

Pain_Graphs

June 11, 2020

1 Informes y predicciones de COVID-19 en España

Actualizado diariamente, este documento se [visualiza mejor aquí](#).

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1.2 2. Comparativas y predicciones

Comparativas			
de	Comparativas		
dos	por	Comparativas	
dimensiones	comunidades	individuales	Predicciones

Section	Section	Section	Section
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Section	Section	Section	Section
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Section	Section	Section	Section
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	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>'))
```

```
Insertar_Enlace('DatosMadrid')

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

<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

Fecha	Fallecidos hoy variacion respecto ayer	Fallecidos hoy porcentaje \
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

Fecha	Tasa Mortalidad	Curados	Curados hoy absoluto \
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

Fecha	Casos excluidos curados \
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

Fecha	Proporcion Curados hoy absoluto / Casos hoy absoluto	UCI \
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"""\nslope: {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

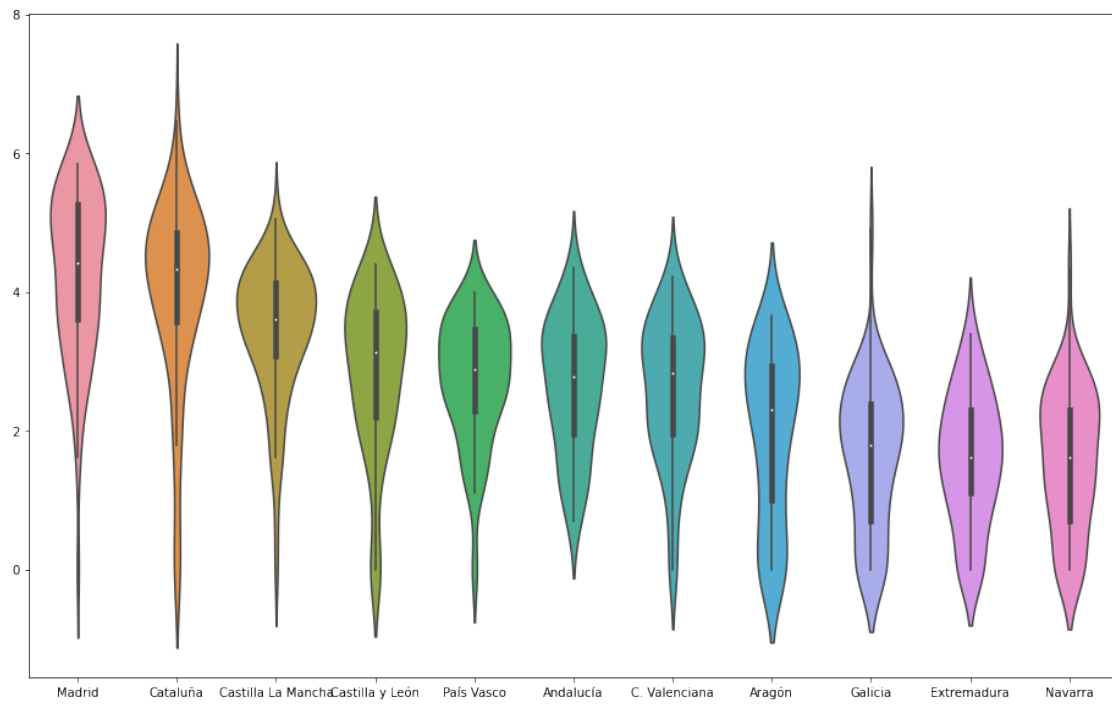
dimension = 'Fallecidos hoy absoluto'
df = plot_violin(dimension)

```

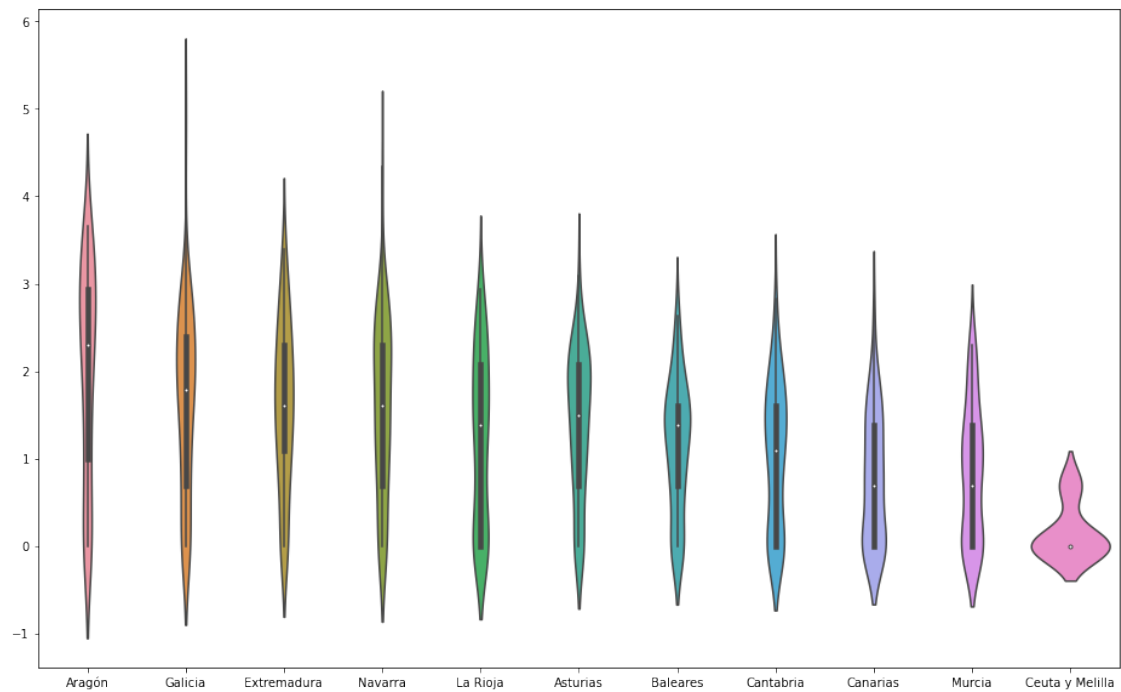
<IPython.core.display.HTML object>

<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
2020-06-04	0		0	0		0	0
2020-06-03	0		0	0		0	0
2020-06-02	0		0	0		0	0
2020-06-01	0		0	0		0	0
...
2020-03-11	0		0	1		0	0
2020-03-10	0		0	2		0	0
2020-03-09	0		0	0		0	0
2020-03-06	0		0	1		0	0
2020-03-05	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

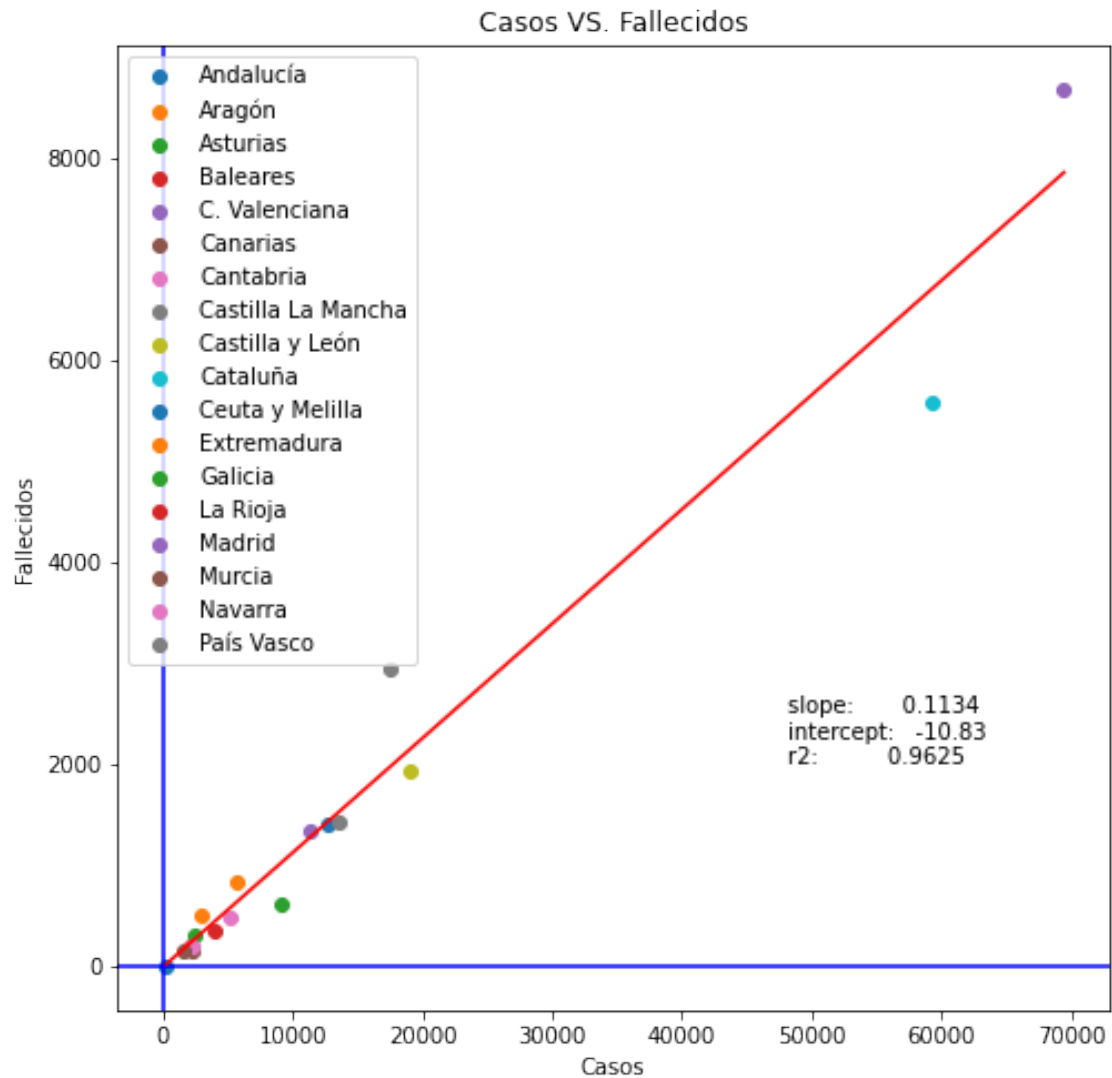
from Loading_data import Get_Comunidades_List as comunidades
COMUNIDADES = comunidades()

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

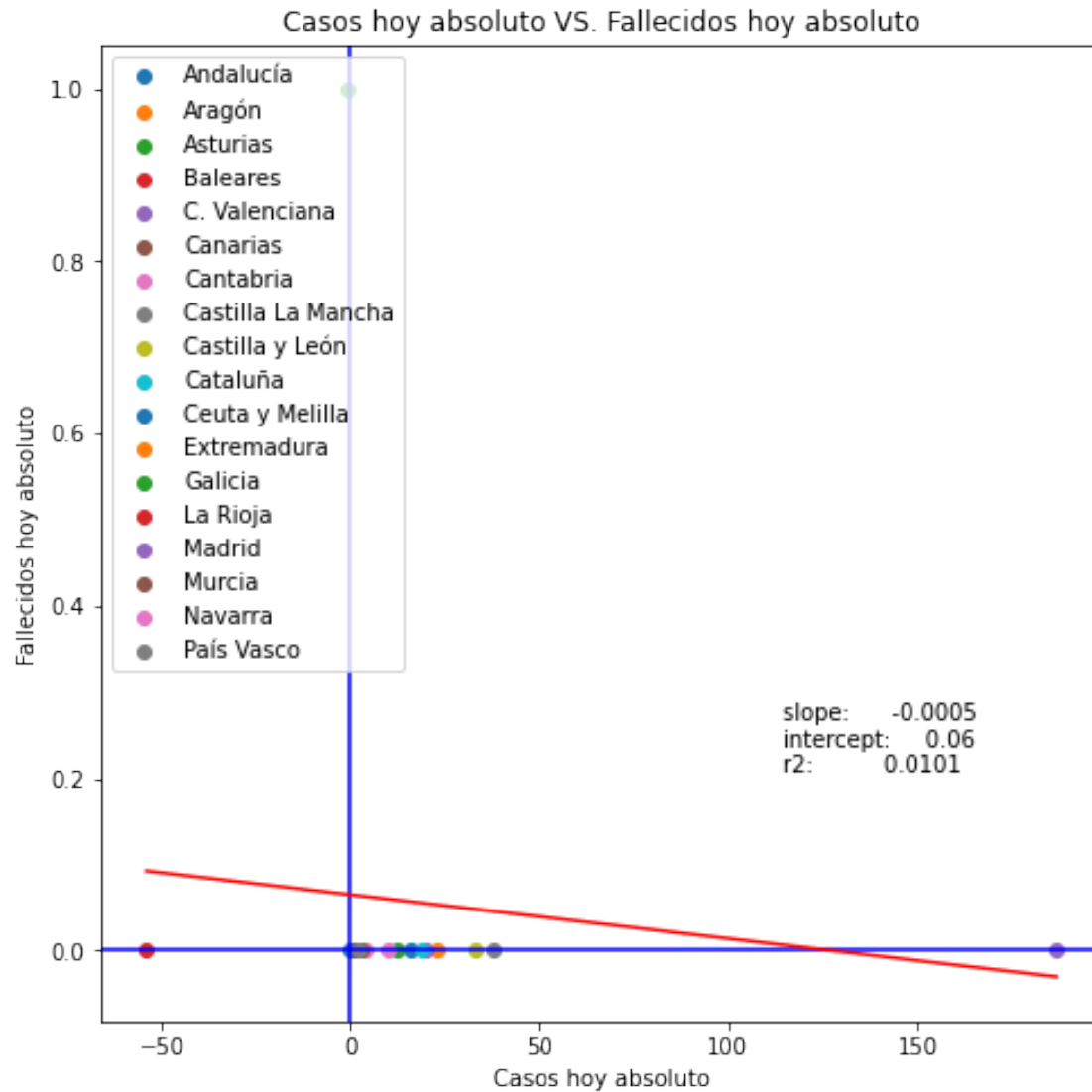
Total: Fallecidos 27134

<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

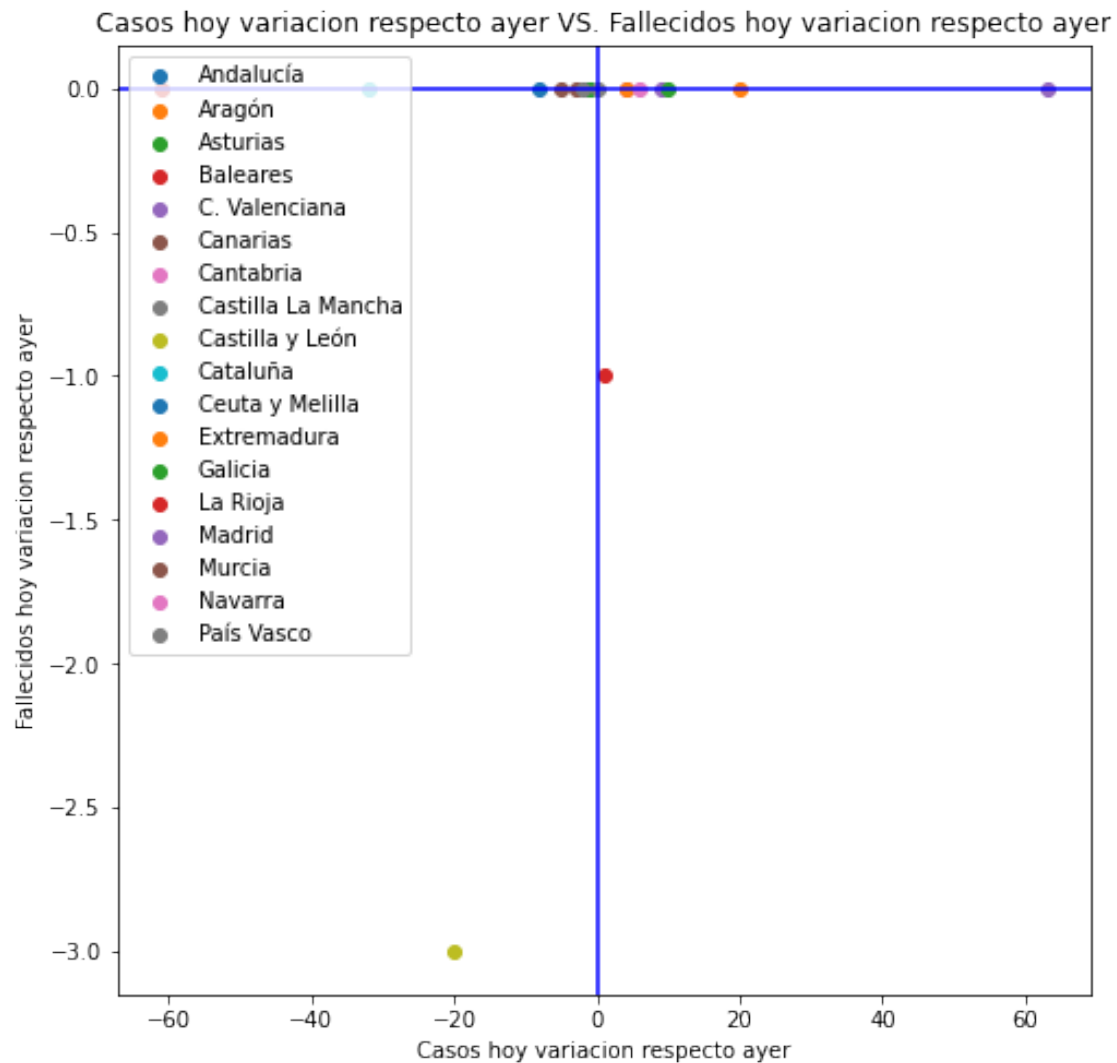
Total: Fallecidos hoy absoluto 1

<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().axis.set_major_formatter(mdates.DateFormatter('%Y-%m-%d'))
    plt.gca().axis.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

