

# Pain\_Graphs

June 8, 2020

## 1 Informes y predicciones de COVID-19 en España

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

### Indice

#### 1.1 Section ??

#### 1.2 2. Comparativas y predicciones

---

Comparativas			
de	Comparativas		
dos	por	Comparativas	
dimensiones	comunidades	individuales	Predicciones

---

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

```
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	Lugar	Casos	Casos hoy absoluto	\
-------	-------	-------	--------------------	---

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	Casos hoy variacion respecto ayer	Casos hoy porcentaje	\
-------	-----------------------------------	----------------------	---

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	Fallecidos	Fallecidos hoy absoluto	\
-------	------------	-------------------------	---

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

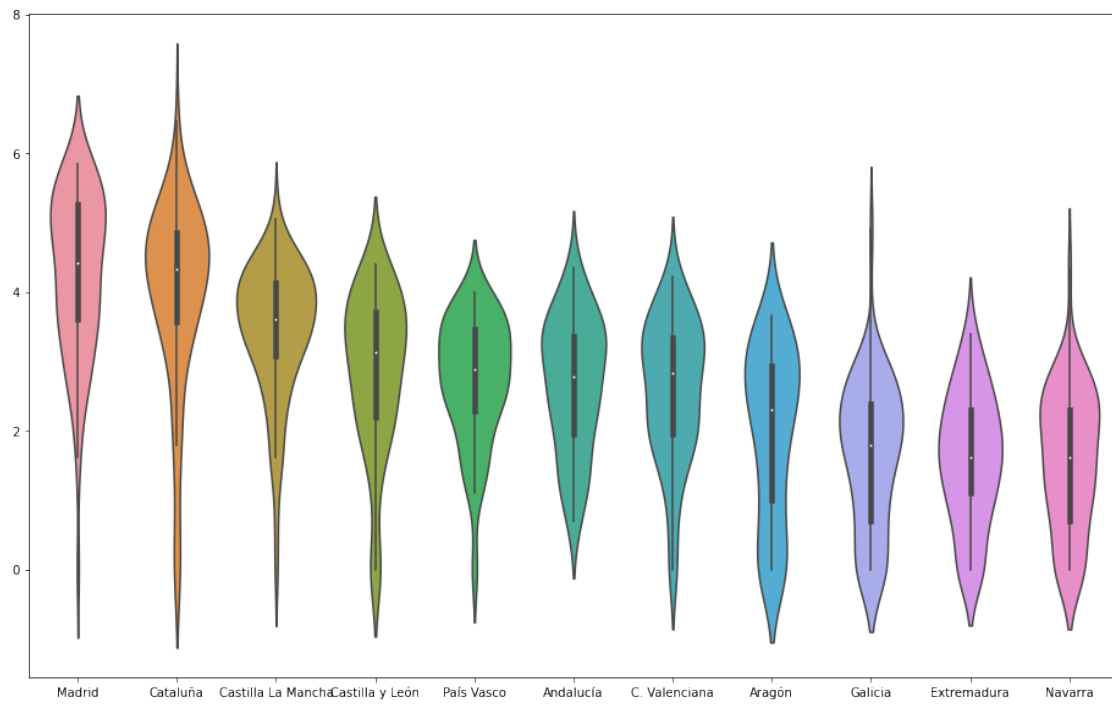
dimension = 'Fallecidos hoy absoluto'
df = plot_violin(dimension)

```

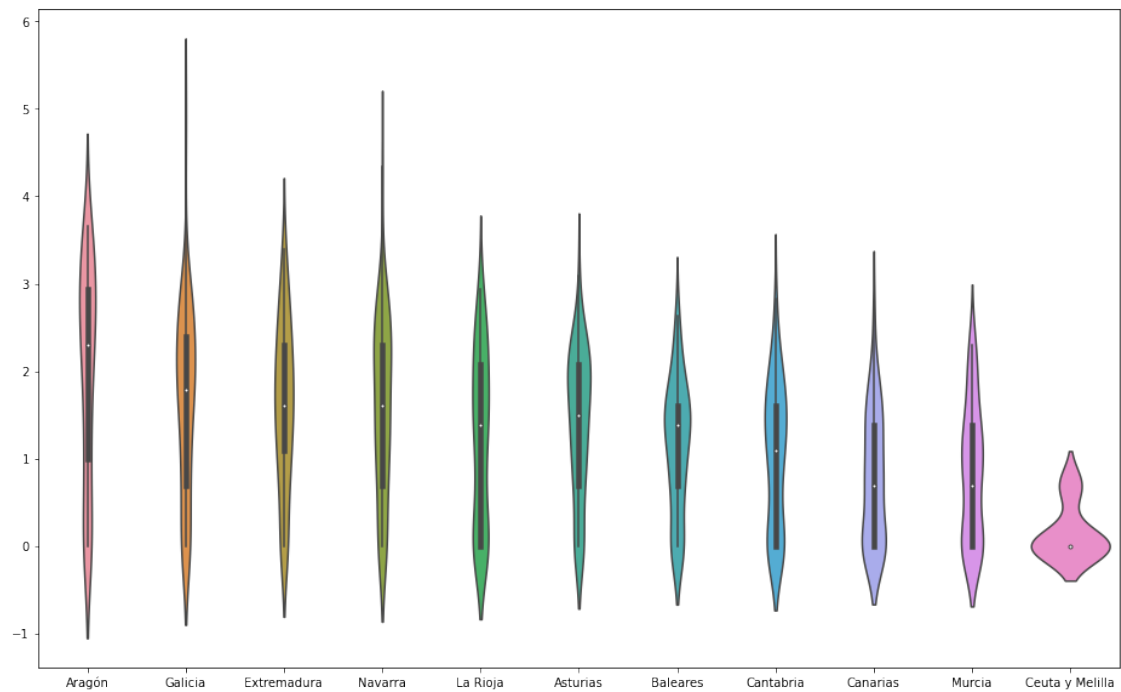
<IPython.core.display.HTML object>

<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

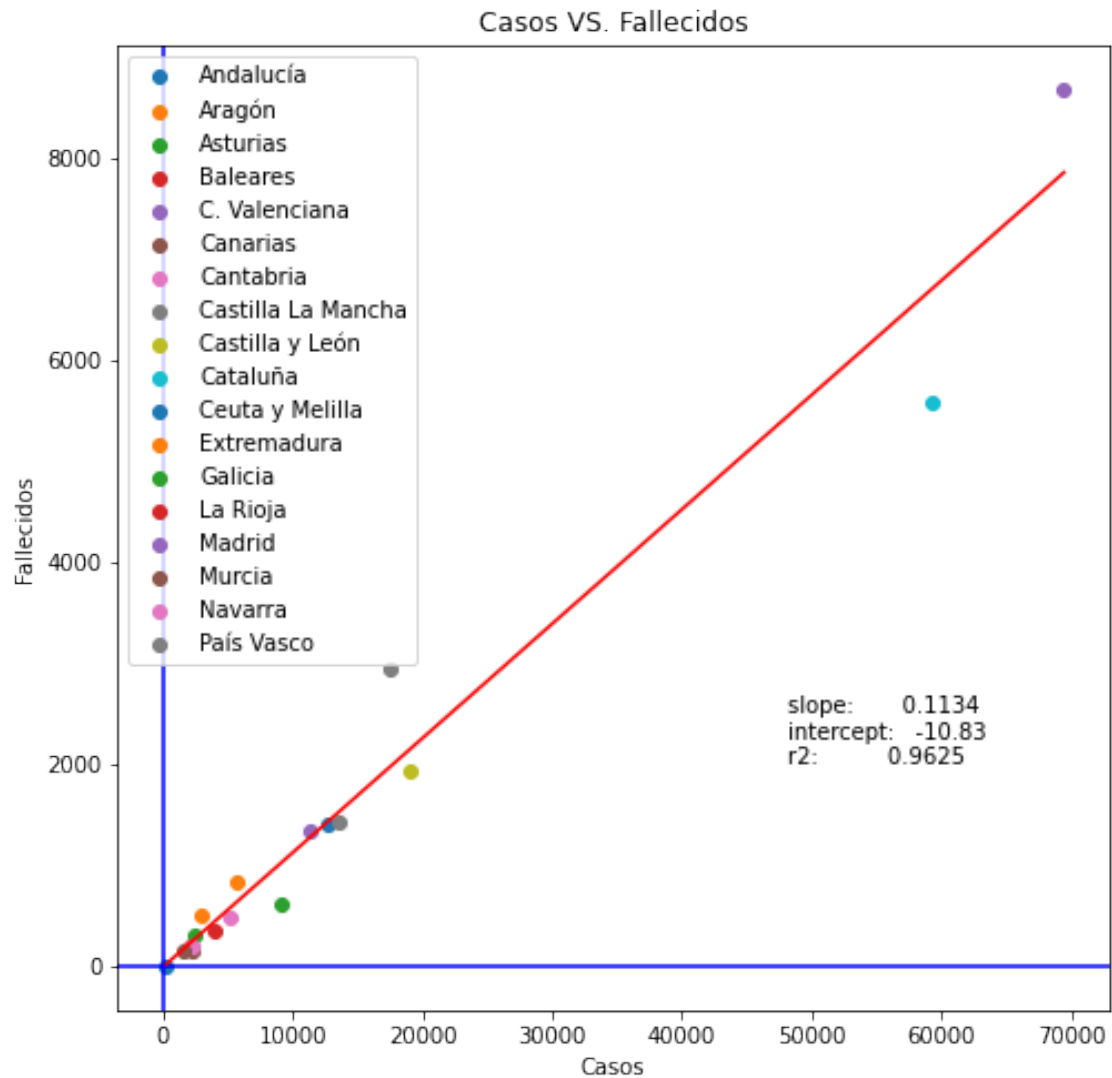
from Loading_data import Get_Comunidades_List as comunidades
COMUNIDADES = comunidades()

