Effect of Air Pollution on COVID-19 Cases

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Abstract

Air pollution’s growing problems have plagued the world since Europe’s Industrial Revolution. This study evaluated the association between air pollution, weather, and the intensity of COVID-19. During the time frame between April 1, 2020 and May 31, 2020, daily new cases, air pollution data, and meteorological data were obtained. A multiple linear regression was used to determine whether air pollution (PM2.5, PM10, CO, NO2, O3, and SO2) and weather (mean temperature, humidity, air pressure, and wind speed) could predict COVID-19 cases. The individual predictors were examined, and it was determined that PM2.5,O3, humidity, and pressure were significant predictors of COVID-19 new cases.

Keywords: COVID-19, air pollution, multiple linear regression

# Introduction

The COVID-19 pandemic took the world by surprise; its sudden spread and massive scope caught many off-guard. The novel coronavirus first appeared in Wuhan, China then spread rapidly throughout the world. Although a similar virus reached multiple countries, its effect varied from region to region. In addition to the various responses from the government, the differences in the COVID-19 cases may be attributed to the variations in air quality.

Further understanding air pollution personally concerns me because I have seen the effects of air pollution. When I went to Beijing, the thick layer of pollution in the air gave everything a dark and gloomy feel. Only the lights were visible on distant buildings, and a faint odor constantly lingered in the air. Air pollution severely harms human health. It causes a variety of risks such as increased infant mortality, increased prevalence of respiratory symptoms, and decreased lung function (Bates, 1995). Every time I see the yellowish grey cloud and hear my breath on my masked face, I think about how detrimental air pollution is to health. This leads to the question: How does air pollution affect the intensity of COVID-19? In my research, I investigated the effects of air pollution on the number of COVID-19 cases.

# Methods

## Study Area

This study included 88 counties across the United States. These 88 counties accounted for 77% of all confirmed cases as of April 1, 2020. For each county, air pollution, meteorological, and COVID-19 confirmed cases data was gathered. Under the air pollution category, PM2.5, PM10, CO, NO2, O3, and SO2 data was collected. For the meteorological data, 4 climatic measurements were taken: mean temperature, relative humidity, air pressure, and wind speed.

## Data Collection

The meteorological data was collected from the World Weather Online API.