

Europe hit by the second wave of Covid-19? Can you validate this with the covid-19 datasets that you have or downloading fresh data from [CSSE git repository](#)? Please show the analysis using a time series plot (no. of deaths vs. day from 1st April till now)

GENERATING FUNCTION WHILE IMPORTING DATA

```
function x10_17_2020 = importfile(filename, dataLines)
%IMPORTFILE Import data from a text file
% X10_17_2020 = IMPORTFILE(FILENAME) reads data from text file FILENAME
% for the default selection. Returns the data as a table.
%
% X10_17_2020 = IMPORTFILE(FILE, DATALINES) reads data for the
% specified row interval(s) of text file FILENAME. Specify DATALINES as
% a positive scalar integer or a N-by-2 array of positive scalar
% integers for dis-contiguous row intervals.
%
% Example:
% x10_17_2020 = importfile("/MATLAB Drive/jhudata/10-17-2020.csv", [2,
Inf]);
%
% See also READTABLE.
%
% Auto-generated by MATLAB on 12-Dec-2020 05:10:37

%% Input handling

% If dataLines is not specified, define defaults
if nargin < 2
    dataLines = [2, Inf];
end

%% Set up the Import Options and import the data
opts = delimitedTextImportOptions("NumVariables", 14);

% Specify range and delimiter
opts.DataLines = dataLines;
opts.Delimiter = ",";

% Specify column names and types
opts.VariableNames = ["FIPS", "Admin2", "Province_State",
"Country_Region", "Last_Update", "Lat", "Long_", "Confirmed", "Deaths",
"Recovered", "Active", "Combined_Key", "Incidence_Rate",
"CaseFatality_Ratio"];
opts.VariableTypes = ["string", "double", "string", "categorical",
"datetime", "double", "double", "double", "double", "double", "double",
"string", "double", "double"];

% Specify file level properties
opts.ExtraColumnsRule = "ignore";
opts.EmptyLineRule = "read";

% Specify variable properties
```

```
opts = setvaropts(opts, ["FIPS", "Province_State", "Combined_Key"],  
"WhitespaceRule", "preserve");  
opts = setvaropts(opts, ["FIPS", "Province_State", "Country_Region",  
"Combined_Key"], "EmptyFieldRule", "auto");  
opts = setvaropts(opts, "Last_Update", "InputFormat", "yyyy-MM-dd  
HH:mm:ss");  
opts = setvaropts(opts, "Admin2", "TrimNonNumeric", true);  
opts = setvaropts(opts, "Admin2", "ThousandsSeparator", ",");
```

```
% Import the data  
x10_17_2020 = readtable(filename, opts);
```

```
end
```

```
disp('Running covid-19 data extraction code');  
Running covid-19 data extraction code
```

```
datestr(now)  
ans = '12-Dec-2020 23:27:54'
```

```
sessionstart=datetime('now');
```

```
tic
```

DEFINING GLOBAL VARIABLES AND PATHS TO FOLDERS

```
%defining global variables  
global abspath datapath scriptpath datasetspath;
```

```
%path of the folder  
abspath='/MATLAB Drive/';
```

```
%path for the raw data from SOOFA  
datapath=strcat(abspath, 'jhudata/');
```

```
%path where the scripts are kept  
scriptpath=strcat(abspath, 'scripts/');
```

```
%path where the results are kept  
datasetspath=strcat(abspath, 'datasets/');
```

```
addpath(scriptpath);  
addpath(datapath);  
addpath(datasetspath);
```

REMOVING UNWANTED DATA

```
%s1allFiles = dir(datapath);
%s1allFileNames = {s1allFiles.name};%this has to be done manually to
delete the non csv files.

%manually delete the files such as .,.,.,.gitignore,READ.md (all files
%except .csv files)
%delete the .csv files till 03-31-2020 as the fields were changing.
% if size(s1allFileNames,2) > 1
%     s1allFileNames=transpose(s1allFileNames);
% end
%save('/MATLAB Drive/datasets/covid19FileNames.mat','s1allFileNames');
%save(strcat(datasetspath,'test.mat'),'s1allFileNames');
```

```
load covid19FileNames.mat;
```

APPENDING AND SAVING DATASETS TO DESIGNATED FOLDERS CREATED IN THE DIRECTORY

```
s1numFiles=numel(s1allFileNames);
covid19_data=importfile1(strcat(datapath,s1allFileNames{1}));
```

```
for i = 2:s1numFiles
s1FileNamei=s1allFileNames{i};
covid19_data_onefile = importfile1(strcat(datapath,s1FileNamei));
covid19_data=vertcat(covid19_data,covid19_data_onefile);
end
covid19_data2 = convertvars(covid19_data,'Last_Update',@string);
covid19_data2.Last_Update=datetime(covid19_data2.Last_Update,'InputFormat'
,'yyyy-MM-dd HH:mm:ss');
%convert string to datetime variable in a Table
covid19_data2.Last_Update=datetime(covid19_data2.Last_Update,'InputFormat'
,'yyyy-MM-dd HH:mm:ss');
% save('/MATLAB Drive/datasets/covid19_data2.mat','covid19_data2');
datestr(now)
ans = '12-Jan-2021 23:28:50'
toc
Elapsed time is 55.544894 seconds.
```

BOUNDARY CONDITIONS

```
covid19_data3=covid19_data2(covid19_data2.Deaths>=0,:);
covid19_data4=covid19_data3(covid19_data3.Active>=0,:);
covid19_data5=covid19_data4(covid19_data4.Recovered>=0,:);
covid19_data6=covid19_data5(covid19_data5.Confirmed>=0,:);
```

```
covid19_data7=covid19_data6(covid19_data6.Lat>=-90,:);
covid19_data8=covid19_data7(covid19_data7.Long_>=-180,:);
```