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

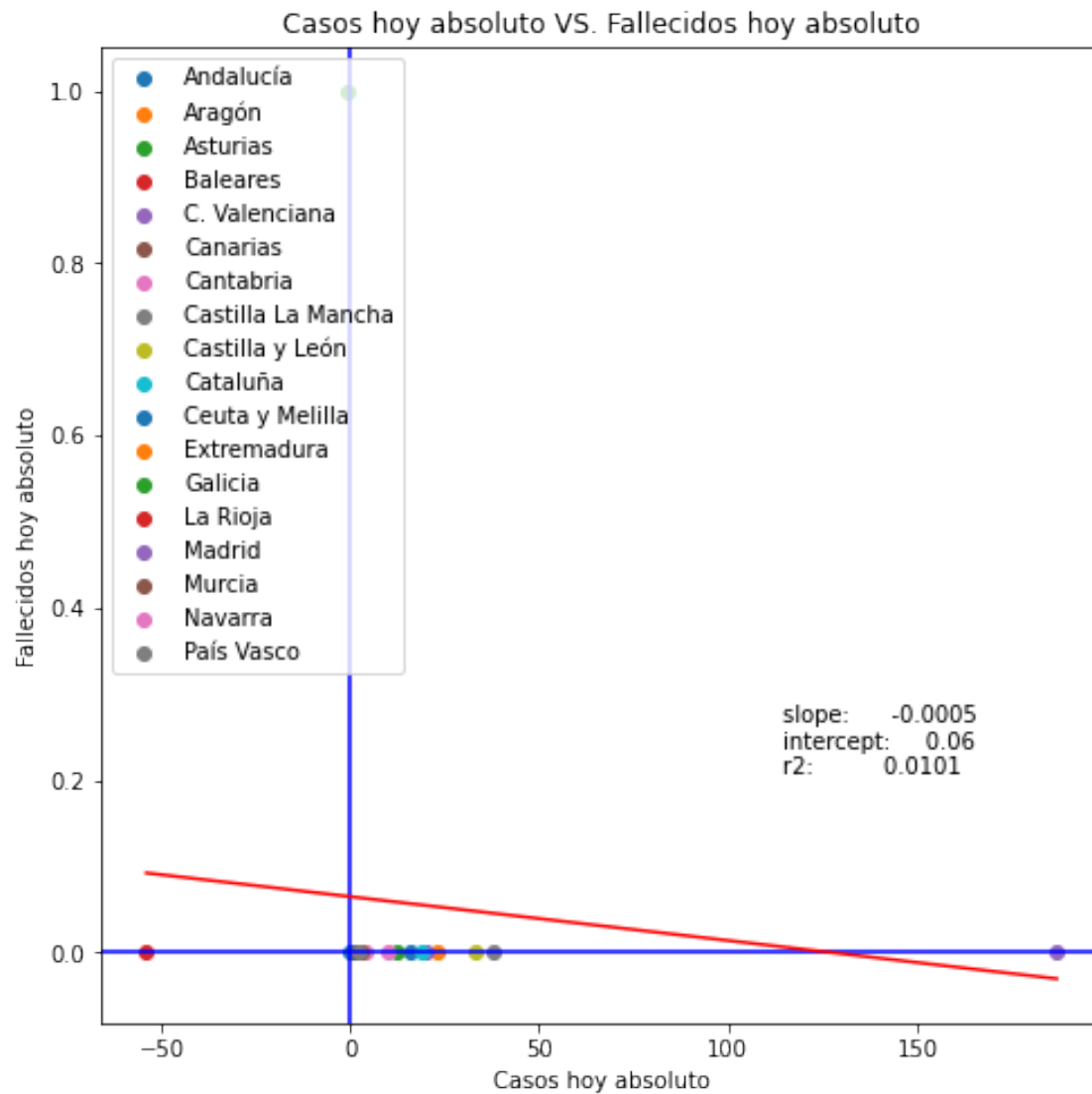
Total: Fallecidos 27134

<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

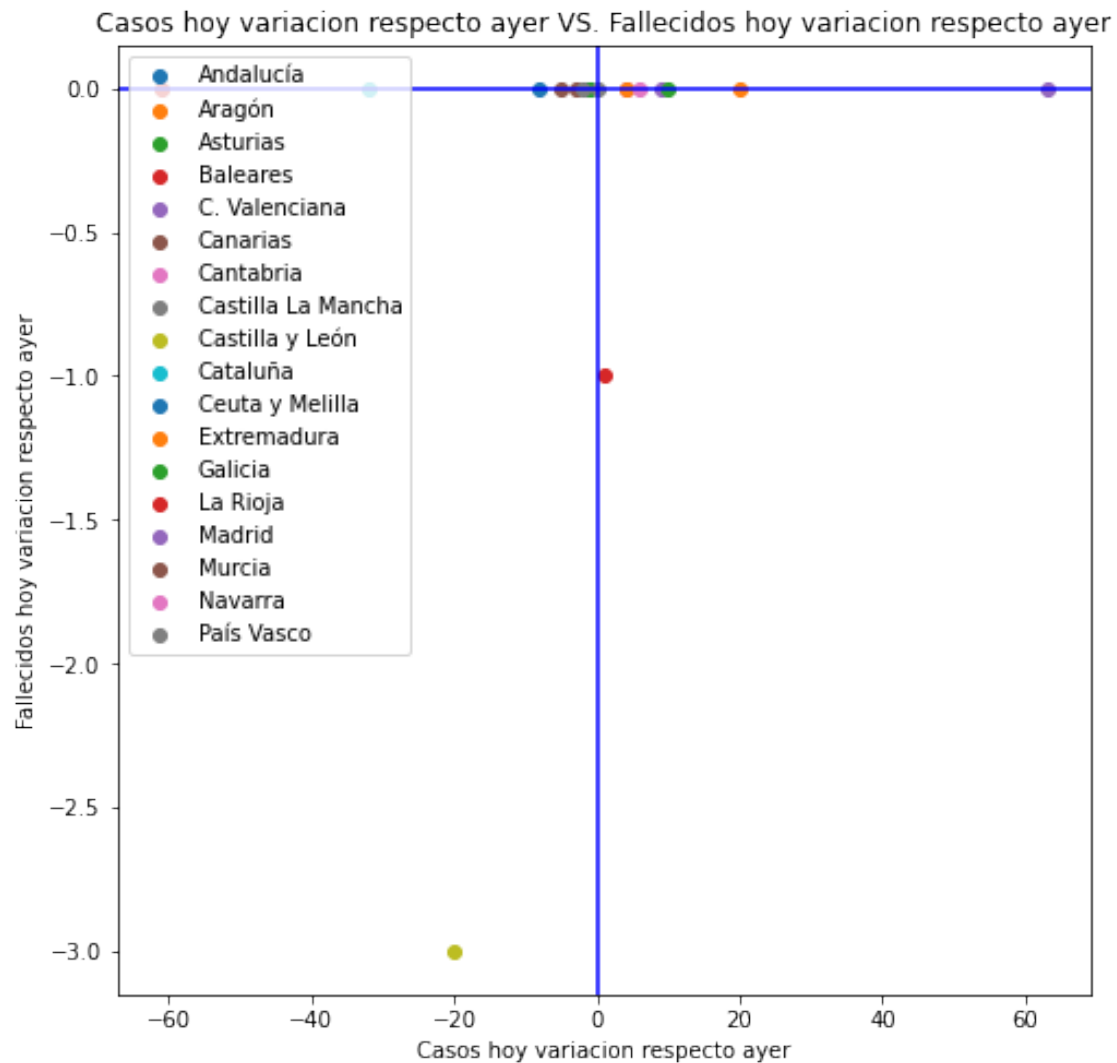
Total: Fallecidos hoy absoluto 1

<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

