IMPACT ON AIR POLLUTION

COVID 19 ANALYSIS

Here,Analysis of Covid 19 then from data set built an application Covid 19 Moniter It will show the total number of affected cases, total deaths cases, total recovered cases. It will show a graph which will predict the number of affected cases in near future.Using this Analysis of Impact on Air Pollution.

ANKIT KUMAR

1/6/2020

Project Name – Covoid-19 Monitor

A website to get latest covid-19 related data using the data obtained to get visual analysis tools like graphs and charts.
I will crawl the government websites for getting the datas and updates.This update will be shown on our website within 24 hrs.This data will be updated automatically.

Input:

Regular text data from Twitter and social media, and checking whether fake news or not
Ministry of Health and Govt of India and regional Governments data
WHO, CDC

Output of the system

1. It will show the total number of affected cases, total deaths cases, total cured/recovered cases.
2. It will show a graph which will predict the number of affected cases in near future**.**
3. It will show a graph which will predict the number of affected cases in near future for each and every state in Country individually.
4. It will show the total number of affected cases, total deaths cases, total cured/recovered cases for each and every state in the country individually.
5. It will show a graph for trend and seasonality analysis.
6. This graph does other statistical calculations like mean, variation.
7. It describes Corona Virus, awareness, Symptoms.

Intended Audience

- Data Scientists
- Statistician
- Governments (for prediction based resource distribution)
- Anyone who wants to visualize the situation and future prediction

Technology Stack

Languages

- HTML
- CSS
- Python
- Java Script

Libraries
- Flask
- Matplotlib
- Scikit
- Pandas

FOR DETAILED CODE AND FORKED DATA VISIT MY GITHUB ACCOUNT:

https://github.com/ankit-kumar04

Introduction

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The disease was first identified in 2019 in Wuhan, China, and has since spread globally, resulting in the 2019–20 coronavirus pandemic. Common symptoms include fever, cough and shortness of breath. Muscle pain, sputum production and sore throat are less common. The rate of deaths per number of diagnosed cases is on average 3.4%, ranging from 0.2% in those less than 20 to approximately 15% in those over 80 years old.

WORKING:

So Firstly,I will inspect the data, represent it on chart and model future trends with Python, using some open source data science libraries such as `Pandas`, `Matplotlib` and `Scikit-learn`.

Installing necessary libraries

```
pip install pandas matplotlib scikit-learn
```

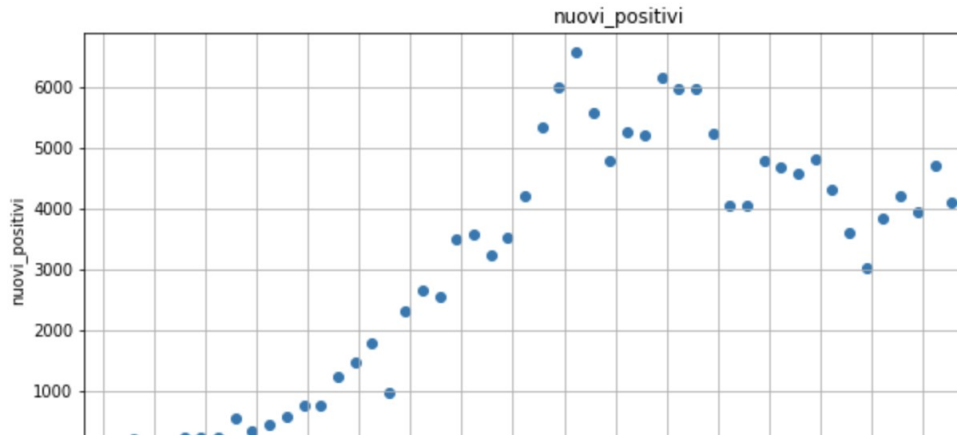
Importing data and extracting fields

First, I import all the necessary libraries, then I import the COVID dataset GitHub account and we store it in a *Pandas Data Frame*. Then, we explore the structure of the table, in order to have a clearer view on the variables.I am taking Italy Data for this project Work.