REMOVING DUPLICATES

```
covid19_data9
=varfun(@max,covid19_data8,'GroupingVariables',{'Country_Region','Province
_State','Last_Update'}, ...
'InputVariables',{'Lat','Long_','Confirmed','Deaths','Active','Recovered',
'Incidence_Rate','CaseFatality_Ratio'});
```

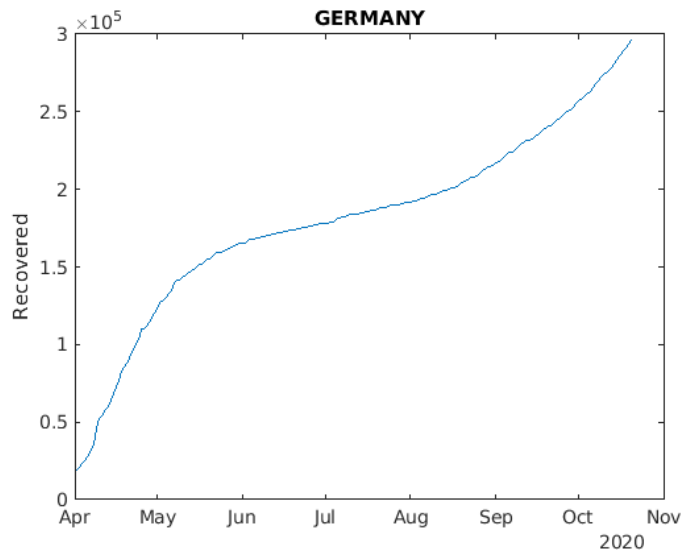
EXTRACTING DATA FOR SIX COUNTRIES

```
covid19_data10 = removevars(covid19_data9,{'GroupCount'});
covid19_data8_GE=covid19_data10(covid19_data10.Country_Region ==
'Germany',:);
covid19_data8_UK=covid19_data10(covid19_data10.Country_Region == 'United
Kingdom',:);
covid19_data8_IT=covid19_data10(covid19_data10.Country_Region ==
'Italy',:);
covid19_data8_SW=covid19_data10(covid19_data10.Country_Region ==
'Switzerland',:);
covid19_data8_FR=covid19_data10(covid19_data10.Country_Region ==
'France',:);
covid19_data8_SP=covid19_data10(covid19_data10.Country_Region ==
'Spain',:);
covid19_data8_BL=covid19_data10(covid19_data10.Country_Region ==
'Belgium',:);
```

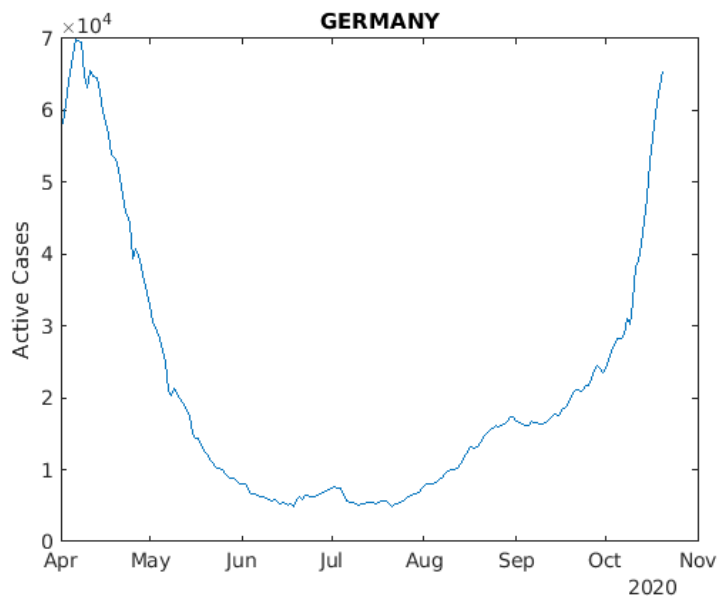
```
Covid_GE=varfun(@sum,covid19_data8_GE,'GroupingVariables',{'Country_Region
','Last_Update'},'InputVariables',{'max_Deaths','max_Active','max_Recover
e d'});
Covid_UK=varfun(@sum,covid19_data8_UK,'GroupingVariables',{'Country_Region
','Last_Update'},'InputVariables',{'max_Deaths','max_Active','max_Recover
e d'});
Covid_IT=varfun(@sum,covid19_data8_IT,'GroupingVariables',{'Country_Region
','Last_Update'},'InputVariables',{'max_Deaths','max_Active','max_Recover
e d'});
Covid_SW=varfun(@sum,covid19_data8_SW,'GroupingVariables',{'Country_Region
','Last_Update'},'InputVariables',{'max_Deaths','max_Active','max_Recover
e d'});
Covid_FR=varfun(@sum,covid19_data8_FR,'GroupingVariables',{'Country_Region
','Last_Update'},'InputVariables',{'max_Deaths','max_Active','max_Recover
e d'});
Covid_SP=varfun(@sum,covid19_data8_SP,'GroupingVariables',{'Country_Region
','Last_Update'},'InputVariables',{'max_Deaths','max_Active','max_Recover
e d'});
Covid_BL=varfun(@sum,covid19_data8_BL,'GroupingVariables',{'Country_Region
','Last_Update'},'InputVariables',{'max_Deaths','max_Active','max_Recover
e d'});
```