```

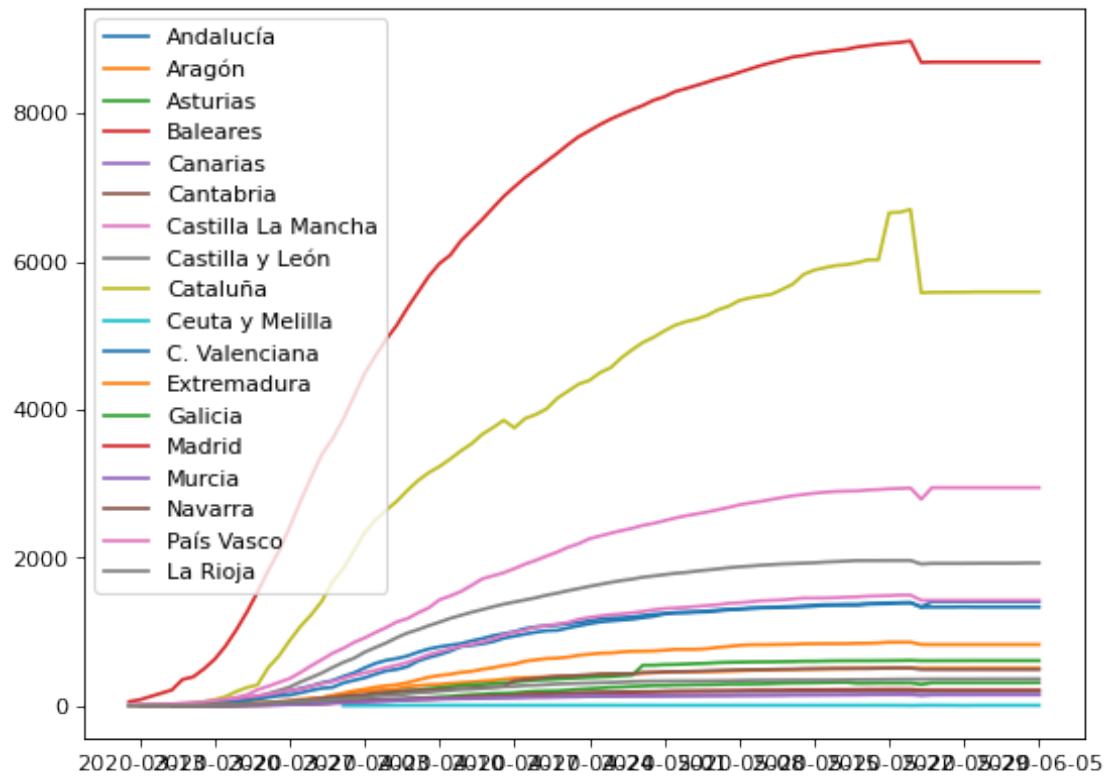
```

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

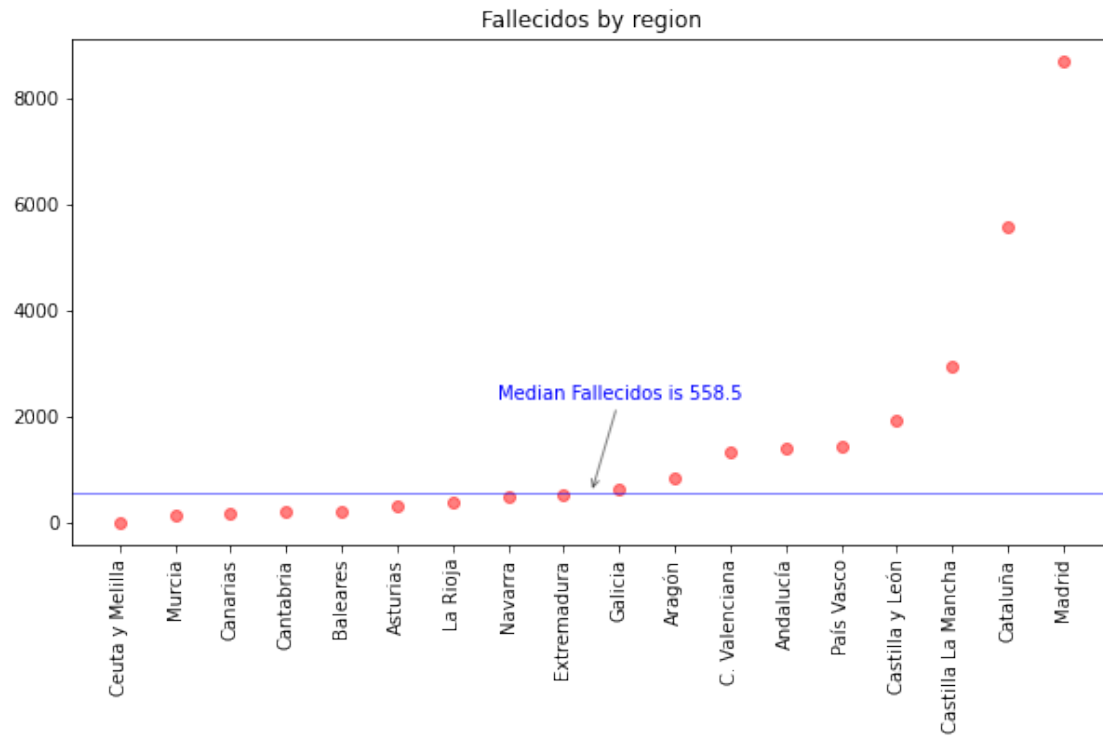
```

<IPython.core.display.HTML object>

## Comparativa de: Fallecidos



<IPython.core.display.HTML object>

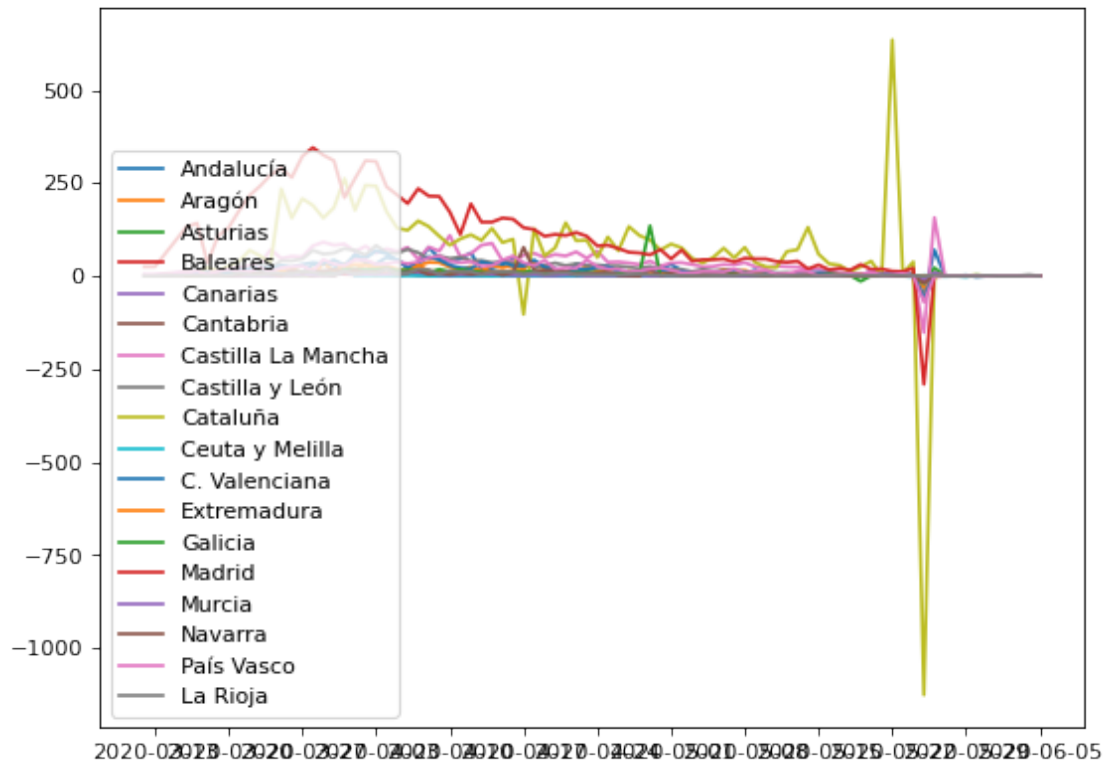