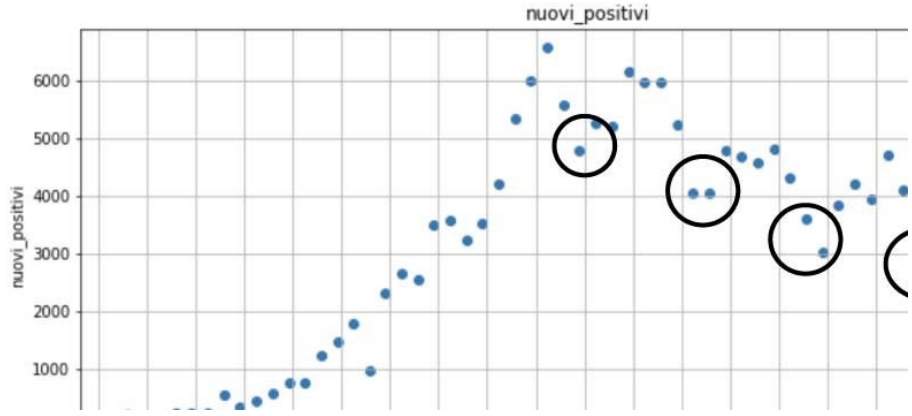
```
import pandas as pd
from datetime import datetime, timedelta
import matplotlib.pyplot as plt
from matplotlib.dates import DateFormatter
import matplotlib.dates as mdatesdata =
pd.read_csv("https://raw.githubusercontent.com/pcm-dpc/COVID-19/master/dati-andamento-nazionale/dpc-covid19-ita-andamento-nazionale.csv")
print (data.columns)
```

In order to calculate the daily increase of those two variables, we run a simple pandas function.

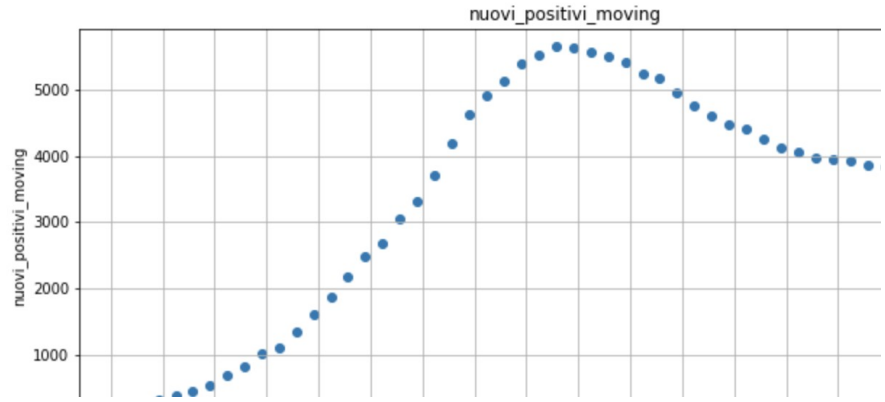
At first glance, seems to be the most important for estimating the epidemic progression: the number of daily new positive cases.



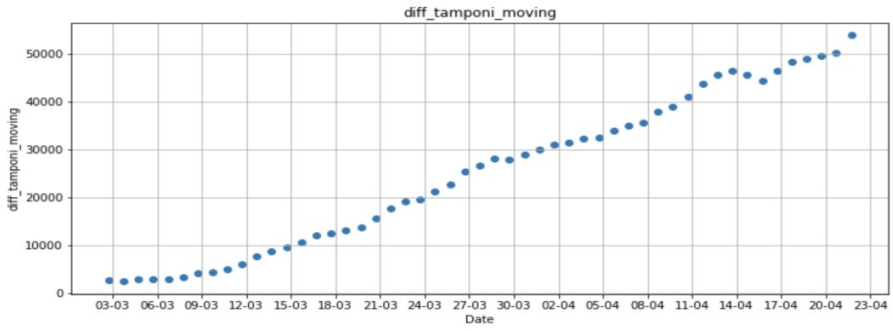
There is a recurrent pattern in the plot above



