Pain_Graphs

August 24, 2020

1 Informes y predicciones de COVID-19 en España

Actualizado diariamente, este documento se visualiza mejor aquí.

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Comparativas de dos dimensiones	Comparativas por comunidades	Comparativas individuales	Predicciones
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Section ??	Section ??	Section ??	Section ??
Section ??	Section ??	Section ??	Section ??
	Section ??	Section ??	Section ??
		Section ??	Section ??

1.3 Section ??

[1]:

```
# Cargamos datos
import Loading_data
from matplotlib import pyplot as plt
import warnings
warnings.filterwarnings('ignore')
from IPython.display import display, HTML

def Insertar_Enlace(cell_name):
    display(HTML('<a id="'+ cell_name +'"></a>'))
```

```python
Insertar_Enlace('DatosMadrid')

COMUNIDAD_A_CONSIDERAR = 'Madrid'
comunidad = Loading_data.Get_Comunidad(COMUNIDAD_A_CONSIDERAR)
comunidad.head(10)
```

```
/root/scripts/COVID-19/jupyter/Loading_data.py:22: FutureWarning: Sorting
because non-concatenation axis is not aligned. A future version
of pandas will change to not sort by default.

To accept the future behavior, pass 'sort=False'.

To retain the current behavior and silence the warning, pass 'sort=True'.

  df = pd.concat([df,this_df])

<IPython.core.display.HTML object>
```

[1]:

```
             Lugar  Casos  Casos hoy absoluto  \
Fecha
2020-06-05  Madrid  69423                 187
2020-06-04  Madrid  69236                 124
2020-06-03  Madrid  69112                 152
2020-06-02  Madrid  68960                 108
2020-06-01  Madrid  68852                  22
2020-05-31  Madrid  68830                  90
2020-05-30  Madrid  68740                 143
2020-05-29  Madrid  68597                 146
2020-05-28  Madrid  68451                 185
2020-05-27  Madrid  68266                 200

            Casos hoy variacion respecto ayer  Casos hoy porcentaje  \
Fecha
2020-06-05                                 63              0.002694
2020-06-04                                -28              0.001791
2020-06-03                                 44              0.002199
2020-06-02                                 86              0.001566
2020-06-01                                -68              0.000320
2020-05-31                                -53              0.001308
2020-05-30                                 -3              0.002080
2020-05-29                                -39              0.002128
2020-05-28                                -15              0.002703
2020-05-27                                 66              0.002930

            Fallecidos  Fallecidos hoy absoluto  \
Fecha
2020-06-05        8691                        0
```

```
2020-06-04        8691                        0
2020-06-03        8691                        0
2020-06-02        8691                        0
2020-06-01        8691                        0
2020-05-31        8691                        0
2020-05-30        8691                        0
2020-05-29        8691                        0
2020-05-28        8691                        0
2020-05-27        8691                        0

            Fallecidos hoy variacion respecto ayer  Fallecidos hoy porcentaje  \
Fecha
2020-06-05                                       0                        0.0
2020-06-04                                       0                        0.0
2020-06-03                                       0                        0.0
2020-06-02                                       0                        0.0
2020-06-01                                       0                        0.0
2020-05-31                                       0                        0.0
2020-05-30                                       0                        0.0
2020-05-29                                       0                        0.0
2020-05-28                                       0                        0.0
2020-05-27                                      -5                        0.0

            Tasa Mortalidad  Curados  Curados hoy absoluto  \
Fecha
2020-06-05         0.125189        0                   0.0
2020-06-04         0.125527        0                   0.0
2020-06-03         0.125752        0                   0.0
2020-06-02         0.126030        0                   0.0
2020-06-01         0.126227        0                   0.0
2020-05-31         0.126268        0                   0.0
2020-05-30         0.126433        0                   0.0
2020-05-29         0.126697        0                   0.0
2020-05-28         0.126967        0                   0.0
2020-05-27         0.127311        0                   0.0

            Casos excluidos curados  \
Fecha
2020-06-05                    69423
2020-06-04                    69236
2020-06-03                    69112
2020-06-02                    68960
2020-06-01                    68852
2020-05-31                    68830
2020-05-30                    68740
2020-05-29                    68597
2020-05-28                    68451
```

```
2020-05-27                    68266

            Proporcion Curados hoy absoluto / Casos hoy absoluto   UCI  \
Fecha
2020-06-05                                                0.0     3551
2020-06-04                                                0.0     3550
2020-06-03                                                0.0     3546
2020-06-02                                                0.0     3546
2020-06-01                                                0.0     3544
2020-05-31                                                0.0     3544
2020-05-30                                                0.0     3544
2020-05-29                                                0.0     3544
2020-05-28                                                0.0     3544
2020-05-27                                                0.0     3544

            Hospitalizados
Fecha
2020-06-05           42079
2020-06-04           42068
2020-06-03           42041
2020-06-02           42041
2020-06-01           42017
2020-05-31           42014
2020-05-30           42011
2020-05-29           41993
2020-05-28           41972
2020-05-27           41945
```

[2]:

```
import pandas as pd


def Get_Dimensions_All_CCAA(Atributos,media_movil ):
    array = []
    dias_a_considerar = 4 if media_movil else 1
    for ca in COMUNIDADES:

        comunidad = Loading_data.Get_Comunidad(ca).head(dias_a_considerar)
        comunidad = comunidad.reset_index() # Resets the index, makes factor a␣
 ↪column
        if media_movil : comunidad = pd.DataFrame(comunidad.mean(axis=0)).T
        temp_dict = {}
        temp_dict['Lugar'] = ca
        for attr in Atributos:
            temp_dict[attr] = comunidad[attr].iloc[0]
        array.append(temp_dict)

    return pd.DataFrame.from_records(array)
```

[3]:

```
import scipy.stats as spstats
from matplotlib import pyplot as plt


def Print_Two_Cordinates_CCAA(df, add_LR=False):
    fig,ax = plt.subplots()
    fig.set_figheight(8)
    fig.set_figwidth(8)
    ax.axhline(y=0, color='blue')
    ax.axvline(x=0, color='blue')

    for k,d in df.groupby('Lugar'):
        ax.scatter(d[df.columns[1]], d[df.columns[2]], label=k)

    plt.legend(bbox_to_anchor=(0, 1), loc='upper left', ncol=1)

    if add_LR:
        slope, intercept, r_value, p_value, std_err = spstats.linregress(df[df.
 ↪columns[1]], df[df.columns[2]])
        plt.plot(df[df.columns[1]], intercept + slope*df[df.columns[1]], 'r',␣
 ↪label='fitted line')
        #.format(round(slope, 2),round(intercept, 2),round(r_value, 2))
        note2add = f"""slope: {slope:12.4f}\nintercept: {intercept:8.2f}\nr2:␣
 ↪{r_value**2:15.4f}"""
        plt.annotate(note2add,xy=(0.7,0.3), xycoords='figure fraction')

    ax.set_xlabel(df.columns[1])
    ax.set_ylabel(df.columns[2])
    ax.set_title(df.columns[1]+ ' VS. ' + df.columns[2])

    return plt
```

[4]:

```
import numpy as np
import seaborn as sns

from Loading_data import Get_Comunidades_List as comunidades
COMUNIDADES = comunidades()

def Get_Single_Dimension(dimension ):
    df = pd.DataFrame()
    df_tmp = pd.DataFrame()
    array = []
    #
    for ca in COMUNIDADES:
        df_tmp = Loading_data.Get_Comunidad(ca)
        new = df_tmp[[dimension]].copy()
        new.rename(columns={dimension: ca}, inplace=True)
        array.append(new)
    #
    df =  pd.concat(array, axis=1)
    return df

def plot_violin(dimension):
    """ Muestra la distribucion logaritmica por comunidades, de una dimension"""
    df = Get_Single_Dimension(dimension)
    # Ordenamos comunidades
    s = df.sum()
    df = df[s.sort_values(ascending=False).index[:]]

    # Pasamos a logaritmo
    df2 = np.log(df)
    df2.replace(-np.inf,  np.nan, inplace=True)
    display(HTML("<h2>Comparativa de distribucion de '" +dimension+ "', en cada␣
 ↪CC.AA </h2>"))
    display(HTML("Distribuciones convertidas a logaritmos neperianos, para␣
 ↪facilitar la comparación."))

    # primer grafico
    f, ax = plt.subplots()
    f.set_size_inches( 16, 10)
    f.suptitle("Comunidades con más, " + dimension.lower())
    sns.violinplot(data=df2.iloc[:,:-7])

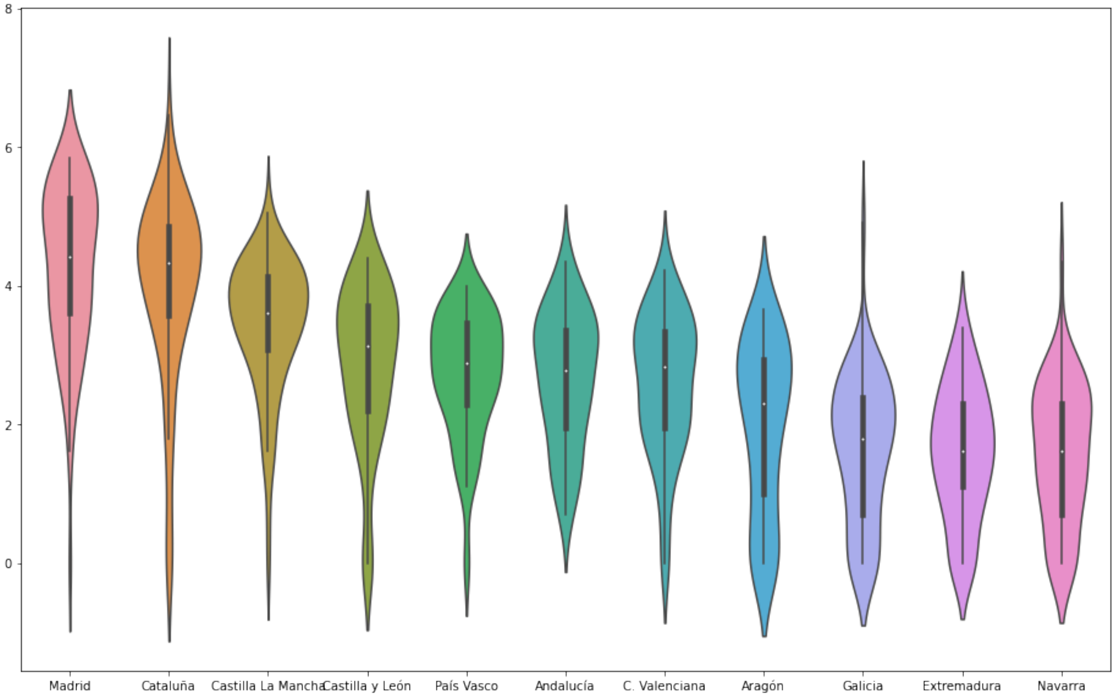
    #segundo grafico
    f, ax = plt.subplots()
    f.set_size_inches( 16, 10)
    f.suptitle("Comunidades con menos, " + dimension.lower()+".")
    sns.violinplot(data=df2.iloc[:,7:])
    return df

dimension = 'Fallecidos hoy absoluto'
df = plot_violin(dimension)
```

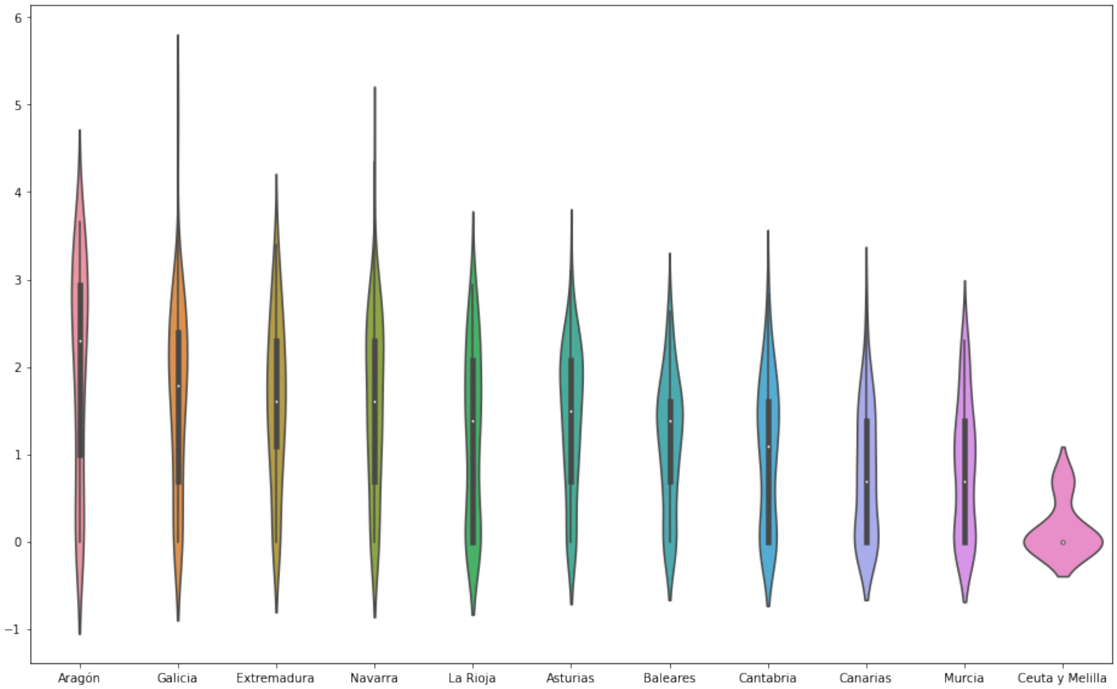
```
<IPython.core.display.HTML object>
```

```
<IPython.core.display.HTML object>
```

Comunidades con más, fallecidos hoy absoluto



Comunidades con menos, fallecidos hoy absoluto.



[5]:
```
df
```

[5]:
```
            Madrid  Cataluña  Castilla La Mancha  Castilla y León  País Vasco  \
Fecha
2020-06-05       0         0                   0                0           0
2020-06-04       0         0                   0                3           0
2020-06-03       0         0                   0                1           0
2020-06-02       0         0                   0                0           0
2020-06-01       0         0                   0                0           0
…            …       …                 …              …         …
2020-03-11      10         0                   0                0           0
2020-03-10      13         2                   0                0           1
2020-03-09       6         1                   0                0           5
2020-03-06       1         0                   0                0          -1
2020-03-05       0         0                   0                0           0

            Andalucía  C. Valenciana  Aragón  Galicia  Extremadura  Navarra  \
Fecha
2020-06-05          0              0       0        0            0        0
2020-06-04          0              0       0        0            0        0
2020-06-03          0              0       0        0            0        0
2020-06-02          0              0       0        0            0        0
2020-06-01          0              0       0        0            0        0
…               …            …     …      …          …      …
2020-03-11          0              0       1        0            0        0
2020-03-10          0              0       2        0            0        0
2020-03-09          0              0       0        0            0        0
2020-03-06          0              0       1        0            0        0
2020-03-05          0              0       0        0            0        0

            La Rioja  Asturias  Baleares  Cantabria  Canarias  Murcia  \
Fecha
2020-06-05         0         1         0          0         0       0
2020-06-04         1         1         0          0         0       0
2020-06-03         0         0         0          0         0       0
2020-06-02         0         0         0          0         0       0
2020-06-01         0         0         0          0         0       0
…              …       …       …        …       …     …
2020-03-11         1         0         0          0         0       0
2020-03-10         1         0         0          0         0       0
2020-03-09        -1         0         0          0         0       0
2020-03-06         1         0         0          0         0       0
2020-03-05         0         0         0          0         0       0

            Ceuta y Melilla
```

```
Fecha
2020-06-05                0
2020-06-04                0
2020-06-03                0
2020-06-02                0
2020-06-01                0
…                     …
2020-03-11                0
2020-03-10                0
2020-03-09                0
2020-03-06                0
2020-03-05                0

[89 rows x 18 columns]
```

[6]:

```
import Loading_data

from Loading_data import Get_Comunidades_List as comunidades
COMUNIDADES = comunidades()

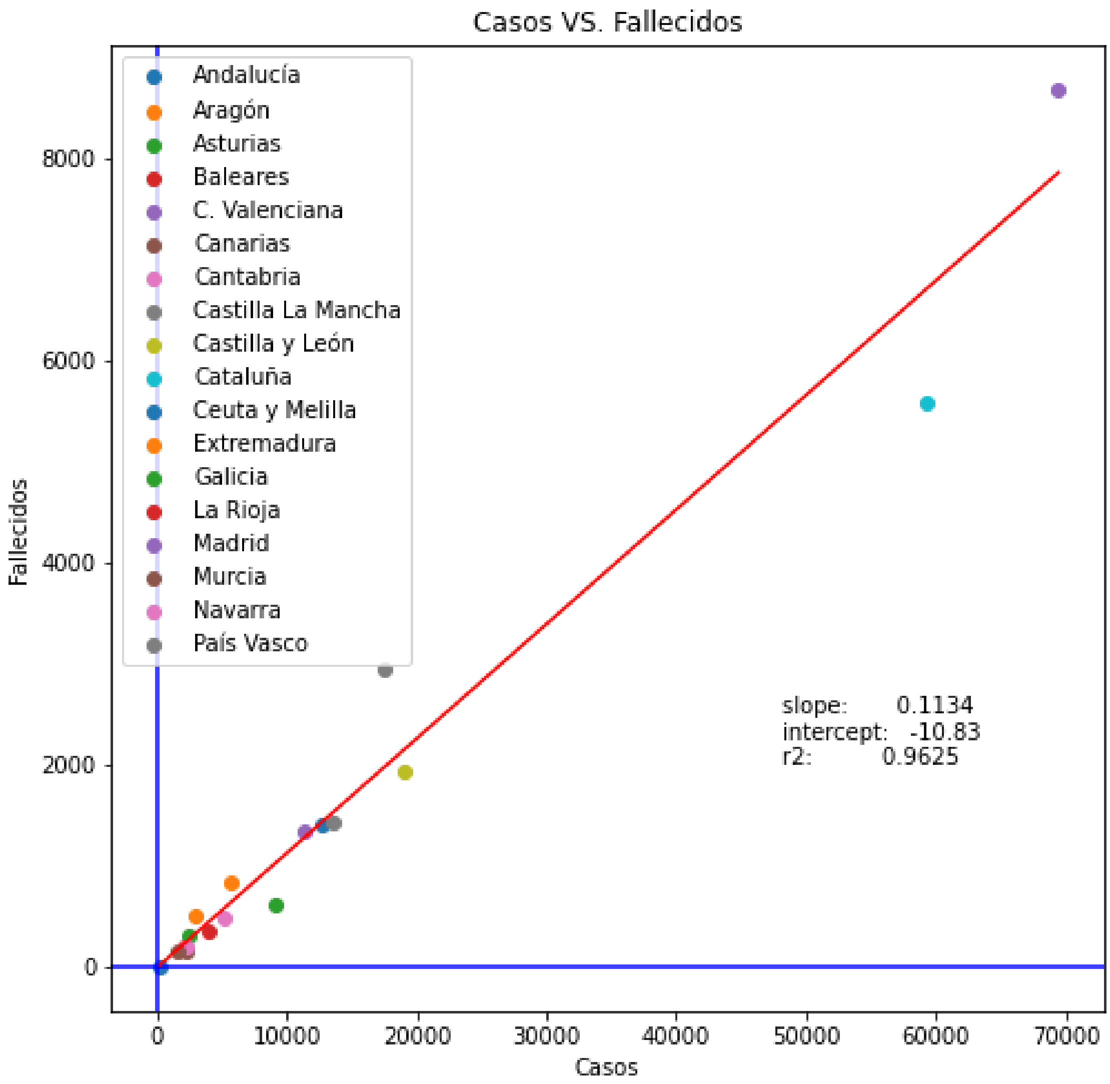
def Comparar_Dos_Dimensiones(Atributos, media_movil=False, add_LR=False ):
    """ Compara dos dimensiones de atributos, Ma indica si hacerlo con la media␣
 ↪movil"""

    df = Get_Dimensions_All_CCAA(Atributos,media_movil )
    df = df.sort_values(by=[df.columns[1],df.columns[2]])
    plt = Print_Two_Cordinates_CCAA(df, add_LR)
    plt.show()
    print(  'Total: '  + df.columns[1], df[df.columns[1]].sum() )
    print(  'Total: '  + df.columns[2], df[df.columns[2]].sum() )
    display(HTML(df.set_index('Lugar').to_html(index=True)))
    return
```

