Madrid_Pain_Graphs

June 8, 2020

[1]:
```
! cd ../data/; FILELIST=" 200509 200508 200507 200506 200505 200504 200503␣
↪200502 200501 200430 200429 200428 200427 200426 200425 200424 200423 200422␣
↪200510 200511 200512 200513 200514 200515 200516 200517 200518 200519 200520␣
↪200521 200522 200523 200524 200525 200526 200527 200528 200529 200530 200609␣
↪200608 200607 200606 200605 200604 200603 200602 200601 200610 200611 200612␣
↪200613 200614 200615 200616 200617 200618 200619 200620 200621 200622 200623␣
↪200624 200625 200626 200627 200628 200629 200630 " ; for fecha in `echo␣
↪$FILELIST`  ; do  FILE=${fecha}_cam_covid19.pdf ;  [ ! -f ../data/${FILE} ]␣
↪&& echo $FILE::::: && wget https://www.comunidad.madrid/sites/default/
↪files/doc/sanidad/$FILE 1>/dev/null  2>/dev/null && ls -altr $FILE ; done

! pwd
```

[2]:
```
from tabula import read_pdf
import os
import pandas as pd
import glob
import re
from tqdm.notebook import tqdm
import warnings
warnings.filterwarnings('ignore')

os.environ["JAVA_HOME"] = "/usr/lib/jvm/java-1.8.0-openjdk-1.8.0.141-1.b16.
↪el7_3.x86_64/jre"

# Auxiliary functions
from datetime import datetime, date, time, timedelta

""" Rellenar dias vacios con interpolacion"""
def interpolate_dataframe(df,freq):
    if freq == 'H':
        rng = pd.date_range(df.index.min(), df.index.max() + pd.Timedelta(23,␣
↪'H'), freq='H')
    elif freq == 'D' :
        rng = pd.date_range(
                        datetime.strptime(str(df.index.min())[:10]+' 00:00:00',␣
↪"%Y-%m-%d %H:%M:%S") ,
```

```
                        datetime.strptime(str(df.index.max())[:10]+' 00:00:00',␣
↪"%Y-%m-%d %H:%M:%S"),
                        freq='D')
        df.index = pd.to_datetime(df.index)
    df2 = df.reindex(rng)
    df = df2
    for column in df.columns :
        s = pd.Series(df[column])
        s.interpolate(method="quadratic", inplace =True)
        df[column] = pd.DataFrame([s]).T
    return df

def fet_daily_date_new_format(fecha):
    df_pdf =  read_pdf('../data/'+fecha+'_cam_covid19.pdf',area=(000, 600, 400,␣
↪800) , pages='1')
    df = df_pdf[0]
    df = df['Unnamed: 0'].astype(str).str.replace(r".", '').replace("(", ' ')
    df = df.T
    df.columns = df.iloc[0]
    df = df.iloc[1:]


    df = pd.DataFrame(data=df)
    df

    dict = {}
    dict['HOSPITALES'] = df[df['Unnamed: 0'].str.contains('Hospitales')].
↪iloc[0]['Unnamed: 0'].split(' ')[0]
    dict['DOMICILIOS'] = df[df['Unnamed: 0'].str.contains('Domicilios')].
↪iloc[0]['Unnamed: 0'].split(' ')[0]
    dict['CENTROS SOCIOSANITARIOS'] = df[df['Unnamed: 0'].str.
↪contains('Centros')].iloc[0]['Unnamed: 0'].split(' ')[0]
    dict['OTROS LUGARES'] = df[df['Unnamed: 0'].str.contains('otros')].
↪iloc[0]['Unnamed: 0'].split(' ')[0]

    cadena_a_parsear = df[df['Unnamed: 0'].str.contains('otal')].
↪iloc[0]['Unnamed: 0']

    dict['FALLECIDOS TOTALES'] = re.search(r'(\d+)', cadena_a_parsear)[0]

    df = pd.DataFrame.from_dict(dict, orient='index').T
    df['Fecha'] =  pd.to_datetime(fecha, format='%y%m%d')
    df.set_index('Fecha', inplace=True, drop=True)
    return df
```

```
def get_daily_data(fecha):
    if fecha > '200512' :
        return fet_daily_date_new_format(fecha)

    col2str = {'dtype': str}
    kwargs = {'output_format': 'dataframe',
              'pandas_options': col2str,
              'stream': True}
    df_pdf =  read_pdf('../data/'+fecha+'_cam_covid19.
 ↪pdf',pages='1',multiple_tables = True,**kwargs)


    df = df_pdf[0]

    df = df[df['Unnamed: 0'].notna()]
    df = df[(df['Unnamed: 0']=='HOSPITALES') | (df['Unnamed: 0'] ==␣