```
[13]: Insertar_Enlace("Comunidades_Fallecidos_Hoy")  
Report_Location("Fallecidos hoy absoluto")
```

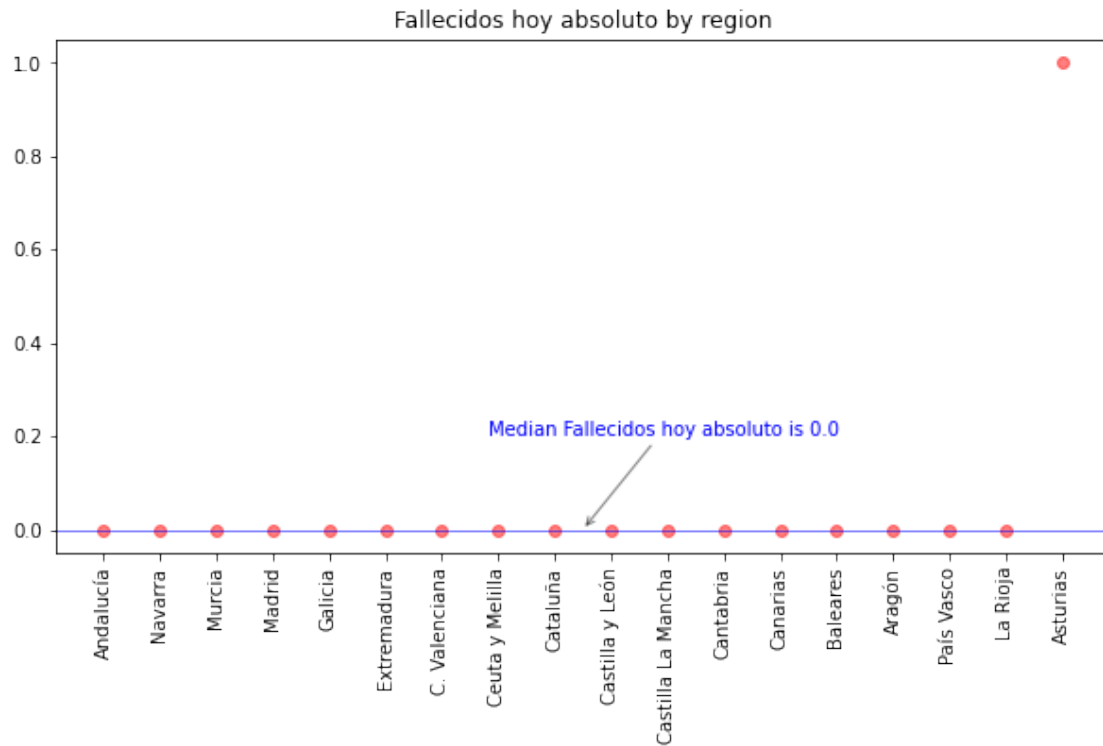
<IPython.core.display.HTML object>



## Comparativa de: Fallecidos hoy absoluto



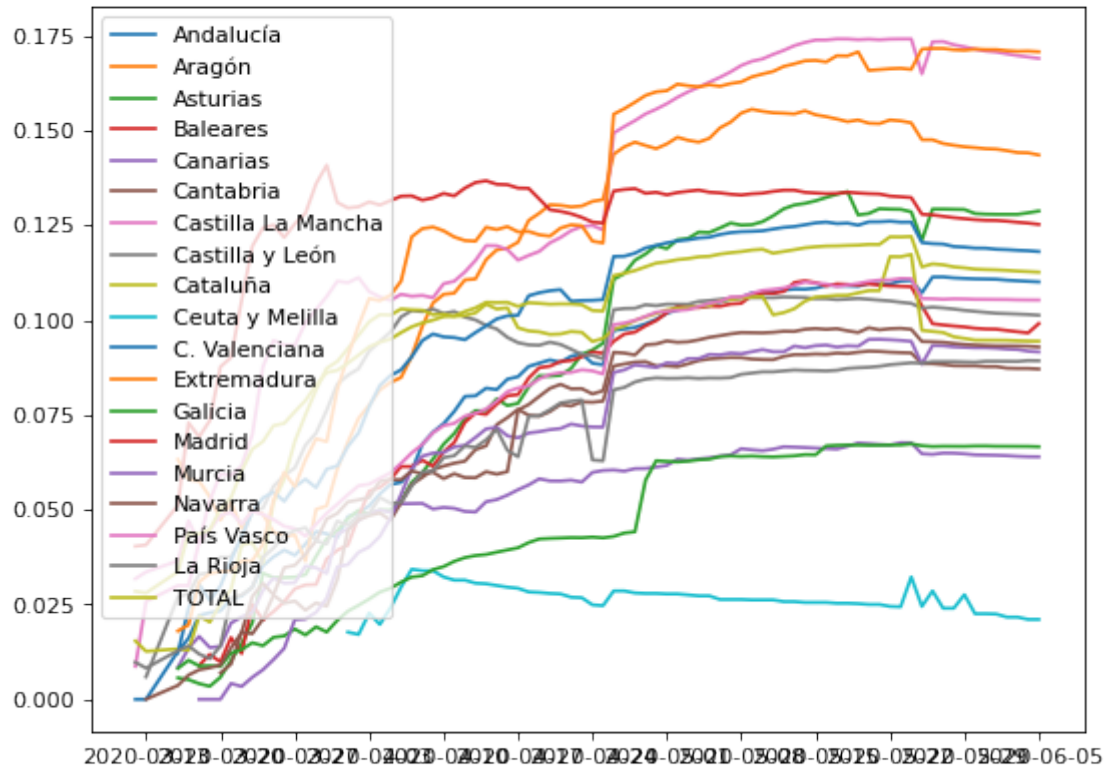
<IPython.core.display.HTML object>



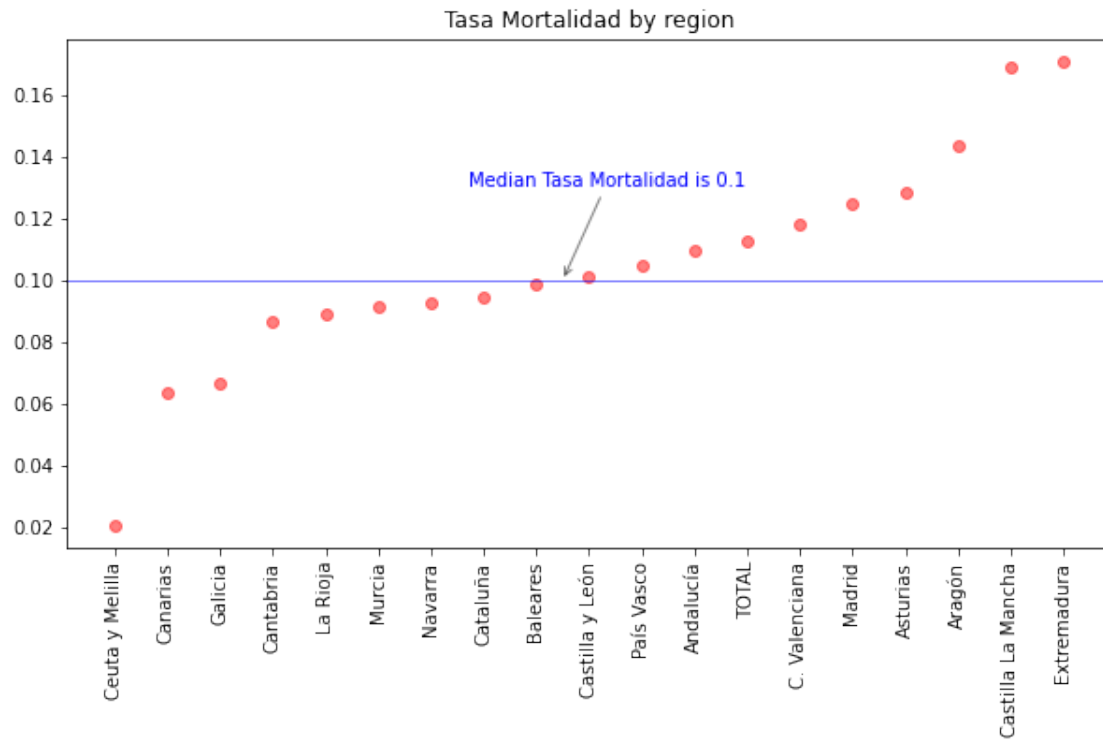
```
[14]: Insertar_Enlace("Comunidades_Mortalidad")  
Report_Location("Tasa Mortalidad", True)
```

<IPython.core.display.HTML object>

## Comparativa de: Tasa Mortalidad



<IPython.core.display.HTML object>

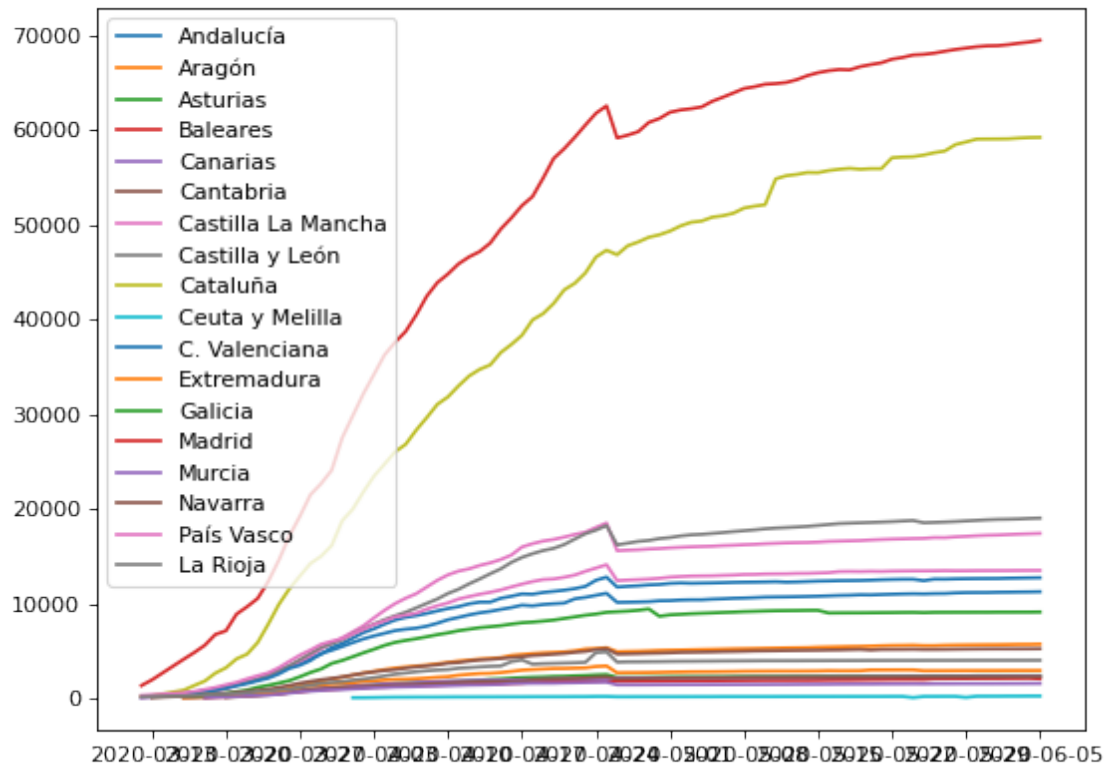