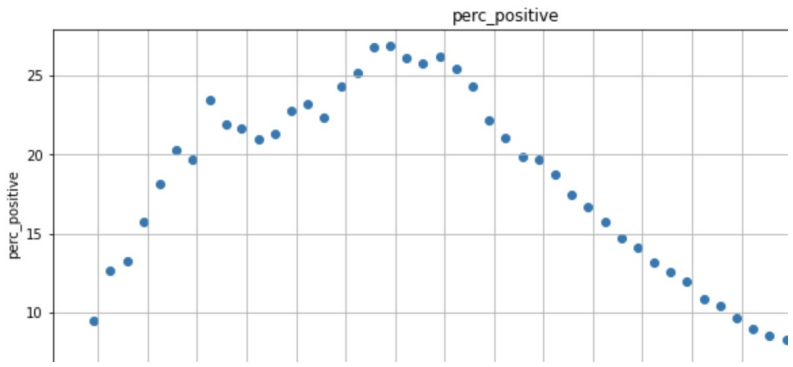
The first moving average is calculated by averaging the first subset of 7 days, and then the subset is changed by moving forward to the next fixed subset, and so on.



The chart above represents the trend of new cases averaged over a 7-days period, masking out weekend anomalies. Nevertheless, the effect of the daily number of swabs tested every day is not fully compensated yet. Clearly, the number of positive cases is strictly correlated with the quantity of tests performed. Let's take a look to the trend of daily tests performed in Italy ...

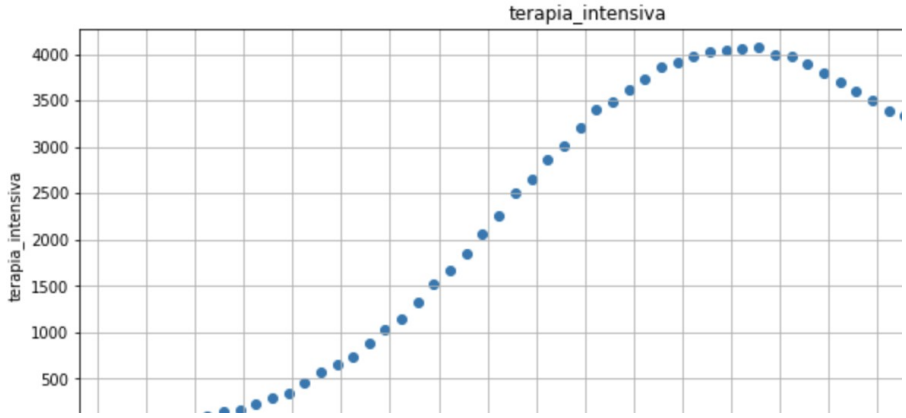


The number of daily swabs is about 20 times higher than the beginning, therefore the variable `new pos` is suffering from this important bias. In order to find a more representing trend, we now calculate the percentage of new positive over the total daily tests, and we inspect the variation over time.

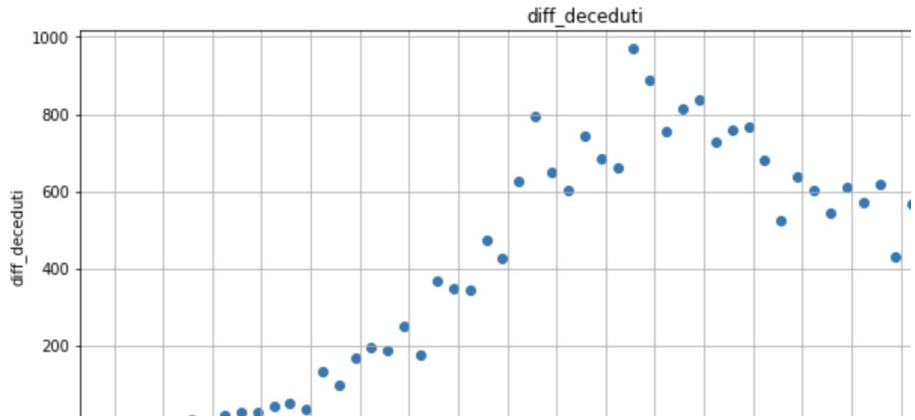


The derived variable `per positive` provides a more reliable representation of the epidemic progression,