 ↪'DOMICILIOS') | (df['Unnamed: 0'] == 'CENTROS SOCIOSANITARIOS') |␣
 ↪(df['Unnamed: 0'] == 'OTROS LUGARES') | (df['Unnamed: 0'] == 'FALLECIDOS␣
 ↪TOTALES')]
    df = df[['Unnamed: 0','Unnamed: 2']]
    df['Unnamed: 2'] = df['Unnamed: 2'].astype(str).str.replace(r".", '')
    df = df.T
    df.columns = df.iloc[0]
    df = df.iloc[1:]

    df['Fecha'] =  pd.to_datetime(fecha, format='%y%m%d')
    df = df.rename_axis(None)

    df.set_index('Fecha', inplace=True, drop=True)
    df.index
    df.dropna()
    #df = df.T
    return df

def get_all_data( ):
    #BLACKLIST = ["200429","200422"]
    #BLACKLIST = ["200514",]
    BLACKLIST = []
    df = pd.DataFrame()
    list_df = []

    pdf_list= sorted(glob.glob('../data/*_cam_covid19.pdf'),
                     key=os.path.getmtime,
                     reverse=True )

    #for pdf_file in pdf_list:
```

```
    for pdf_file in tqdm(pdf_list,
                         desc="Procesando pdfs diarios"):
        # extract fecha from username , eg : ../data/2200422_cam_covid19.pdf
        fecha = pdf_file.split('/')[2].split('_')[0]
        if fecha not in BLACKLIST:
            #print("processing", fecha)
            df = get_daily_data(fecha)
        list_df.append(df)

    df = pd.concat(list_df)
    df = df.astype(int)
    df = df.drop_duplicates()

    df = df.sort_values(by=['Fecha'], ascending=True)
    ###jaime
    #df = interpolate_dataframe(df,'D')
    #df.index.name = 'Fecha'

    df['HOSPITALES hoy'] = df['HOSPITALES'] - df['HOSPITALES'].shift(1)
    df['CENTROS SOCIOSANITARIOS hoy'] = df['CENTROS SOCIOSANITARIOS'] -␣
↪df['CENTROS SOCIOSANITARIOS'].shift(1)
    df['FALLECIDOS TOTALES hoy'] = df['FALLECIDOS TOTALES'] - df['FALLECIDOS␣
↪TOTALES'].shift(1)

    df = df.sort_values(by=['Fecha'], ascending=False)

    return df

total =  get_all_data()
```

```
HBox(children=(FloatProgress(value=0.0, description='Procesando pdfs', max=48.0, style=Progress
```

```
Got stderr: Jun 08, 2020 7:59:04 PM
org.apache.pdfbox.pdmodel.font.PDCIDFontType2 <init>
INFO: OpenType Layout tables used in font CIDFont+F1 are not implemented in
PDFBox and will be ignored
Jun 08, 2020 7:59:04 PM org.apache.pdfbox.pdmodel.font.PDCIDFontType2 <init>
INFO: OpenType Layout tables used in font CIDFont+F2 are not implemented in
PDFBox and will be ignored
Jun 08, 2020 7:59:04 PM org.apache.pdfbox.pdmodel.font.PDCIDFontType2 <init>
INFO: OpenType Layout tables used in font CIDFont+F3 are not implemented in
PDFBox and will be ignored
Jun 08, 2020 7:59:04 PM org.apache.pdfbox.pdmodel.font.PDCIDFontType2 <init>
INFO: OpenType Layout tables used in font CIDFont+F1 are not implemented in
PDFBox and will be ignored
Jun 08, 2020 7:59:05 PM org.apache.pdfbox.pdmodel.font.PDCIDFontType2 <init>
INFO: OpenType Layout tables used in font CIDFont+F2 are not implemented in
```

```
PDFBox and will be ignored
Jun 08, 2020 7:59:05 PM org.apache.pdfbox.pdmodel.font.PDCIDFontType2 <init>
INFO: OpenType Layout tables used in font CIDFont+F3 are not implemented in
PDFBox and will be ignored
Jun 08, 2020 7:59:05 PM org.apache.pdfbox.pdmodel.font.PDCIDFontType2 <init>
INFO: OpenType Layout tables used in font CIDFont+F1 are not implemented in
PDFBox and will be ignored
Jun 08, 2020 7:59:05 PM org.apache.pdfbox.pdmodel.font.PDCIDFontType2 <init>
INFO: OpenType Layout tables used in font CIDFont+F2 are not implemented in
PDFBox and will be ignored
Jun 08, 2020 7:59:05 PM org.apache.pdfbox.pdmodel.font.PDCIDFontType2 <init>
INFO: OpenType Layout tables used in font CIDFont+F3 are not implemented in
PDFBox and will be ignored
```

