AQI in India

An in depth analysis done using python

What is AQI ?

- Think of the AQI as a yardstick that runs from 0 to 500.
- The higher the AQI value, the greater the level of air pollution and the greater the health concern.
- For example, an AQI value of 50 or below represents good air quality, while an AQI value over 300 represents hazardous air quality.
- For each pollutant an AQI value of 100 generally corresponds to an ambient air concentration that equals the level of the short-term national ambient air quality standard for protection of public health.

Measuring AQI

- The AQI is divided into six categories. Each category corresponds to a different level of health concern. Each category also has a specific color. The color makes it easy for people to quickly determine whether air quality is reaching unhealthy levels in their communities.

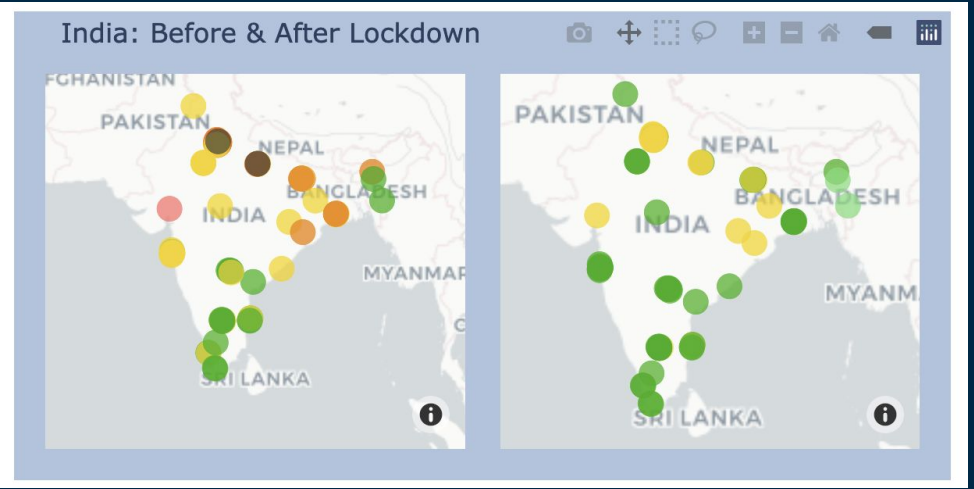
AQI	Remark	Colour Code	Possible Health Effects
0-50	Good		Minimal impact
51-100	Satisfactory		Minor breathing discomfort to sensitive people
101-200	Moderate		Breathing discomfort to the people with lungs, asthma and heart diseases
201-300	Poor		Breathing discomfort to most people on prolonged exposure
301-400	Very Poor		Respiratory illness on prolonged exposure
401-500	Severe		Affects healthy people and seriously impacts those with existing diseases

Impact of COVID 19 on AQI

- The nationwide lockdown to curb the spread of coronavirus was imposed from 23rd March.
- A lockdown restricts the movement of people i.e they have to stay in their houses and can come out only to purchase essential items.
- So, all the things that contribute to pollution were put to a full stop. As a result, the environment starts to heal.

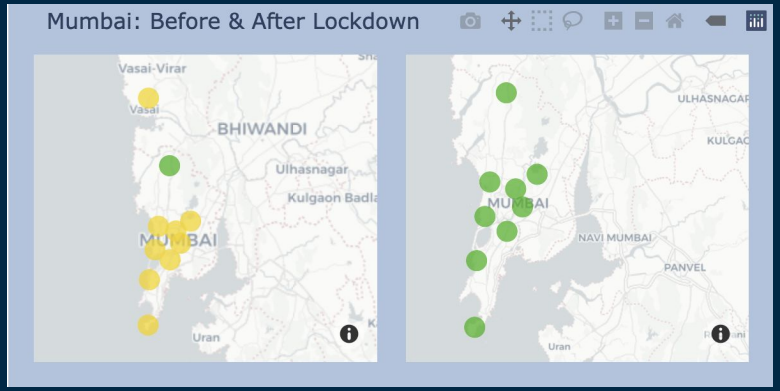
Major Impact on the Country

- Through the below plot, we'll try to analyse that if the air quality has really improved because of the lockdown. Left part of the plot will show the Before Lockdown Scenario and the right part will show the After Lockdown Scenario. The colorscale used is in accordance with the standard Indian AQI calculation scale.