GRAPHICAL ANALYSIS OF DATASETS

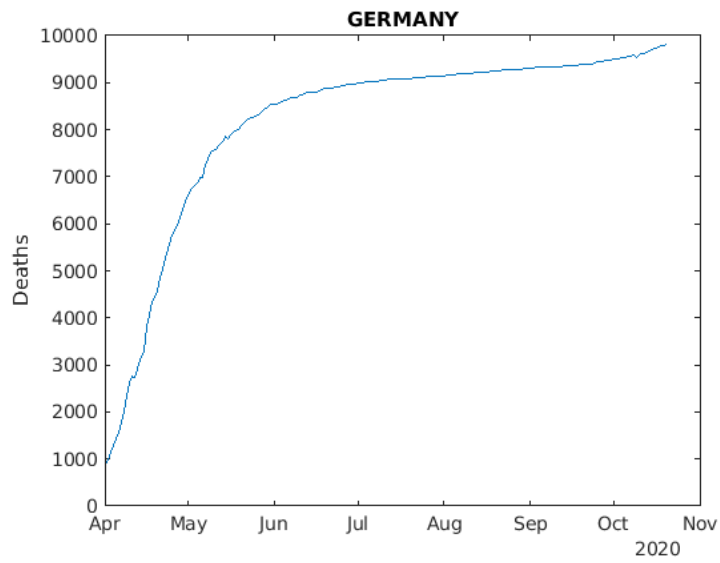
```
plot(Covid_GE.Last_Update,Covid_GE.sum_max_Recovered)  
ylabel('Recovered');title('GERMANY')
```



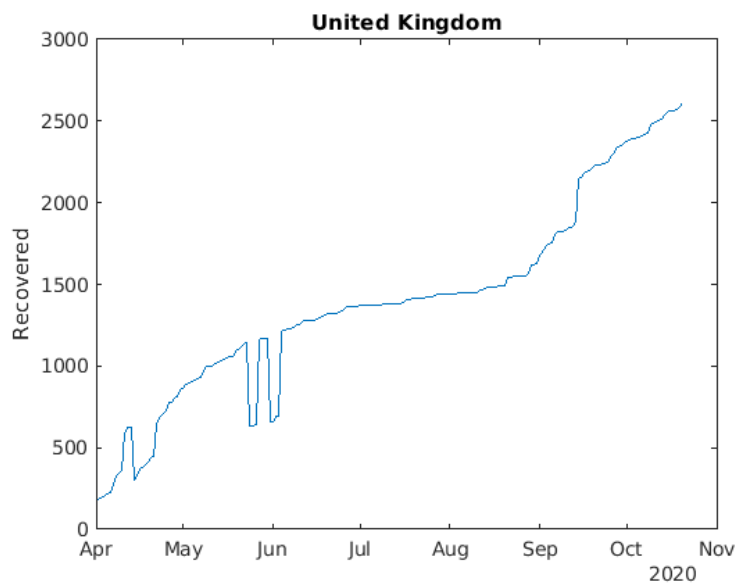
```
plot(Covid_GE.Last_Update,Covid_GE.sum_max_Active)  
ylabel('Active Cases');title('GERMANY')
```



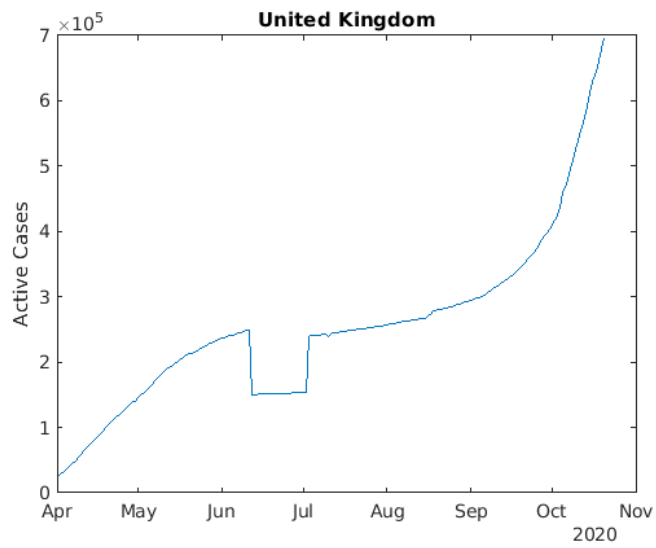
```
plot(Covid_GE.Last_Update,Covid_GE.sum_max_Deaths);  
ylabel('Deaths');title('GERMANY')
```



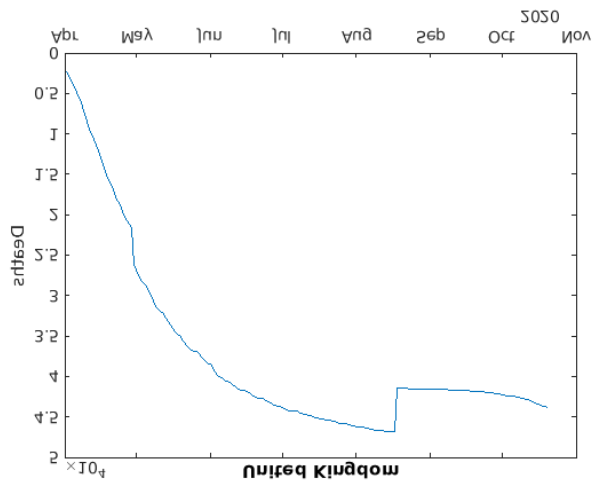
```
plot(Covid_UK.Last_Update,Covid_UK.sum_max_Recovered)  
ylabel('Recovered');title('United Kingdom')
```



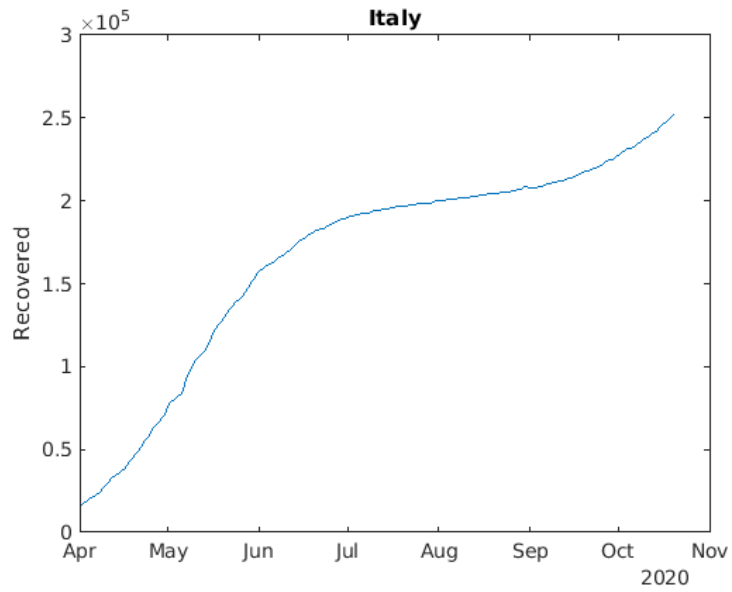
```
plot(Covid_UK.Last_Update,Covid_UK.sum_max_Active)  
ylabel('Active Cases');title('United Kingdom')
```