There are other important fields that we should further inspect intensive care and daily deaths, respectively.



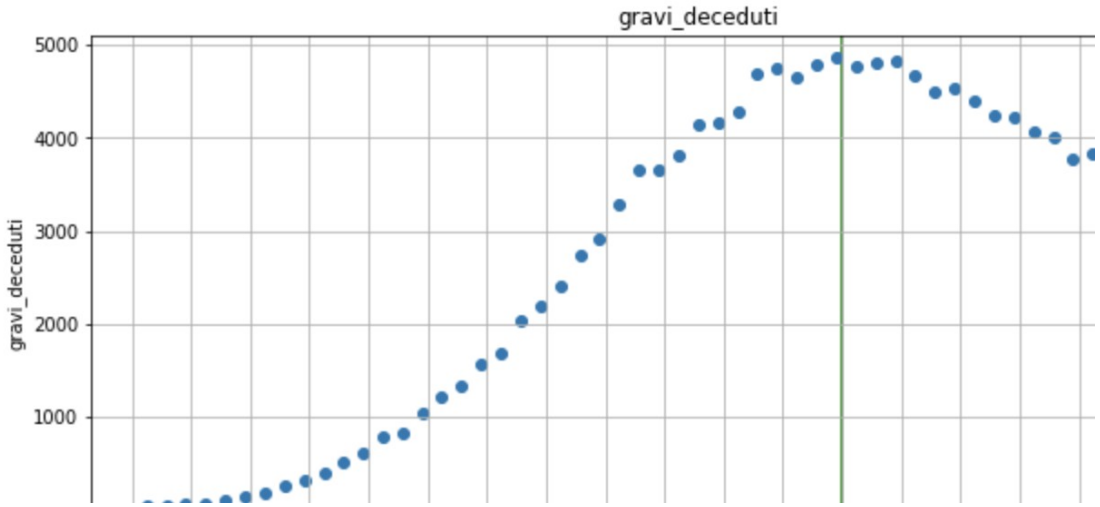
As shown in the chart above, the number of patients currently in intensive care seems to follow a more regular trend.



The above charts shows that daily deaths have been increasing until march 28th, and then it started decreasing at a slower pace.

Creating derived variable for the project

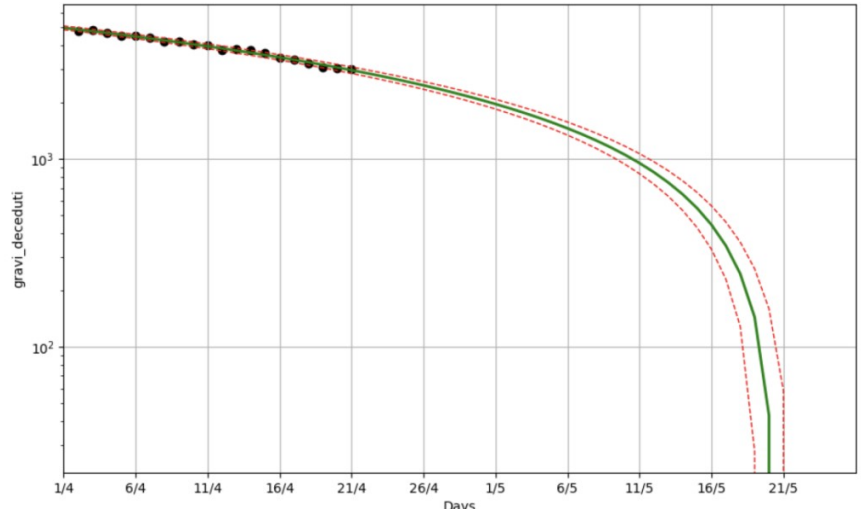
The main assumption is that the combined value of intensive care and daily deaths can be a reliable variable for estimating the current epidemic progression, and for modeling future trends. calculate the sum of patients in severe distress with daily deaths, and plot the resulting values.