Impact on Mumbai

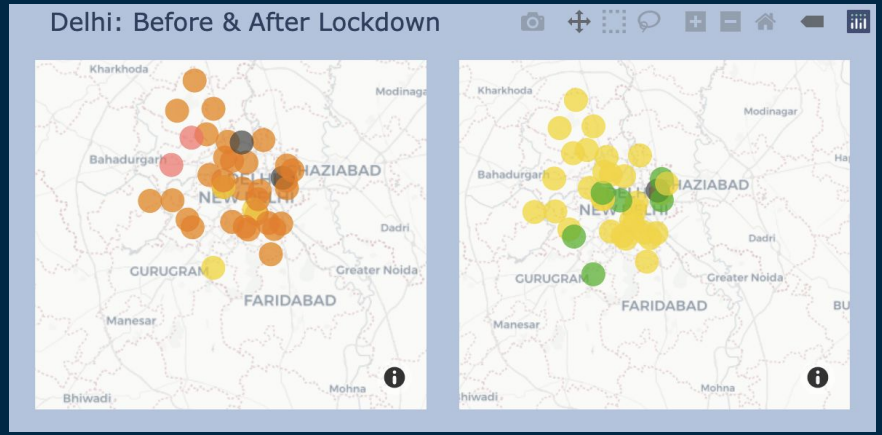
- It's apparent that the lockdown has worked in favour of reducing the air pollution in India as Air Quality is at most "Satisfactory" level across all the measuring stations.
- Let's see how much impact the lockdown has had on our city, Mumbai.



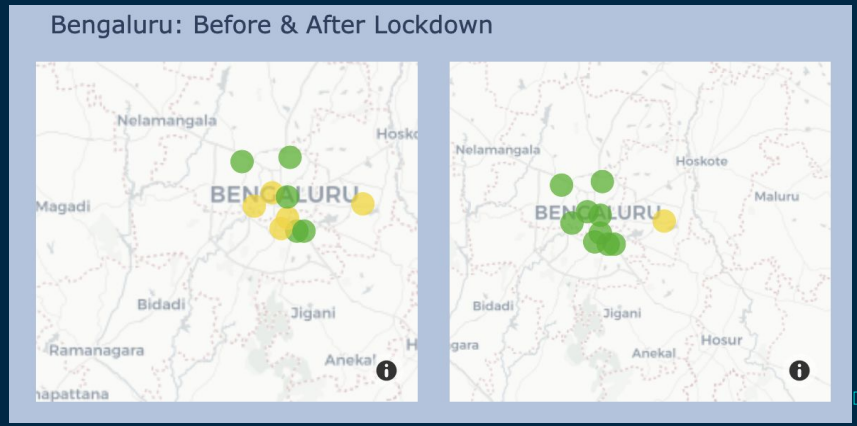
Quite an improvement in Mumbai. See the transition from almost all yellows to all greens. That's substantial!

Impact on other cities:

1. Delhi:
   - As you can see from the above plot, the lockdown has worked wonders to reduce the pollution in Delhi. Also, the air quality improves in summers a bit, but this is something substantial.



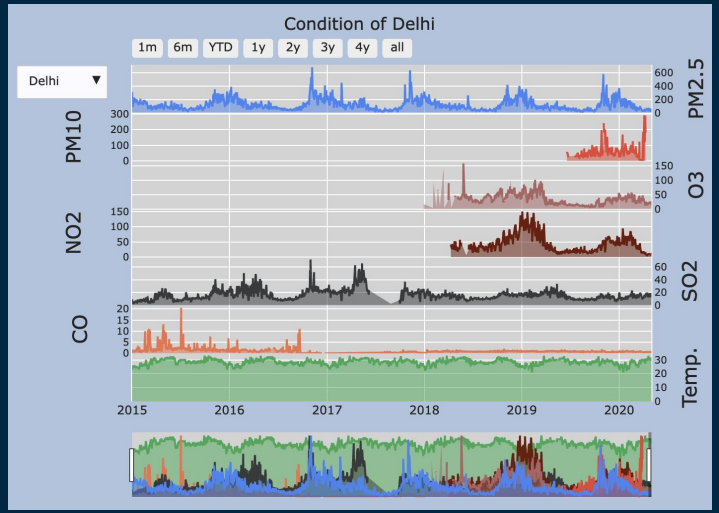
2. Bengaluru:
   - The air quality in Bangalore was already pretty good before the lockdown but after the lockdown, it has also shown some improvement.