[7]:

```
Insertar_Enlace("Comparativa_Casos_Fallecidos")
Comparar_Dos_Dimensiones(['Casos', 'Fallecidos'],add_LR=True )
```

```
<IPython.core.display.HTML object>
```



```
Total: Casos 240978
Total: Fallecidos 27134
```

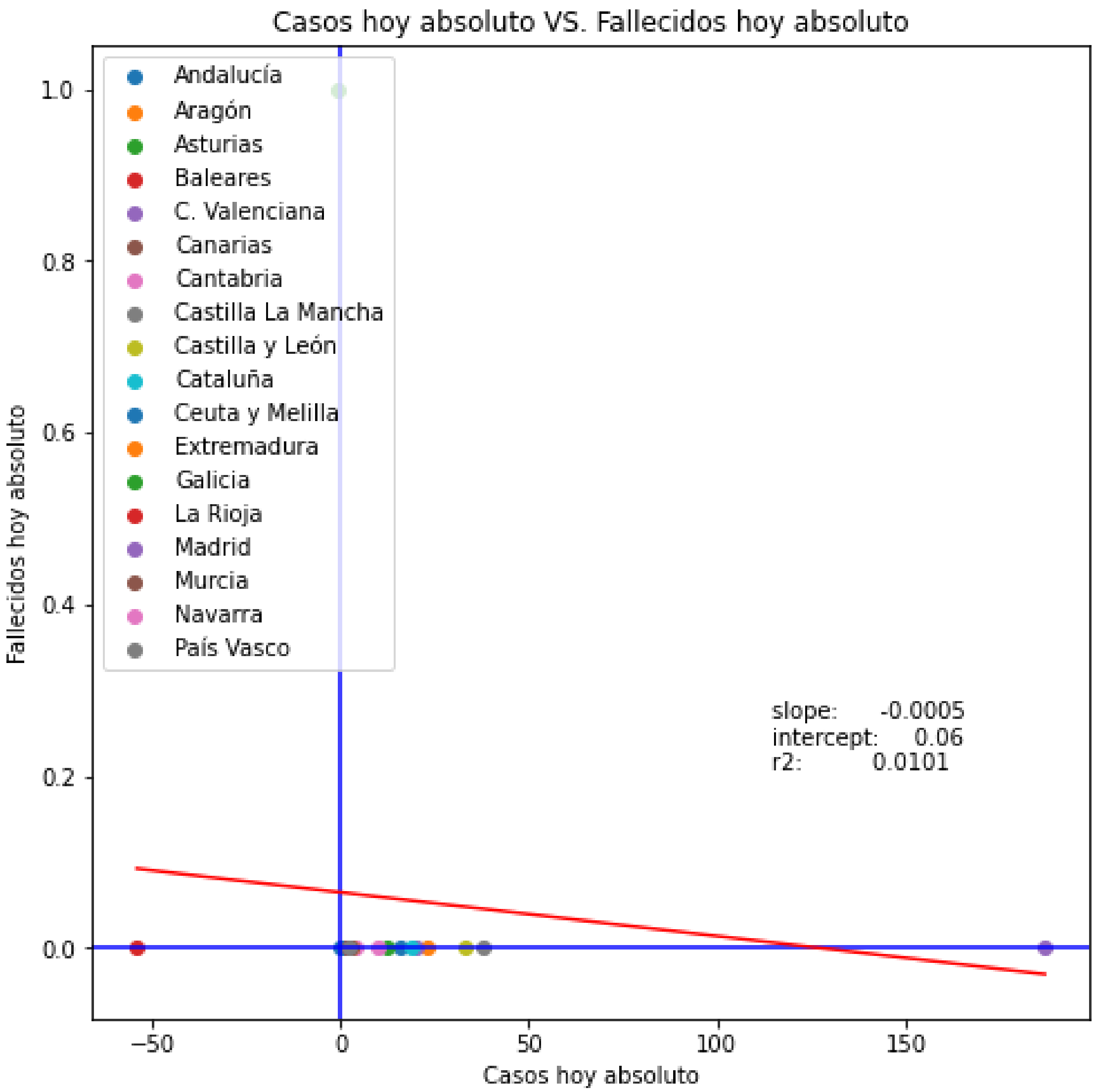
```
<IPython.core.display.HTML object>
```

[8]:

```
Insertar_Enlace("Comparativa_Casos_Fallecidos_Hoy")

Comparar_Dos_Dimensiones(['Casos hoy absoluto', 'Fallecidos hoy␣
 ↪absoluto'],add_LR=True )
```

```
<IPython.core.display.HTML object>
```



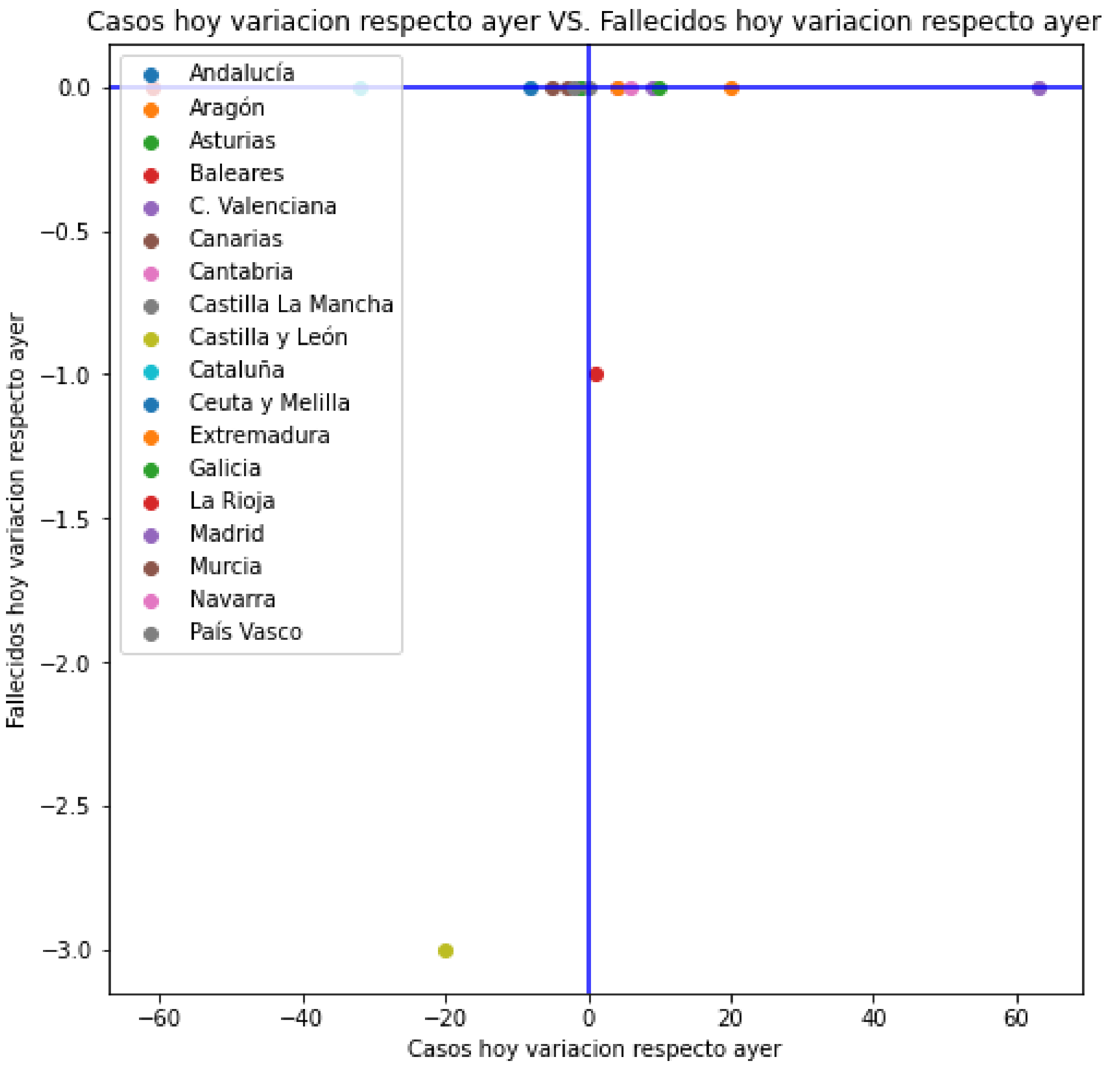
```
Total: Casos hoy absoluto 318
Total: Fallecidos hoy absoluto 1
```

```
<IPython.core.display.HTML object>
```

[9]:
```
Insertar_Enlace("Comparativa_Casos_Fallecidos_Variacion_Diaria")

Comparar_Dos_Dimensiones(['Casos hoy variacion respecto ayer', 'Fallecidos hoy␣
 ↪variacion respecto ayer'])
```

```
<IPython.core.display.HTML object>
```



```
Total: Casos hoy variacion respecto ayer -16
Total: Fallecidos hoy variacion respecto ayer -4
```

```
<IPython.core.display.HTML object>
```

[10]:

```
# Cargamos datos
import pandas as pd
import Loading_data

from Loading_data import Get_Comunidades_List as comunidades
COMUNIDADES = comunidades()

def Get_Dimension_CCAA(Dimension,include_nation=False):
    def Do_Stuff_to_DF(df):
        df = df.sort_values(by='Fecha')
        # df = df.reset_index() # Resets the index, makes factor a column
        df = df[df["Casos"] >= 100]
        return df

    dimension_df = pd.DataFrame()
    for ca in COMUNIDADES:
        df = Loading_data.Get_Comunidad(ca)
        df = Do_Stuff_to_DF(df)
        dimension_df[ca] = df[Dimension]
    if include_nation:
        df = Loading_data.Get_Nacion()
        df = Do_Stuff_to_DF(df)
        dimension_df['TOTAL'] = df[Dimension]

    return dimension_df
```

[11]:

```
from matplotlib import pyplot as plt
import matplotlib.dates as mdates
from IPython.display import display, HTML
import pandas as pd

import numpy as np


def compare_charts_median(Dimension,df):
    short_df = df.tail(1)
    short_df = short_df.T
    short_df = short_df.sort_values(by=(short_df.columns[0]))
    short_df.columns = [Dimension]

    #mean_y = short_df.median(axis=1)[0]
    #mean_y= df.tail(1).T.median().values[0]
    median_y= df.tail(1).T.drop(axis=0,labels=(['TOTAL'] if 'TOTAL' in short_df.
 ↪index else [])).median().values[0]
    x = short_df.index
    y = short_df[Dimension]

    plt.figure(figsize = (10, 5))
    plt.scatter(x, y, c= "red", alpha = 0.5)
    plt.title(Dimension + " by region")
    color = 'blue'
    plt.xticks(rotation=90)
    plt.axhline(median_y, c = color, alpha = 0.5, lw = 1)
    plt.annotate('Median ' + Dimension+  ' is {}'.format(round(median_y, 2)),
            xy=(8.5, median_y),
            xycoords='data',
            xytext=(-50, 50),
            textcoords='offset points',
            arrowprops=dict(arrowstyle="->", color = "k", alpha = 0.5),
            color = color)
    return

def compare_charts_time(Dimension,df):
    fig = plt.figure(figsize=(8, 6), dpi=80)
    for ca in df.columns:
        plt.plot(df[ca])
    plt.legend(df.columns)

    plt.gca().xaxis.set_major_formatter(mdates.DateFormatter('%Y-%m-%d'))
    plt.gca().xaxis.set_major_locator(mdates.DayLocator(interval=7))

    fig.suptitle('Comparativa de: '+Dimension, fontsize=20)
    plt.show()
    return

def Report_Location(Dimension,include_nation=False):
    # Ger Data
    df = Get_Dimension_CCAA(Dimension,include_nation)
    # Compare chart
    compare_charts_time(Dimension,df)
    # Compare median chart
    compare_charts_median(Dimension,df)

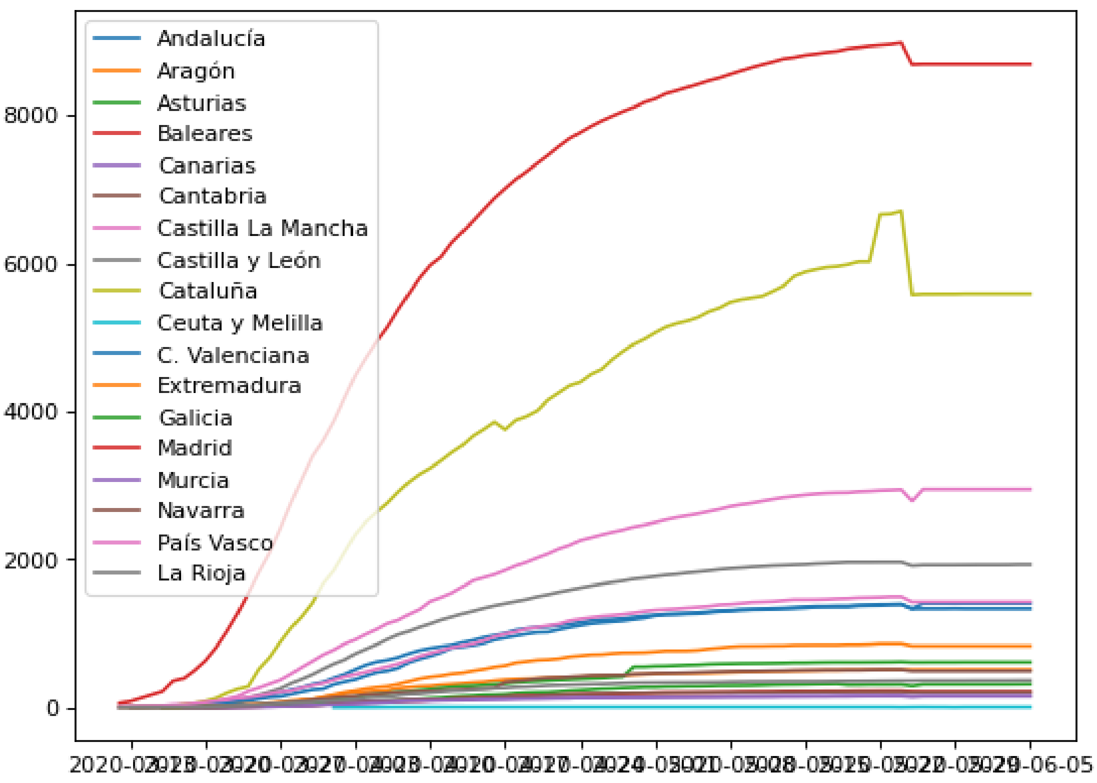
    with pd.option_context("display.max_rows", 1000):
        display(HTML(df.to_html()))
    return
```

[12]:

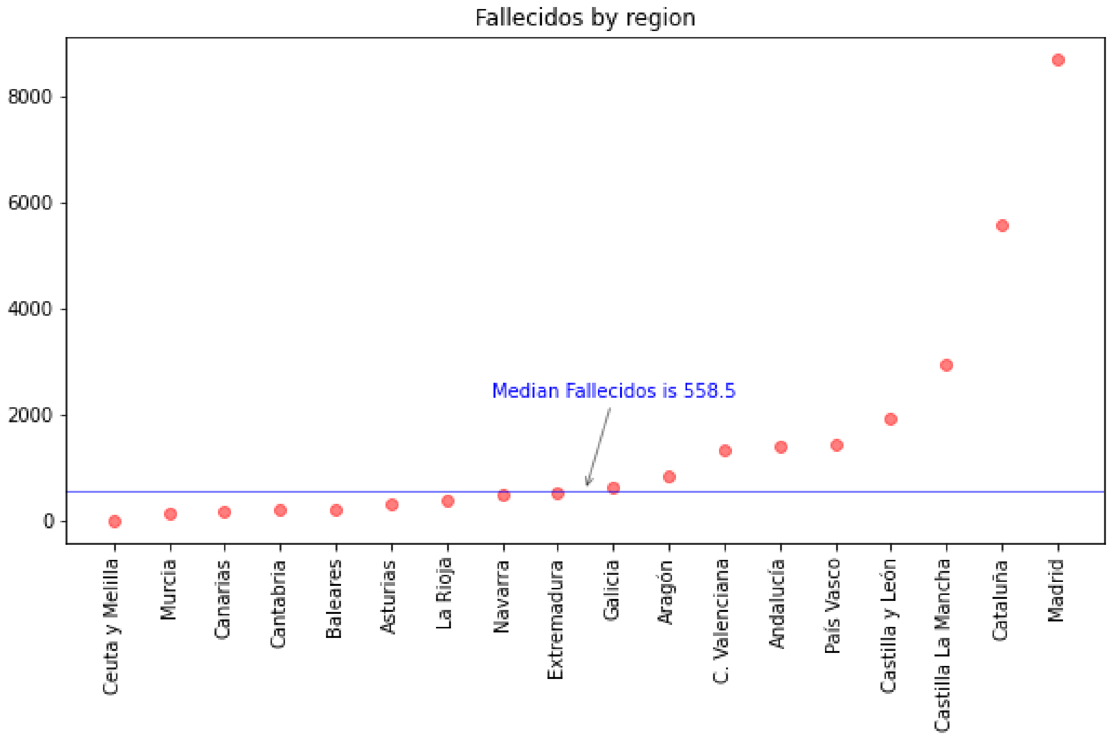
```
Insertar_Enlace("Comunidades_Fallecidos")
Report_Location("Fallecidos")
```

```
<IPython.core.display.HTML object>
```

