.wikipedia.org/wiki/Nitrogen\_dioxide [↑](#footnote-ref-1)