Modeling the epidemic trend

A Linear Regression model and train it with the data starting from that date, April 1st.Linear Regression is one of the most popular classical machine learning algorithms for supervised learning.

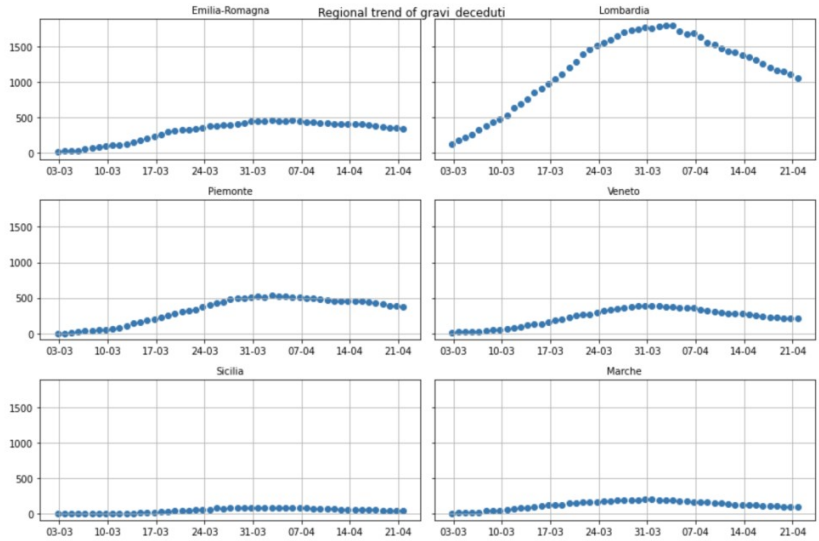
Plot the forecast



Regional trends

The above analysis is treating Italian COVID-19 epidemic on a national basis,. In order to quantify this, we can inspect the regional COVID-19 dataset provided by the Civil Protection, and calculate the proportion of the deaths registered in those regions

If just those 4 regions (out of 20) account for more than 80% of the total deaths, having a single model that predicts the trend for the whole country is a major oversimplification. In fact, the situation varies considerably from region to region, as shown in the image below.



For each region a different model should be applied, in order to better understand the epidemic trends in the different areas of the country. Given that the data on Github.

This Analysis tells us that the COVID-19 epidemic will end in Italy in one and two year, if the current trend is maintained over time.This data set and result shows that Other Country Like India has a low number of cases per one lakh people and this is significant if one considers the availability of resources and population density in India.An important element in the data here is the doubling time. Doubling time shows the number of days it takes for total confirmed cases to double and is a good indicator to see the growth of COVID-19.The doubling rate is way higher India(cases double every 14 days) ,United states (35), Russia (20), UK (35), Spain (56), Italy (55), and Germany (54). The only exception to this is Brazil with a doubling time of just 13 days.

Now, The Main part

I had analysed Data in two fragments : Pre Corona [2016 to 2020] from Data available at different sources and Post Corona [2020 to 2023] by extrapolating the current shift during lockdown and expected recovery & changes post corona, analysing different factors which affect this trend and ultimate reflection and impact of this on our lives.
My Topic is Impact of Air Pollution on our Lives [Vehicular and Industrial Pollution to be taken as key point.After Analysing the Project that was on a Dataset I am here with my Observation.