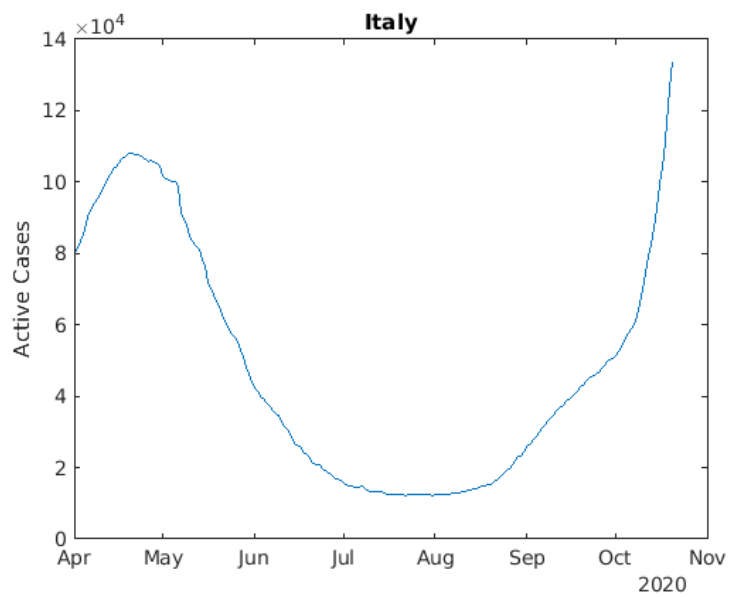
```
plot(Covid_UK.Last_Update,Covid_UK.sum_max_Deaths);  
ylabel('Deaths');title('United Kingdom')
```



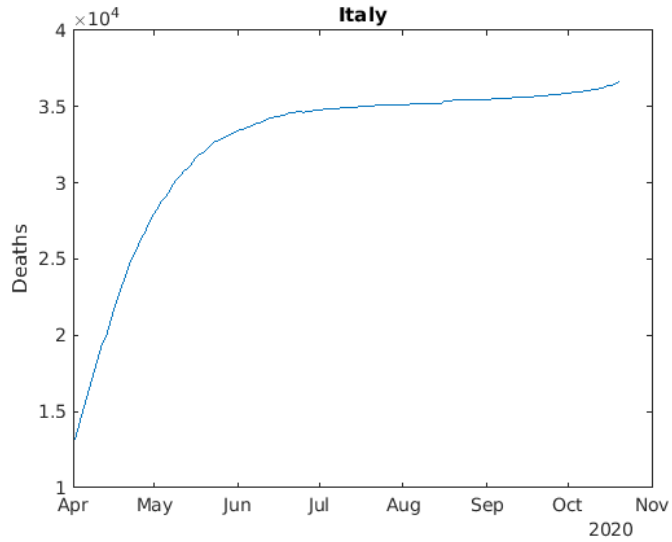
```
plot(Covid_IT.Last_Update,Covid_IT.sum_max_Recovered)
ylabel('Recovered');title('Italy')
```



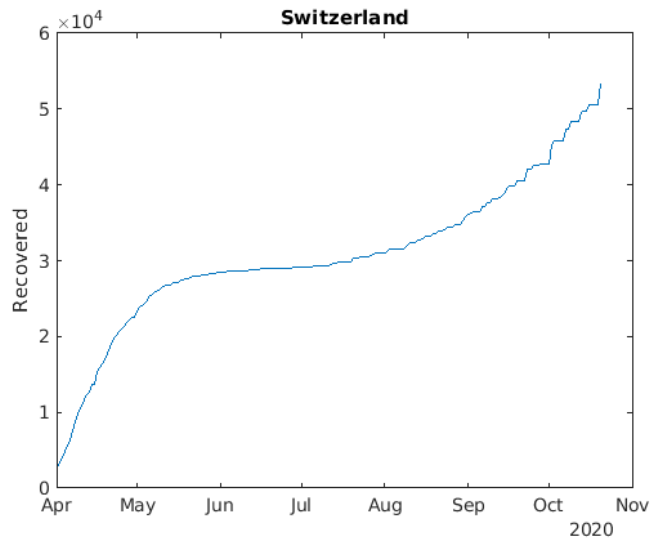
```
plot(Covid_IT.Last_Update,Covid_IT.sum_max_Active)
ylabel('Active Cases');title('Italy')
```



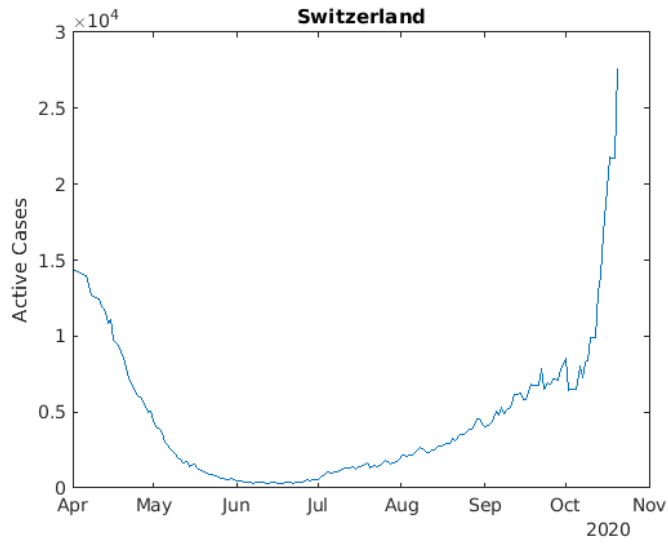

```
plot(Covid_IT.Last_Update,Covid_IT.sum_max_Deaths);  
ylabel('Deaths');title('Italy')
```