[3]:
```
total
VENTANA_MEDIA_MOVIL=7
df = interpolate_dataframe(total,'D')
df.index.name = 'Fecha'
df = df.sort_values(by=['Fecha'], ascending=True)
df['HOSPITALES hoy'] = df['HOSPITALES'] - df['HOSPITALES'].shift(1)
df['CENTROS SOCIOSANITARIOS hoy'] = df['CENTROS SOCIOSANITARIOS'] - df['CENTROS␣
 ↪SOCIOSANITARIOS'].shift(1)
df['FALLECIDOS TOTALES hoy'] = df['FALLECIDOS TOTALES'] - df['FALLECIDOS␣
 ↪TOTALES'].shift(1)


df['MA CENTROS SOCIOSANITARIOS hoy'] = df['CENTROS SOCIOSANITARIOS hoy'].
 ↪rolling(window=VENTANA_MEDIA_MOVIL).mean()
df['MA HOSPITALES hoy'] = df['HOSPITALES hoy'].
 ↪rolling(window=VENTANA_MEDIA_MOVIL).mean()
df['MA FALLECIDOS TOTALES hoy'] = df['FALLECIDOS TOTALES hoy'].
 ↪rolling(window=VENTANA_MEDIA_MOVIL).mean()

df = df.sort_index(ascending=False)
df_master = df.copy()
```

[4]:
```
from matplotlib import colors

def background_gradient(s, m, M, cmap='PuBu', low=0, high=0):
    rng = M - m
    norm = colors.Normalize(m - (rng * low),
                            M + (rng * high))
    normed = norm(s.values)
    c = [colors.rgb2hex(x) for x in plt.cm.get_cmap(cmap)(normed)]
```

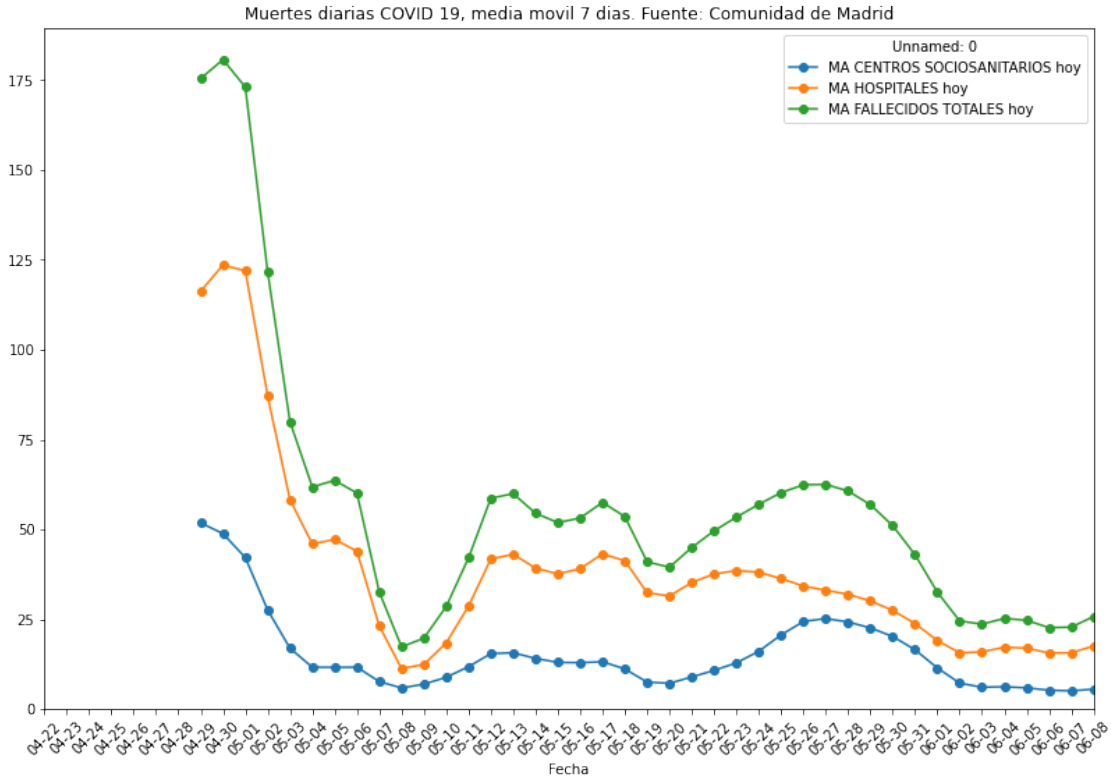
```
    return ['background-color: %s' % color for color in c]

df.style.format ({ c : "{:20,.0f}" for c in df.columns }).
 ↪background_gradient(cmap='Wistia', subset= df.columns[-3:] )
```