```
[15]: Insertar_Enlace("Comunidades_Casos")

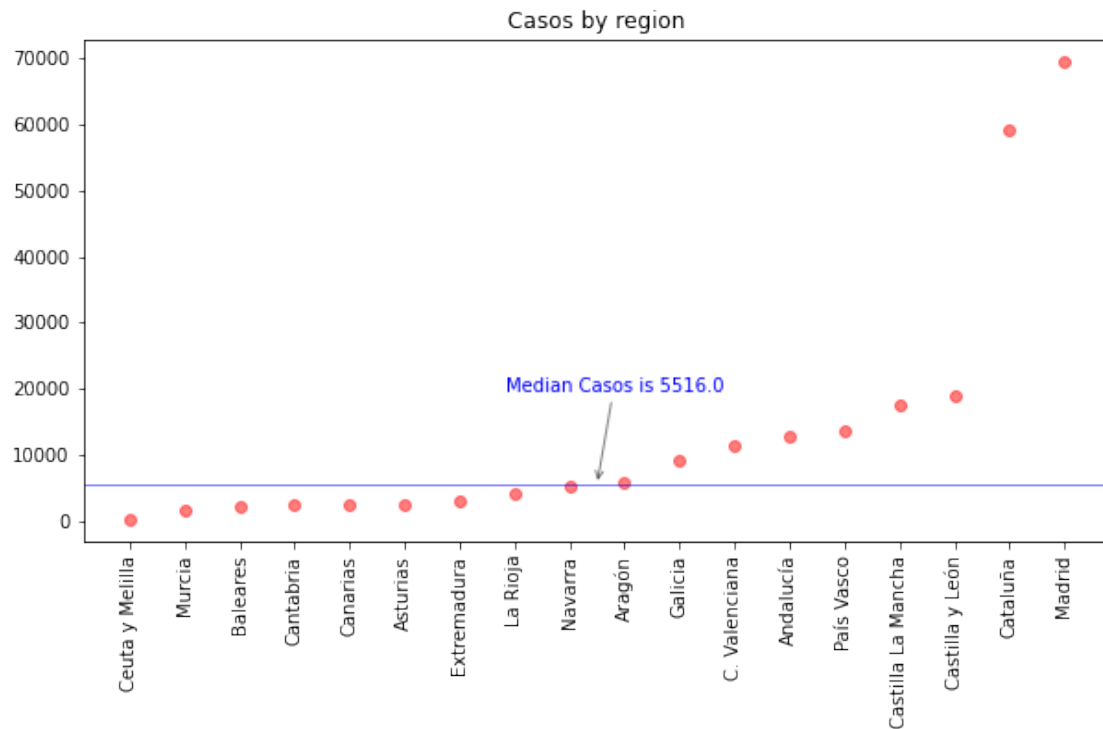
      Report_Location("Casos")
```

<IPython.core.display.HTML object>

## Comparativa de: Casos



<IPython.core.display.HTML object>

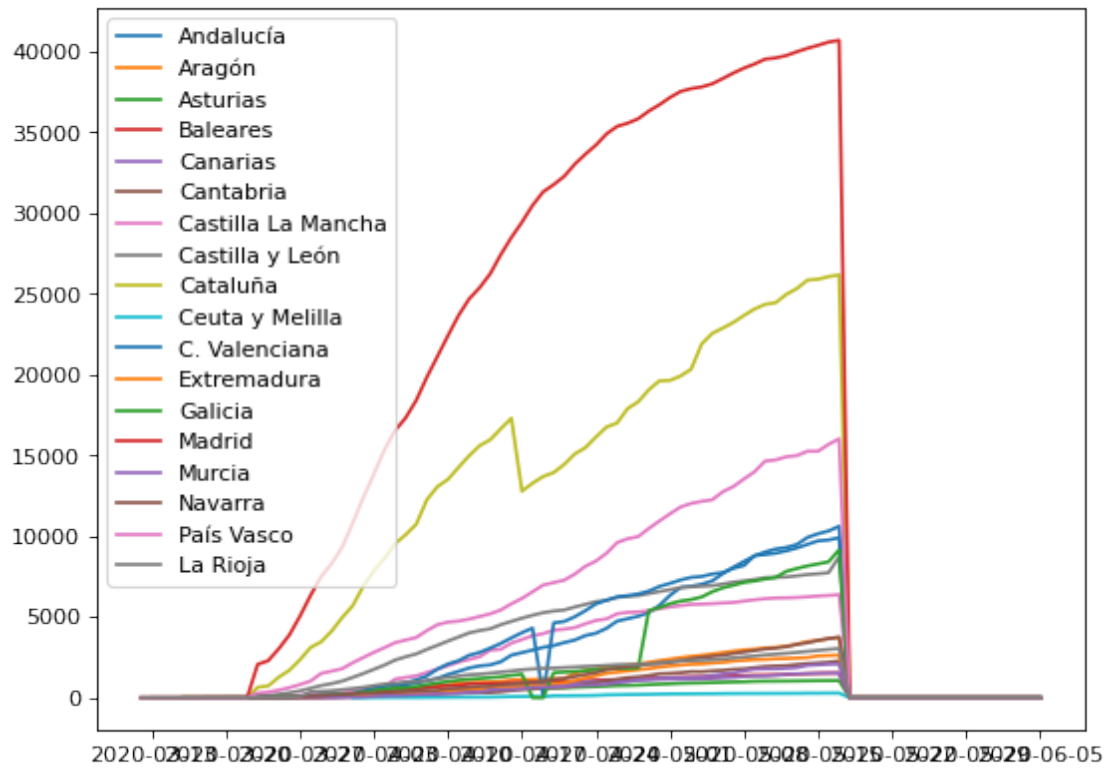


```
[16]: Insertar_Enlace("Curados")
```

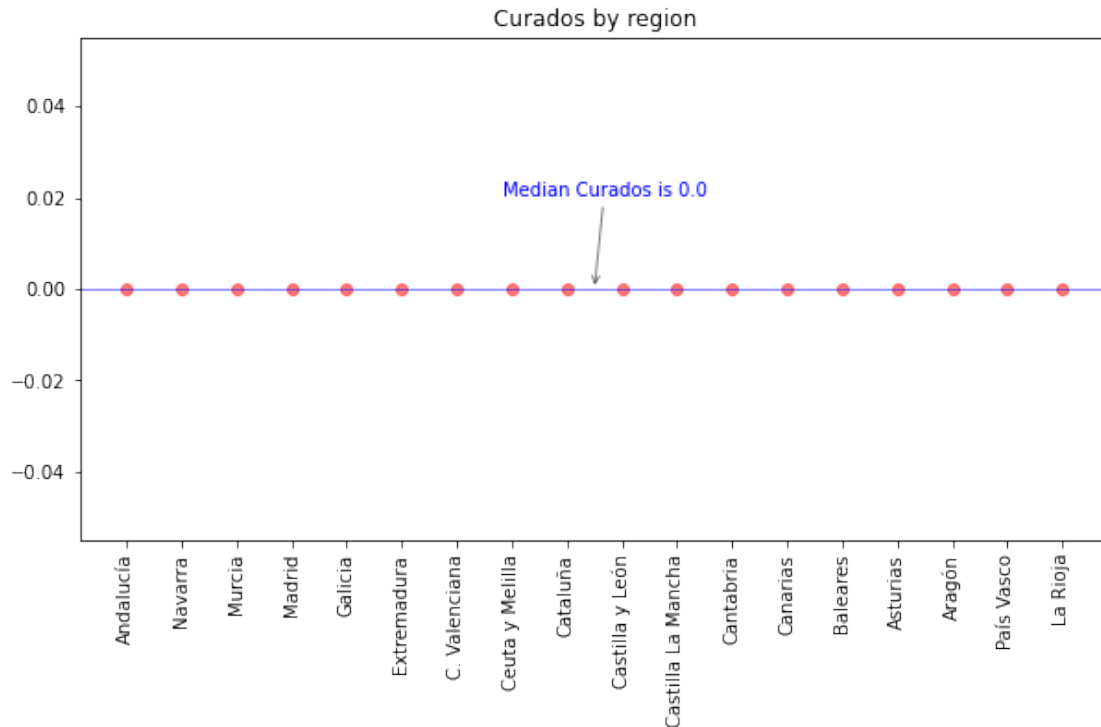
```
Report_Location("Curados")
```

<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

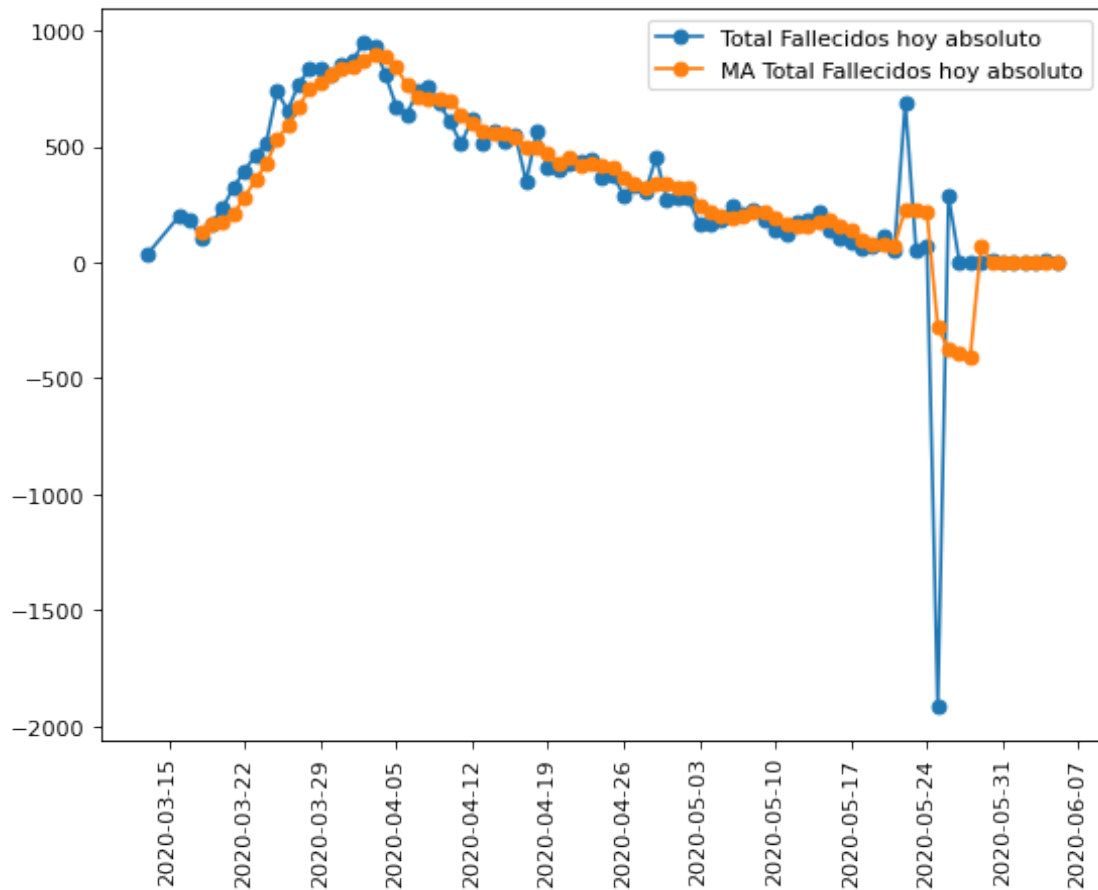
```

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>

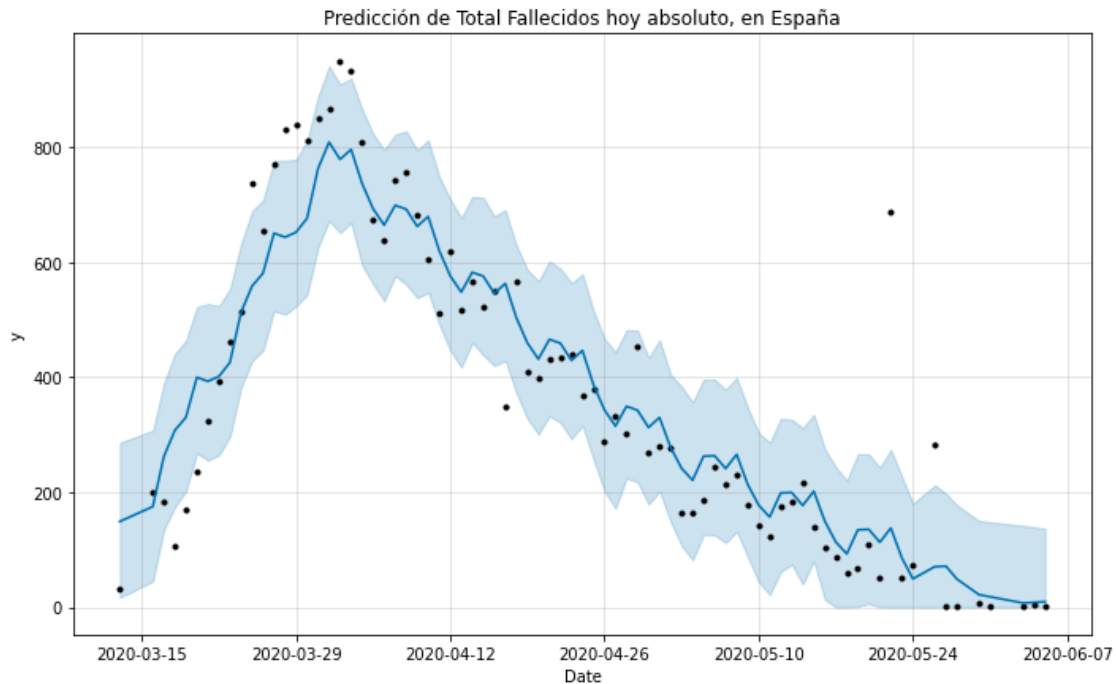
<IPython.core.display.HTML object>

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

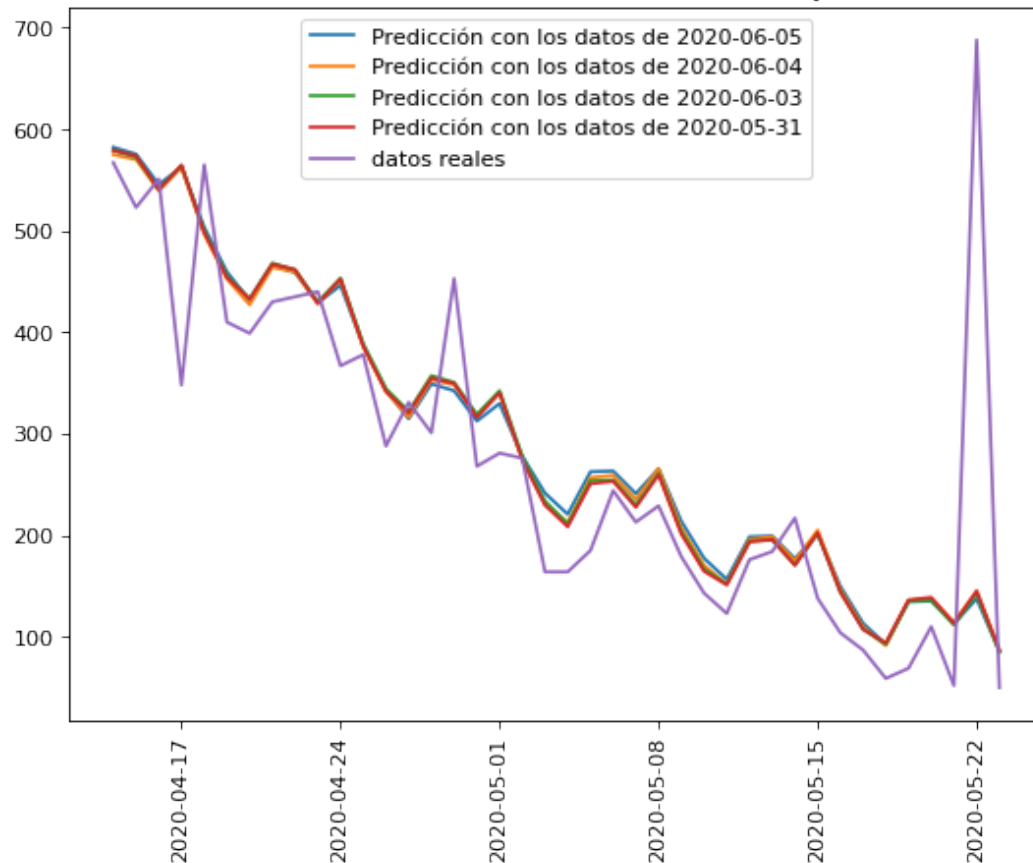
	Predicción con los datos de 2020-05-31	datos reales
ds		
2020-04-14	579.305102	567.0
2020-04-15	573.944162	523.0
2020-04-16	540.465098	551.0
2020-04-17	564.653543	348.0
2020-04-18	498.416012	565.0
2020-04-19	453.937000	410.0
2020-04-20	432.659435	399.0
2020-04-21	467.129999	430.0
2020-04-22	461.769061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

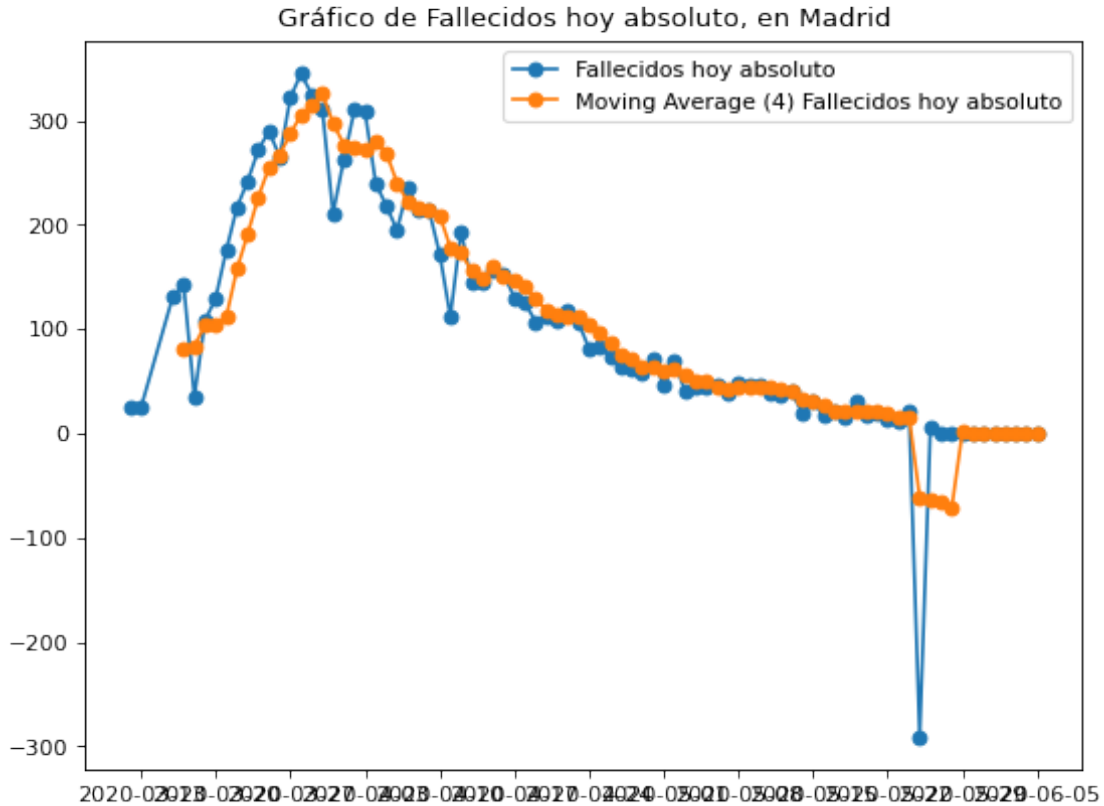
```

<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
      )
```

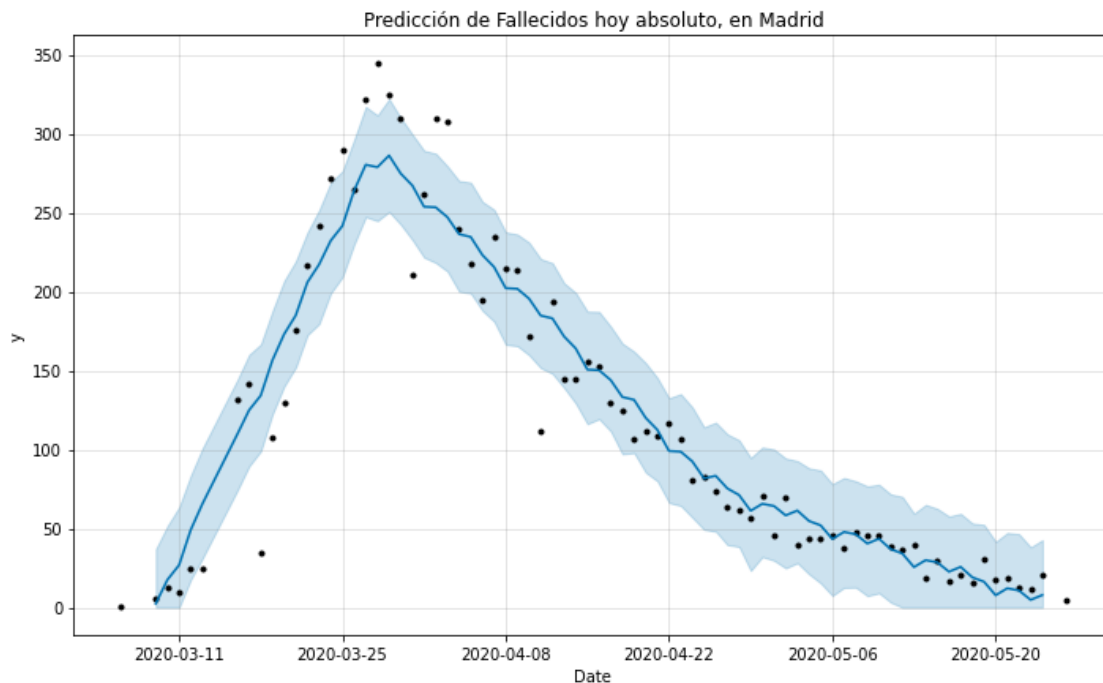
INFO:fbprophet:Disabling yearly seasonality. Run prophet with yearly\_seasonality=True to override this.

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

<IPython.core.display.HTML object>

<IPython.core.display.HTML object>

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 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

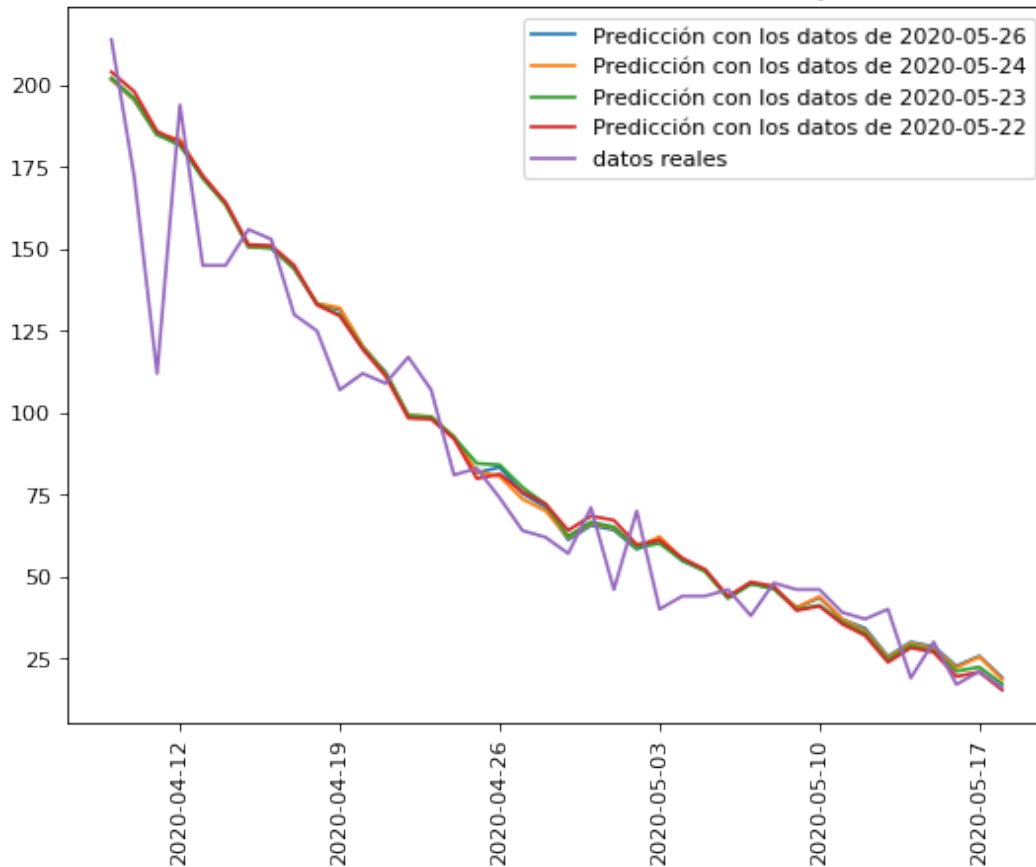
Predicción con los datos de 2020-05-22    datos reales

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")

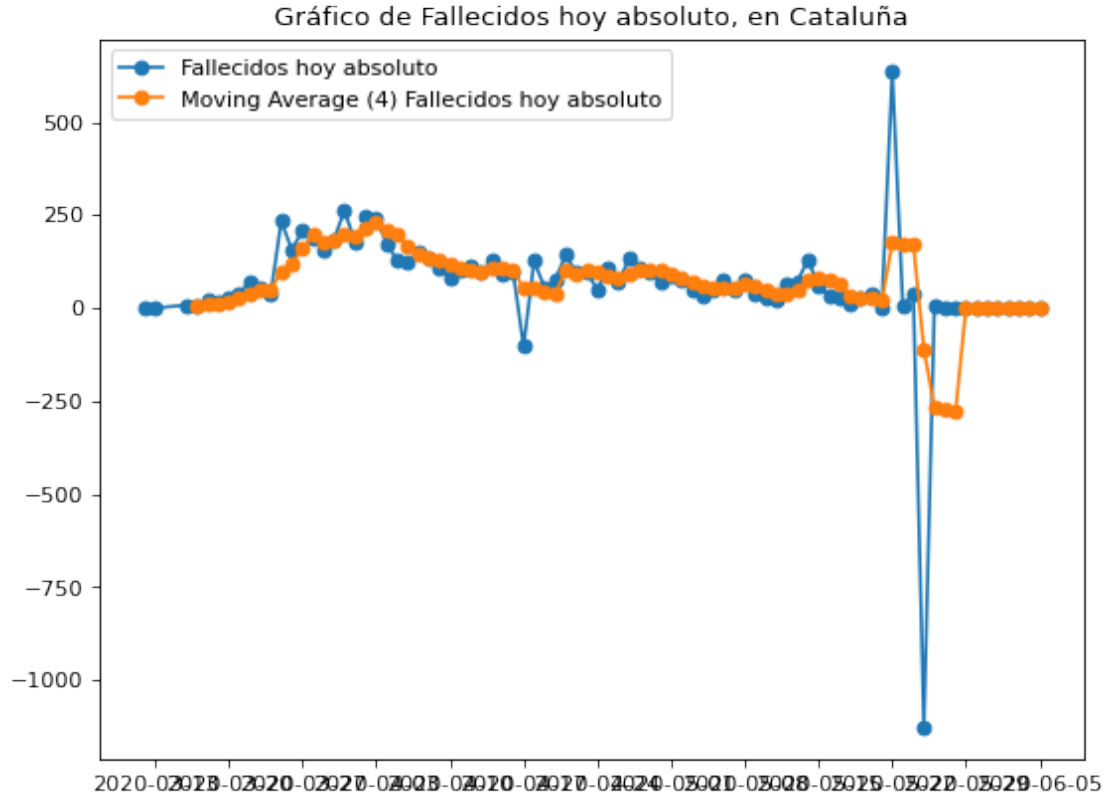
      report_single_location_single_dimension(COMUNIDAD_A_CONSIDERAR,dimension)
```

<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)
```