Comparativa de: Fallecidos



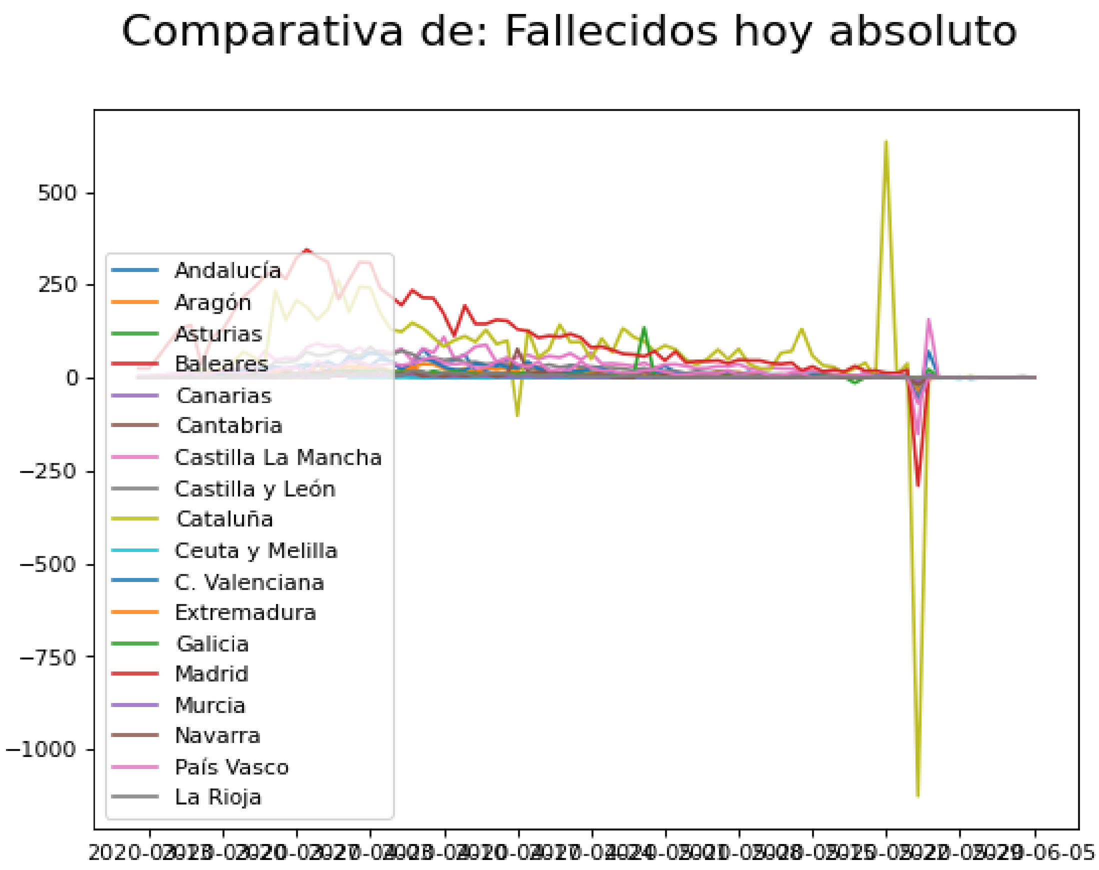
```
<IPython.core.display.HTML object>
```



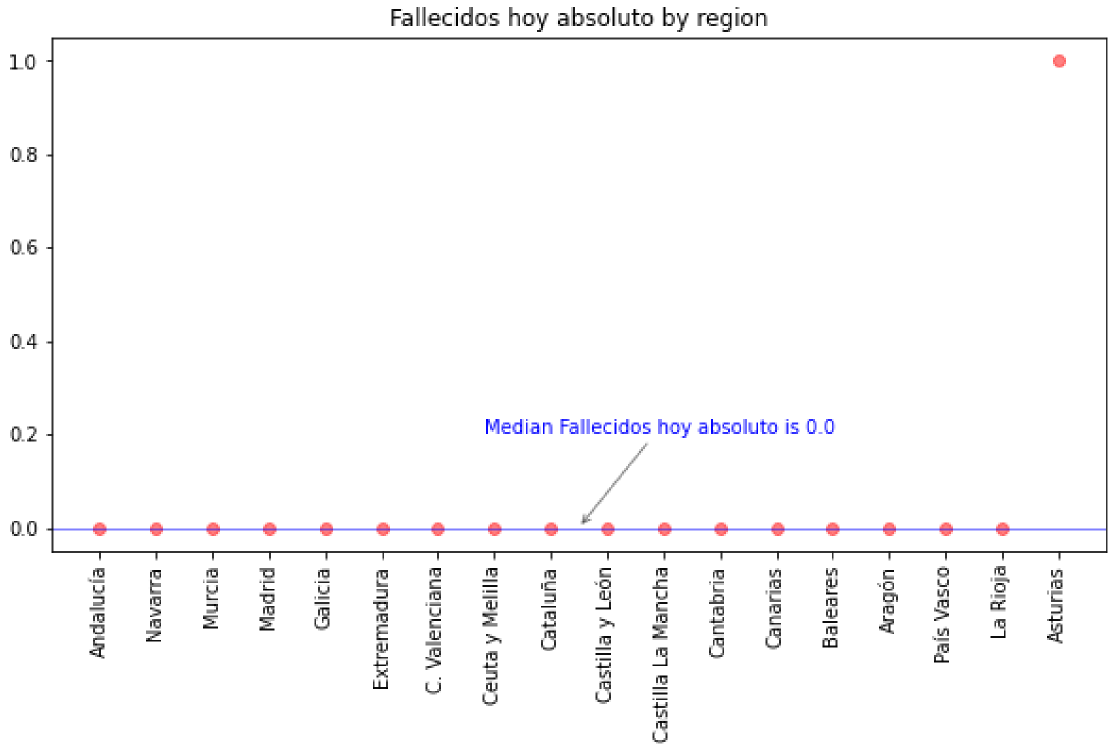
[13]:
```
Insertar_Enlace("Comunidades_Fallecidos_Hoy")

Report_Location("Fallecidos hoy absoluto")
```

```
<IPython.core.display.HTML object>
```


Comparativa de: Fallecidos hoy absoluto
500
250
0
−250
−500
−750
−1000
2020-03-13
2020-03-20
2020-03-27
2020-04-03
2020-04-10
2020-04-17
2020-04-24
2020-05-01
2020-05-08
2020-05-15
2020-05-22
2020-05-29
2020-06-05
Andalucía
Aragón
Asturias
Baleares
Canarias
Cantabria
Castilla La Mancha
Castilla y León
Cataluña
Ceuta y Melilla
C. Valenciana
Extremadura
Galicia
Madrid
Murcia
Navarra
País Vasco
La Rioja

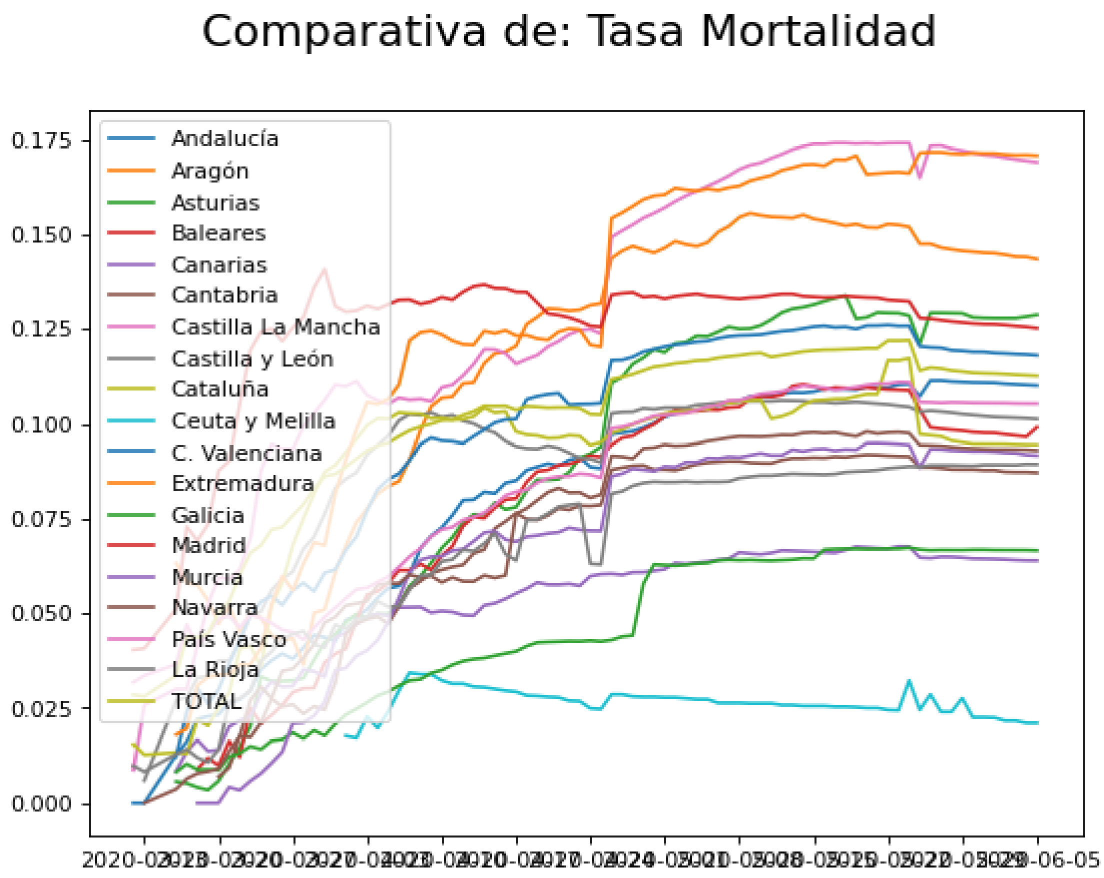
```
<IPython.core.display.HTML object>
```



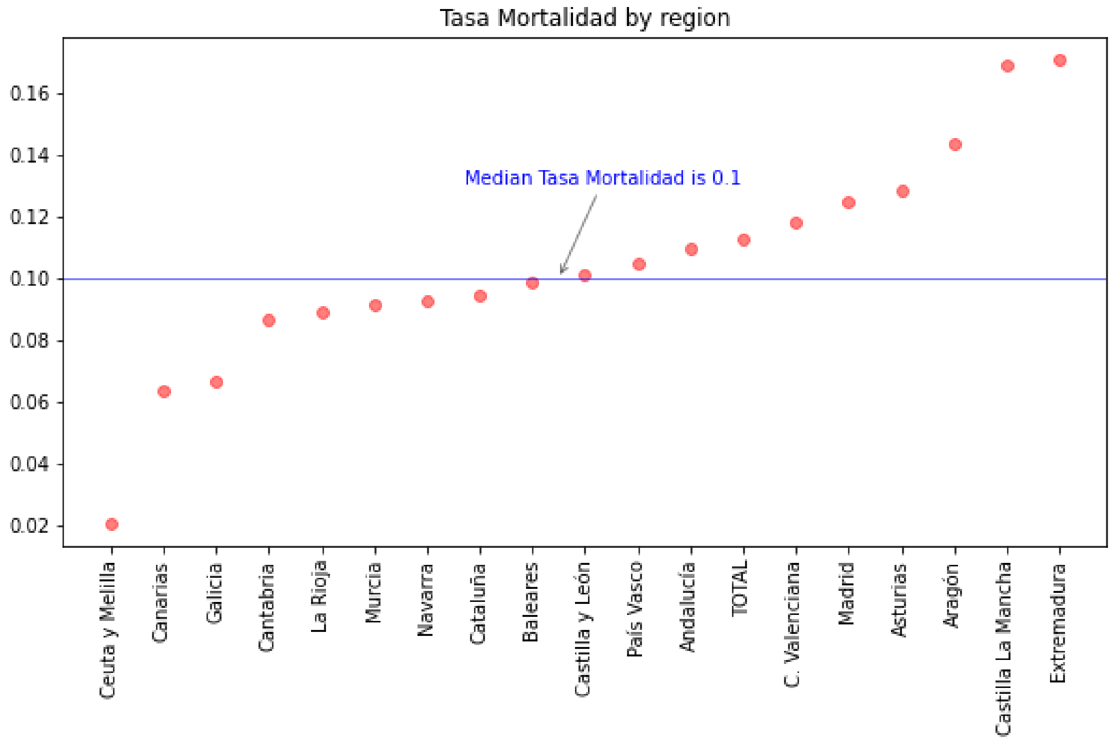
[14]:
```
Insertar_Enlace("Comunidades_Mortalidad")

Report_Location("Tasa Mortalidad",True)
```

```
<IPython.core.display.HTML object>
```


Comparativa de: Tasa Mortalidad
Andalucía
Aragón
Asturias
Baleares
Canarias
Cantabria
Castilla La Mancha
Castilla y León
Cataluña
Ceuta y Melilla
C. Valenciana
Extremadura
Galicia
Madrid
Murcia
Navarra
País Vasco
La Rioja
TOTAL
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
2020-03-13
2020-03-20
2020-03-27
2020-04-03
2020-04-10
2020-04-17
2020-04-24
2020-05-01
2020-05-08
2020-05-15
2020-05-22
2020-05-29
2020-06-05

```
<IPython.core.display.HTML object>
```

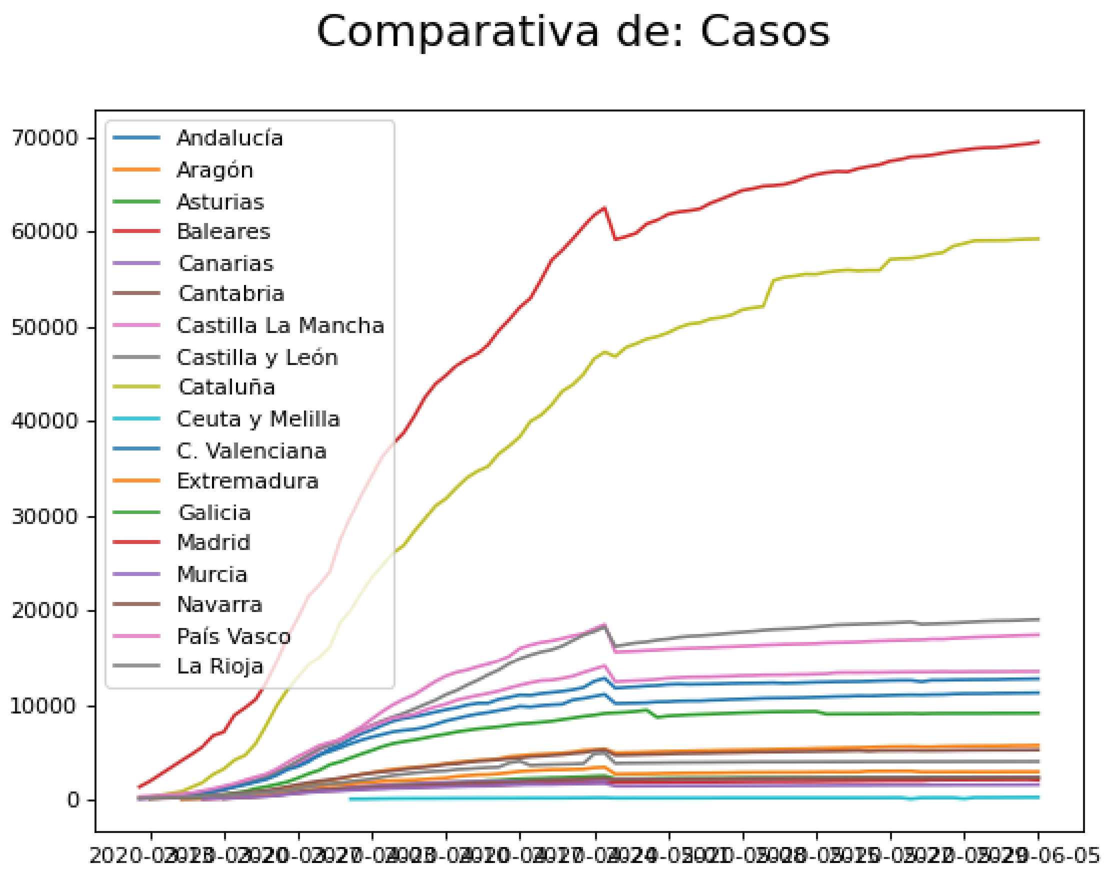


[15]:

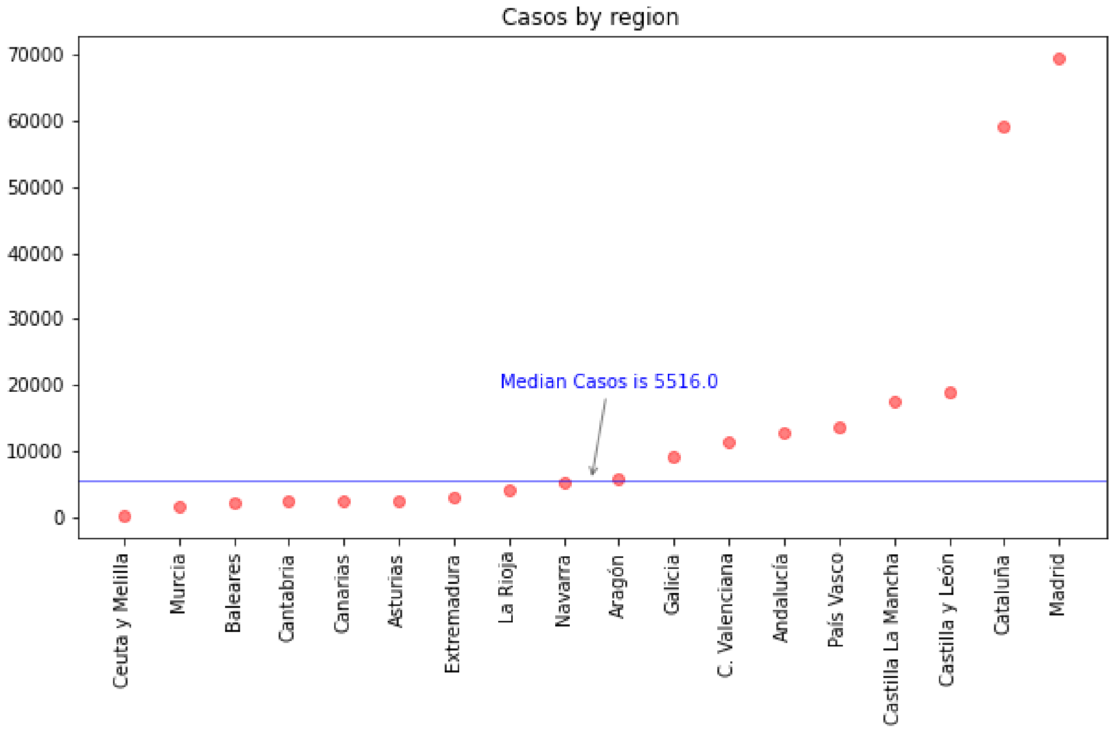
```
Insertar_Enlace("Comunidades_Casos")

Report_Location("Casos")
```

```
<IPython.core.display.HTML object>
```


