Trajectory_new

October 30, 2020

[1]:
```
import pandas as pd
import matplotlib.pyplot as plt
import numpy as np
from numpy import ma
import requests
np.seterr(invalid='ignore')

link = "https://covid.ourworldindata.org/data/ecdc/new_deaths.csv"
f = requests.get(link)

with open("deaths_new.csv","w+") as out:
    out.seek(0)
    out.write(f.text)
    out.truncate()
```

[2]:
```
deaths=pd.read_csv("deaths_new.csv")

deaths_old=deaths.drop(deaths.index[260-7:])
average_period=7
total_deaths=deaths.cumsum(axis=0)
rolling_average=deaths.rolling(average_period).mean()

average_period=30

average_deaths=pd.read_csv("5YearDeaths.csv")
average_deaths.loc[:,'Total'] = average_deaths.sum(axis=1)
average_deaths['Rolling Average'] = average_deaths['Total'].
 ↪rolling(average_period).mean()
average_deaths['Rolling ST Dev'] = average_deaths['Total'].
 ↪rolling(average_period).std()
average_deaths['Rolling ST Dev 30 Before'] = average_deaths['Total'].
 ↪rolling(average_period).std().shift(average_period)
average_deaths['Rolling ST Dev ratio']=average_deaths["Rolling ST Dev"]/
 ↪average_deaths["Rolling ST Dev 30 Before"]
```

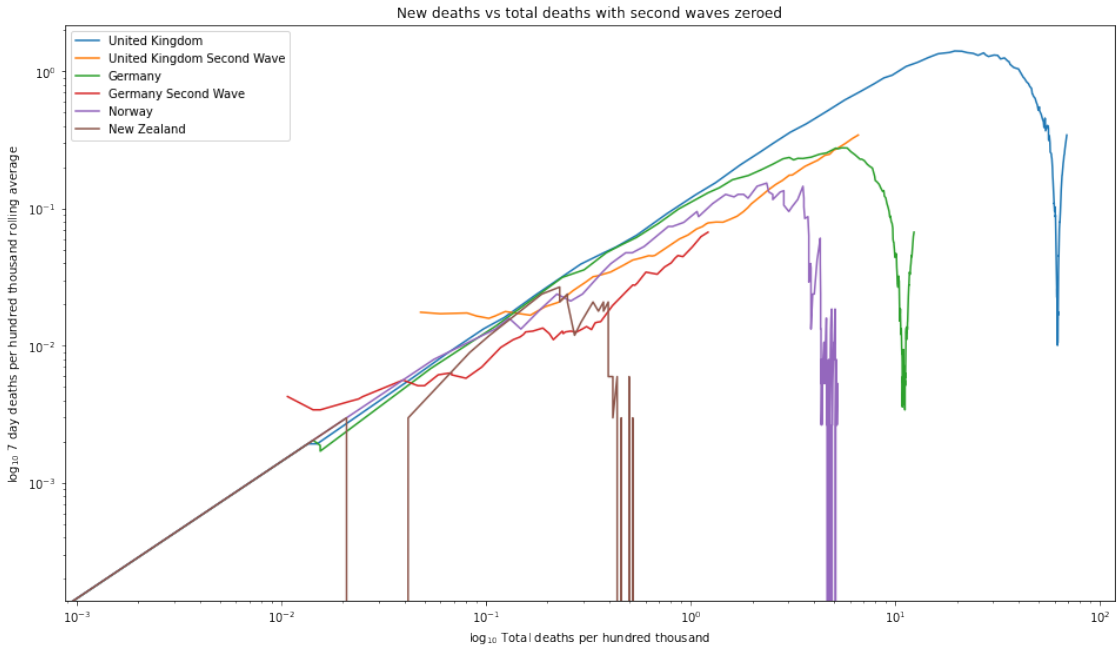
[3]:
```
non_winter_average_deaths=1378
prop_of_covid_would_be_winter=.5
```

```
winter_mortality=average_deaths.drop(average_deaths.index[:122-30-30-23]).
 ↪drop(average_deaths.index[122-30-30-23+51:])
winter_mortality["Excess"]=winter_mortality["Rolling␣
 ↪Average"]-non_winter_average_deaths+114-1.366667+32-30
winter_mortality["Excess Adjusted"]=winter_mortality["Excess"].apply(lambda x :␣
 ↪x -x*prop_of_covid_would_be_winter*total_deaths["United Kingdom"][260-7]/
 ↪winter_mortality["Excess"].sum())
total_winter_mortality=winter_mortality.cumsum(axis=0)
```