```

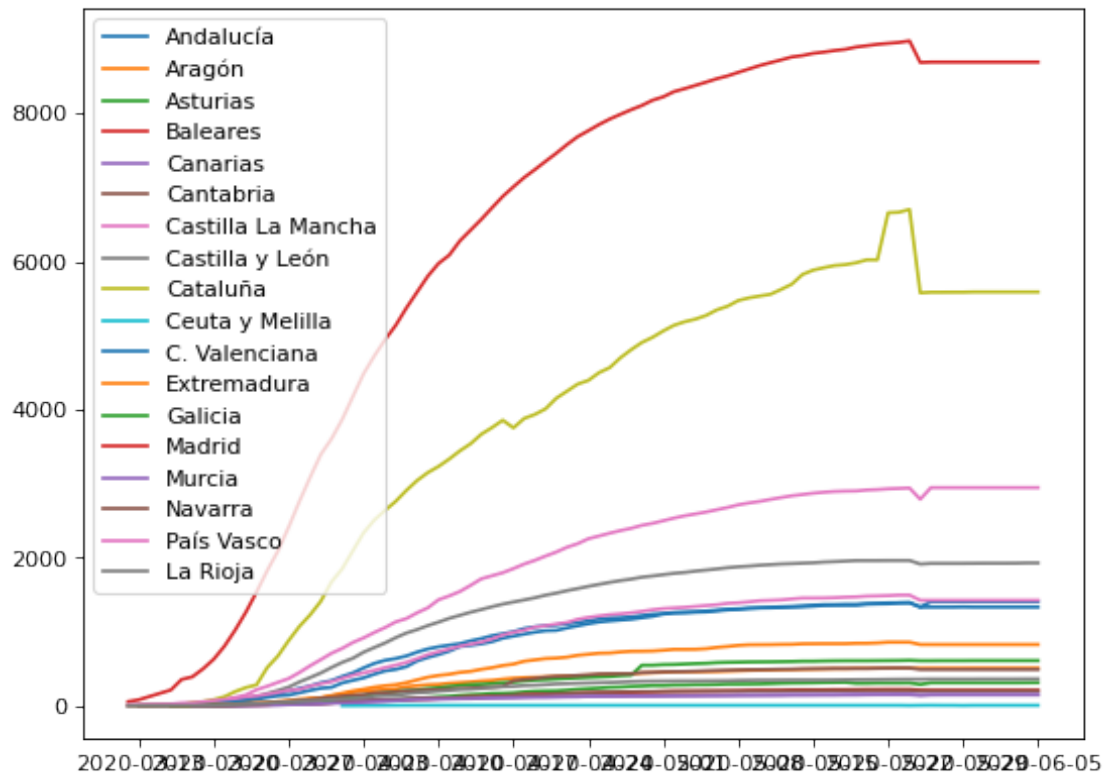
```

[12]: Insertar_Enlace("Comunidades_Fallecidos")
      Report_Location("Fallecidos")

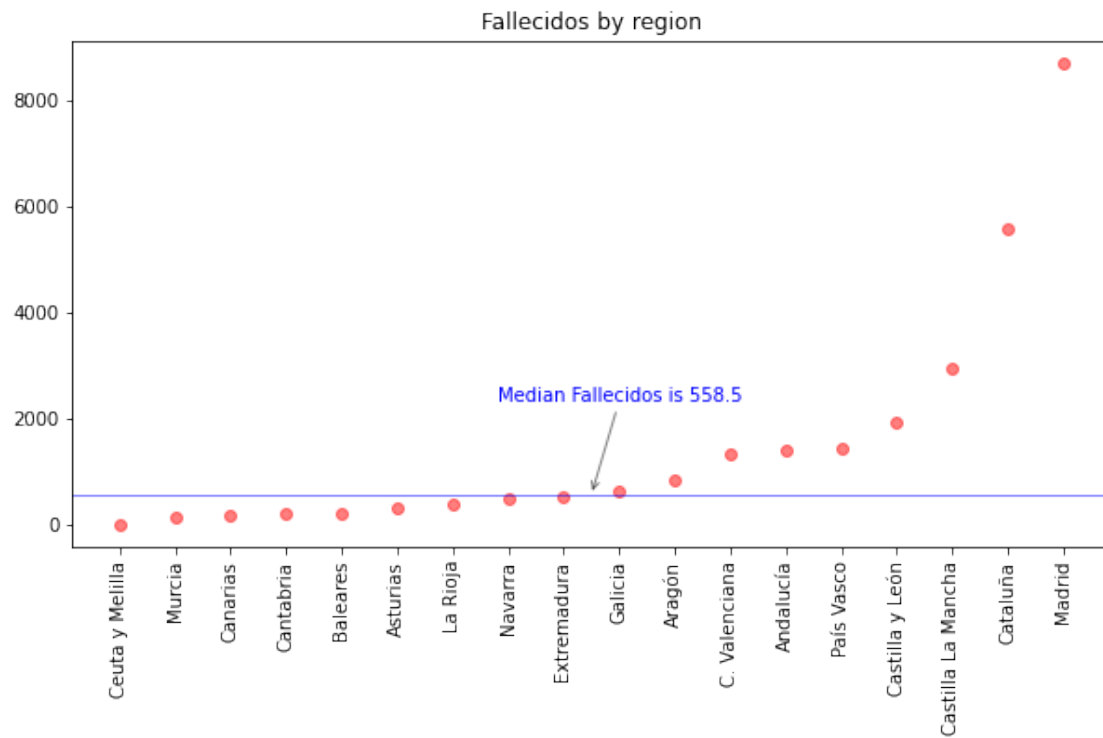
```