[4]:
```
<pandas.io.formats.style.Styler at 0x7fe7506061d0>
```

[19]:
```
HTML("<h2>Gráfico muertes diarias en Madrid, según Comunidad de Madrid </h2>")
```

[19]:
```
<IPython.core.display.HTML object>
```

[17]:
```
import pandas as pd
import io
import matplotlib.dates as mdates
from matplotlib import pyplot as plt

df = df_master
chart_df=df[df.columns[-3:]]
chart_df.plot(legend=True,figsize=(13.5,9), marker='o')

plt.gca().xaxis.set_major_formatter(mdates.DateFormatter('%m-%d'))
plt.gca().xaxis.set_major_locator(mdates.DayLocator(interval=1))
plt.xticks(rotation=45)

ax = plt.gca()

ax.set_title("Muertes diarias COVID 19, media movil␣
 ↪"+str(VENTANA_MEDIA_MOVIL)+" dias. Fuente: Comunidad de Madrid")
ax.set_ylim(ymin=0)

plt.show()
```



[6]:
```
 from IPython.display import display, HTML
HTML("<h2>Comparamos los datos de hoy, de hace una semana y de un mes </h2>")
```

[6]: <IPython.core.display.HTML object>

[7]:
```
df = df_master
pd.concat([df.head(1).tail(1) , df.head(7).tail(1) , df.head(30).tail(1)]).
 ↪astype(int)[['MA HOSPITALES hoy','MA CENTROS SOCIOSANITARIOS hoy','MA␣
 ↪FALLECIDOS TOTALES hoy']].style.format ({ c : "{:20,.0f}" for c in df.
 ↪columns }).background_gradient(cmap='Wistia', subset= df.columns[-3:] )
```

[7]: <pandas.io.formats.style.Styler at 0x7fe70b9d45c0>

[8]:
```
from IPython.display import display, HTML
HTML("<h2>Muertes medias diarias, últimos 7 días, con datos</h2>")
```

[8]: <IPython.core.display.HTML object>

[9]:
```
from datetime import date

df = df_master
inicio_crisis = df.head(7).index[6]
```

```
df=df.head(7)
dia_mas_reciente = df.index[0]
dias_transcurridos_inicio_crisis = dia_mas_reciente - inicio_crisis
df = pd.DataFrame((df.head(1).max(axis=0) - df.tail(1).max(axis=0) ) / ␣
 ↪dias_transcurridos_inicio_crisis.days  ).
 ↪T[['HOSPITALES','DOMICILIOS','CENTROS SOCIOSANITARIOS','OTROS␣
 ↪LUGARES','FALLECIDOS TOTALES']]
df.style.format ({ c : "{:20,.0f}" for c in df.columns }).
 ↪background_gradient(cmap='Wistia'  )
```

[9]: <pandas.io.formats.style.Styler at 0x7fe7099a5e80>

[14]:
```
HTML("<h2>Muertes medias diarias desde que la comunidad de Madrid publica␣
 ↪datos</h2>")
```

[14]: <IPython.core.display.HTML object>

[13]:
```
# Calculamos los incrementos medios, desde que tenemos fechas
df = df_master
df = pd.DataFrame((df.head(1).max(axis=0) - df.tail(1).max(axis=0) ) / df.
 ↪shape[0] ).T[['HOSPITALES','DOMICILIOS','CENTROS SOCIOSANITARIOS','OTROS␣
 ↪LUGARES','FALLECIDOS TOTALES']]
df.style.format ({ c : "{:20,.0f}" for c in df.columns }).
 ↪background_gradient(cmap='Wistia'  )
```

[13]: <pandas.io.formats.style.Styler at 0x7fe7505a1668>

[ ]: