1. **Introduction:**

1.1 Background

London’s air pollution rarely hit headlines around the world but in fact the city has been persistently breaching the EU and UK air pollution limits every year.

Two main pollutants that contribute to London’s air pollution and have bad impacts on human health and environment are: Nitrogen dioxide (NO2) - a gas that is caused mainly by diesel vehicles and particular matter (PM) - particles with varying shape, size and composition that come from residential and commercial combustion. Long term exposure to these two pollutants can cause lung and heart diseases, respiratory infections and reduced life expectancy. [2] Recent studies show that there is a correlation between coronavirus deaths and the level of air pollution, with London and the Midlands are examples. [3]

The UK went into lockdown on 23 March 2020 in an effort to curb the spread of coronavirus and ever since there are news and reports on the reduction of air pollution in London.

1.2 Problem:

This report aims to analyse whether the level air pollution in London has decreased since the Covid-19 lockdown and analyse whether air pollution has a strong correlation with possible sources.

It is for everyone who have read news about the reduction in air pollution since lockdown to understand what it really means and for local authorities to have an insight to the borough profiles and develop solutions to tackle air pollution at the local level.

**2. Data sources, data cleaning and assumptions**

* 1. Data sources
     + NO2, PM2.5, and PM10 data: The London Air Quality Network (LAQN) measure and record air pollution in different monitoring sites across London. The data for NO2 and PM2.5 for the period from 23 February 2020 to 26 April 2020 and the same period in 2019 were obtained from the London Air - LAQN’s website. This is used to compare air pollution in London one month before and after lockdown. [4]
     + London traffic index: I scraped the traffic flows data in 2019 and 2020 from an article from The Guardian of which the main data source is from TomTom to analyse the correlation between London traffic flows and the level of NO2 and PM2.5 in London.[5]
     + Coordinates of London boroughs: I downloaded a json file from GitHub to create a choropleth map of NO2 and PM10 level and a cluster map of London boroughs.[6]
     + London borough profiles: The dataset was published by the Greater London Authority (GLA) that contains demographic, economic, social and environmental information for each borough in London and City of London. I used this for clustering boroughs and determine whether it has any correlation to the level of air pollution by PM10. [7]
     + London energy consumption in 2017: This dataset was also obtained from the GLA and will be merged into the London borough profiles data as energy consumption is also one of the causes of air pollution. [8]