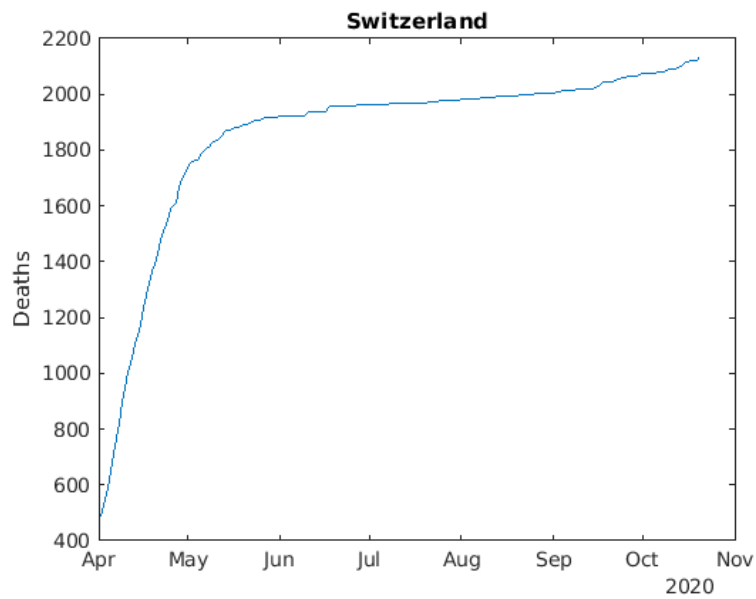
```
plot(Covid_SW.Last_Update,Covid_SW.sum_max_Recovered)  
ylabel('Recovered');title('Switzerland')
```



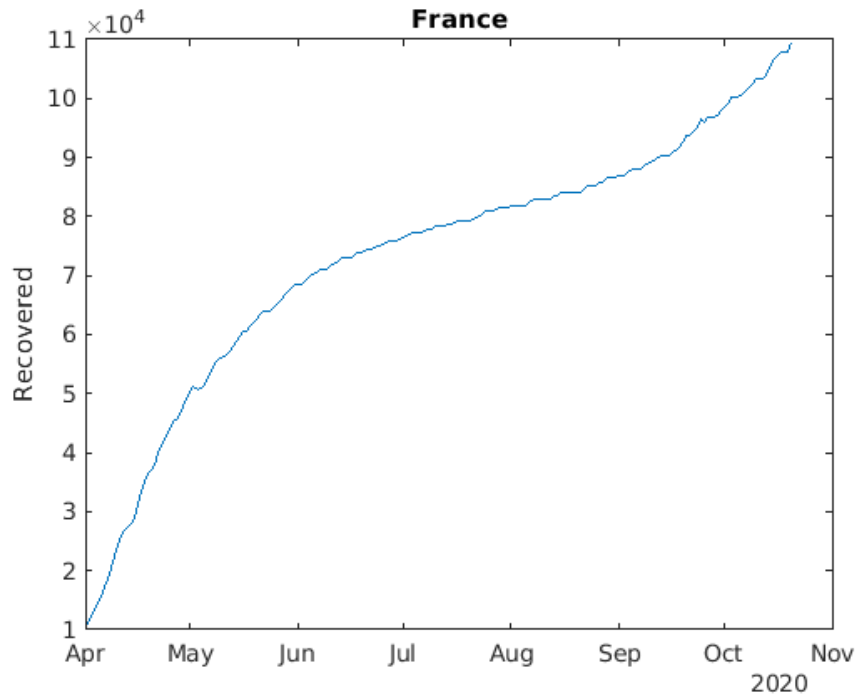
```
plot(Covid_SW.Last_Update,Covid_SW.sum_max_Active)  
ylabel('Active Cases');title('Switzerland')
```



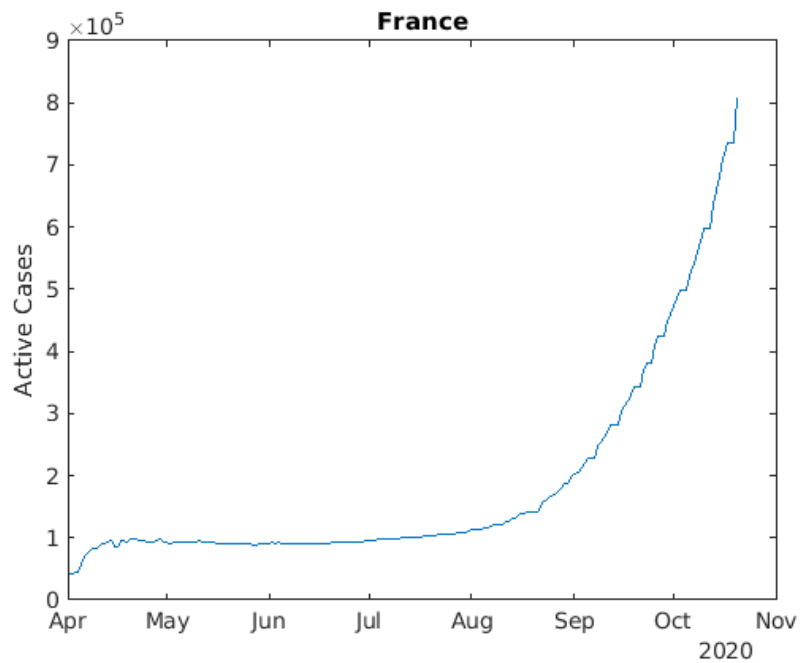
```
plot(Covid_SW.Last_Update,Covid_SW.sum_max_Deaths);  
ylabel('Deaths');title('Switzerland')
```