<IPython.core.display.HTML object>

Comparativa de: Fallecidos



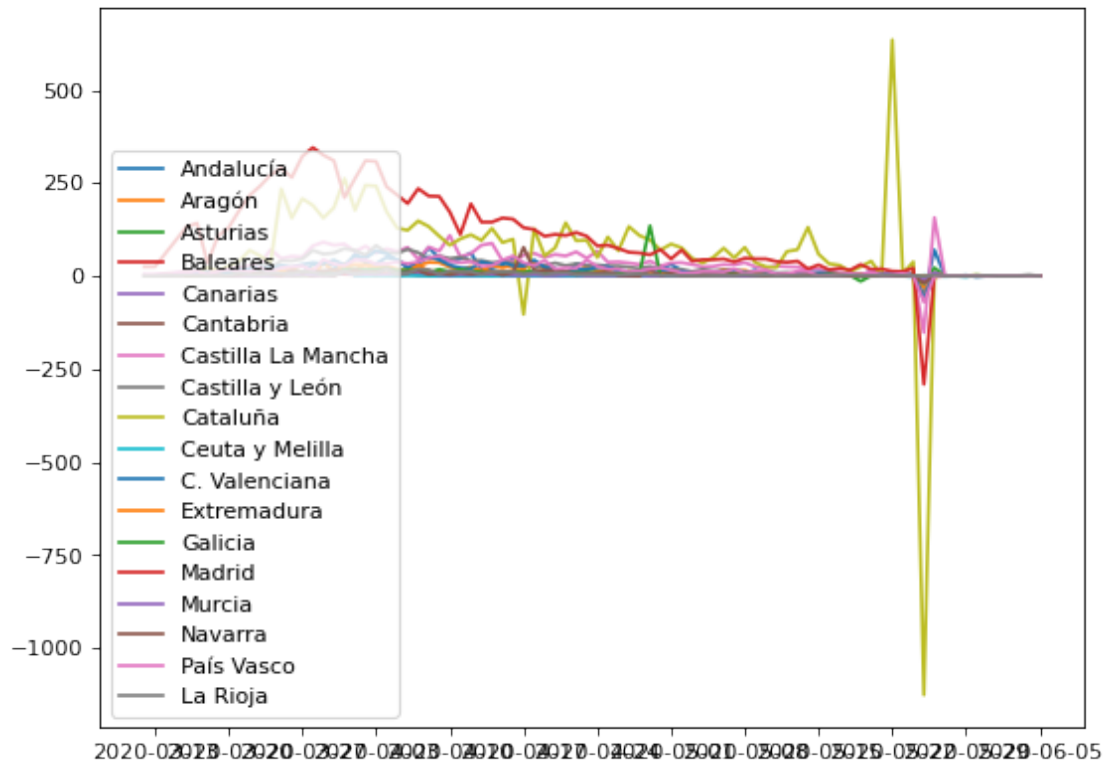
<IPython.core.display.HTML object>



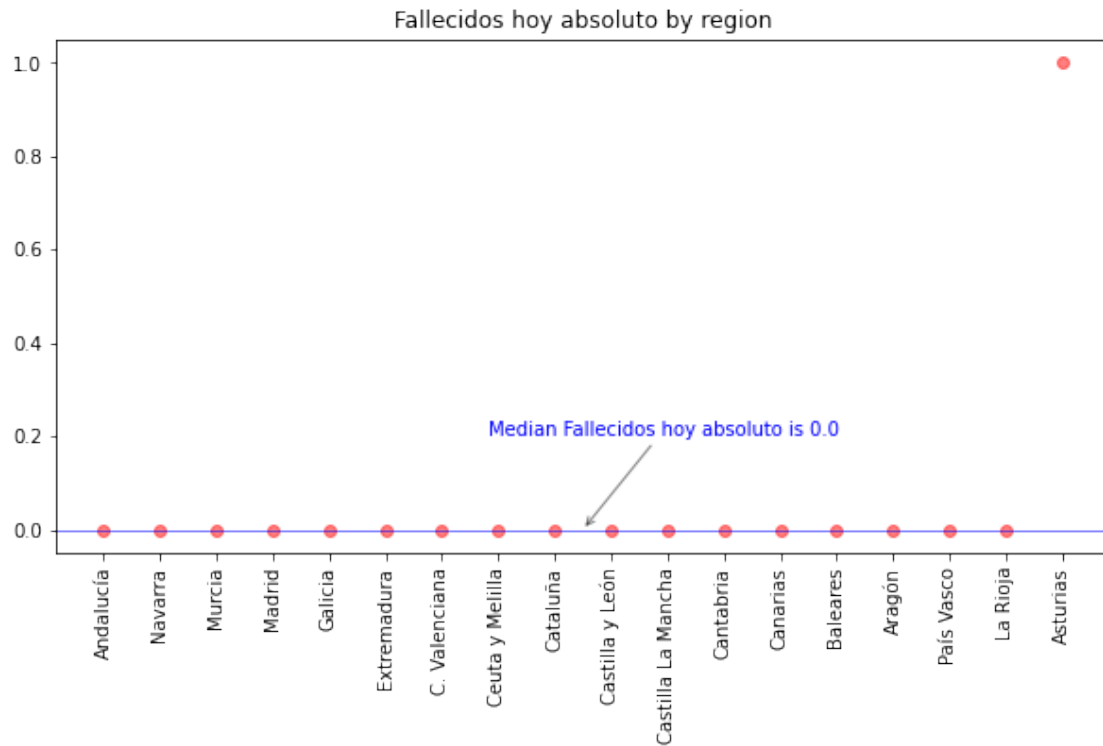
```
[13]: Insertar_Enlace("Comunidades_Fallecidos_Hoy")  
Report_Location("Fallecidos hoy absoluto")
```

<IPython.core.display.HTML object>

Comparativa de: Fallecidos hoy absoluto



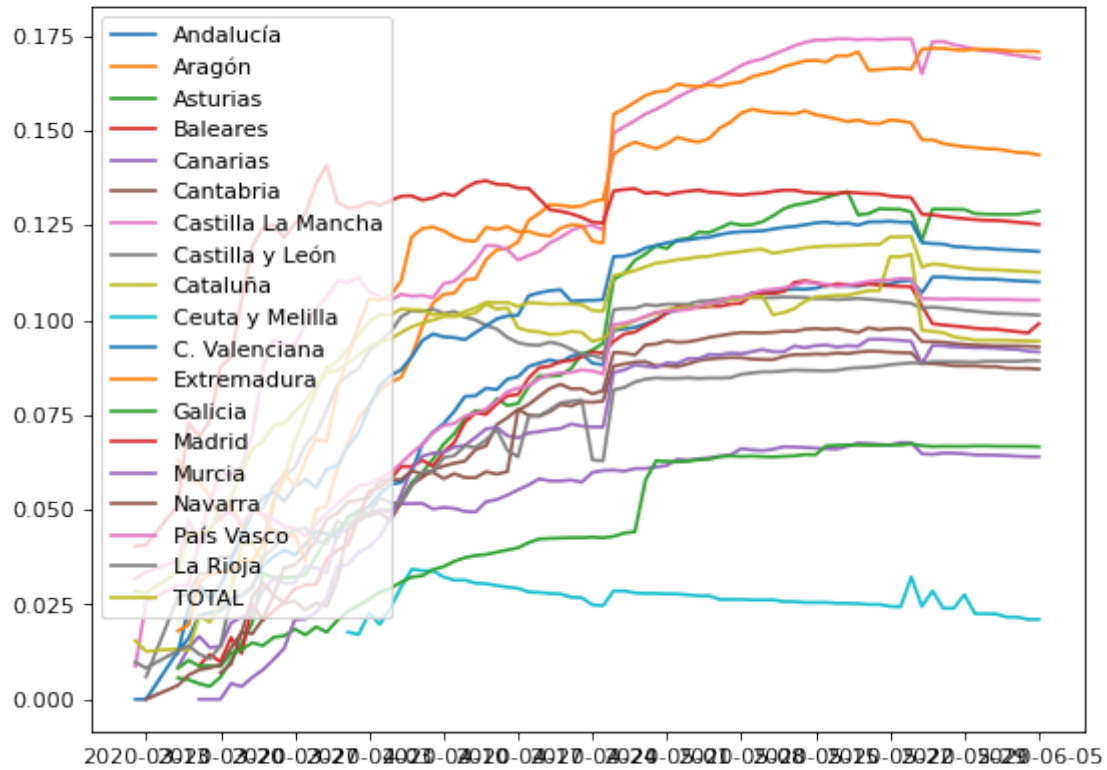
<IPython.core.display.HTML object>



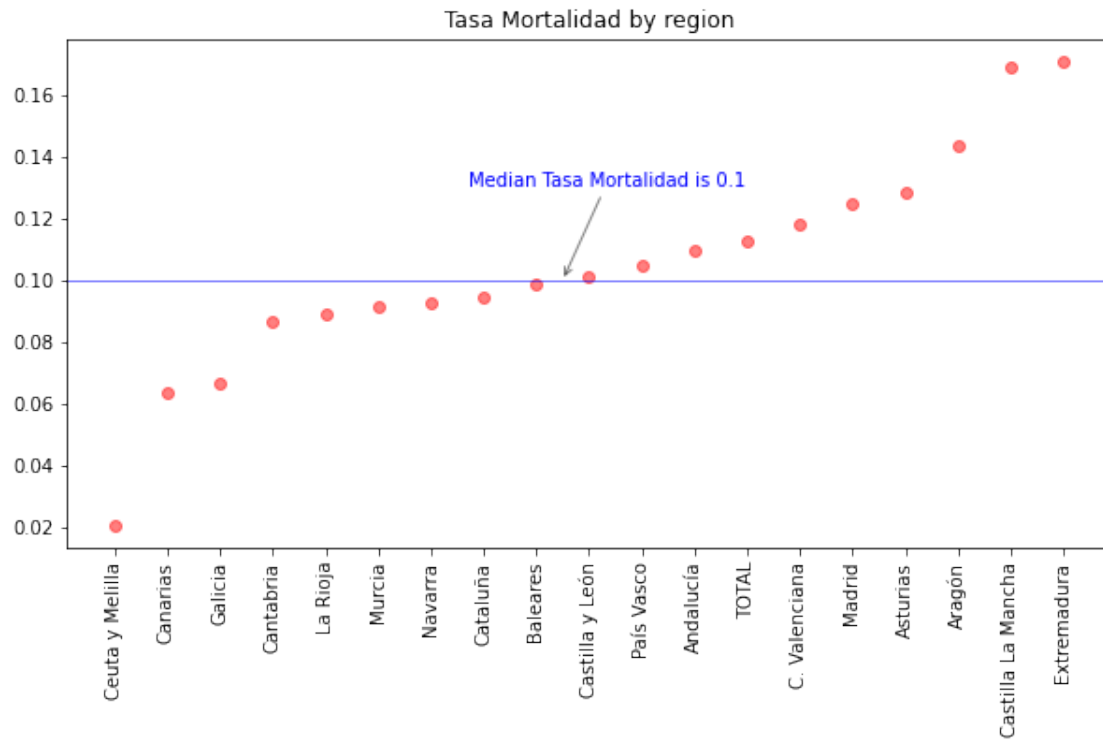
```
[14]: Insertar_Enlace("Comunidades_Mortalidad")  
  
Report_Location("Tasa Mortalidad", True)
```