Condition of Metropolitans

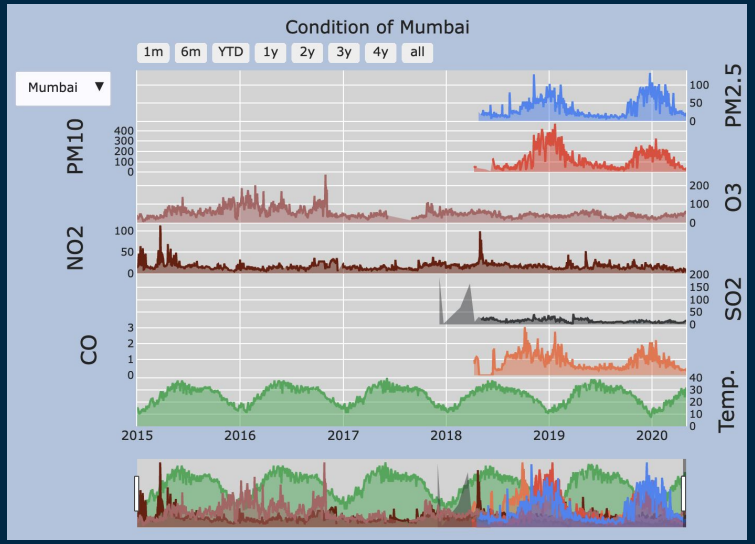
Let's study the Air Quality among major cities of India. I am using area plots to show the data from year 2015-2020 for all the major pollutants along with the temperature. The plot contain a dropdown to toggle between the metroplitans of India. The default setting is for Chennai. Also, a time slider and a range selector is added for convenience.

1. Delhi:

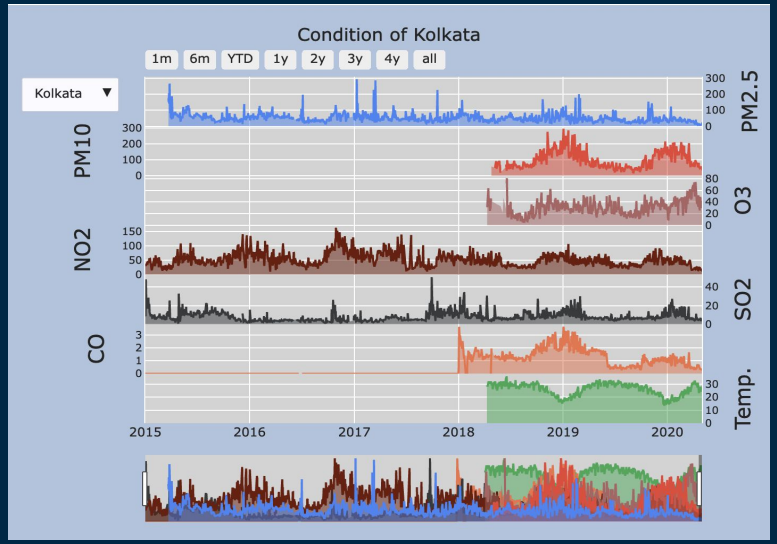


Condition of Metropolitans

2. Mumbai



3. Kolkata



Conclusion

- India's average air quality is pretty bad throughout the year. Just a few patches of greens meaning just a small proportion of days having satisfactory air quality.
- Air quality is better in the summers as compared to the winters.
- India has moderate air quality throughout the year. Yellow patches tell the story.