Impact of Air Pollution on our Lives :

Relation between enviroment and covid19

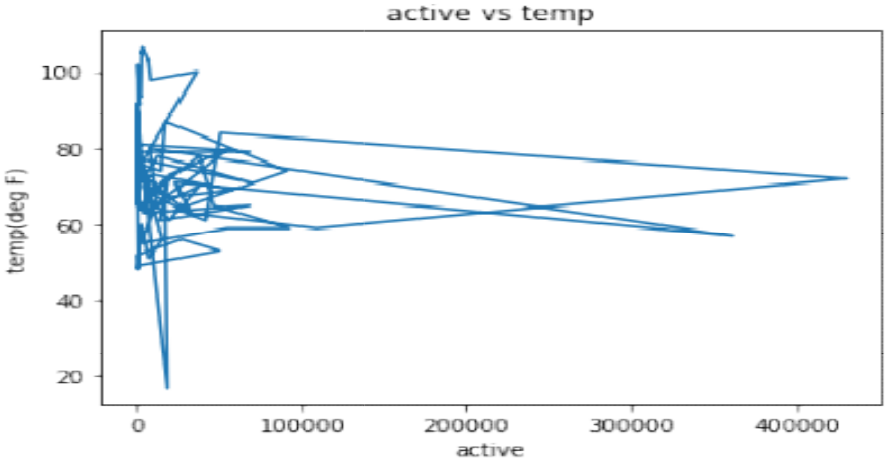
The pinpoint of the environmental factors that could affect the transmission of the coronavirus disease 2019 (COVID-19) in an effort to minimize dangerous environments and stem the spread.The behaviors of viruses and how they react to various environments is highly variable, Some viruses can be transmitted through water and others are airborne. This potential role of the environment in the spread of COVID-19 highlights the multitude of applied research needs that must be addressed to effectively control outbreaks and pandemics as novel enveloped viruses emerge," the researchers said in viewpoint published in *Environmental Science and Technology.*

Enviroment factors:

In addition to understanding how large of a role indirect transmission plays in the COVID-19 pandemic, the researchers added that various environmental conditions can influence how long the virus survives on various surfaces. Those conditions can include relative humidity, fomite material, and air temperature, and understanding these variations could help ensure properly cleaned surfaces and environments in which the virus is less likely to spread.

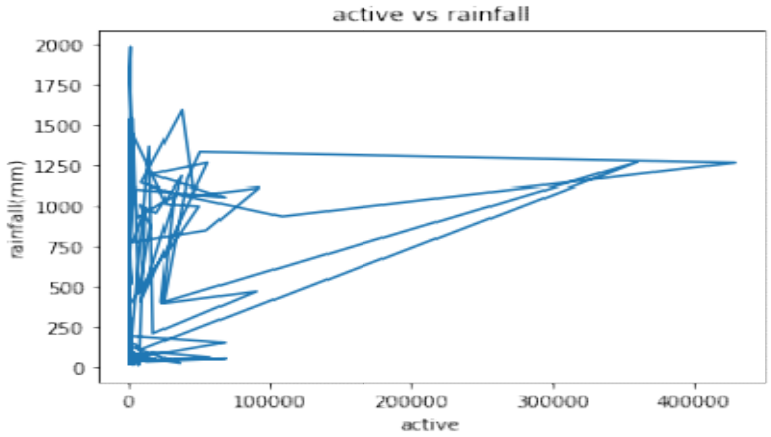
Resuls on temparature

In this study we found that areas with significant community transmission of COVID-19 had distribution roughly at consistently similar weather patterns consisting of average temperatures of 45 F to 75 F. We get the idea about the spread of covid -19 based on seasonality.



Result on Humidity &* Wind speed(rainfall)*:

An environment of 10% -20% relative humidity contributed to good viral clearance and an efficient immune response.When cold, dry air comes indoors and is warmed, the relative humidity indoors drops by about 30%. Such a drop in humidity makes it easier for airborne viral particles to travel. The study also stated that countries next to regions that receive high wind speed (10-12 m/s) were more feavourable to the virus to spread.



One can observe the sharp rise (and falls, if any) very easily in this kind of visualization. It is useful for data with exponential relationships, or where one variable covers a large range of values. In our scenario, the case counts are increasing exponentially.Just because the rise in number of cases is exponential, it does not imply that we can fit the data to an exponential curve and predict the number of cases in the coming days. Compartmental model techniques are normally used to model infectious diseases. Each member of the population typically progresses from susceptible to infectious to recovered. This can be shown as a flow diagram in which the boxes represent the different compartments and the arrows the transition between compartments

So, What Can We Do?

Since there is no vaccine available right now, the only way to handle the spread is to slow down the transmission. As it can be seen even in the under-estimates and from the actual data around us, the sharply increasing number of cases is bound to overwhelm the medical infrastructure of any nation. So, by slowing down the transmission, we don't actually stop the spread but keep the transmission and the active cases at any point in time well within the limits of the medical handling capacity. This is what is being referred to as "Flattening The Curve".

FUTURE WITH COVID 19:

Many of these changes may remain for some time. Even once the spread of coronavirus is contained, the risk of a new wave of contagion will remain as long as a vaccine is not available, which may take between one and two years.

For people drink and eat on long tables in the open.That could provide the ideal setting to practice social distancing in company. Gathering around a table instead of, for example, sitting on a blanket for a picnic allows people to keep a safe distance without sitting apart in a way that feels forced. From a practical perspective, gardens also make it easier to space out the seating plan and sanitise each table more easily,. Whether restaurants and bars have outdoor access or not, people will need to maintain safe distance. Small, modular tables will allow her to rearrange the space accordingly,. When spaces are too small to ensure appropriate distancing, or are indoors, it becomes more difficult. some have criticised those solutions which are based on defensive design principles – which seek to "mistake-proof" a design out of fear that the user may misuse a device. In restaurants, one example is using plastic screens to split restaurant tables, making it all but impossible for customers to get too close to one another. Some felt that the screens were impractical and would take away the joy of a shared meal

The importance of trust

Recent research has identified trust as the backbone of social and economic recovery. In order to go back to normal life – and to use public or communal spaces – people must feel physically safe and trust that others are looking after their safety, too.“Trust is key to rebuild people’s confidence when gathering in public or private spaces “When it comes to restaurants, gyms and theatres, people are worried about hygiene standards and protocols, they want to feel safe and secure.”

While the pandemic forced us to reorganise our shared spaces, lockdown has given us the time to rethink what we want our social life to look like. And although we may have to wave goodbye to the lively, crowded bars, theatres and gyms that we used to love, at least for some time, we also have the unique opportunity to rediscover what togetherness means in new spaces – and to reimagine those spaces from scratch.

IMPACT BY AIR POLUTION

when it comes to Covid-19, these risks to respiratory health are not the sum of their parts; researchers in the US are building a case that suggests air pollution has significantly worsened the Covid-19 outbreak and led to more deaths than if pollution-free skies were the norm. As well as predisposing the people who have lived with polluted air for decades, scientists have also suggested that air pollution particles may be acting as vehicles for viral transmission.Scientists say that improving air quality could play an important role in overcoming the pandemic.

One recent study found that even small increases in fine particulate matter, known as PM2.5, have had an outsized effect in the US. An increase of just 1 microgram per cubic metre corresponded to a 15% increase in Covid-19 deaths, It is pretty clear that people who have been living in places that are more polluted over time, that they are more likely to die from coronavirus.the association is likely down to the higher risk of existing respiratory and heart diseases in areas of higher pollution. **Air pollution is also known to weaken the immune system**, compromising people’s ability to fight off infection

Also, Amidst the devastating Covid-19 pandemic, a rare positive has been the significant global decrease in air pollution levels.It’s ironic that this devastating respiratory virus has illuminated another respiratory crisis. May World make the recent decreases in air pollution that have provided a glimmer of hope during these difficult times permanent, rather than a temporary glimpse at what’s possible.