<IPython.core.display.HTML object>

Comparativa de: Tasa Mortalidad



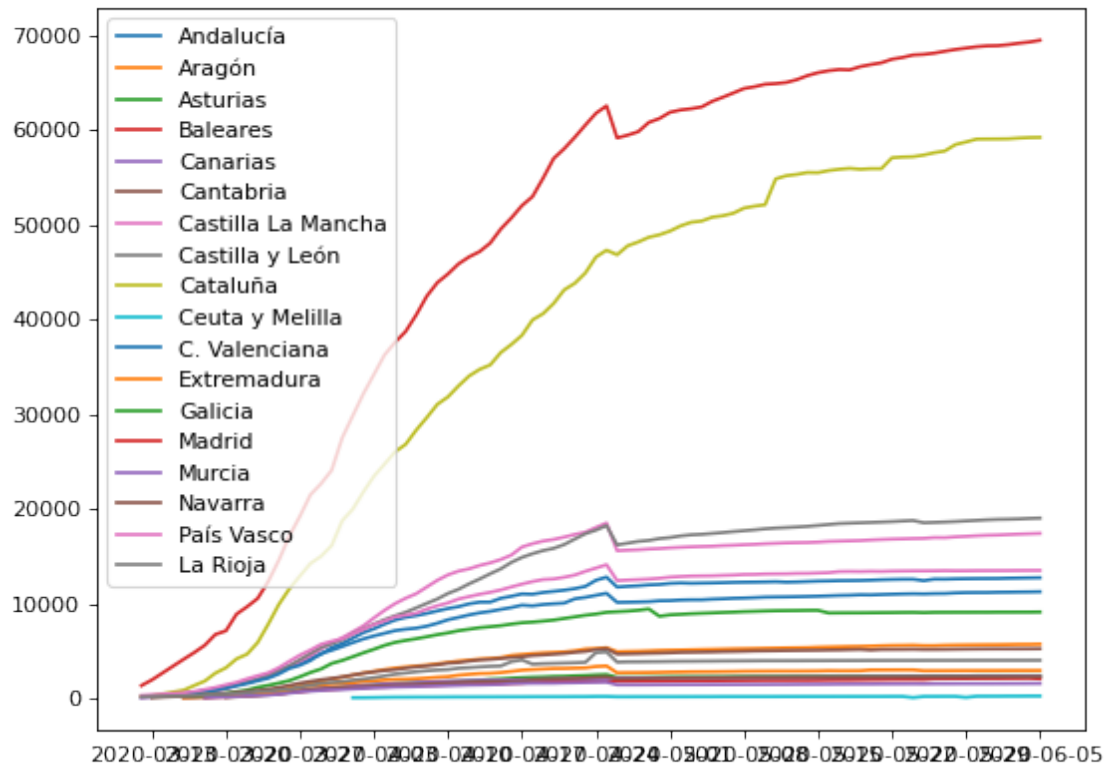
<IPython.core.display.HTML object>



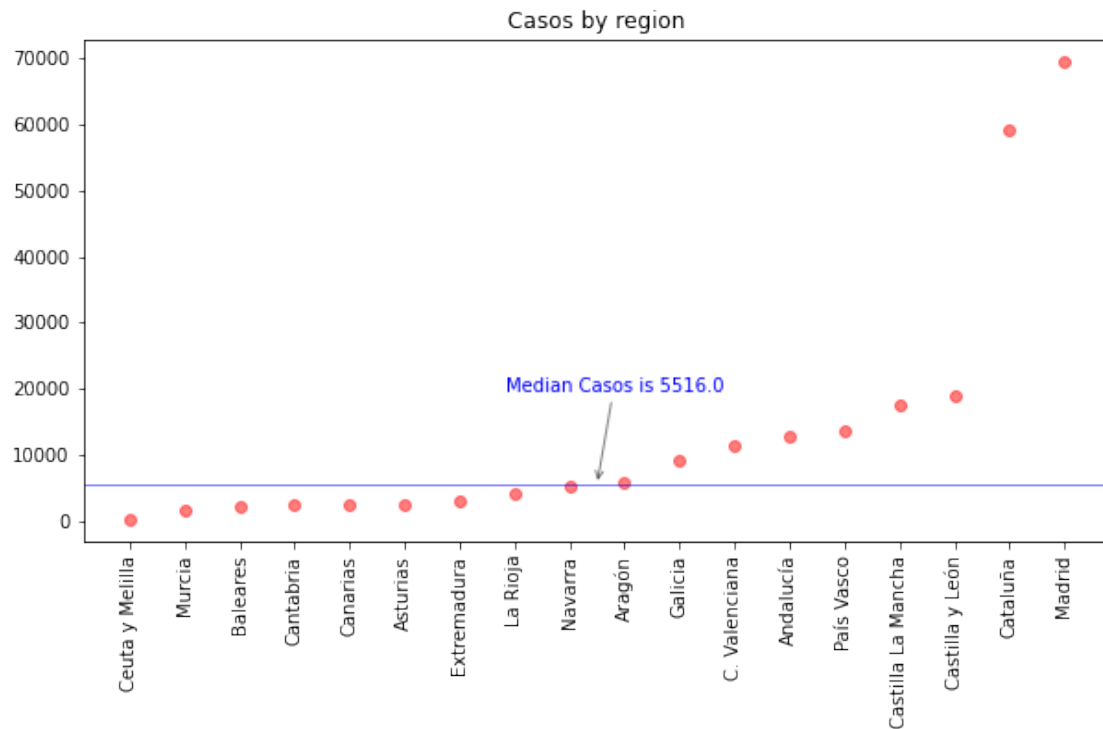
```
[15]: Insertar_Enlace("Comunidades_Casos")  
  
Report_Location("Casos")
```

<IPython.core.display.HTML object>

Comparativa de: Casos



<IPython.core.display.HTML object>

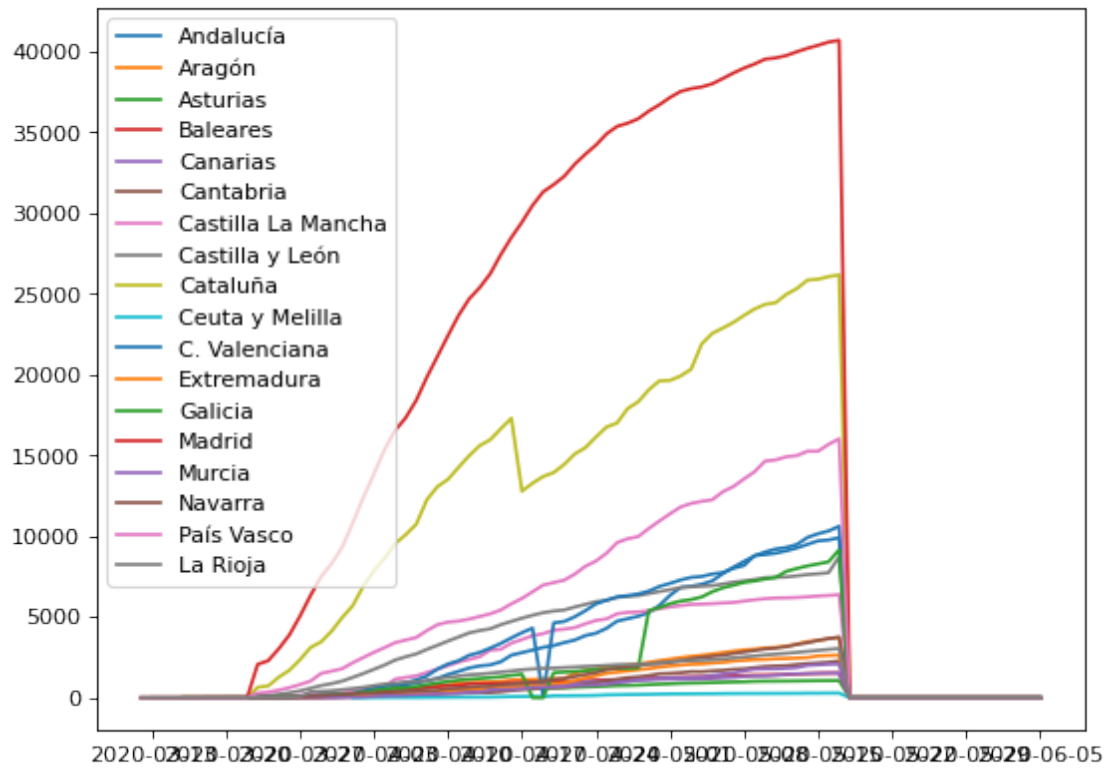


```
[16]: Insertar_Enlace("Curados")
```

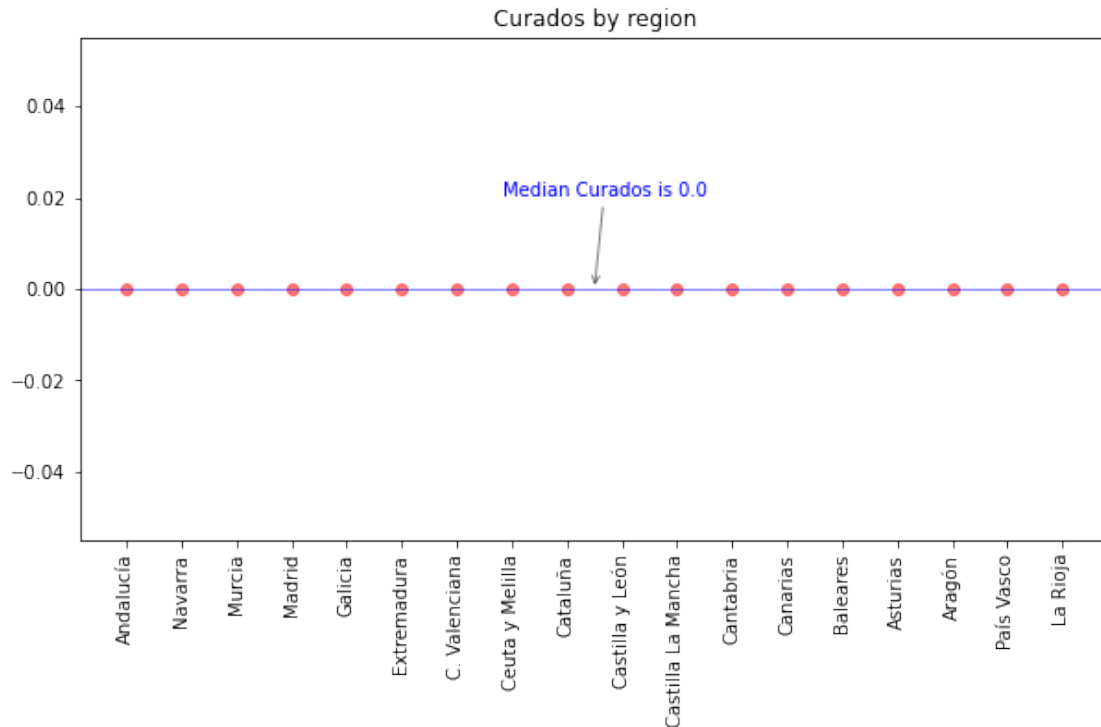
```
Report_Location("Curados")
```

<IPython.core.display.HTML object>

Comparativa de: Curados



<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

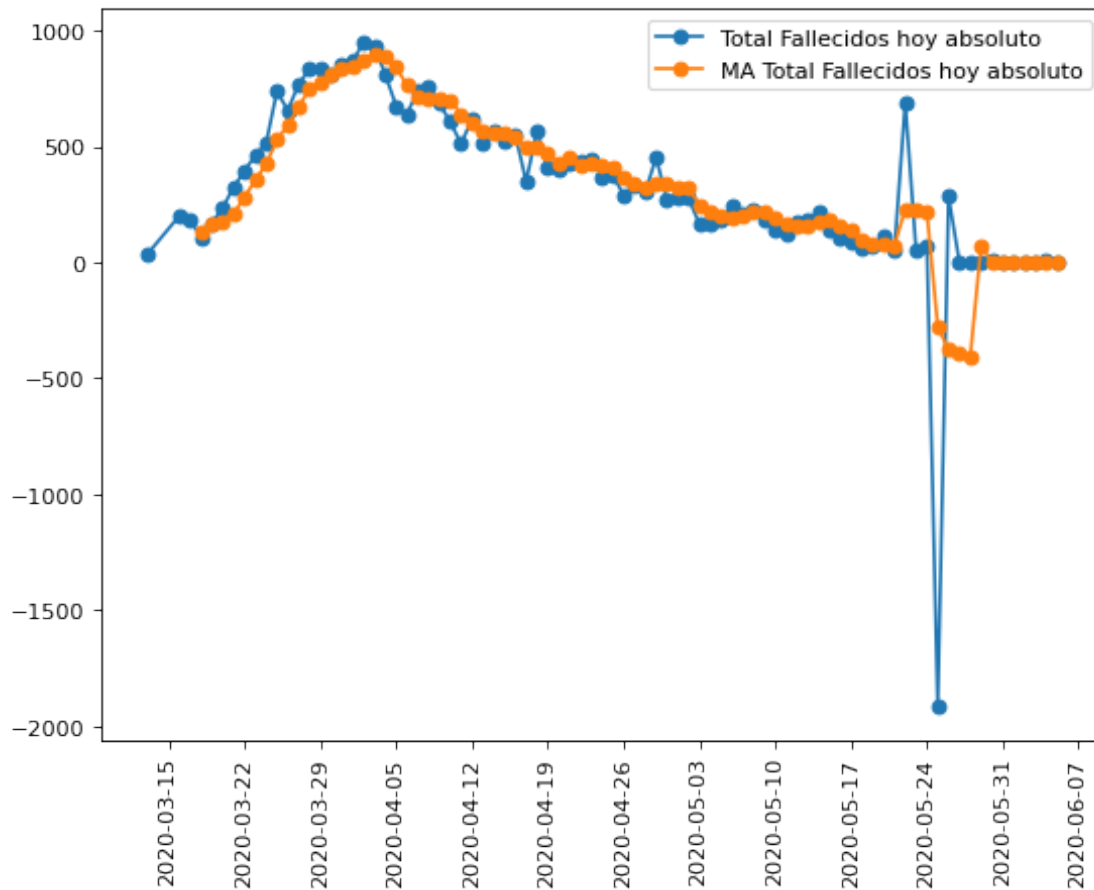
```

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

Fecha	Variacion MA Total Fallecidos hoy absoluto
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]

Total fallecidos en España



```
[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>

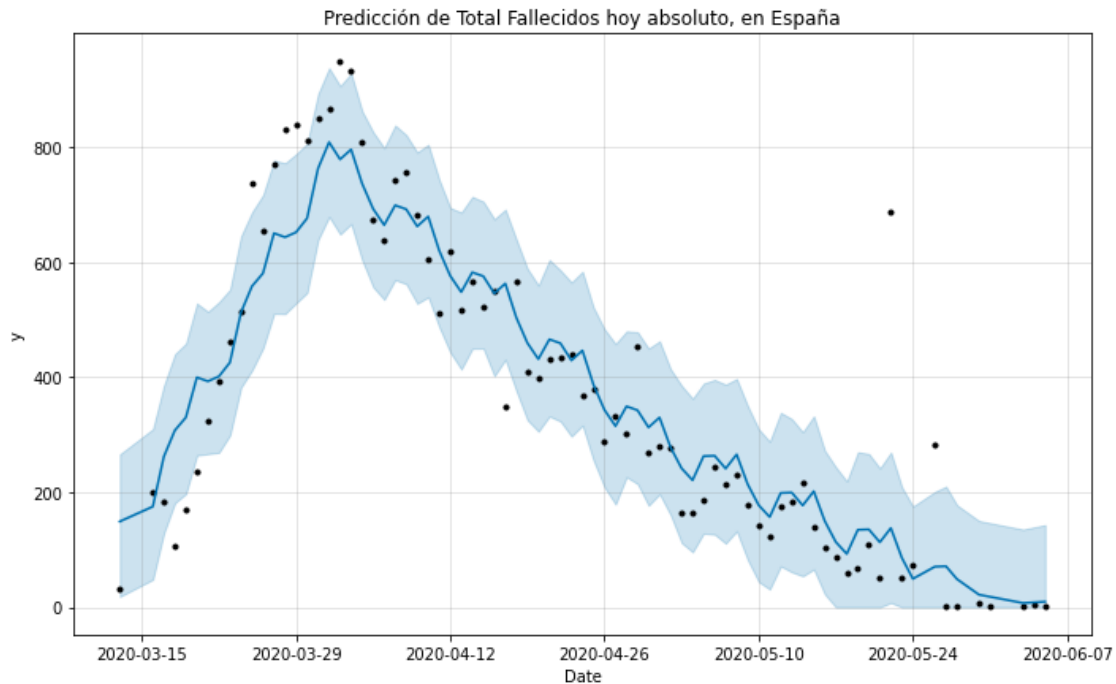
<IPython.core.display.HTML object>

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 día a día")
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 día a día

```
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

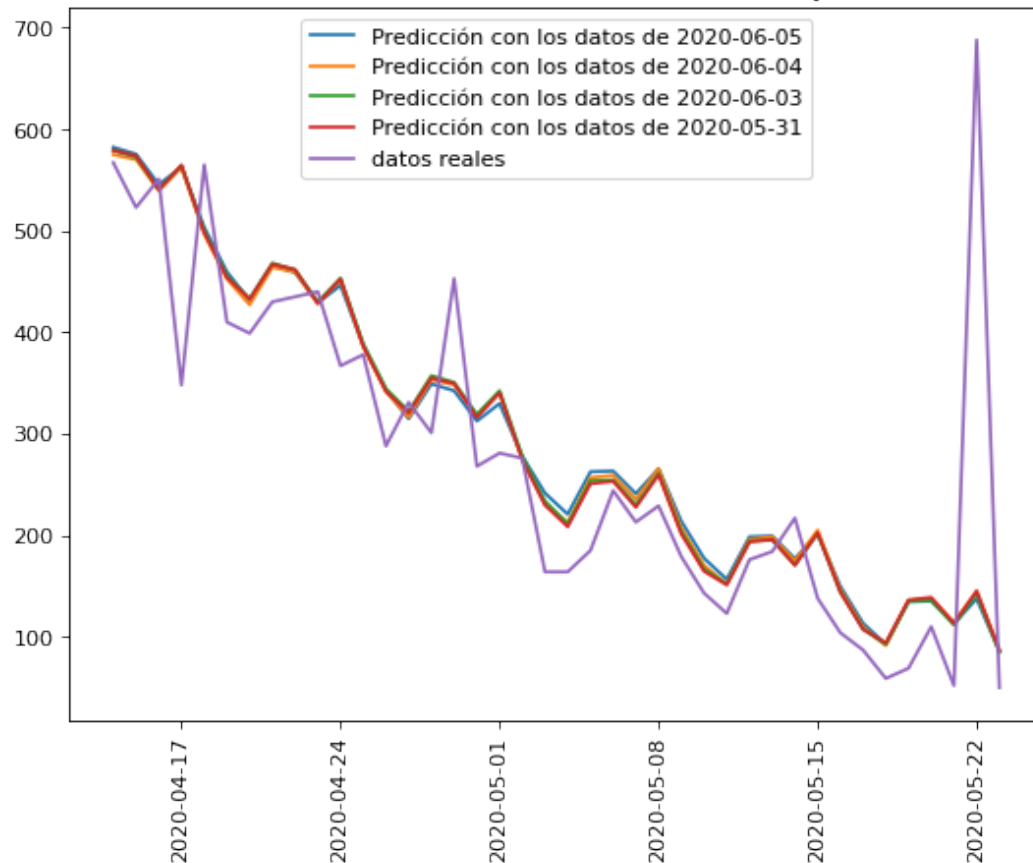
	Predicción con los datos de 2020-05-31	datos reales
ds		
2020-04-14	579.305102	567.0
2020-04-15	573.944162	523.0
2020-04-16	540.465098	551.0
2020-04-17	564.653543	348.0
2020-04-18	498.416012	565.0
2020-04-19	453.937000	410.0
2020-04-20	432.659435	399.0
2020-04-21	467.129999	430.0
2020-04-22	461.769061	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
2020-05-23

145.234538
86.852320

688.0
50.0

Predicciones en días anteriores Vs. Datos reales Fallecidos hoy absoluto, en España



```
[21]: MOVING_AVERAGE_WINDOW = 4
def
    report_single_location_single_dimension(location,dimension>window_size=MOVING_AVERAGE_WINDOW
    )
    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>Análisis 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)