Comparativa de: Casos
70000
60000
50000
40000
30000
20000
10000
0
Andalucía
Aragón
Asturias
Baleares
Canarias
Cantabria
Castilla La Mancha
Castilla y León
Cataluña
Ceuta y Melilla
C. Valenciana
Extremadura
Galicia
Madrid
Murcia
Navarra
País Vasco
La Rioja
2020-03-13
2020-03-20
2020-03-27
2020-04-03
2020-04-10
2020-04-17
2020-04-24
2020-05-01
2020-05-08
2020-05-15
2020-05-22
2020-05-29
2020-06-05

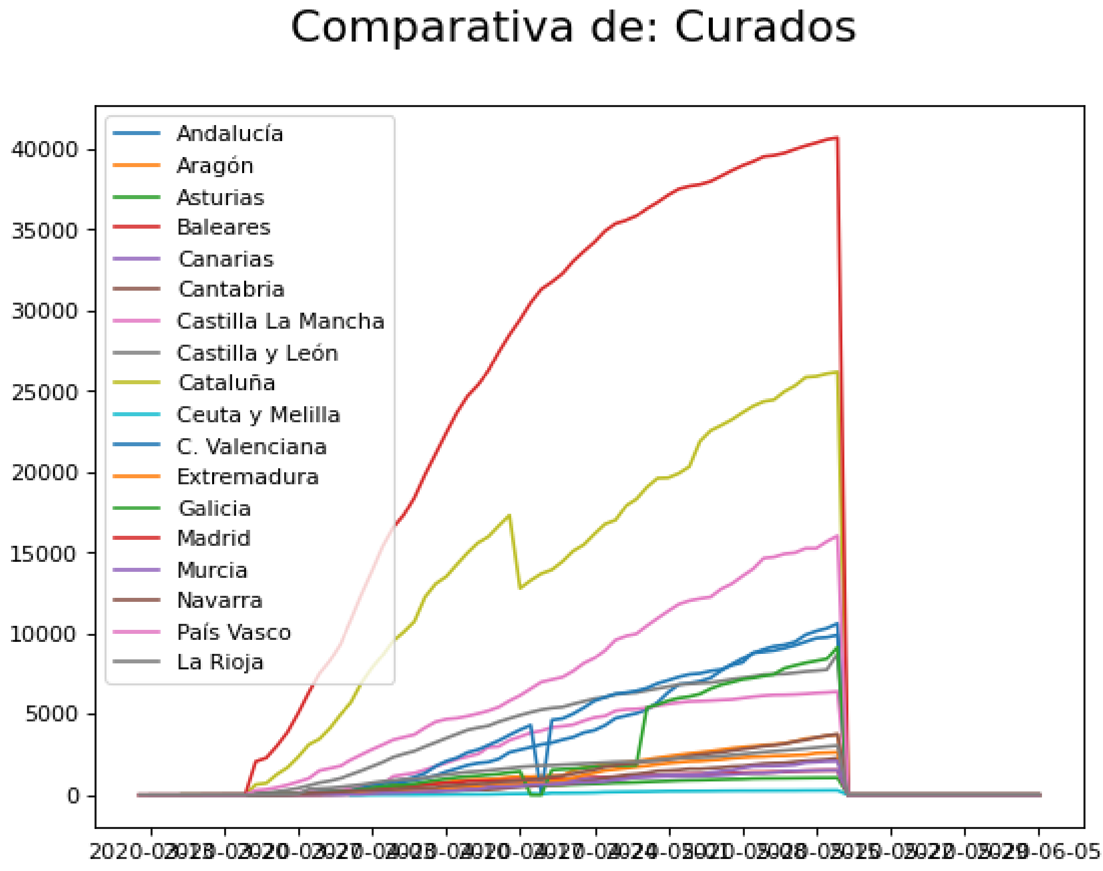
```
<IPython.core.display.HTML object>
```



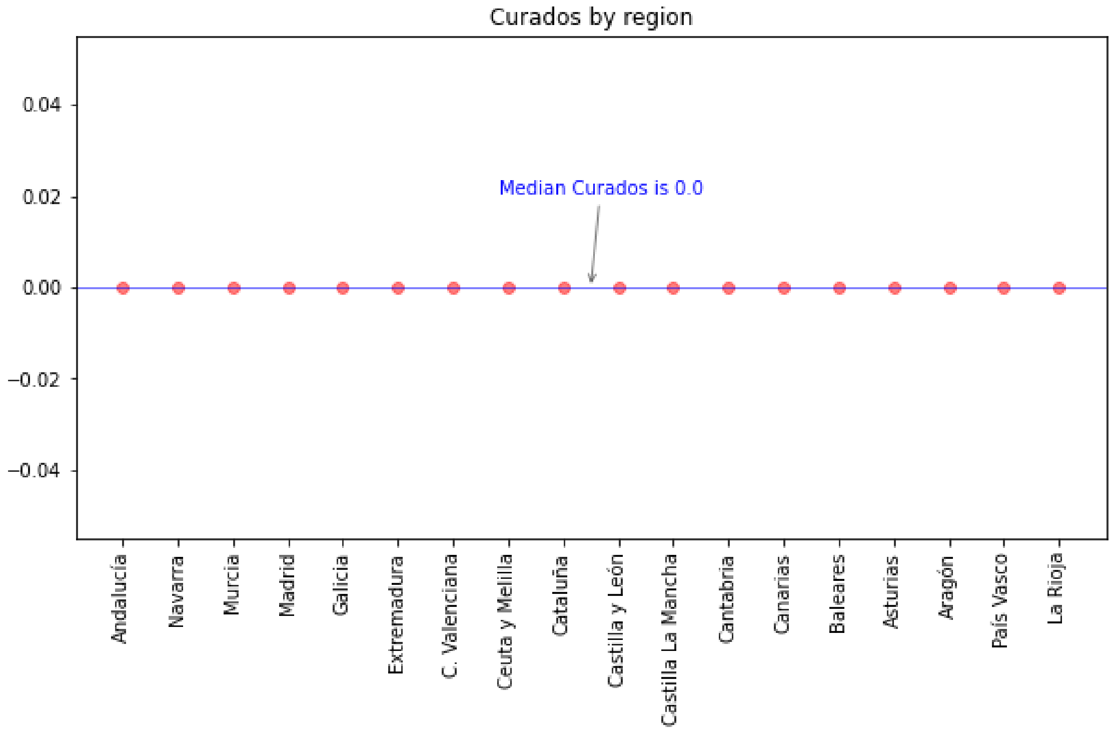
```
[16]: Insertar_Enlace("Curados")

      Report_Location("Curados")
```

```
<IPython.core.display.HTML object>
```


Comparativa de: Curados
Andalucía
Aragón
Asturias
Baleares
Canarias
Cantabria
Castilla La Mancha
Castilla y León
Cataluña
Ceuta y Melilla
C. Valenciana
Extremadura
Galicia
Madrid
Murcia
Navarra
País Vasco
La Rioja
40000
35000
30000
25000
20000
15000
10000
5000
0
2020-03-13
2020-03-20
2020-03-27
2020-04-03
2020-04-10
2020-04-17
2020-04-24
2020-05-01
2020-05-08
2020-05-15
2020-05-22
2020-05-29
2020-06-05

```
<IPython.core.display.HTML object>
```



1.4 ¿Hemos alcanzado el pico de la curva?

1.4.1 Casos totales españa, evolucion

[17]:
```
# Casos totales españa, evolucion
import Loading_data

MOVING_AVERAGE_WINDOW=4

def get_fallecidos_nacion(window_size=MOVING_AVERAGE_WINDOW):
    Dimension = 'Fallecidos'

    Insertar_Enlace("Pico_España")

    df = Get_Dimension_CCAA(Dimension)

    df['Total Fallecidos'] = df.sum(axis=1)
    df['Total Fallecidos']

    CONVERT_INT_COLUMNS = ['Total Fallecidos']
    for column in CONVERT_INT_COLUMNS :
        df[column] = df[column].fillna(0)
        df[column] = df[column].astype(np.int64)
    df['Total Fallecidos hoy absoluto'] = df['Total Fallecidos'] - df['Total␣
 ↪Fallecidos'].shift(1)
    df['MA Total Fallecidos hoy absoluto'] = df['Total Fallecidos hoy␣
 ↪absoluto'].rolling(window=window_size).mean()

    df['Variacion MA Total Fallecidos hoy absoluto'] = df['MA Total Fallecidos␣
 ↪hoy absoluto'] - df['MA Total Fallecidos hoy absoluto'].shift(1)
    return df

df = get_fallecidos_nacion()
df_plt = df[['Total Fallecidos hoy absoluto','MA Total Fallecidos hoy␣
 ↪absoluto']]
fig = plt.figure(figsize=(8, 6), dpi=80)
plt.plot(df_plt, marker='o')
plt.xticks(rotation=90)
plt.gca().xaxis.set_major_formatter(mdates.DateFormatter('%Y-%m-%d'))
plt.gca().xaxis.set_major_locator(mdates.DayLocator(interval=7))
plt.legend(df_plt.columns)
fig.suptitle( "Total fallecidos en España", fontsize=20)

df[['Total Fallecidos',
    'Total Fallecidos hoy absoluto',
    'MA Total Fallecidos hoy absoluto',
    'Variacion MA Total Fallecidos hoy absoluto']]
```

```
<IPython.core.display.HTML object>
```

[17]:

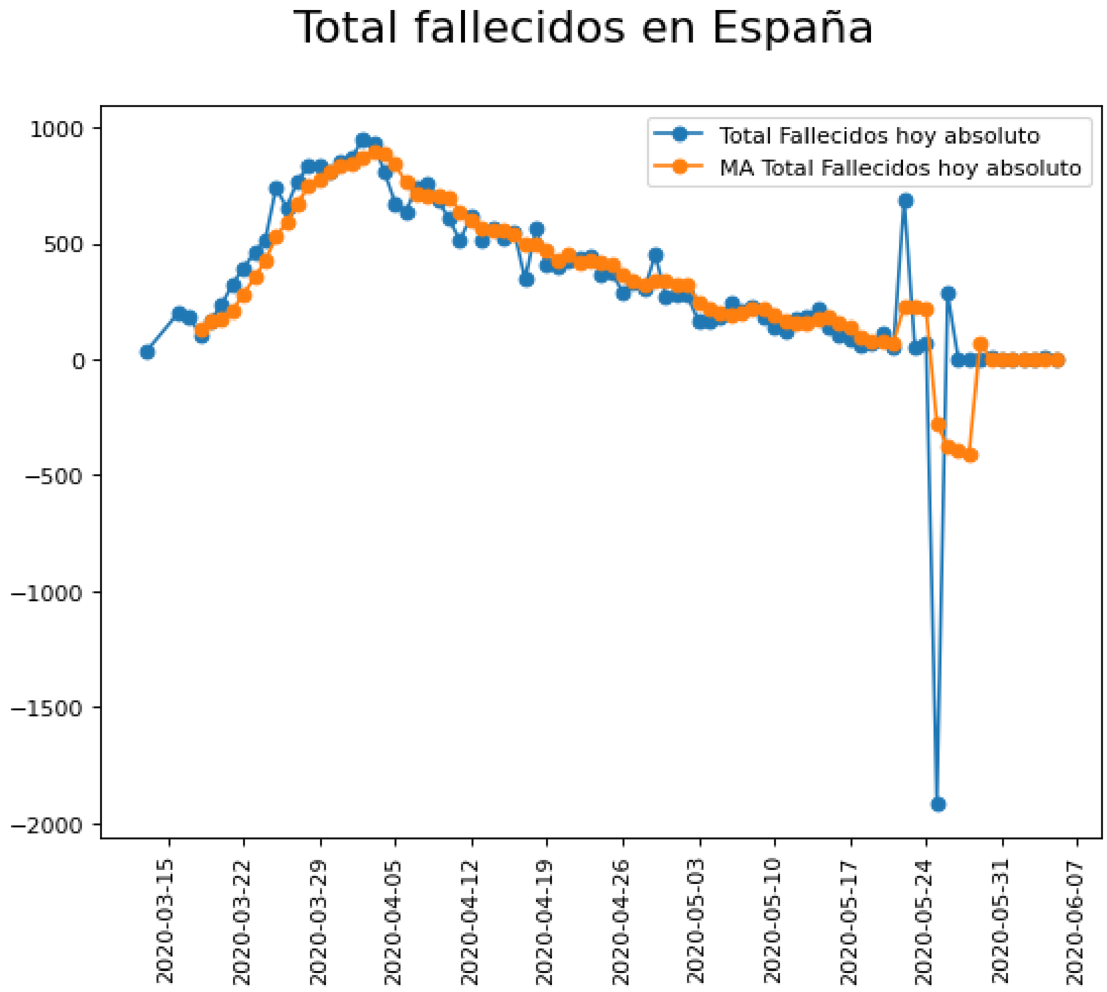
```
            Total Fallecidos  Total Fallecidos hoy absoluto  \
Fecha
2020-03-12                74                            NaN
2020-03-13               107                           33.0
2020-03-16               308                          201.0
2020-03-17               490                          182.0
2020-03-18               597                          107.0
…                          …                              …
2020-06-01             27127                            0.0
2020-06-02             27127                            0.0
2020-06-03             27128                            1.0
2020-06-04             27133                            5.0
2020-06-05             27134                            1.0

            MA Total Fallecidos hoy absoluto  \
Fecha
2020-03-12                               NaN
2020-03-13                               NaN
2020-03-16                               NaN
```

```
2020-03-17                               NaN
2020-03-18                            130.75
…                                     …
2020-06-01                              2.00
2020-06-02                              2.00
2020-06-03                              0.75
2020-06-04                              1.50
2020-06-05                              1.75

            Variacion MA Total Fallecidos hoy absoluto
Fecha
2020-03-12                                         NaN
2020-03-13                                         NaN
2020-03-16                                         NaN
2020-03-17                                         NaN
2020-03-18                                         NaN
…                                              …
2020-06-01                                       -0.25
2020-06-02                                        0.00
2020-06-03                                       -1.25
2020-06-04                                        0.75
2020-06-05                                        0.25

[84 rows x 4 columns]
```



[18]:

```
import fbprophet
def Get_Prediction_Nacion(df,dimension,location='España' , link=None) :
    df = df[[dimension]]
    df = df[df[dimension] > 0]

    df = df.dropna()
    df = df.reset_index()
    df.columns = ['ds','y']


    df_prophet = fbprophet.Prophet(changepoint_prior_scale=0.15)
    df_prophet.fit(df)

    # Make a future dataframe for 2 years
    df_forecast = df_prophet.make_future_dataframe(periods=45, freq='D')
    # Make predictions
    df_forecast = df_prophet.predict(df_forecast)
    df_forecast

    df_forecast = df_forecast[df_forecast["yhat"] >= 0]
    df_forecast.loc[df_forecast.yhat_lower < 0, 'yhat_lower'] = 0

    if link is not None:
        Insertar_Enlace(link)

    df_prophet.plot(df_forecast, xlabel = 'Date' )
    plt.title('Predicción de ' + dimension + ", en " + location )

    suma = df_forecast.trend.sum()
    display(HTML(pd.DataFrame(df_forecast).to_html()))

    print ("Prediccion total para " + dimension + " : " + str(suma) )
    return df_forecast


Insertar_Enlace("Prediccion_Fallecidos_España")

prediccion = Get_Prediction_Nacion( df = get_fallecidos_nacion(),
                                   dimension = 'Total Fallecidos hoy absoluto')
```

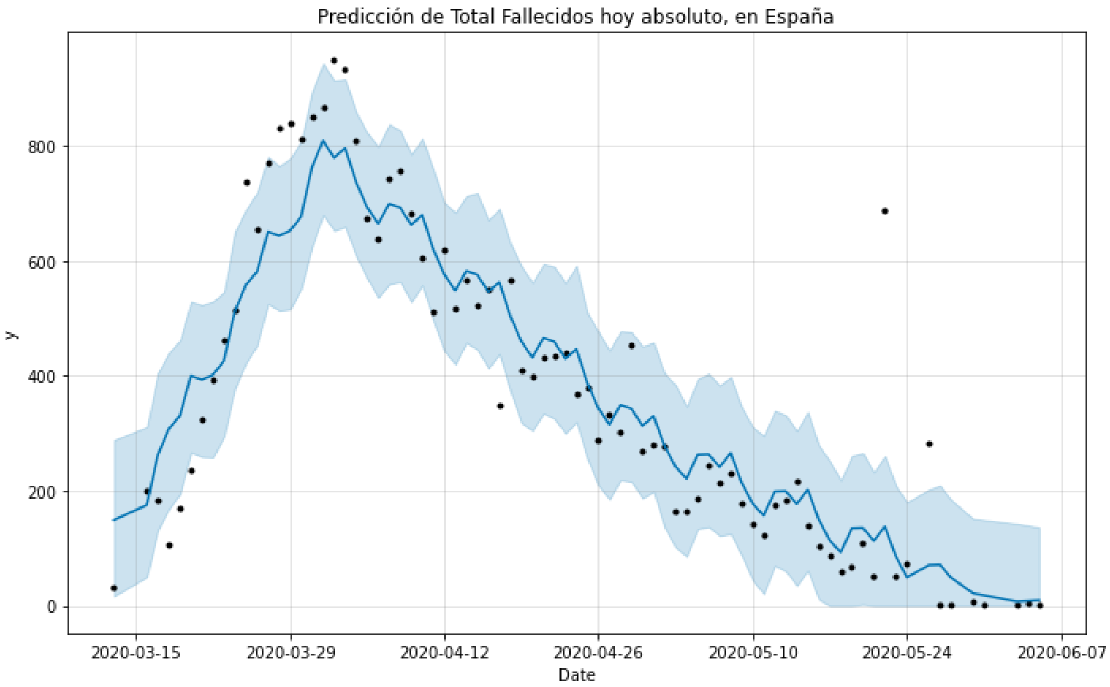
```
<IPython.core.display.HTML object>
```

```
<IPython.core.display.HTML object>
```

```
INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
```

```
<IPython.core.display.HTML object>
```

```
Prediccion total para Total Fallecidos hoy absoluto : 28874.763016918456
```



[19]:

```
def Get_Predictions_Compare(df,dimension,location='España' , link=None) :
    if link is not None:
        Insertar_Enlace(link)


    display(HTML("<h2>Comparativa de predicciones, hoy contra días pasados, "␣
 ↪+dimension+ " en " +  location+ "</h2>"))


    df = df[[dimension]]
    df = df[df[dimension] > 0]

    df = df.dropna()
    df = df.reset_index()

    df.columns = ['ds','y']

    df_original = df.copy()


    results = pd.DataFrame()
    array_results_temp = []
    for i in range(4):

        if i >= 1 : df = df.iloc[1:]
        fecha=max(df.ds)
        fecha_short = str(fecha)[:10]


        df_prophet = fbprophet.Prophet(changepoint_prior_scale=0.15)
        df_prophet.fit(df)

        # Make a future dataframe
        df_forecast = df_prophet.make_future_dataframe(periods=45, freq='D')
        # Make predictions
        df_forecast = df_prophet.predict(df_forecast)
        suma = df_forecast.yhat.sum()

        title_column = "Predicción con los datos de " + fecha_short
        df_forecast[title_column] = df_forecast.yhat

        array_results_temp.append(pd.
↪DataFrame(df_forecast[['ds',title_column]]))


    df_1 = pd.merge(array_results_temp[0], array_results_temp[1], how ='outer',␣
↪on ='ds')
    df_2 = pd.merge(df_1                 , array_results_temp[2], how ='outer',␣
↪on ='ds')
    df_3 = pd.merge(df_2                 , array_results_temp[3], how ='outer',␣
↪on ='ds')
    df_4 = pd.merge(df_3                 , df_original          , how ='outer',␣
↪on ='ds')
    df_4['datos reales'] = df_4['y']
    del df_4['y']


    df_chart = df_4
    df_chart = df_chart.set_index('ds')
    df_chart = df_chart.head(70).tail(40)

    for c in df_chart.columns:
        df_chart.loc[df_chart[c] < 0, c] = 0

    df_chart.drop(df_chart.loc[df_chart.sum(axis=1)==0].index, inplace=True)
    df_chart.drop(columns=df_chart.columns[df_chart.sum()==0], inplace=True)


    fig = plt.figure(figsize=(8, 6), dpi=80)
    plt.plot(df_chart)
    plt.title("Predicciones en días anteriores Vs. Datos reales" + dimension␣
↪+", en " + location )
    plt.gca().xaxis.set_major_formatter(mdates.DateFormatter('%Y-%m-%d'))
    plt.gca().xaxis.set_major_locator(mdates.DayLocator(interval=7))
    plt.xticks(rotation=90)
    plt.legend(df_chart.columns)



    #print(df_chart)

    print("Las predicciones del total de "+ dimension+  " en " +  location+  ",␣
↪cambian dia a dia")
    print(df_chart.sum(axis=0) )

    return df_chart
```

[20]:

```
dimension = 'Fallecidos hoy absoluto'
COMUNIDAD_A_CONSIDERAR = 'España'

link="Prediccion_Fallecidos_hoy_absoluto_España"


df = get_fallecidos_nacion()[['Total Fallecidos hoy absoluto']]
df.columns = [ 'Fallecidos hoy absoluto' ]
df.sort_index(inplace=True,ascending=False)

prediccion = Get_Predictions_Compare( df = df,
                                   dimension = dimension,
                                   link = link,
                                   location  = COMUNIDAD_A_CONSIDERAR
                                   )
prediccion
```

```
<IPython.core.display.HTML object>


<IPython.core.display.HTML object>


<IPython.core.display.HTML object>


INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
```

```
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
```

```
Las predicciones del total de Fallecidos hoy absoluto en España, cambian dia a
dia
Predicción con los datos de 2020-06-05    11897.539567
Predicción con los datos de 2020-06-04    11836.116703
Predicción con los datos de 2020-06-03    11843.586486
Predicción con los datos de 2020-05-31    11811.418008
datos reales                              11189.000000
dtype: float64
```

```
[20]:             Predicción con los datos de 2020-06-05  \
      ds
      2020-04-14                              582.224242
      2020-04-15                              575.448560
      2020-04-16                              545.580085
      2020-04-17                              562.757646
      2020-04-18                              503.446611
      2020-04-19                              459.503110
      2020-04-20                              431.318357
      2020-04-21                              465.684783
      2020-04-22                              458.910934
      2020-04-23                              429.044292
      2020-04-24                              446.223685
      2020-04-25                              386.923228
      2020-04-26                              342.990304
      2020-04-27                              314.817569
      2020-04-28                              349.196015
      2020-04-29                              342.432697
      2020-04-30                              312.585675
      2020-05-01                              329.784688
      2020-05-02                              277.948727
      2020-05-03                              241.480299
      2020-05-04                              220.770275
      2020-05-05                              262.621938
      2020-05-06                              263.331837
      2020-05-07                              240.958472
      2020-05-08                              265.631141
      2020-05-09                              213.815216
```

```
2020-05-10                              177.371411
2020-05-11                              156.686009
2020-05-12                              198.553152
2020-05-13                              199.278531
2020-05-14                              176.911118
2020-05-15                              201.589742
2020-05-16                              149.779772
2020-05-17                              113.337335
2020-05-18                               92.653301
2020-05-19                              134.520446
2020-05-20                              135.245829
2020-05-21                              112.878418
2020-05-22                              137.557043
2020-05-23                               85.747072

            Predicción con los datos de 2020-06-04  \
ds
2020-04-14                              575.004341
2020-04-15                              570.120000
2020-04-16                              539.401778
2020-04-17                              562.343466
2020-04-18                              496.797175
2020-04-19                              452.574676
2020-04-20                              427.164464
2020-04-21                              464.088056
2020-04-22                              459.203951
2020-04-23                              428.485965
2020-04-24                              451.432332
2020-04-25                              385.890720
2020-04-26                              341.675600
2020-04-27                              316.272767
2020-04-28                              353.203738
2020-04-29                              348.343068
2020-04-30                              317.648517
2020-05-01                              340.618170
2020-05-02                              275.099844
2020-05-03                              230.905310
2020-05-04                              212.662854
2020-05-05                              256.754203
2020-05-06                              259.048534
2020-05-07                              235.508984
2020-05-08                              265.629344
2020-05-09                              207.273013
2020-05-10                              170.240473
2020-05-11                              152.021481
2020-05-12                              196.136293
2020-05-13                              198.443172
```

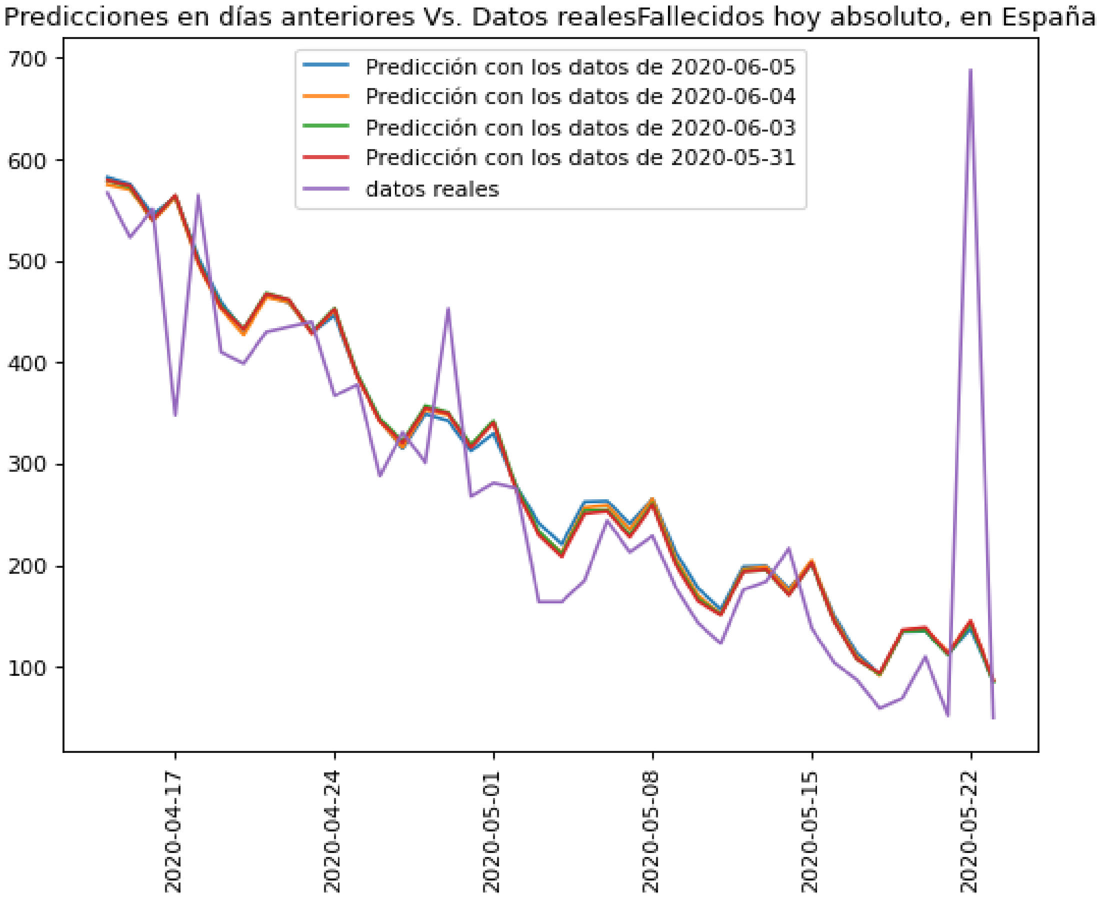
```
2020-05-14                              174.916324
2020-05-15                              205.049387
2020-05-16                              146.694476
2020-05-17                              109.663357
2020-05-18                               91.444525
2020-05-19                              135.559498
2020-05-20                              137.866537
2020-05-21                              114.339695
2020-05-22                              144.472763
2020-05-23                               86.117852

            Predicción con los datos de 2020-06-03  \
ds
2020-04-14                              579.060350
2020-04-15                              572.508599
2020-04-16                              540.870451
2020-04-17                              564.296696
2020-04-18                              499.554638
2020-04-19                              455.441574
2020-04-20                              433.050117
2020-04-21                              468.130640
2020-04-22                              461.579055
2020-04-23                              429.941111
2020-04-24                              453.367561
2020-04-25                              388.625707
2020-04-26                              344.514606
2020-04-27                              322.125112
2020-04-28                              357.209912
2020-04-29                              350.662604
2020-04-30                              319.028898
2020-05-01                              342.460736
2020-05-02                              277.724270
2020-05-03                              233.627012
2020-05-04                              211.251361
2020-05-05                              253.696302
2020-05-06                              254.509135
2020-05-07                              230.235569
2020-05-08                              261.033245
2020-05-09                              203.662618
2020-05-10                              166.922332
2020-05-11                              151.903652
2020-05-12                              194.356911
2020-05-13                              195.178065
2020-05-14                              170.912821
2020-05-15                              201.711971
2020-05-16                              144.342818
2020-05-17                              107.602536
```

```
2020-05-18                               92.583859
2020-05-19                              135.037122
2020-05-20                              135.858276
2020-05-21                              111.593033
2020-05-22                              142.392183
2020-05-23                               85.023030

            Predicción con los datos de 2020-05-31  datos reales
ds
2020-04-14                              579.305102         567.0
2020-04-15                              573.944162         523.0
2020-04-16                              540.465098         551.0
2020-04-17                              564.653543         348.0
2020-04-18                              498.416012         565.0
2020-04-19                              453.937000         410.0
2020-04-20                              432.659435         399.0
2020-04-21                              467.129999         430.0
2020-04-22                              461.769061         435.0
2020-04-23                              428.291747         440.0
2020-04-24                              452.481941         367.0
2020-04-25                              386.252072         378.0
2020-04-26                              341.780721         288.0
2020-04-27                              320.512797         331.0
2020-04-28                              354.993003         301.0
2020-04-29                              349.641707         453.0
2020-04-30                              316.174098         268.0
2020-05-01                              340.373998         281.0
2020-05-02                              274.149339         276.0
2020-05-03                              229.683200         164.0
2020-05-04                              208.418507         164.0
2020-05-05                              250.735583         185.0
2020-05-06                              253.221157         244.0
2020-05-07                              227.590815         213.0
2020-05-08                              259.627982         229.0
2020-05-09                              201.240228         179.0
2020-05-10                              164.610992         143.0
2020-05-11                              151.183204         123.0
2020-05-12                              193.508572         176.0
2020-05-13                              196.002439         184.0
2020-05-14                              170.378689         217.0
2020-05-15                              202.422449         138.0
2020-05-16                              144.040230         104.0
2020-05-17                              107.416531          87.0
2020-05-18                               93.994278          59.0
2020-05-19                              136.320154          69.0
2020-05-20                              138.814528         110.0
2020-05-21                              113.190779          52.0
```

```
2020-05-22                                  145.234538          688.0
2020-05-23                                   86.852320           50.0
```



```
[21]: MOVING_AVERAGE_WINDOW = 4
      def␣
       ↪report_single_location_single_dimension(location,dimension,window_size=MOVING_AVERAGE_WINDO
       ↪

          Dimension = 'Fallecidos'
          labelMa = f'Moving Average ({window_size}) {dimension}'

          df = pd.DataFrame()
          df[dimension] = Get_Dimension_CCAA(dimension)[location]
          df[labelMa] = df[dimension].rolling(window=window_size).mean()

          display(HTML("<h2>Analisis de '''" + dimension +"''', en " + location + "</
       ↪h2>"))
          fig = plt.figure(figsize=(8, 6), dpi=80)
```

```
    plt.plot(df, marker='o')
    plt.title("Gráfico de " + dimension +", en " + location)
    plt.gca().xaxis.set_major_formatter(mdates.DateFormatter('%Y-%m-%d'))
    plt.gca().xaxis.set_major_locator(mdates.DayLocator(interval=7))


    plt.legend(df.columns)
    fig.suptitle( dimension + ' in ' + location, fontsize=20)

    display(HTML(pd.DataFrame(df).to_html()))
    return
```

1.4.2 Casos totales españa, evolucion

[22]:

```
dimension = 'Fallecidos hoy absoluto'
COMUNIDAD_A_CONSIDERAR = 'Madrid'

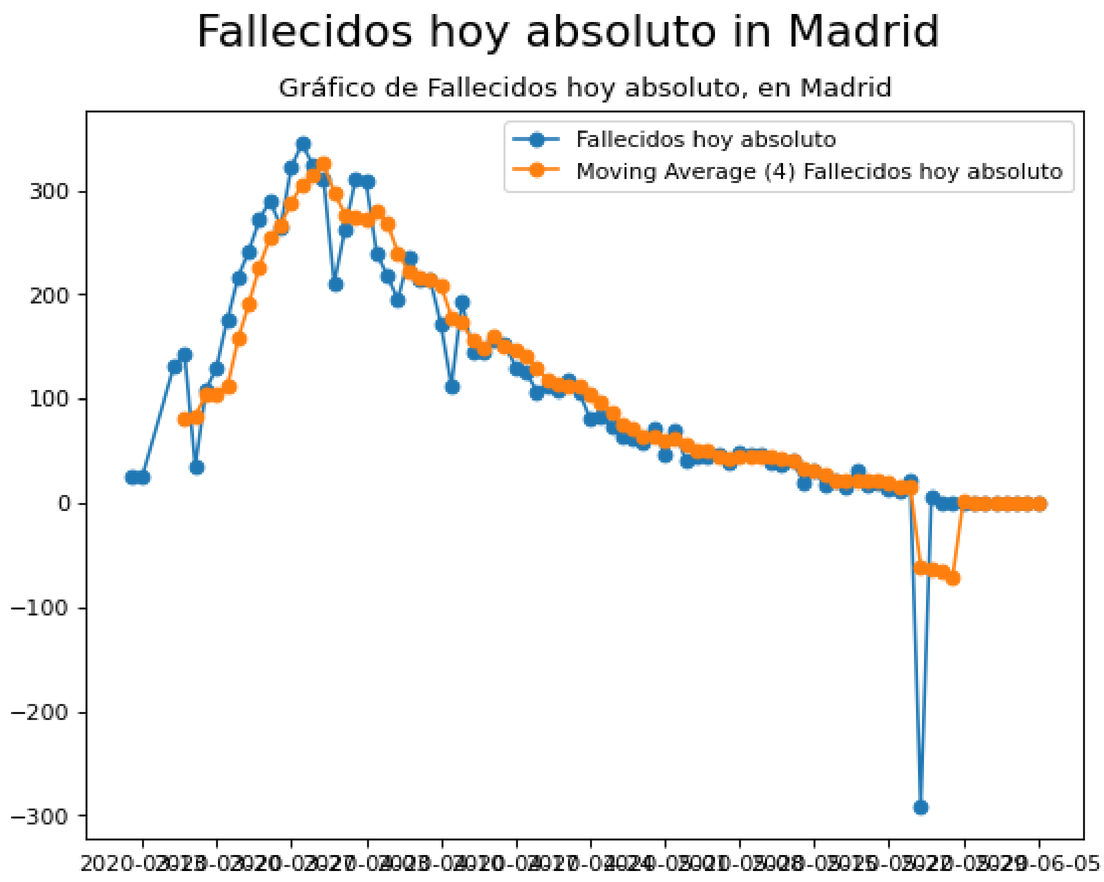
Insertar_Enlace("Reporte_Fallecidos_hoy_absoluto_Madrid")

report_single_location_single_dimension(COMUNIDAD_A_CONSIDERAR,dimension,4)
```

```
<IPython.core.display.HTML object>
```

```
<IPython.core.display.HTML object>
```

```
<IPython.core.display.HTML object>
```



```
[23]: dimension = 'Fallecidos hoy absoluto'
      COMUNIDAD_A_CONSIDERAR = 'Madrid'

      link="Prediccion_Fallecidos_hoy_absoluto_Madrid"

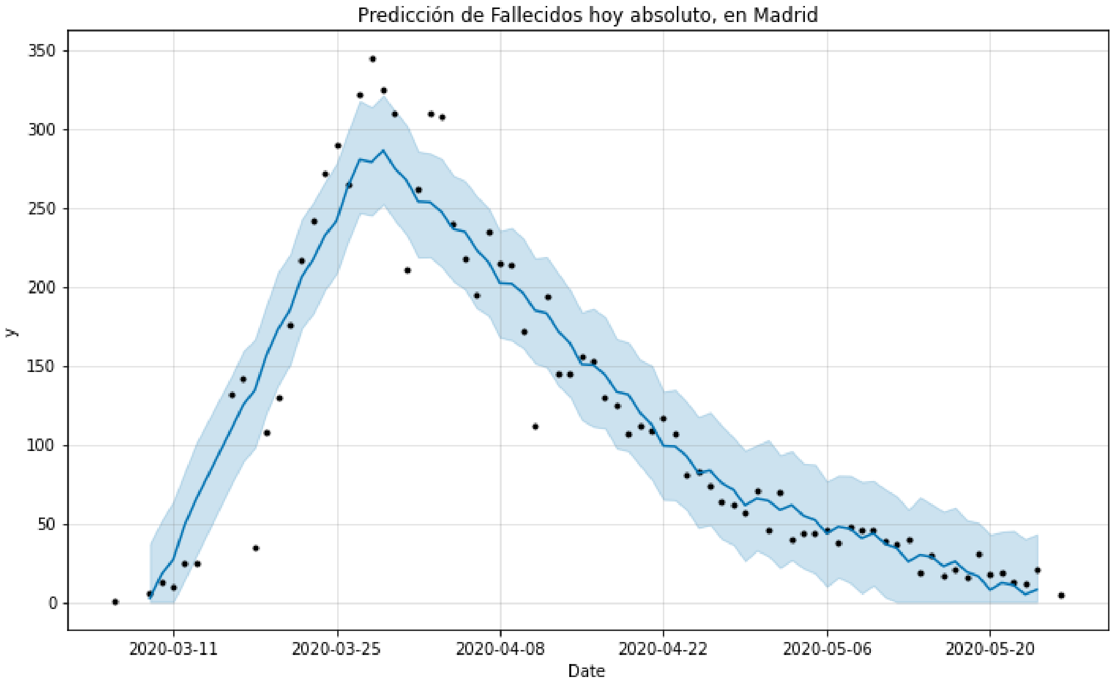
      prediccion = Get_Prediction_Nacion( df = Loading_data.
       ↪Get_Comunidad(COMUNIDAD_A_CONSIDERAR),
                                         dimension = dimension,
                                         link = link,
                                         location  = COMUNIDAD_A_CONSIDERAR
                                         )
```

```
INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
```

```
<IPython.core.display.HTML object>
```

```
<IPython.core.display.HTML object>
```

```
Prediccion total para Fallecidos hoy absoluto : 9027.314200402268
```



[24]:
```
dimension = 'Fallecidos hoy absoluto'
COMUNIDAD_A_CONSIDERAR = 'Madrid'
link="Prediccion_Compare_Fallecidos_hoy_absoluto_Madrid"

df = Loading_data.Get_Comunidad(COMUNIDAD_A_CONSIDERAR)
prediccion = Get_Predictions_Compare( df = df,
                                   dimension = dimension,
                                   link = link,
                                   location  = COMUNIDAD_A_CONSIDERAR
                                   )
prediccion
```

```
<IPython.core.display.HTML object>
```

```
<IPython.core.display.HTML object>
```

```
INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
```

```
INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
```

```
Las predicciones del total de Fallecidos hoy absoluto en Madrid, cambian dia a
dia
Predicción con los datos de 2020-05-26    3505.921985
Predicción con los datos de 2020-05-24    3504.067771
Predicción con los datos de 2020-05-23    3496.654179
Predicción con los datos de 2020-05-22    3495.348031
datos reales                              3277.000000
dtype: float64
```

```
[24]:             Predicción con los datos de 2020-05-26  \
 ds
 2020-04-09                                 201.790011
 2020-04-10                                 195.552844
 2020-04-11                                 184.815203
 2020-04-12                                 183.056038
 2020-04-13                                 171.619473
 2020-04-14                                 164.030593
 2020-04-15                                 150.616153
 2020-04-16                                 150.216847
 2020-04-17                                 143.980997
 2020-04-18                                 133.245770
 2020-04-19                                 131.489019
 2020-04-20                                 120.054868
 2020-04-21                                 112.468940
 2020-04-22                                  99.057452
 2020-04-23                                  98.660200
 2020-04-24                                  92.426405
 2020-04-25                                  81.692136
 2020-04-26                                  83.362048
 2020-04-27                                  75.354559
 2020-04-28                                  71.196082
 2020-04-29                                  61.212046
 2020-04-30                                  65.628350
 2020-05-01                                  64.208111
 2020-05-02                                  58.287399
```

```
2020-05-03                               61.347169
2020-05-04                               54.729539
2020-05-05                               51.959913
2020-05-06                               43.364726
2020-05-07                               47.783664
2020-05-08                               46.366766
2020-05-09                               40.449395
2020-05-10                               43.510499
2020-05-11                               36.894203
2020-05-12                               34.125285
2020-05-13                               25.530807
2020-05-14                               29.950453
2020-05-15                               28.533555
2020-05-16                               22.616184
2020-05-17                               25.677288
2020-05-18                               19.060992

            Predicción con los datos de 2020-05-24  \
ds
2020-04-09                              201.871118
2020-04-10                              195.672429
2020-04-11                              184.952436
2020-04-12                              183.572375
2020-04-13                              171.913139
2020-04-14                              163.628440
2020-04-15                              150.707485
2020-04-16                              150.331574
2020-04-17                              144.133303
2020-04-18                              133.417318
2020-04-19                              132.041263
2020-04-20                              120.389098
2020-04-21                              112.111471
2020-04-22                               99.199919
2020-04-23                               98.833411
2020-04-24                               92.644543
2020-04-25                               81.935659
2020-04-26                               80.566707
2020-04-27                               73.639445
2020-04-28                               70.086720
2020-04-29                               61.897482
2020-04-30                               66.256063
2020-05-01                               64.792284
2020-05-02                               58.812792
2020-05-03                               62.173232
2020-05-04                               55.255116
2020-05-05                               51.711537
2020-05-06                               43.531444
```

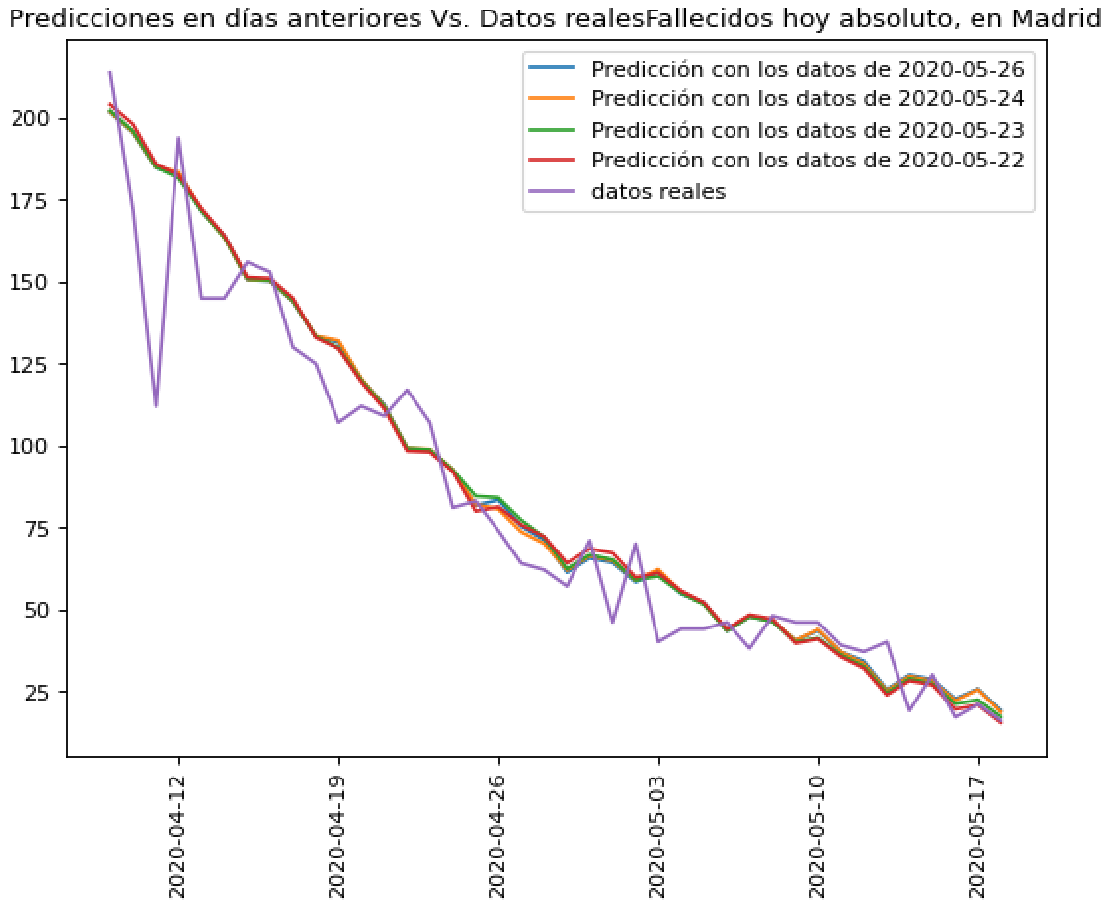
```
2020-05-07                               47.897817
2020-05-08                               46.441829
2020-05-09                               40.465579
2020-05-10                               43.829261
2020-05-11                               36.913606
2020-05-12                               33.372489
2020-05-13                               25.194858
2020-05-14                               29.562272
2020-05-15                               28.107325
2020-05-16                               22.131075
2020-05-17                               25.494756
2020-05-18                               18.579102

            Predicción con los datos de 2020-05-23  \
ds
2020-04-09                              202.230638
2020-04-10                              196.023359
2020-04-11                              185.036751
2020-04-12                              181.596038
2020-04-13                              171.728286
2020-04-14                              163.603606
2020-04-15                              150.842875
2020-04-16                              150.472897
2020-04-17                              144.266012
2020-04-18                              133.280002
2020-04-19                              129.839887
2020-04-20                              119.974976
2020-04-21                              111.853139
2020-04-22                               99.097046
2020-04-23                               98.731706
2020-04-24                               92.529460
2020-04-25                               84.530351
2020-04-26                               84.077138
2020-04-27                               77.200821
2020-04-28                               72.067577
2020-04-29                               62.298189
2020-04-30                               66.621004
2020-05-01                               65.106912
2020-05-02                               58.815569
2020-05-03                               60.070122
2020-05-04                               54.899561
2020-05-05                               51.472073
2020-05-06                               43.408441
2020-05-07                               47.735595
2020-05-08                               46.225842
2020-05-09                               39.936847
2020-05-10                               41.193748
```

```
2020-05-11                                36.023306
2020-05-12                                32.595938
2020-05-13                                24.532425
2020-05-14                                28.859666
2020-05-15                                27.350000
2020-05-16                                21.061006
2020-05-17                                22.317906
2020-05-18                                17.147464

            Predicción con los datos de 2020-05-22  datos reales
ds
2020-04-09                               204.102713         214.0
2020-04-10                               198.106717         172.0
2020-04-11                               185.964283         112.0
2020-04-12                               182.621428         194.0
2020-04-13                               172.442022         145.0
2020-04-14                               164.222118         145.0
2020-04-15                               151.367241         156.0
2020-04-16                               151.057798         153.0
2020-04-17                               145.063882         130.0
2020-04-18                               132.923529         125.0
2020-04-19                               129.582753         107.0
2020-04-20                               119.405425         112.0
2020-04-21                               111.187600         109.0
2020-04-22                                98.333877         117.0
2020-04-23                                98.025588         107.0
2020-04-24                                92.035583          81.0
2020-04-25                                79.899142          83.0
2020-04-26                                81.251700          74.0
2020-04-27                                75.767706          64.0
2020-04-28                                72.243215          62.0
2020-04-29                                64.083549          57.0
2020-04-30                                68.469317          71.0
2020-05-01                                67.170618          46.0
2020-05-02                                59.725482          70.0
2020-05-03                                61.080587          40.0
2020-05-04                                55.599139          44.0
2020-05-05                                52.077195          44.0
2020-05-06                                43.921116          46.0
2020-05-07                                48.310471          38.0
2020-05-08                                47.016000          48.0
2020-05-09                                39.575091          46.0
2020-05-10                                40.933749          46.0
2020-05-11                                35.455855          39.0
2020-05-12                                31.937465          37.0
2020-05-13                                23.782675          40.0
2020-05-14                                28.173318          19.0
```

```
2020-05-15                                      26.878846          30.0
2020-05-16                                      19.437938          17.0
2020-05-17                                      20.796596          21.0
2020-05-18                                      15.318702          16.0
```



```
[25]: dimension = 'Fallecidos hoy absoluto'
      COMUNIDAD_A_CONSIDERAR = 'Cataluña'

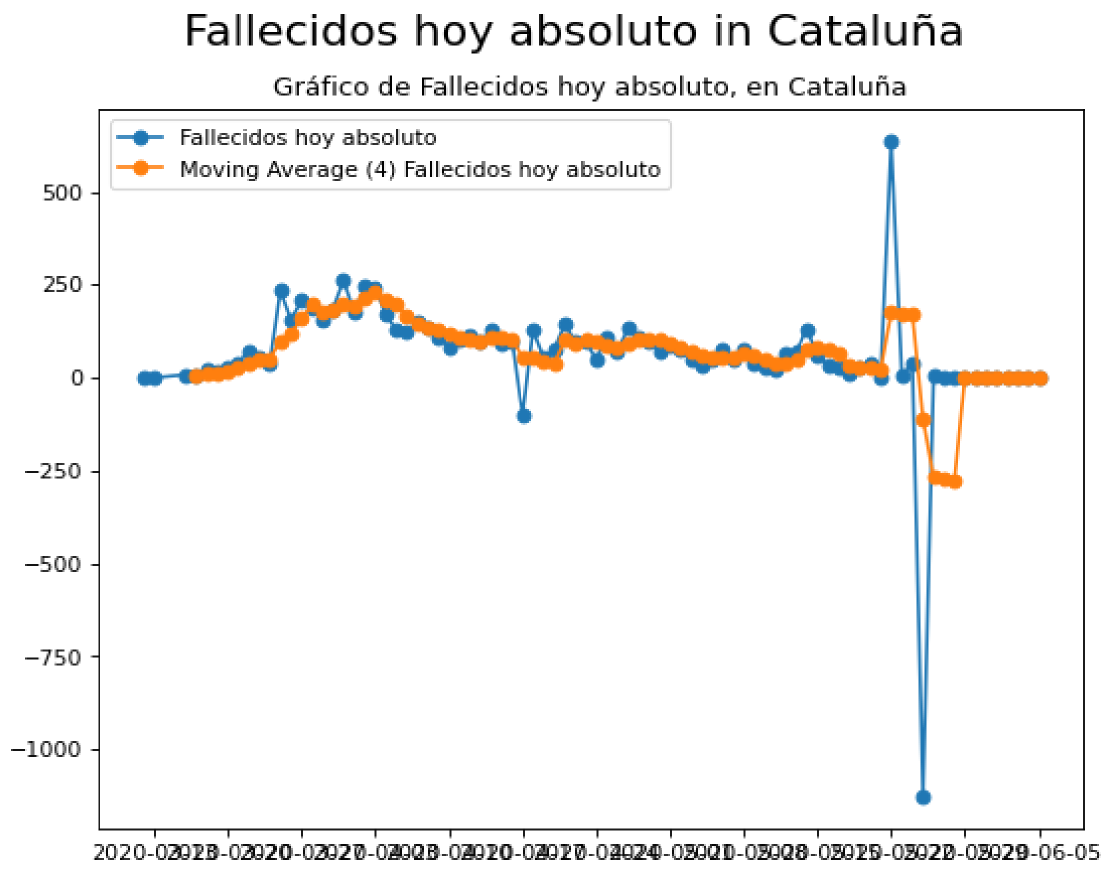
      Insertar_Enlace("Reporte_Fallecidos_hoy_absoluto_Cataluña")

      report_single_location_single_dimension(COMUNIDAD_A_CONSIDERAR,dimension)
```

```
<IPython.core.display.HTML object>


<IPython.core.display.HTML object>


<IPython.core.display.HTML object>
```



```
[26]: dimension = 'Fallecidos hoy absoluto'
COMUNIDAD_A_CONSIDERAR = 'Cataluña'
link="Prediccion_Fallecidos_hoy_absoluto_Cataluña"

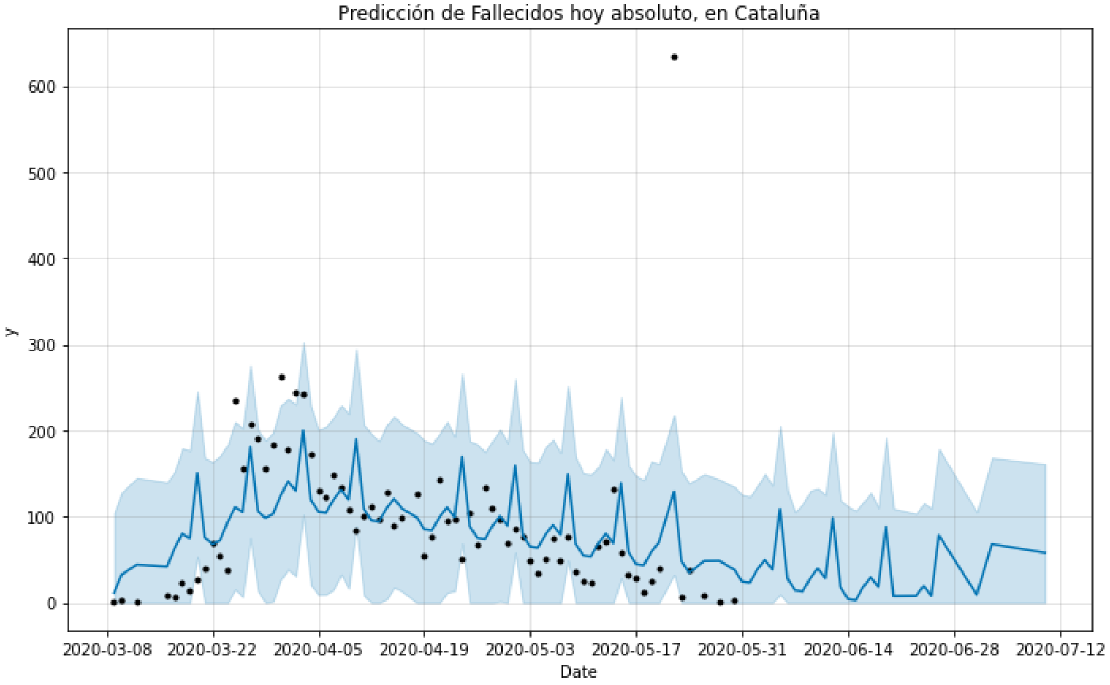

prediccion = Get_Prediction_Nacion( df = Loading_data.
 ↪Get_Comunidad(COMUNIDAD_A_CONSIDERAR),
                                   dimension = dimension,
                                   link = link,
                                   location  = COMUNIDAD_A_CONSIDERAR)
```

```
INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
```

```
<IPython.core.display.HTML object>
```

```
<IPython.core.display.HTML object>
```

```
Prediccion total para Fallecidos hoy absoluto : 7706.624052777044
```