[4]:
```
plt.rcParams["figure.figsize"] = (16,9)

plt.plot((np.divide(deaths["United Kingdom"].cumsum(axis=0).astype(str).
 ↪astype(int).to_numpy(),668)),(np.divide(rolling_average["United Kingdom"].
 ↪astype(str).astype(float).to_numpy(),668)))
plt.plot((np.divide(deaths["United Kingdom"].drop(deaths.index[:260-7]).
 ↪cumsum(axis=0).astype(str).astype(int).to_numpy(),668)),(np.
 ↪divide(rolling_average["United Kingdom"].drop(deaths.index[:260-7]).
 ↪astype(str).astype(float).to_numpy(),668)))

plt.plot((np.divide(total_deaths["Germany"].astype(str).astype(int).
 ↪to_numpy(),839)),(np.divide(rolling_average["Germany"].astype(str).
 ↪astype(float).to_numpy(),839)))
plt.plot((np.divide(deaths["Germany"].drop(deaths.index[0:260-7]).
 ↪cumsum(axis=0).astype(str).astype(int).to_numpy(),839)),(np.
 ↪divide(rolling_average["Germany"].drop(deaths.index[0:260-7]).astype(str).
 ↪astype(float).to_numpy(),839)))

plt.plot((np.divide(total_deaths["Norway"].astype(str).astype(int).
 ↪to_numpy(),54)),(np.divide(rolling_average["Norway"].astype(str).
 ↪astype(float).to_numpy(),54)))
plt.plot((np.divide(total_deaths["New Zealand"].astype(str).astype(float).
 ↪to_numpy(),48)),(np.divide(rolling_average["New Zealand"].astype(str).
 ↪astype(float).to_numpy(),48)))


china_dip=110


plt.xscale('log')
plt.yscale('log')
plt.xlabel("$\log_{10}$ Total deaths per hundred thousand")
plt.ylabel("$\log_{10}$ 7 day deaths per hundred thousand rolling average")
plt.title("New deaths vs total deaths with second waves zeroed")
```

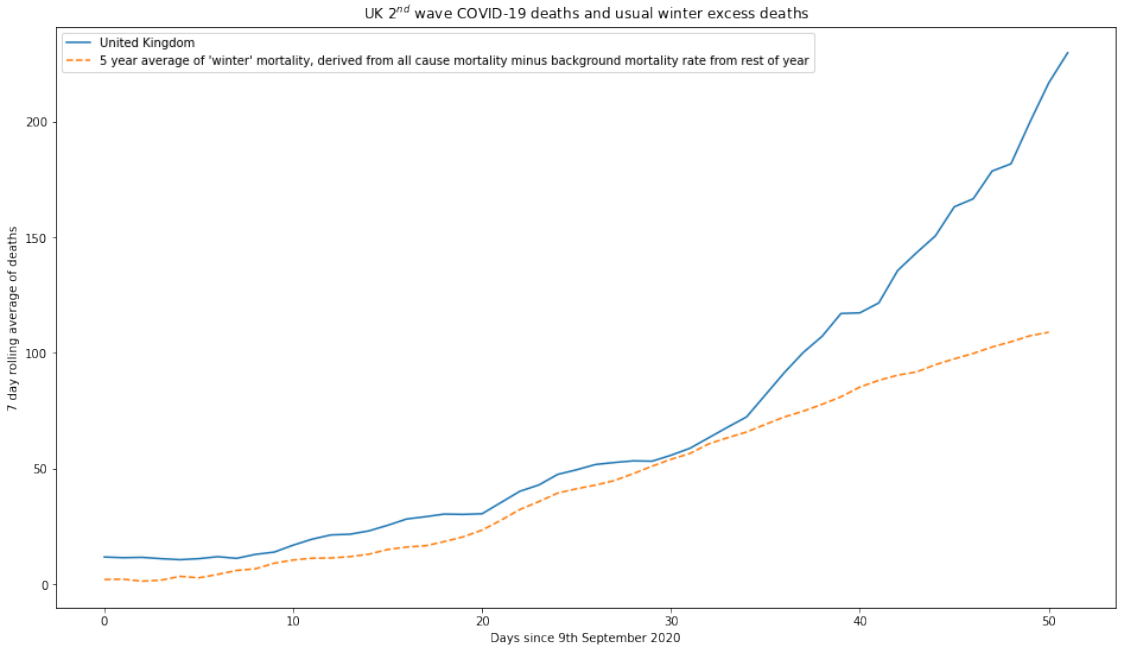
```
plt.legend(["United Kingdom","United Kingdom Second Wave","Germany","Germany␣
 ↪Second Wave","Norway","New Zealand","UK Lockdown Start","UK Tier System␣
 ↪Introduction"])
```

[4]: <matplotlib.legend.Legend at 0x11709fa50>



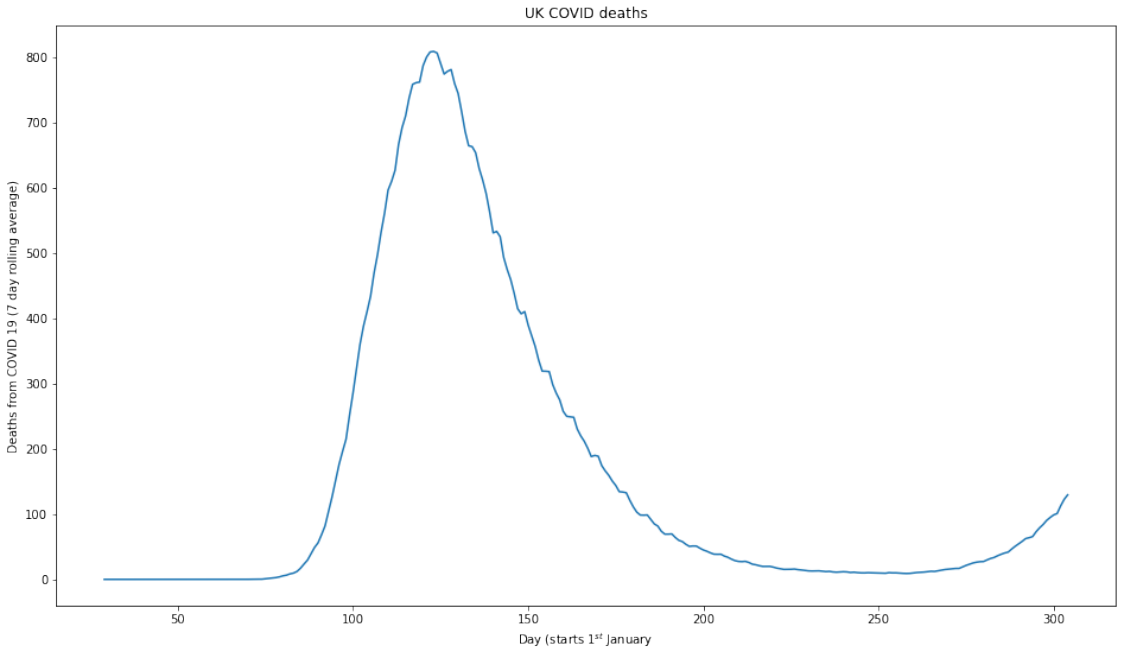
[5]:
```
plt.rcParams["figure.figsize"] = (16,9)

plt.plot((np.divide(rolling_average["United Kingdom"].drop(deaths.index[0:
 ↪260-7]).astype(str).astype(float).to_numpy(),1)))

china_dip=110

plt.plot((np.divide(winter_mortality["Excess"].astype(str).astype(float).
 ↪to_numpy(),1)),linestyle = '--')

plt.xlabel("Days since 9th September 2020")
plt.ylabel("7 day rolling average of deaths")
plt.title("UK $2^{nd}$ wave COVID-19 deaths and usual winter excess deaths")

plt.legend(["United Kingdom","5 year average of 'winter' mortality, derived␣
 ↪from all cause mortality minus background mortality rate from rest of␣
 ↪year","UK Lockdown Start","UK Tier System Introduction","UK Average Winter␣
 ↪Excess Mortality for this period"])#,"Italy","Italy Second␣
 ↪Wave","France","France Second Wave"])"""
```

[5]: <matplotlib.legend.Legend at 0x11761dd90>



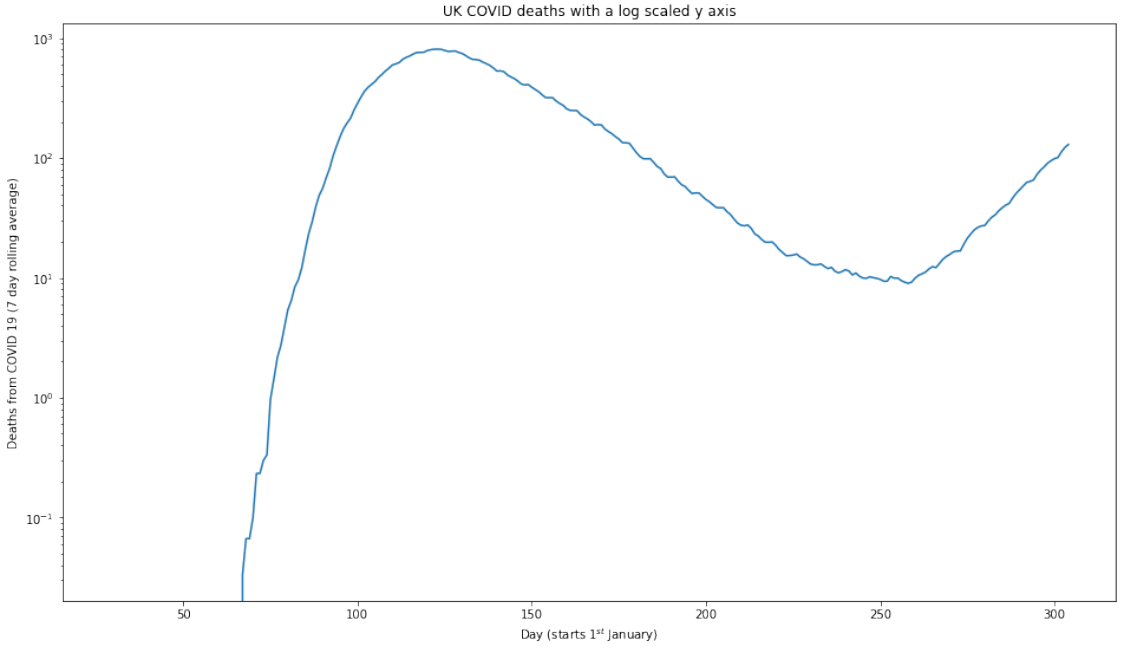
[6]:
```
plt.plot(deaths["United Kingdom"].rolling(average_period).mean())
plt.ylabel("Deaths from COVID 19 (7 day rolling average)")
plt.xlabel("Day (starts $1^{st}$ January")
plt.title("UK COVID deaths")
```

[6]: Text(0.5, 1.0, 'UK COVID deaths')



[7]:
```
plt.plot(deaths["United Kingdom"].rolling(average_period).mean())
plt.yscale('log')
plt.ylabel("Deaths from COVID 19 (7 day rolling average)")
plt.xlabel("Day (starts $1^{st}$ January)")
plt.title("UK COVID deaths with a log scaled y axis")
```

[7]:
```
Text(0.5, 1.0, 'UK COVID deaths with a log scaled y axis')
```



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