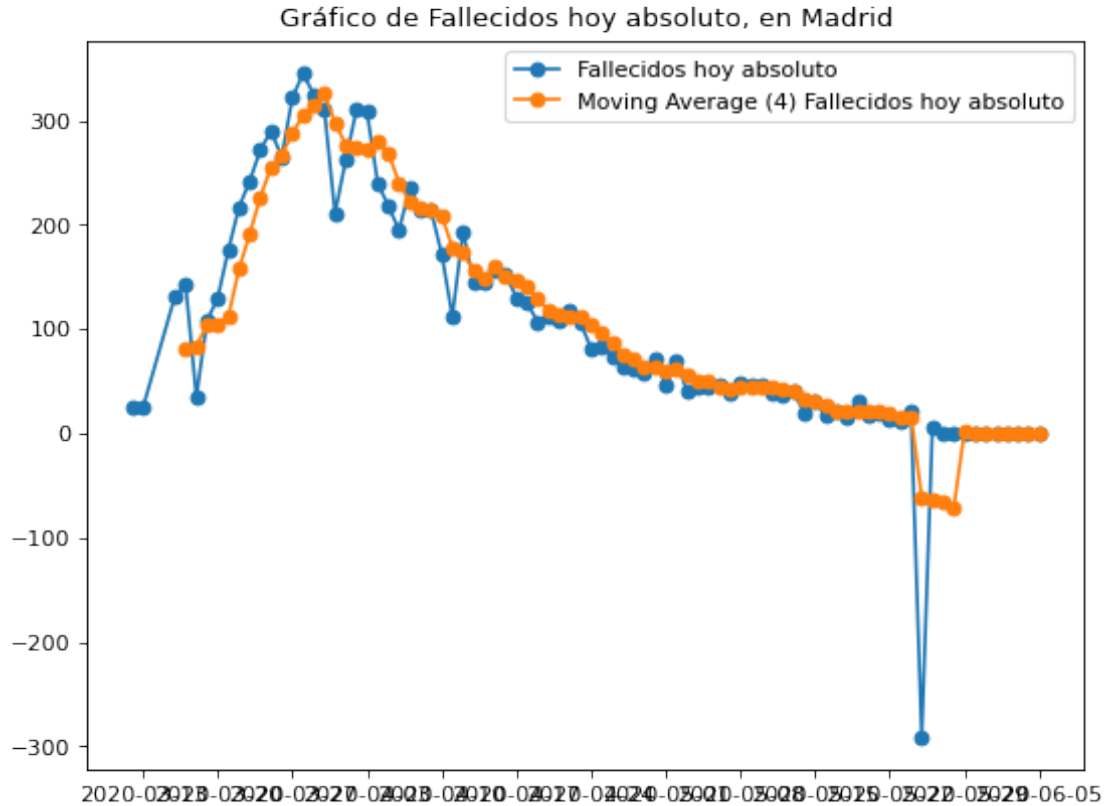
```

<IPython.core.display.HTML object>

<IPython.core.display.HTML object>

<IPython.core.display.HTML object>

Fallecidos hoy absoluto in Madrid



```
[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
      )
```

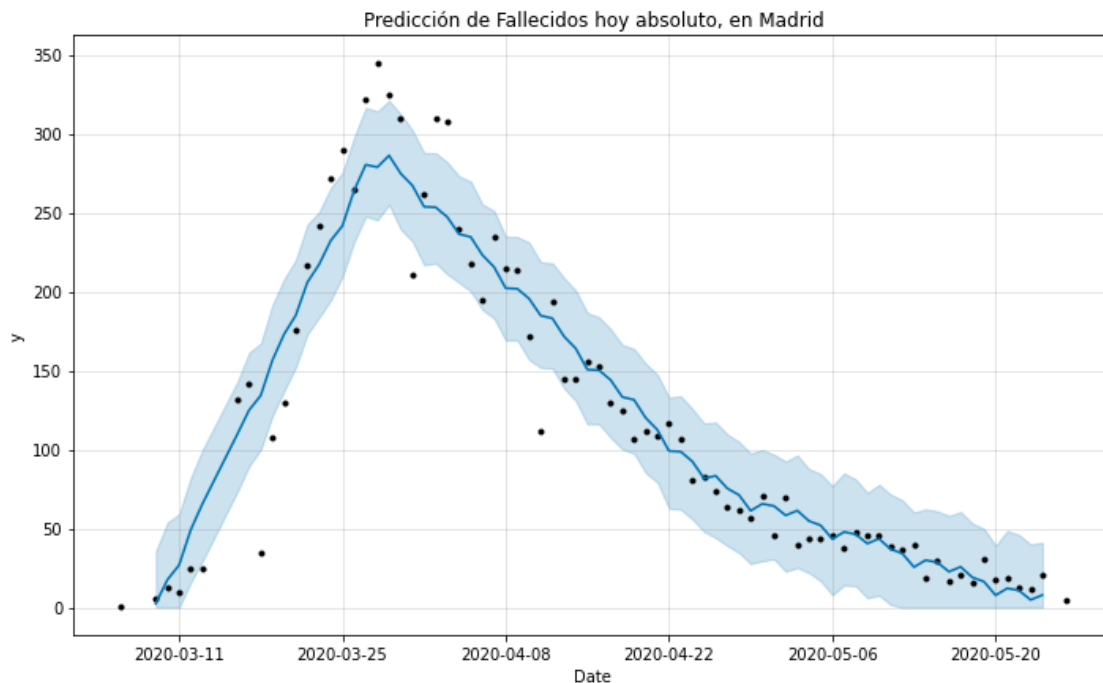
INFO:fbprophet:Disabling yearly seasonality. Run prophet with yearly_seasonality=True to override this.

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

<IPython.core.display.HTML object>

<IPython.core.display.HTML object>

Predicción 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 día a día

```
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

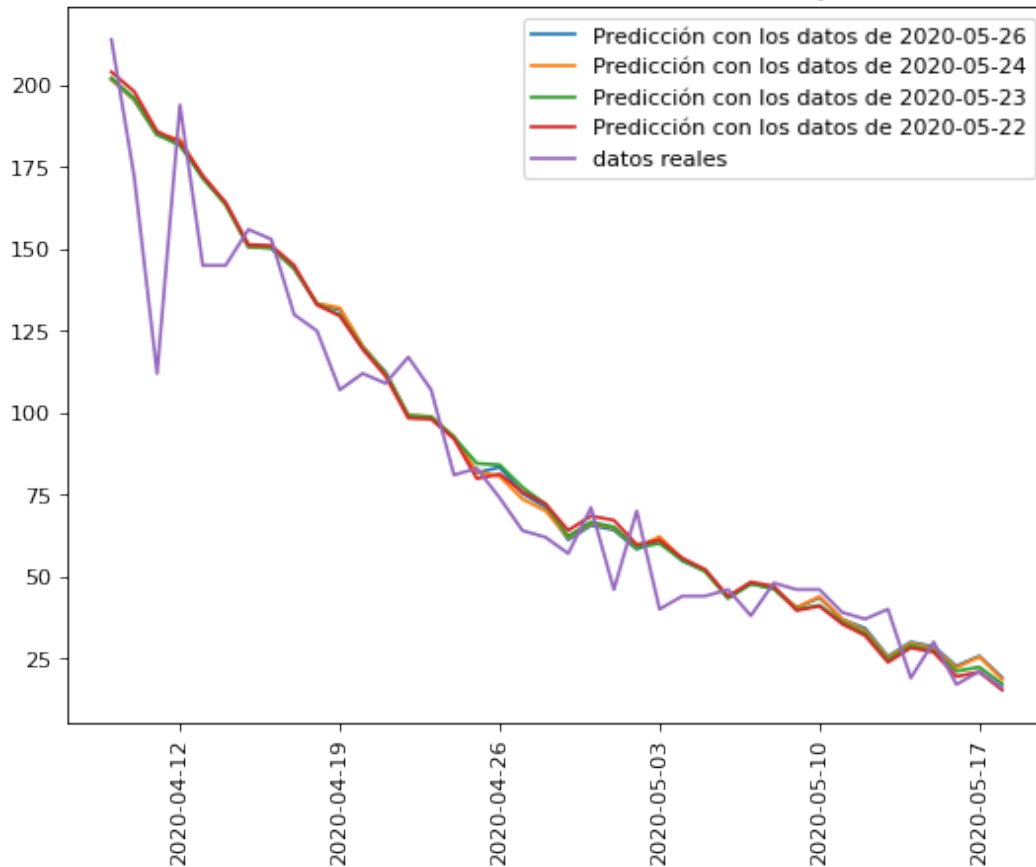
Predicción con los datos de 2020-05-22 datos reales

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

Predicciones en días anteriores Vs. Datos reales Fallecidos hoy absoluto, en Madrid



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

      Insertar_Enlace("Reporte_Fallecidos_hoy_absoluto_Cataluña")

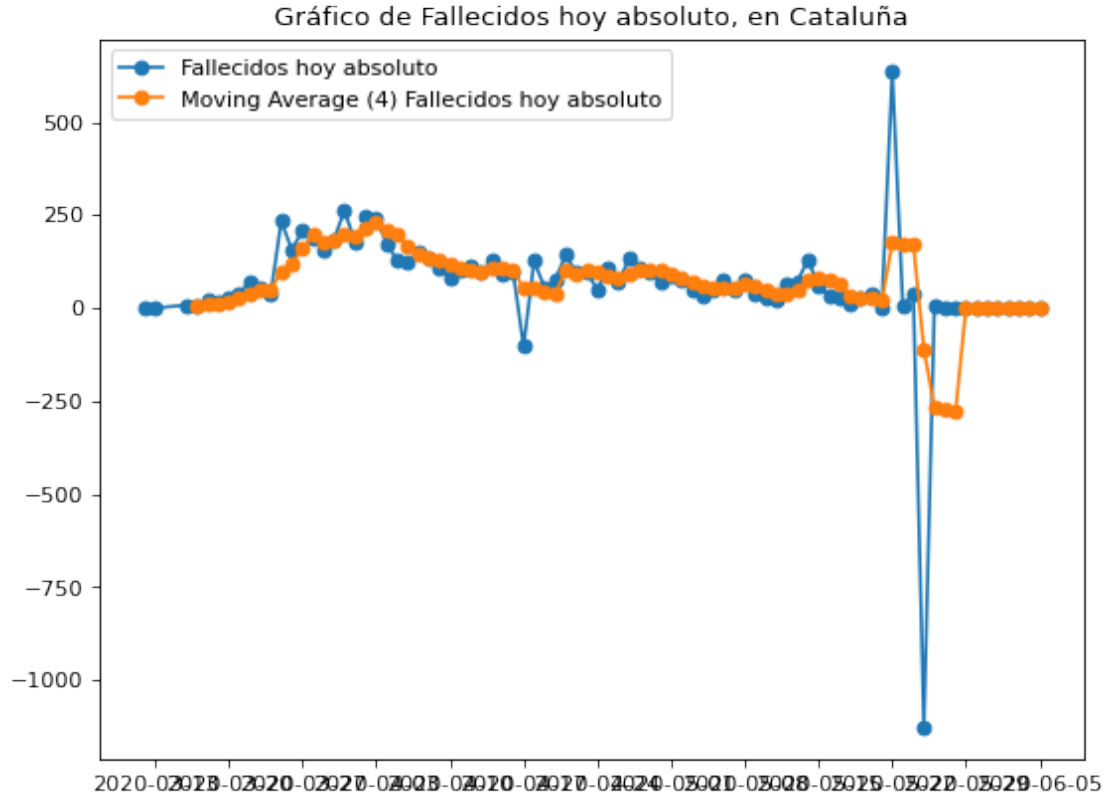
      report_single_location_single_dimension(COMUNIDAD_A_CONSIDERAR,dimension)
```

<IPython.core.display.HTML object>

<IPython.core.display.HTML object>

<IPython.core.display.HTML object>

Fallecidos hoy absoluto in Cataluña



```
[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)
```

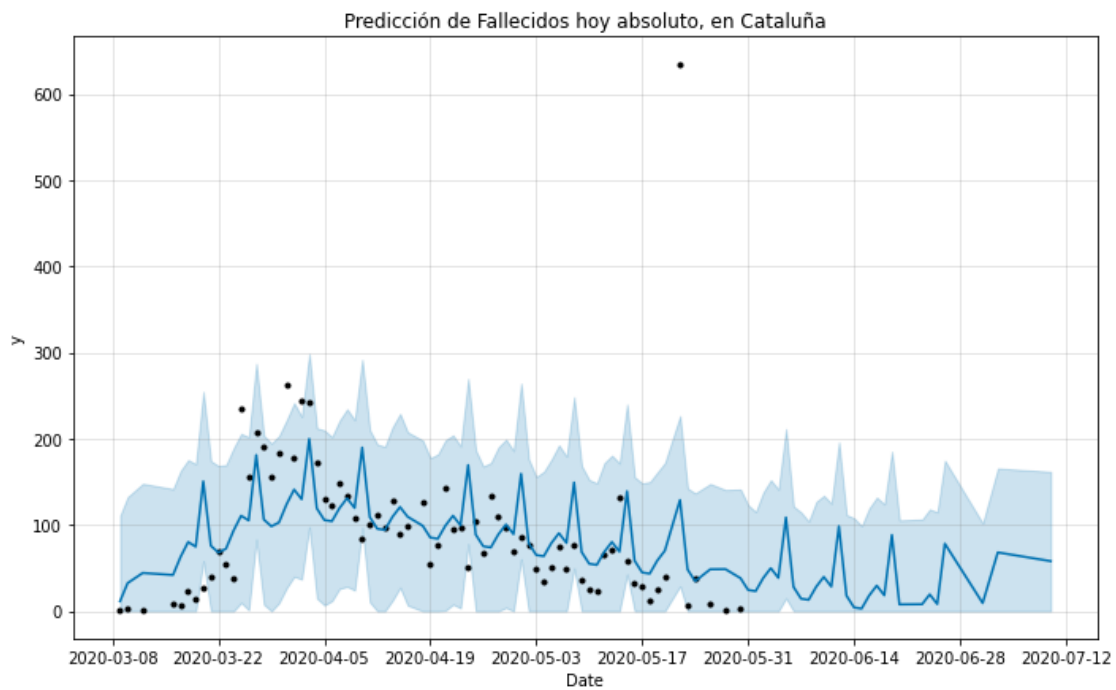
INFO:fbprophet:Disabling yearly seasonality. Run prophet with yearly_seasonality=True to override this.

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

<IPython.core.display.HTML object>

<IPython.core.display.HTML object>

Predicción total para Fallecidos hoy absoluto : 7706.624052777044



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

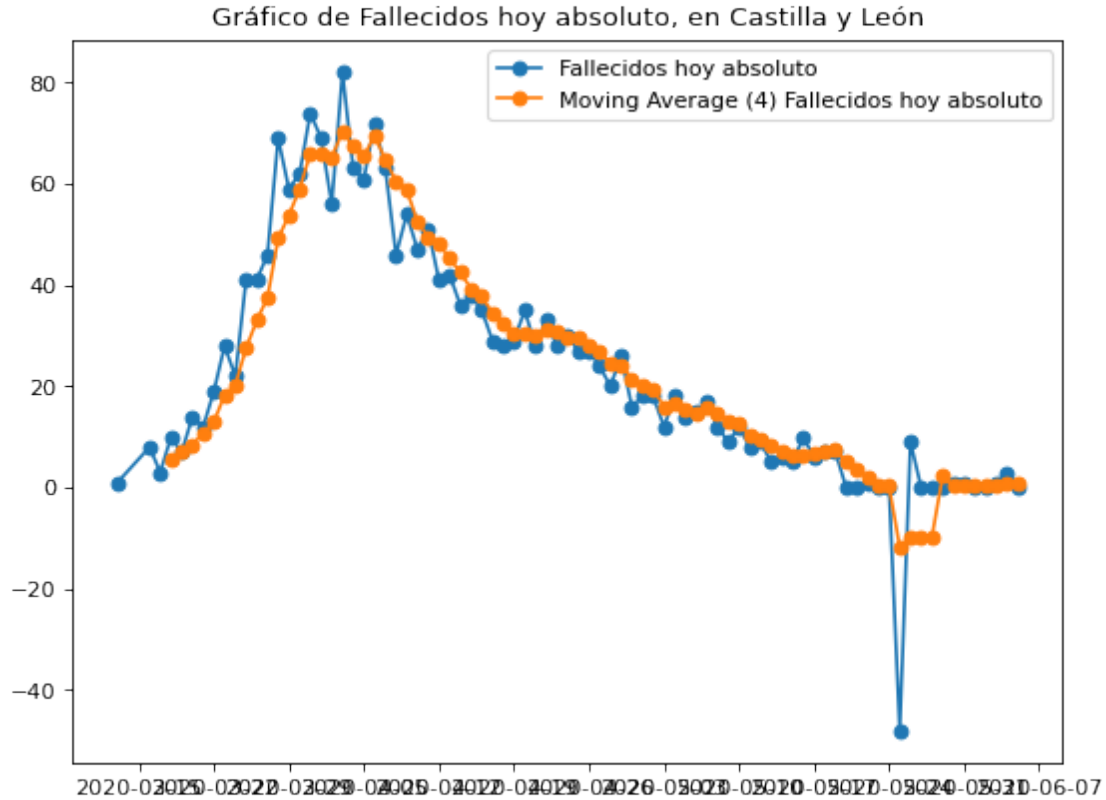
Insertar_Enlace("Reporte_Fallecidos_hoy_absoluto_CyL")
```

<IPython.core.display.HTML object>

<IPython.core.display.HTML object>

<IPython.core.display.HTML object>

Fallecidos hoy absoluto in Castilla y León



```
[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 )
```

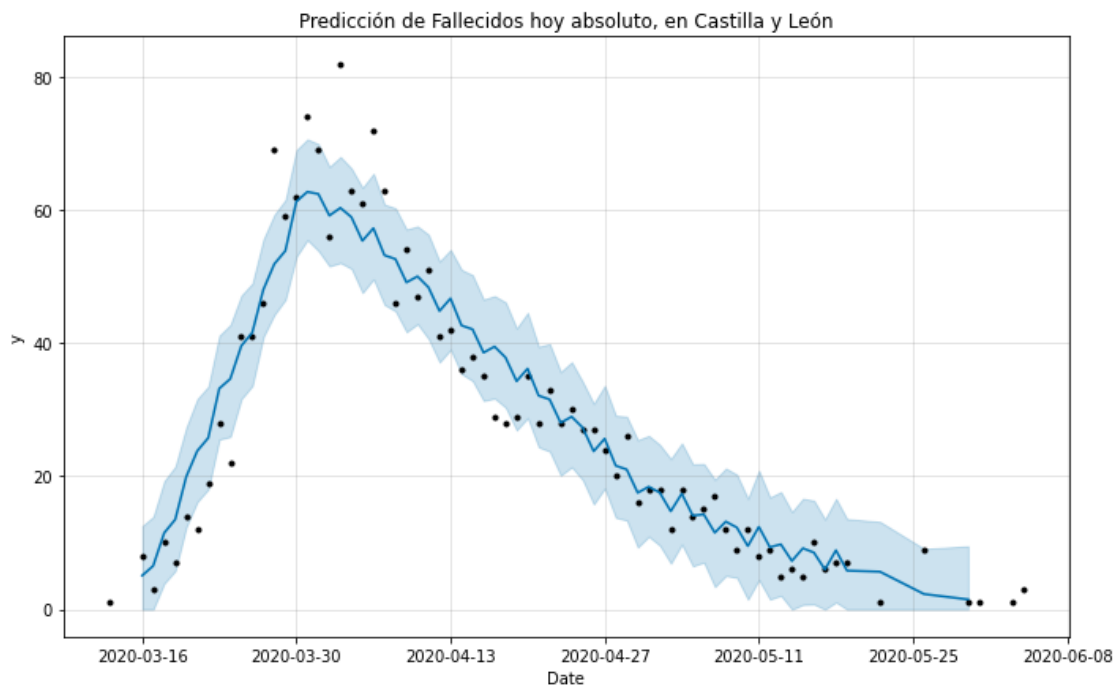
INFO:fbprophet:Disabling yearly seasonality. Run prophet with yearly_seasonality=True to override this.

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

<IPython.core.display.HTML object>

<IPython.core.display.HTML object>

Predicción total para Fallecidos hoy absoluto : 1987.2211587713525



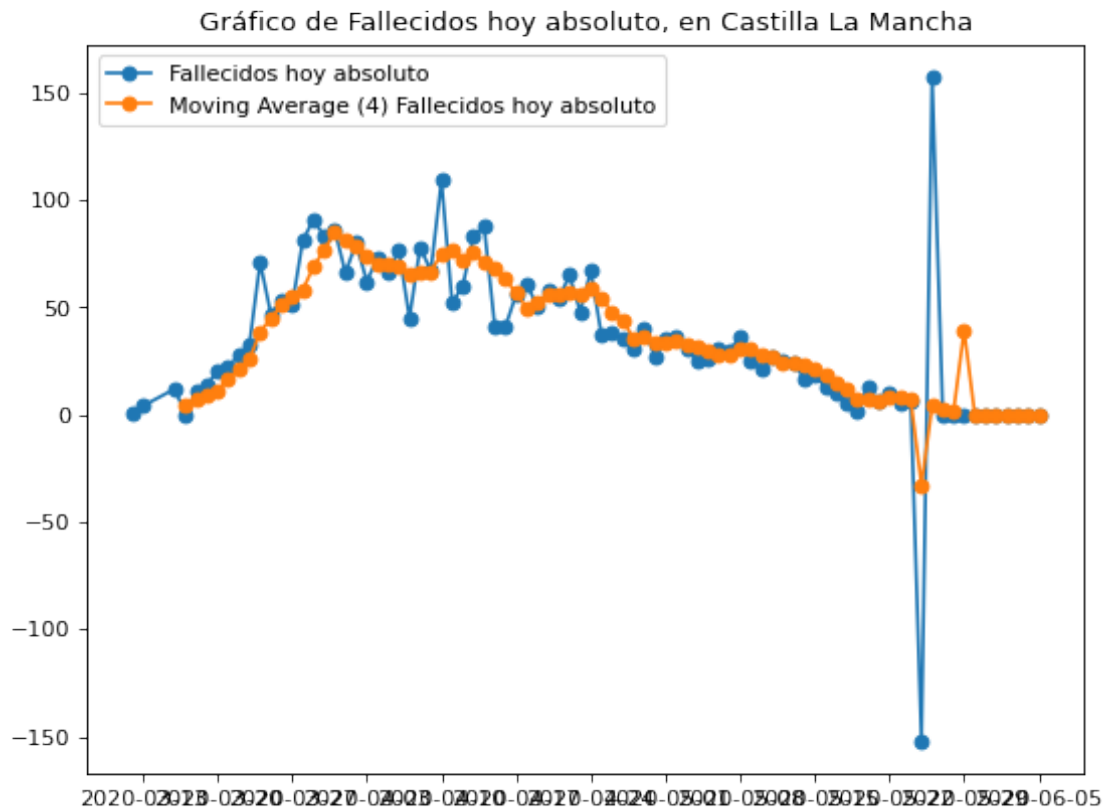
```
[29]: dimension = 'Fallecidos hoy absoluto'
report_single_location_single_dimension('Castilla La Mancha',dimension)
Insertar_Enlace("Reporte_Fallecidos_hoy_absoluto_CM")
```

<IPython.core.display.HTML object>

<IPython.core.display.HTML object>

<IPython.core.display.HTML object>

Fallecidos hoy absoluto in Castilla La Mancha



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

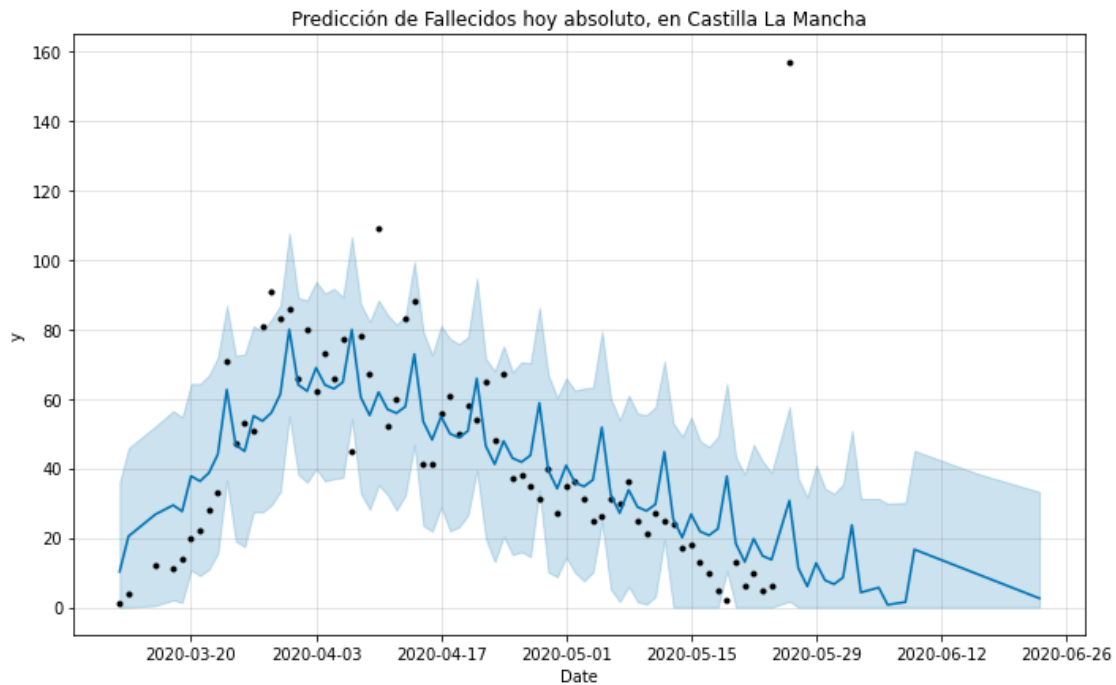
      prediccion = Get_Prediction_Nacion( df = Loading_data.
      ↪Get_Comunidad(COMUNIDAD_A_CONSIDERAR),
                                     dimension = dimension ,
                                     link = link,
                                     location = COMUNIDAD_A_CONSIDERAR )
```

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>

Predicción 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

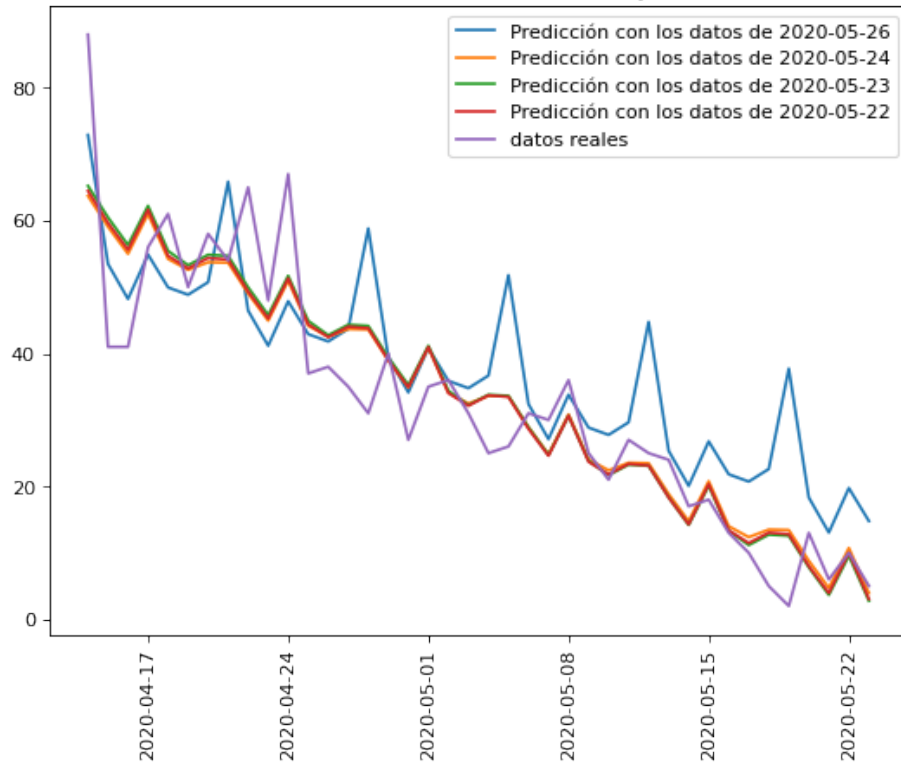
2020-04-14	65.215850
2020-04-15	60.477493
2020-04-16	56.312186
2020-04-17	62.218689
2020-04-18	55.440744
2020-04-19	53.278765
2020-04-20	54.858851
2020-04-21	54.685427
2020-04-22	49.946964
2020-04-23	45.781648
2020-04-24	51.688141
2020-04-25	44.910196
2020-04-26	42.748217
2020-04-27	44.328302
2020-04-28	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

Predicciones en días anteriores Vs. Datos reales Fallecidos hoy absoluto, en Castilla La Mancha



```
[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 )
```

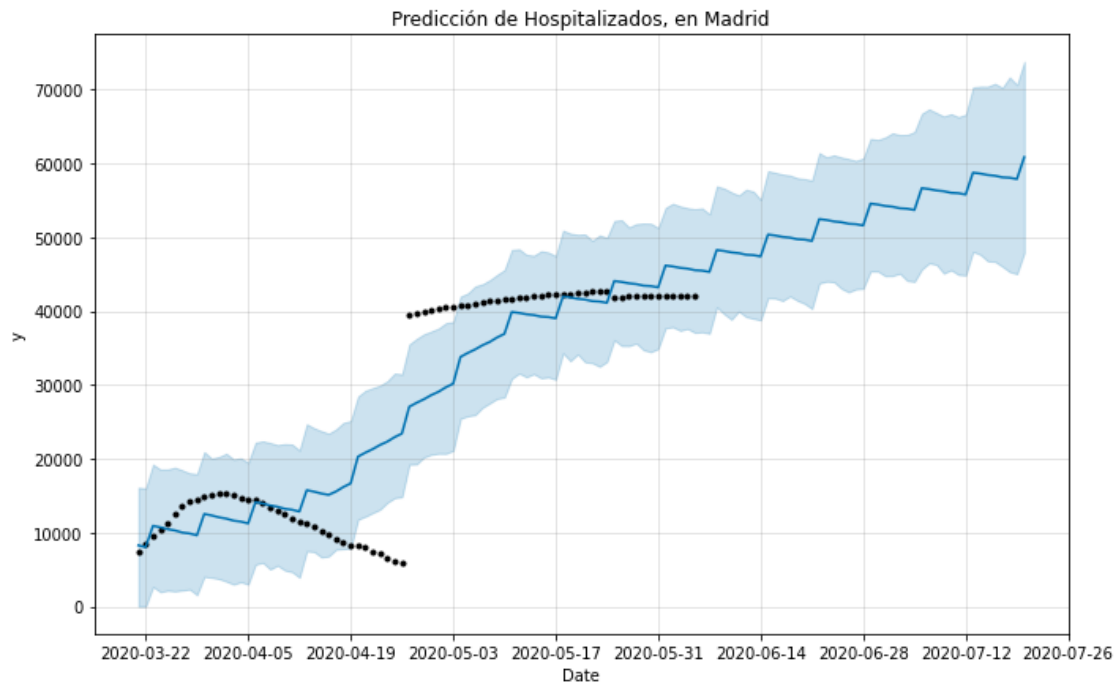
INFO:fbprophet:Disabling yearly seasonality. Run prophet with yearly_seasonality=True to override this.

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

<IPython.core.display.HTML object>

<IPython.core.display.HTML object>

Predicción total para Hospitalizados : 4458071.113367334

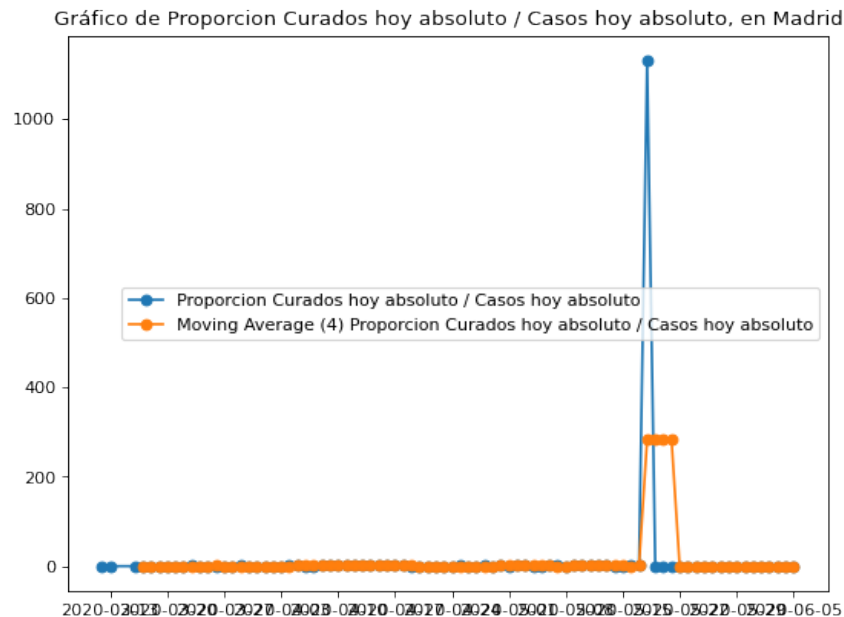


```
[33]: dimension = 'Proporcion Curados hoy absoluto / Casos hoy absoluto'
      report_single_location_single_dimension('Madrid',dimension)
```

<IPython.core.display.HTML object>

<IPython.core.display.HTML object>

Proporcion Curados hoy absoluto / Casos hoy absoluto in Madrid



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"

```

```
))
```

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

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

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

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

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

```
<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')