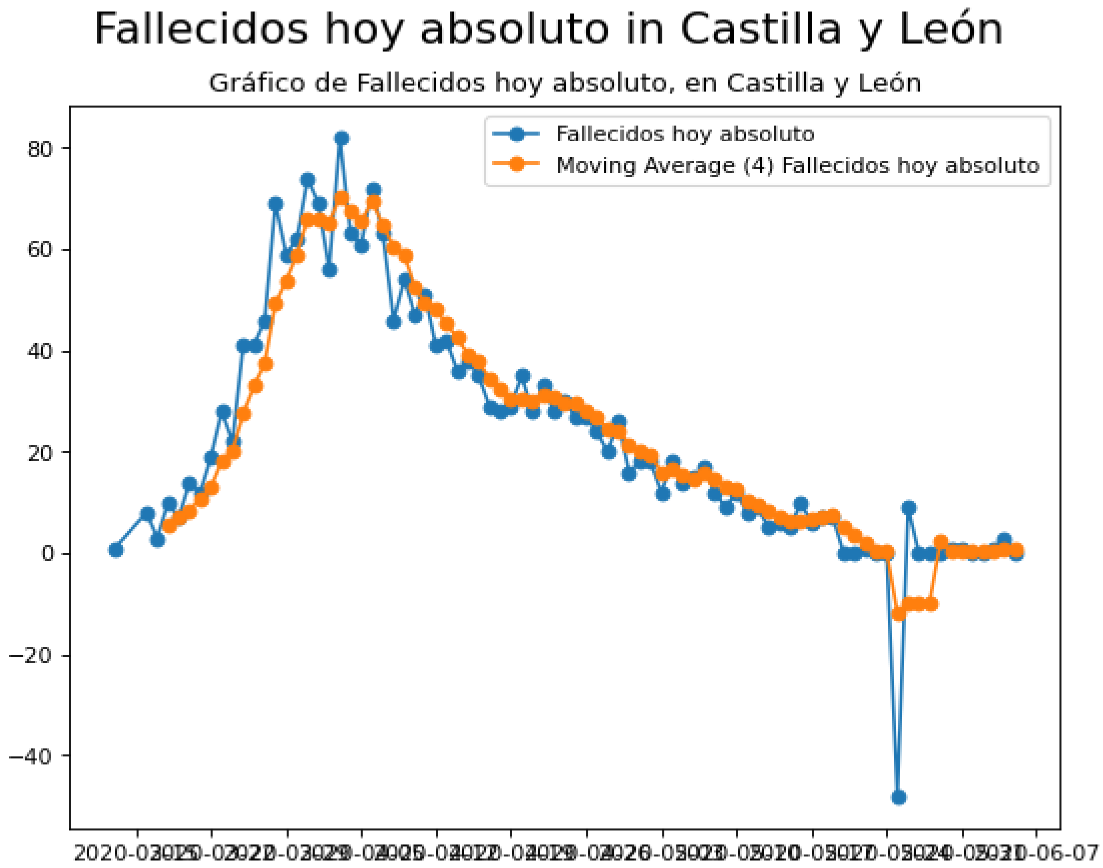
[27]:
```
dimension = 'Fallecidos hoy absoluto'
report_single_location_single_dimension('Castilla y León',dimension)

Insertar_Enlace("Reporte_Fallecidos_hoy_absoluto_CyL")
```

```
<IPython.core.display.HTML object>


<IPython.core.display.HTML object>


<IPython.core.display.HTML object>
```



```
[28]: dimension = 'Fallecidos hoy absoluto'
      COMUNIDAD_A_CONSIDERAR = 'Castilla y León'
      link="Prediccion_Fallecidos_hoy_absoluto_CyL"

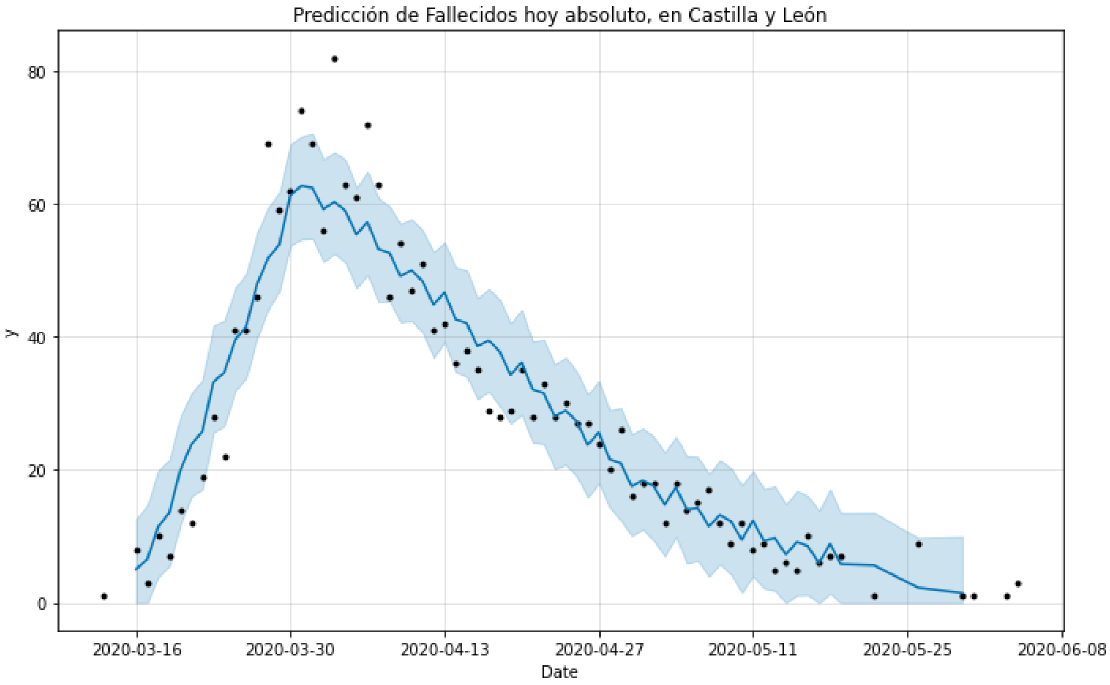
      prediccion = Get_Prediction_Nacion( df = Loading_data.
       ↪Get_Comunidad(COMUNIDAD_A_CONSIDERAR),
                                         dimension = dimension ,
                                         link = link,
                                         location  = COMUNIDAD_A_CONSIDERAR )
```

```
INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
```

```
<IPython.core.display.HTML object>
```

```
<IPython.core.display.HTML object>
```

```
Prediccion total para Fallecidos hoy absoluto : 1987.2211587713525
```

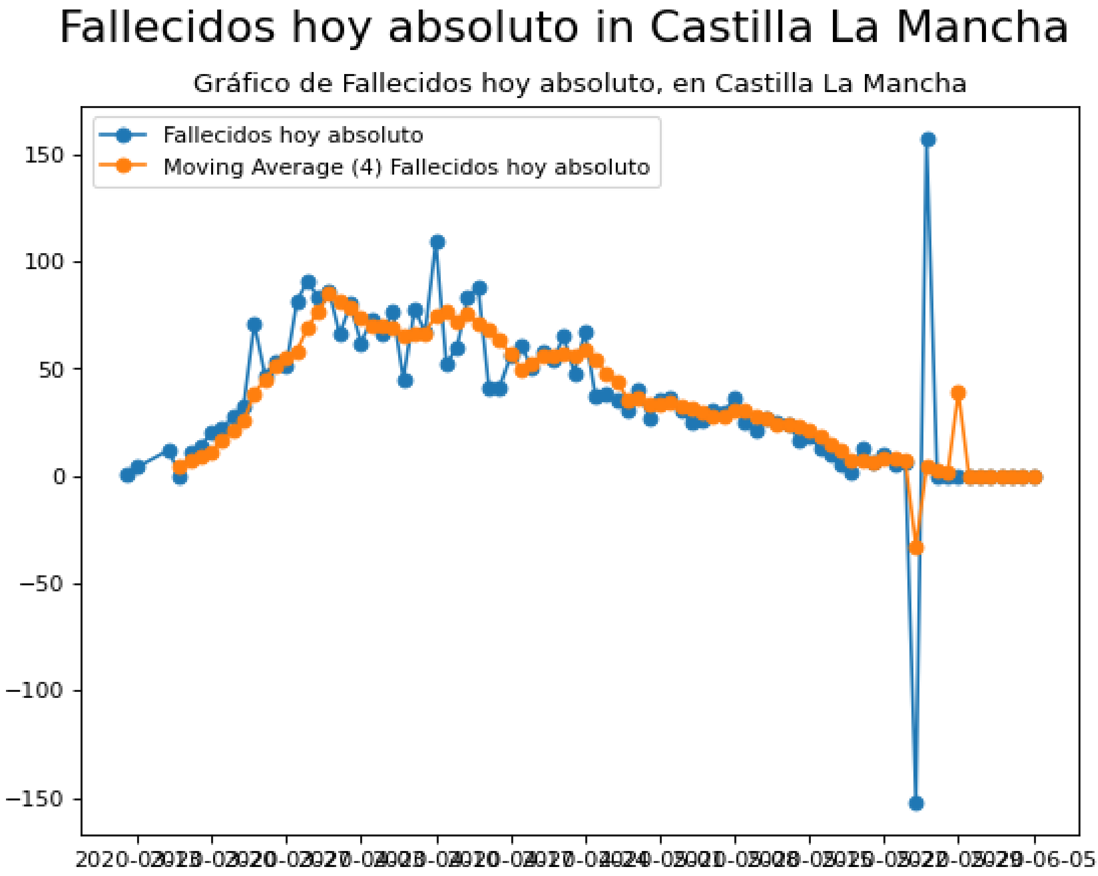


```
[29]: dimension = 'Fallecidos hoy absoluto'
      report_single_location_single_dimension('Castilla La Mancha',dimension)
      Insertar_Enlace("Reporte_Fallecidos_hoy_absoluto_CM")
```

```
<IPython.core.display.HTML object>


<IPython.core.display.HTML object>


<IPython.core.display.HTML object>
```



```
[30]: dimension = 'Fallecidos hoy absoluto'
      COMUNIDAD_A_CONSIDERAR = 'Castilla La Mancha'
      link="Prediccion_Fallecidos_hoy_absoluto_CM"

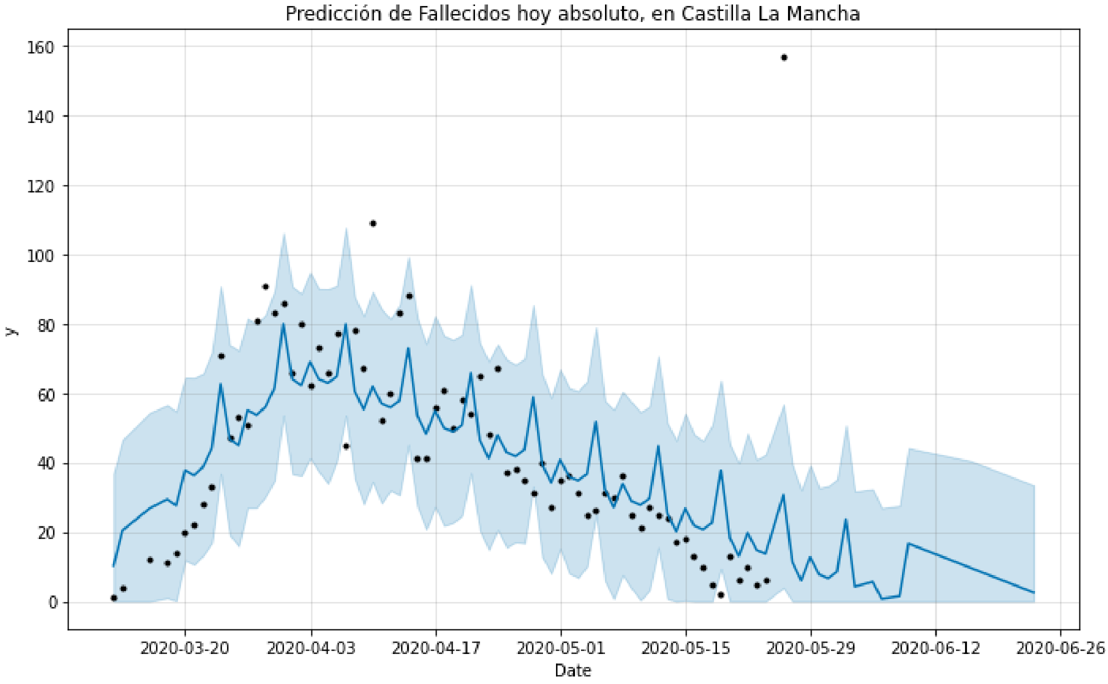
      prediccion = Get_Prediction_Nacion( df = Loading_data.
       ↪Get_Comunidad(COMUNIDAD_A_CONSIDERAR),
                                         dimension = dimension ,
                                         link = link,
                                         location  = COMUNIDAD_A_CONSIDERAR )
```

```
INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
```

```
<IPython.core.display.HTML object>
```

```
<IPython.core.display.HTML object>
```

```
Prediccion total para Fallecidos hoy absoluto : 3179.2353242916706
```



[31]:
```
dimension = 'Fallecidos hoy absoluto'
COMUNIDAD_A_CONSIDERAR = 'Castilla La Mancha'
link="Prediccion_Compare_Fallecidos_hoy_absoluto_CM"

df = Loading_data.Get_Comunidad(COMUNIDAD_A_CONSIDERAR)
prediccion = Get_Predictions_Compare( df = df,
                                   dimension = dimension,
                                   link = link,
                                   location  = COMUNIDAD_A_CONSIDERAR
                                   )
prediccion
```

```
<IPython.core.display.HTML object>
```

```
<IPython.core.display.HTML object>
```

```
INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
```

```
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
```

```
Las predicciones del total de Fallecidos hoy absoluto en Castilla La Mancha,
cambian dia a dia
Predicción con los datos de 2020-05-26    1506.281025
Predicción con los datos de 2020-05-24    1334.306411
Predicción con los datos de 2020-05-23    1338.276538
Predicción con los datos de 2020-05-22    1330.640507
datos reales                              1308.000000
dtype: float64
```

```
[31]:             Predicción con los datos de 2020-05-26  \
       ds
       2020-04-14                               72.880487
       2020-04-15                               53.475360
       2020-04-16                               48.203820
       2020-04-17                               54.890869
       2020-04-18                               49.938951
       2020-04-19                               48.842716
       2020-04-20                               50.732430
       2020-04-21                               65.850194
       2020-04-22                               46.444623
       2020-04-23                               41.172880
       2020-04-24                               47.859726
       2020-04-25                               42.907605
       2020-04-26                               41.811370
       2020-04-27                               43.701084
       2020-04-28                               58.818848
       2020-04-29                               39.413277
       2020-04-30                               34.141534
       2020-05-01                               40.828380
       2020-05-02                               35.876259
       2020-05-03                               34.780024
       2020-05-04                               36.669737
       2020-05-05                               51.787502
       2020-05-06                               32.381931
       2020-05-07                               27.110308
       2020-05-08                               33.797274
       2020-05-09                               28.845274
```

```
2020-05-10                               27.749160
2020-05-11                               29.639175
2020-05-12                               44.757241
2020-05-13                               25.351971
2020-05-14                               20.080529
2020-05-15                               26.767676
2020-05-16                               21.815857
2020-05-17                               20.719923
2020-05-18                               22.609938
2020-05-19                               37.728004
2020-05-20                               18.322734
2020-05-21                               13.051292
2020-05-22                               19.738439
2020-05-23                               14.786620

            Predicción con los datos de 2020-05-24  \
ds
2020-04-14                               63.707229
2020-04-15                               59.072719
2020-04-16                               54.991743
2020-04-17                               61.005644
2020-04-18                               54.230188
2020-04-19                               52.582425
2020-04-20                               53.722275
2020-04-21                               53.660971
2020-04-22                               49.023643
2020-04-23                               44.940573
2020-04-24                               50.952381
2020-04-25                               44.175627
2020-04-26                               42.526566
2020-04-27                               43.665872
2020-04-28                               43.604025
2020-04-29                               38.966629
2020-04-30                               34.883493
2020-05-01                               40.895233
2020-05-02                               34.118479
2020-05-03                               32.469418
2020-05-04                               33.608725
2020-05-05                               33.546877
2020-05-06                               28.909482
2020-05-07                               24.826345
2020-05-08                               30.838086
2020-05-09                               24.061332
2020-05-10                               22.412271
2020-05-11                               23.551577
2020-05-12                               23.489730
2020-05-13                               18.852335
```