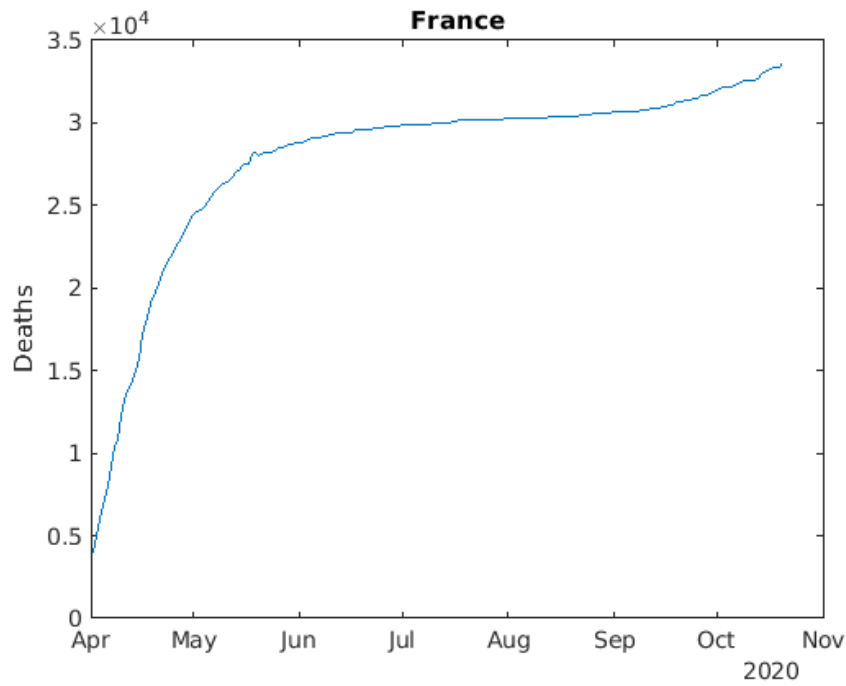
```
plot(Covid_FR.Last_Update,Covid_FR.sum_max_Recovered)
ylabel('Recovered');title('France')
```



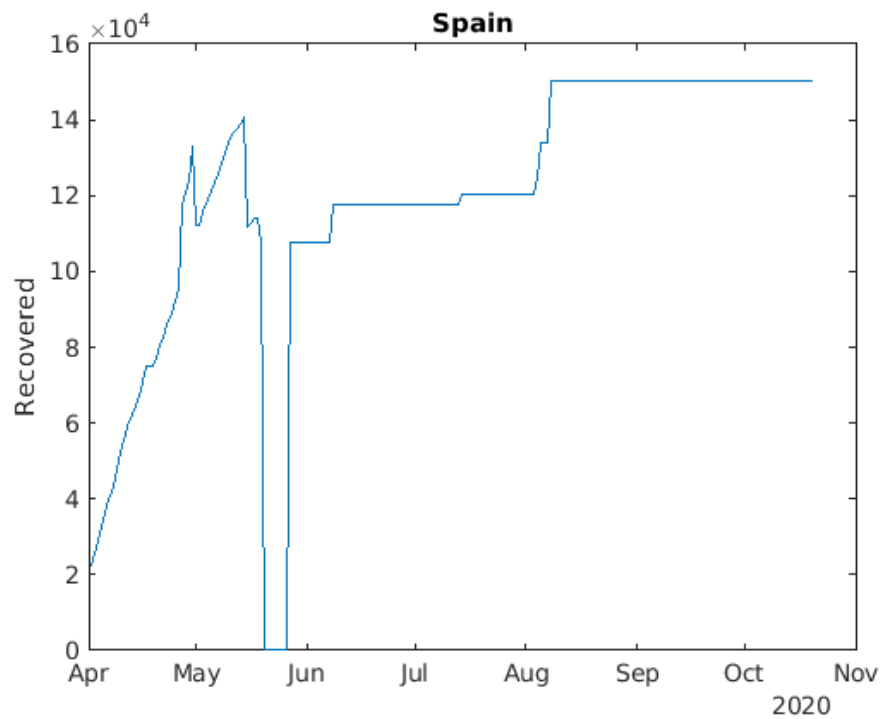
```
plot(Covid_FR.Last_Update,Covid_FR.sum_max_Active)
ylabel('Active Cases');title('France')
```



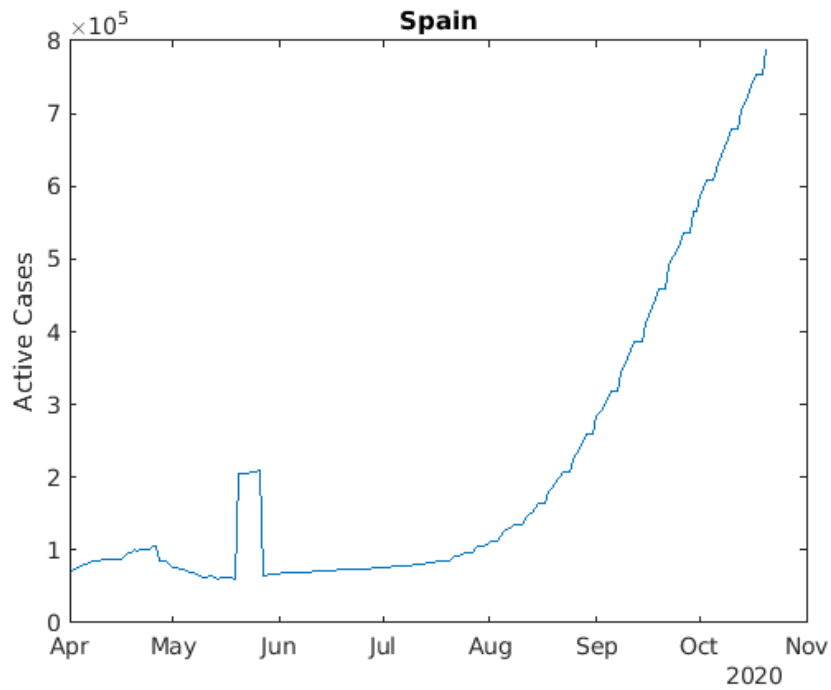
```
plot(Covid_FR.Last_Update,Covid_FR.sum_max_Deaths);  
ylabel('Deaths');title('France')
```