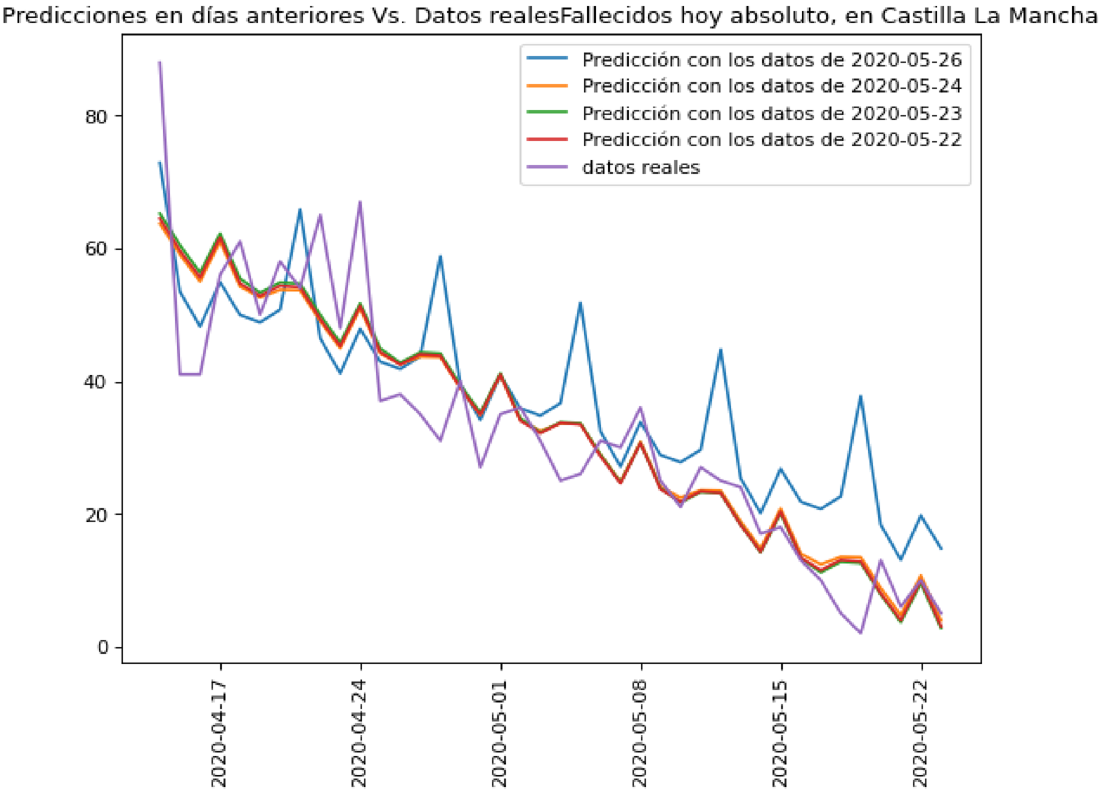
```
2020-05-14                               14.769198
2020-05-15                               20.780938
2020-05-16                               14.004184
2020-05-17                               12.355124
2020-05-18                               13.494430
2020-05-19                               13.432582
2020-05-20                                8.795187
2020-05-21                                4.712050
2020-05-22                               10.723791
2020-05-23                                3.947037

            Predicción con los datos de 2020-05-23  \
ds
2020-04-14                               65.215850
2020-04-15                               60.477493
2020-04-16                               56.312186
2020-04-17                               62.218689
2020-04-18                               55.440744
2020-04-19                               53.278765
2020-04-20                               54.858851
2020-04-21                               54.685427
2020-04-22                               49.946964
2020-04-23                               45.781648
2020-04-24                               51.688141
2020-04-25                               44.910196
2020-04-26                               42.748217
2020-04-27                               44.328302
2020-04-28                               44.154879
2020-04-29                               39.416416
2020-04-30                               35.251100
2020-05-01                               41.157592
2020-05-02                               34.379648
2020-05-03                               32.217668
2020-05-04                               33.797754
2020-05-05                               33.624331
2020-05-06                               28.885868
2020-05-07                               24.720551
2020-05-08                               30.627044
2020-05-09                               23.849099
2020-05-10                               21.687120
2020-05-11                               23.267206
2020-05-12                               23.093782
2020-05-13                               18.355319
2020-05-14                               14.190003
2020-05-15                               20.096496
2020-05-16                               13.318551
2020-05-17                               11.156572
```

```
2020-05-18                               12.736657
2020-05-19                               12.563234
2020-05-20                                7.824771
2020-05-21                                3.659455
2020-05-22                                9.565947
2020-05-23                                2.788003

            Predicción con los datos de 2020-05-22  datos reales
ds
2020-04-14                               64.458739          88.0
2020-04-15                               59.647266          41.0
2020-04-16                               55.594574          41.0
2020-04-17                               61.635046          56.0
2020-04-18                               54.705032          61.0
2020-04-19                               52.798709          50.0
2020-04-20                               54.366811          58.0
2020-04-21                               54.131992          54.0
2020-04-22                               49.319771          65.0
2020-04-23                               45.266330          48.0
2020-04-24                               51.305895          67.0
2020-04-25                               44.374973          37.0
2020-04-26                               42.467742          38.0
2020-04-27                               44.035612          35.0
2020-04-28                               43.800561          31.0
2020-04-29                               38.988116          40.0
2020-04-30                               34.934450          27.0
2020-05-01                               40.974015          35.0
2020-05-02                               34.043092          36.0
2020-05-03                               32.135861          31.0
2020-05-04                               33.703731          25.0
2020-05-05                               33.468681          26.0
2020-05-06                               28.656235          31.0
2020-05-07                               24.602569          30.0
2020-05-08                               30.642134          36.0
2020-05-09                               23.711212          25.0
2020-05-10                               21.803981          21.0
2020-05-11                               23.371851          27.0
2020-05-12                               23.136800          25.0
2020-05-13                               18.324355          24.0
2020-05-14                               14.270689          17.0
2020-05-15                               20.310254          18.0
2020-05-16                               13.379331          13.0
2020-05-17                               11.472100          10.0
2020-05-18                               13.039970           5.0
2020-05-19                               12.804920           2.0
2020-05-20                                7.992474          13.0
2020-05-21                                3.938809           6.0
```

```
2020-05-22                                         9.978373          10.0
2020-05-23                                         3.047451           5.0
```



[32]:
```
dimension = 'Hospitalizados'
COMUNIDAD_A_CONSIDERAR = 'Madrid'
link="Prediccion_Hospitalizados_Madrid"

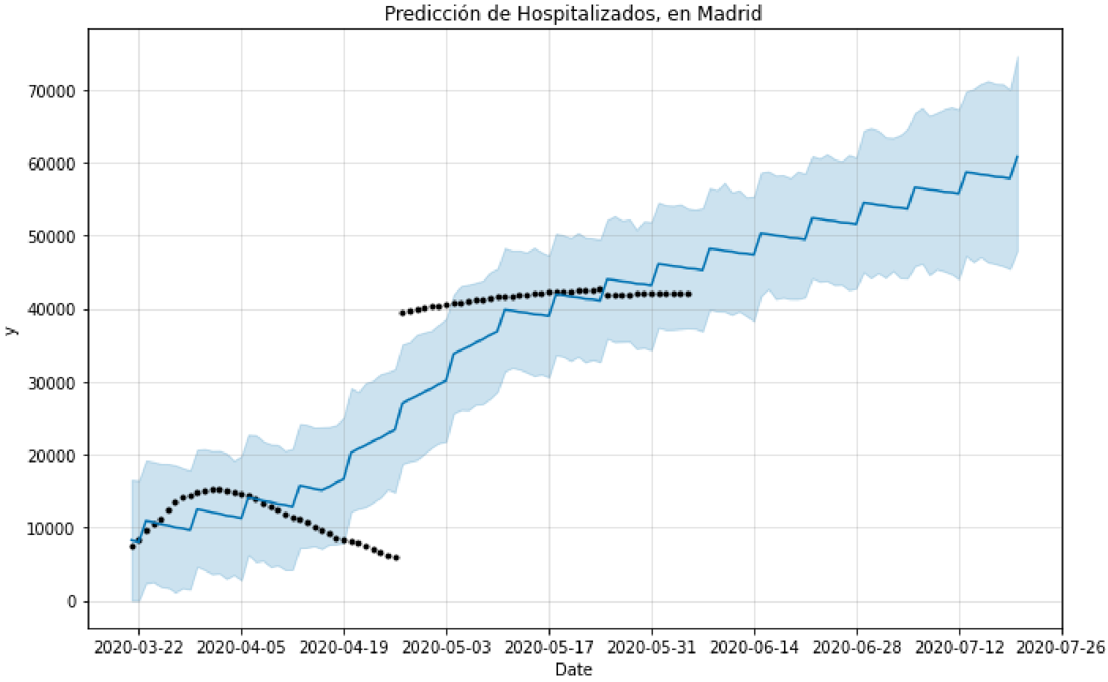
prediccion = Get_Prediction_Nacion( df = Loading_data.
 ↪Get_Comunidad(COMUNIDAD_A_CONSIDERAR),
                                   dimension = dimension ,
                                   link = link,
                                   location  = COMUNIDAD_A_CONSIDERAR )
```

```
INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
```

```
<IPython.core.display.HTML object>
```

```
<IPython.core.display.HTML object>
```

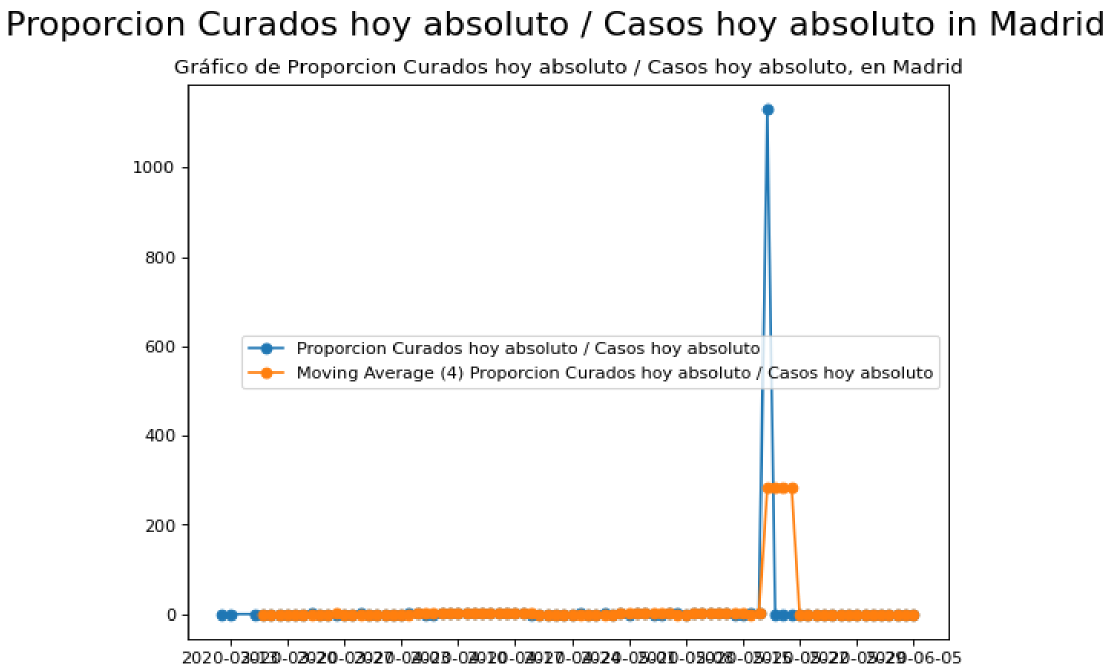
```
Prediccion total para Hospitalizados : 4458071.113367334
```



[33]:
```
dimension = 'Proporcion Curados hoy absoluto / Casos hoy absoluto'
report_single_location_single_dimension('Madrid',dimension)
```

```
<IPython.core.display.HTML object>
```

```
<IPython.core.display.HTML object>
```



2 ¿ Son reales estas cifras ?

2.0.1 Actualizacion: Con los datos de mortalidad del insituto Carlos III, estas cifras se han quedado pequeñas. Ver notebook ”Momo” para mas detalles.

Según reportaje de el mundo :https://www.elmundo.es/madrid/2020/04/07/5e8c427d21efa0b1668b45d6.html

Entre los días 15 y 31 de marzo fallecieron en Madrid capital, ”por todas las causas”, aunque la mayoría por coronavirus, 5.950 personas, cuando en 2019, en el mismo lapso, murieron 1.100 personas

[34]:
```
from datetime import datetime
import warnings
warnings.filterwarnings('ignore')

COMUNIDAD_A_CONSIDERAR = 'Madrid'
comunidad = Loading_data.Get_Comunidad(COMUNIDAD_A_CONSIDERAR)

Insertar_Enlace("Reales")

comunidad.head(24).tail(15)['Fallecidos hoy absoluto'].sum()
comunidad['Fecha'] = comunidad.index

date1 = datetime.strptime('2020-03-15', '%Y-%m-%d')
date2 = datetime.strptime('2020-04-01', '%Y-%m-%d')
```

```
madrid_muertos_segun_sanidad = comunidad.loc[(comunidad['Fecha']>date1) &␣
 ↪(comunidad['Fecha']<date2)]['Fallecidos hoy absoluto'].sum()

display(HTML ("Madrid muertos segun, <b>sanidad</b>, segunda quincena de Marzo:␣
 ↪ <b>" + str(madrid_muertos_segun_sanidad)+"</b>"))

##

madrid_muertos_segun_interior = 5950 - 1100


display(HTML ("Madrid muertos segun, <b>interior</b>, mismo intervalo: <b>" +␣
 ↪str(madrid_muertos_segun_interior)+"</b>"))


porcentaje_error = (madrid_muertos_segun_interior -␣
 ↪madrid_muertos_segun_sanidad) / madrid_muertos_segun_sanidad


display(HTML ("La diferencia porcentual entre los muertos de sanidad e interior␣
 ↪es de  <b>" + str(porcentaje_error) + "</b>") )

prediccion_muertos = comunidad['Fallecidos hoy absoluto'].sum()*␣
 ↪(1+porcentaje_error)



display(HTML ("El numero de <b>fallecidos en Madrid</b>, hasta ahora es de <b>"␣
 ↪+ str(comunidad['Fallecidos hoy absoluto'].sum()) +
         "</b>, pero con el incremento del <b>" + str(porcentaje_error) +
         "</b> ,la cifra real sería de : <b>" + str(  int(prediccion_muertos))␣
 ↪+ "</b> muertos"
                                            ) )
Dimension = 'Fallecidos hoy absoluto'
df = Get_Dimension_CCAA(Dimension)

df['Total Fallecidos'] = df.sum(axis=1)

total_muertos_españa = int(df['Total Fallecidos'].sum())
prediccion_muertos_españa = total_muertos_españa* (1+porcentaje_error)

display(HTML ("El numero de <b>fallecidos en España</b>, hasta ahora es de <b>"␣
 ↪+ str(total_muertos_españa) +
         "</b>, pero con el incremento del <b>" + str(porcentaje_error) +
         "</b> ,la cifra real sería de : <b>" + str( ␣
 ↪int(prediccion_muertos_españa)) + "</b> muertos"
```

```
                                                   ))
```

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<IPython.core.display.HTML object>
```

[35]:

```
from datetime import datetime

COMUNIDAD_A_CONSIDERAR = 'Madrid'
#comunidad = Loading_data.Get_Comunidad(COMUNIDAD_A_CONSIDERAR)


comunidad.head(24).tail(15)['Fallecidos hoy absoluto'].sum()
comunidad['Fecha'] = comunidad.index

date1 = datetime.strptime('2020-03-15', '%Y-%m-%d')
date2 = datetime.strptime('2020-04-01', '%Y-%m-%d')

comunidad.loc[(comunidad['Fecha']>date1) &␣
 ↪(comunidad['Fecha']<date2)]['Fallecidos hoy absoluto'].sum()
```

[35]: 3522

[36]:

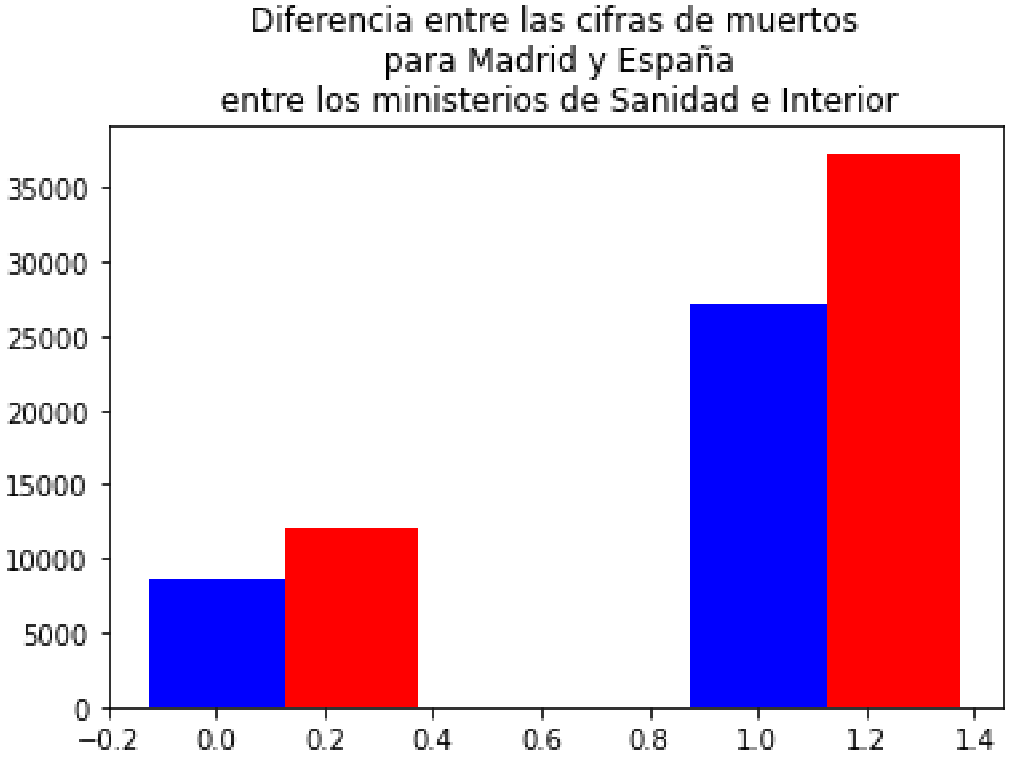
```
y = [comunidad['Fallecidos hoy absoluto'].sum(),total_muertos_españa]
z = [comunidad['Fallecidos hoy absoluto'].sum()* (1+porcentaje_error),␣
 ↪total_muertos_españa* (1+porcentaje_error)]

X = np.arange(2)

ax=plt.subplot(111)
plt.bar(X+0, y,color = 'b', width = 0.25)
plt.bar(X+0.25, z,color = 'r', width = 0.25)


ax.set_title("Diferencia entre las cifras de muertos\n para Madrid y España\n␣
 ↪entre los ministerios de Sanidad e Interior")
```

```
[36]: Text(0.5, 1.0, 'Diferencia entre las cifras de muertos\n para Madrid y España\n
      entre los ministerios de Sanidad e Interior')
```


Diferencia entre las cifras de muertos
para Madrid y España
entre los ministerios de Sanidad e Interior