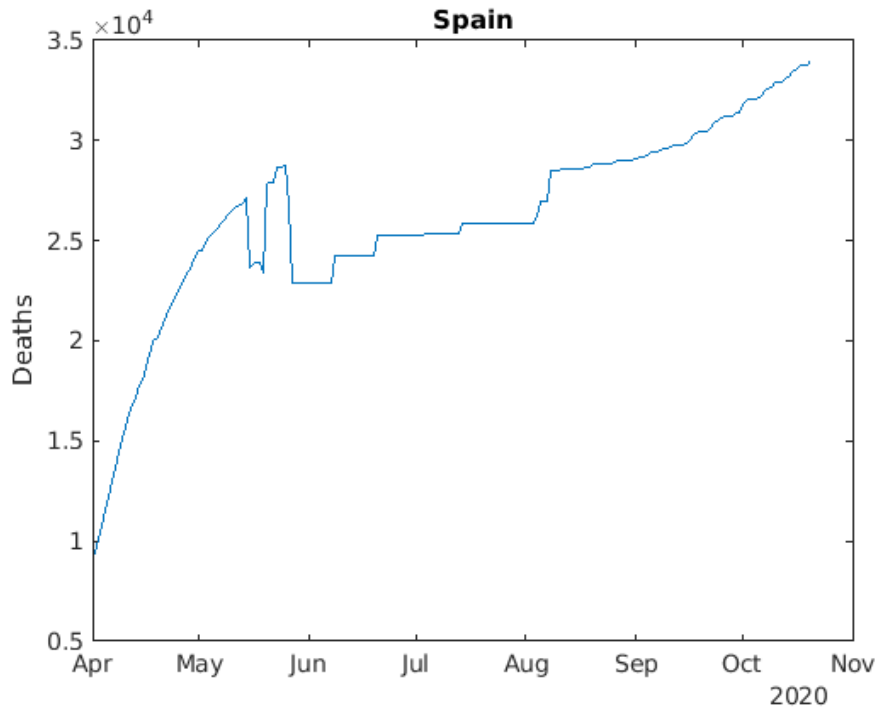
```
plot(Covid_SP.Last_Update,Covid_SP.sum_max_Recovered)  
ylabel('Recovered');title('Spain')
```



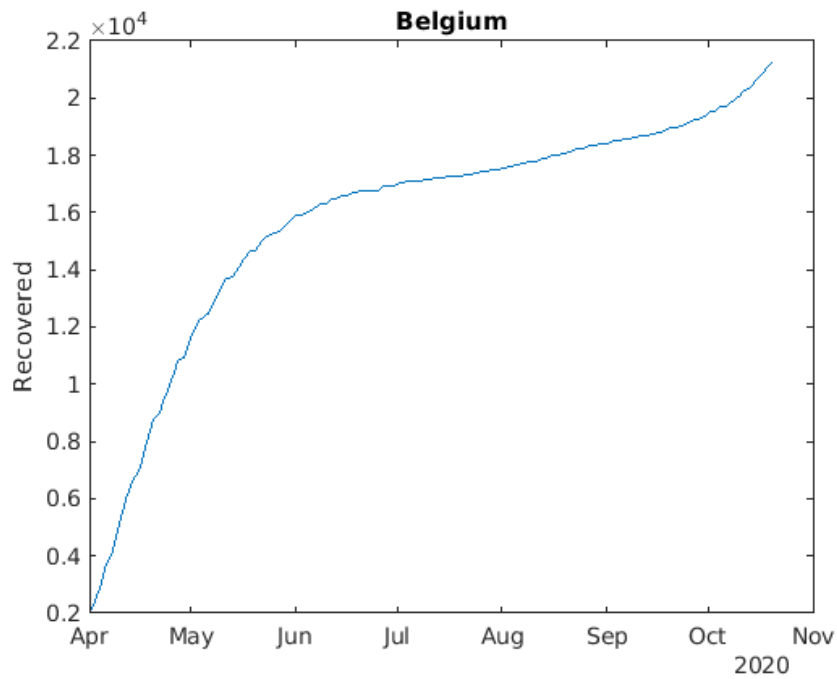
```
plot(Covid_SP.Last_Update,Covid_SP.sum_max_Active)  
ylabel('Active Cases');title('Spain')
```



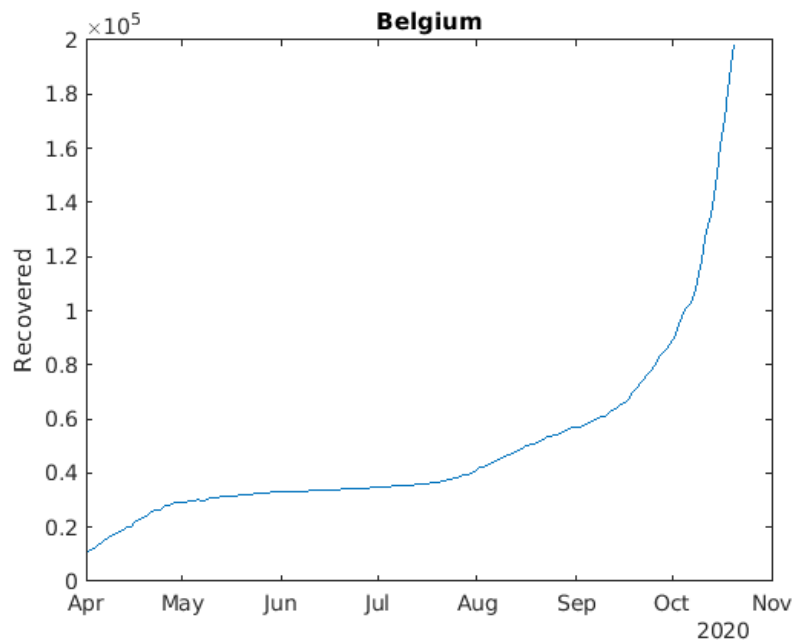
```
plot(Covid_SP.Last_Update,Covid_SP.sum_max_Deaths);  
ylabel('Deaths');title('Spain')
```



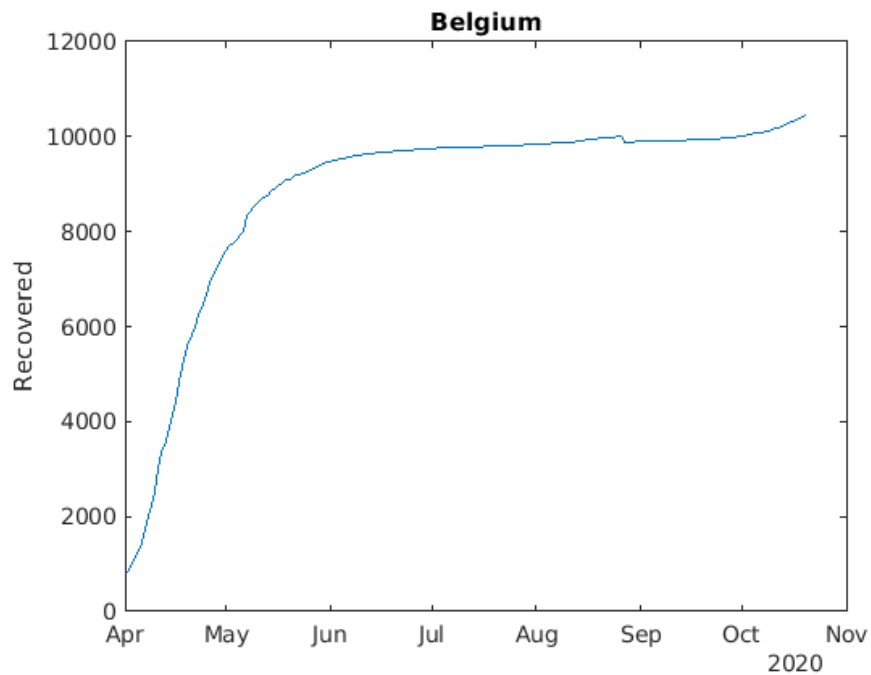
```
plot(Covid_BL.Last_Update,Covid_BL.sum_max_Recovered)
ylabel('Recovered');title('Belgium')
```



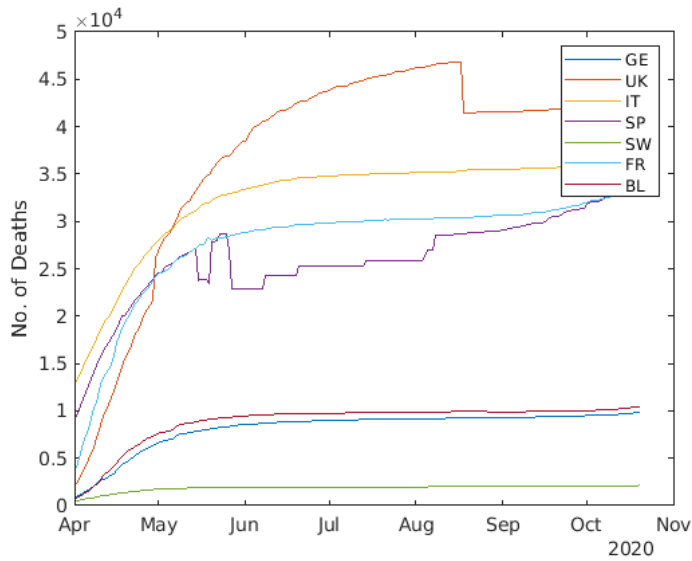
```
plot(Covid_BL.Last_Update,Covid_BL.sum_max_Active)
ylabel('Recovered');title('Belgium')
```



```
plot(Covid_BL.Last_Update,Covid_BL.sum_max_Deaths)
ylabel('Recovered');title('Belgium')
```



```
plot(Covid_GE.Last_Update,Covid_GE.sum_max_Deaths);ylabel('No. of
Deaths');legend('show');legend('GE'); hold on;
plot(Covid_UK.Last_Update,Covid_UK.sum_max_Deaths);ylabel('No. of
Deaths');
plot(Covid_IT.Last_Update,Covid_IT.sum_max_Deaths);ylabel('No. of
Deaths');
plot(Covid_SP.Last_Update,Covid_SP.sum_max_Deaths);ylabel('No. of
Deaths');
plot(Covid_SW.Last_Update,Covid_SW.sum_max_Deaths);ylabel('No. of
Deaths');
plot(Covid_FR.Last_Update,Covid_FR.sum_max_Deaths);ylabel('No. of
Deaths');
plot(Covid_BL.Last_Update,Covid_BL.sum_max_Deaths);ylabel('No. of
Deaths');
legend('show');(legend('GE','UK','IT','SP','SW','FR','BL'));
```



It is observed from the above graph that many countries in Europe are witnessing a second wave especially Spain.

Please also find out if this is the case in your State as well. Show the visuals and the insights.

I am a resident of Agra and thus I have performed analysis for Uttar Pradesh.

It is observed from below analysis that the no. of deaths is still rising. This could be accounted to poor or inaccessible medical facilities.

```

covid19_data8_IN=covid19_data10(covid19_data10.Country_Region == 'India',:);
covid19_UP=covid19_data8_IN(covid19_data8_IN.Province_State == 'Uttar Pradesh',:);
plot(covid19_UP.Last_Update,covid19_UP.max_Deaths);ylabel('Number of Deaths');title('Uttar Pradesh');

```