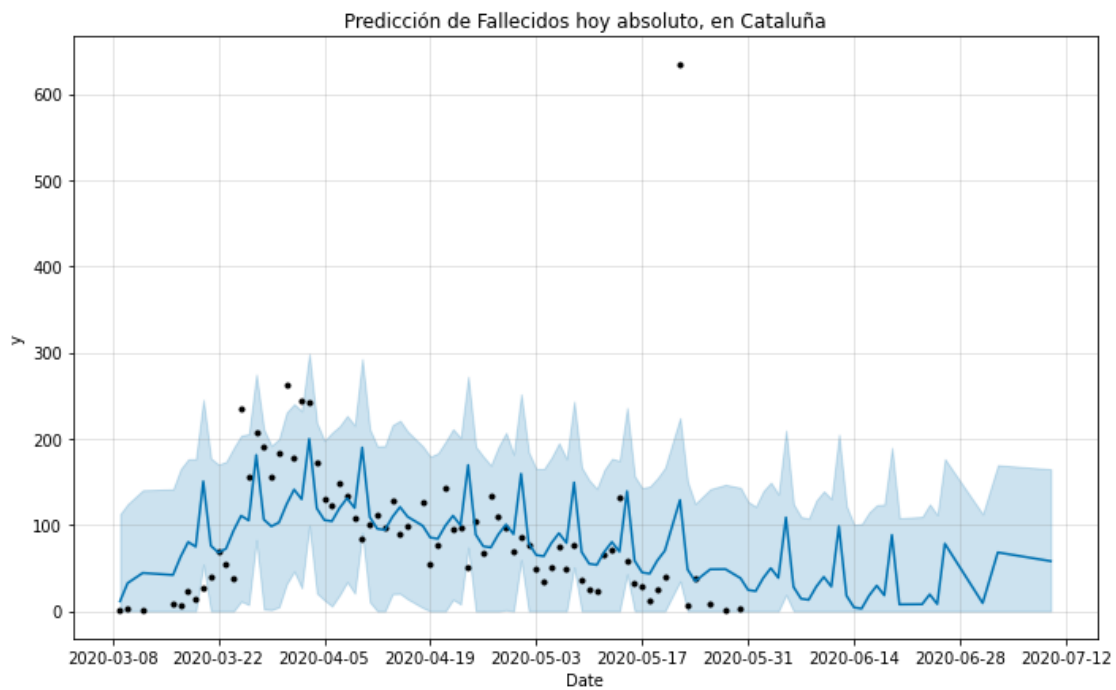
INFO:fbprophet:Disabling yearly seasonality. Run prophet with yearly\_seasonality=True to override this.

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)

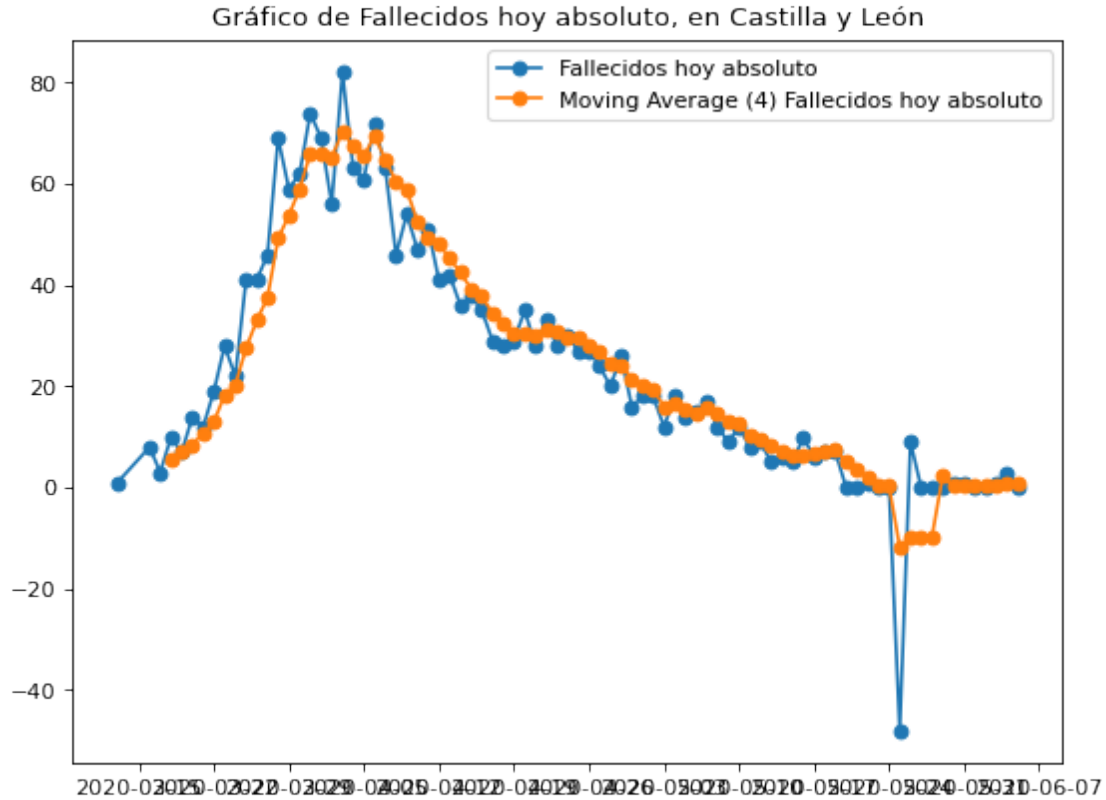
Insertar_Enlace("Reporte_Fallecidos_hoy_absoluto_CyL")
```

<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 )
```

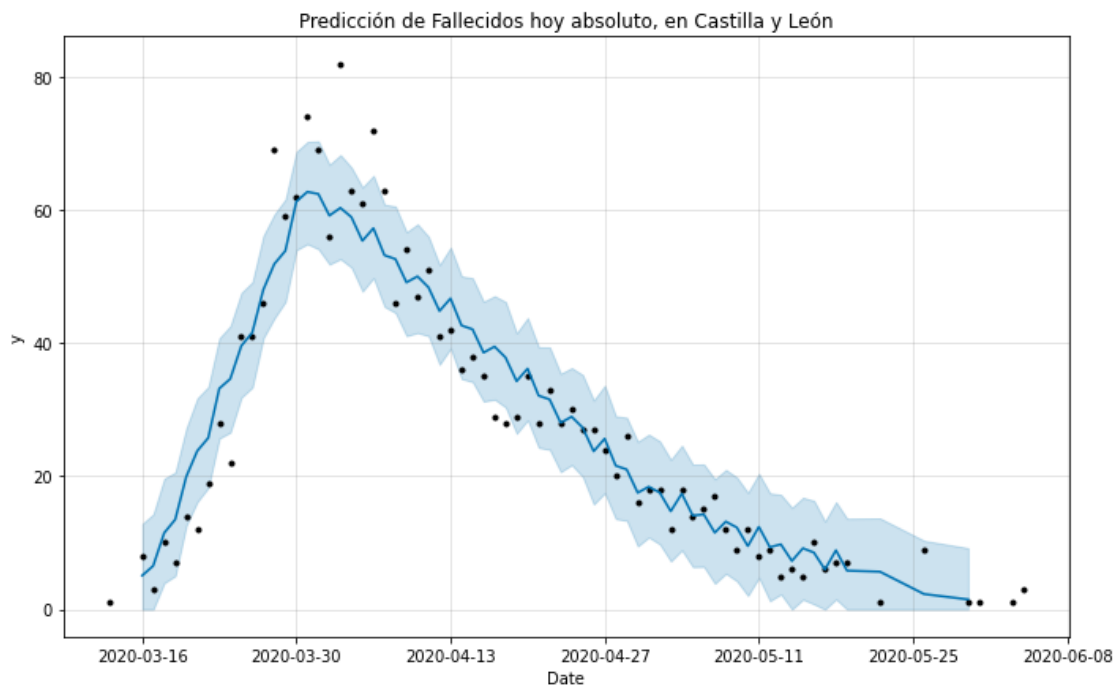
INFO:fbprophet:Disabling yearly seasonality. Run prophet with yearly\_seasonality=True to override this.

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")
```

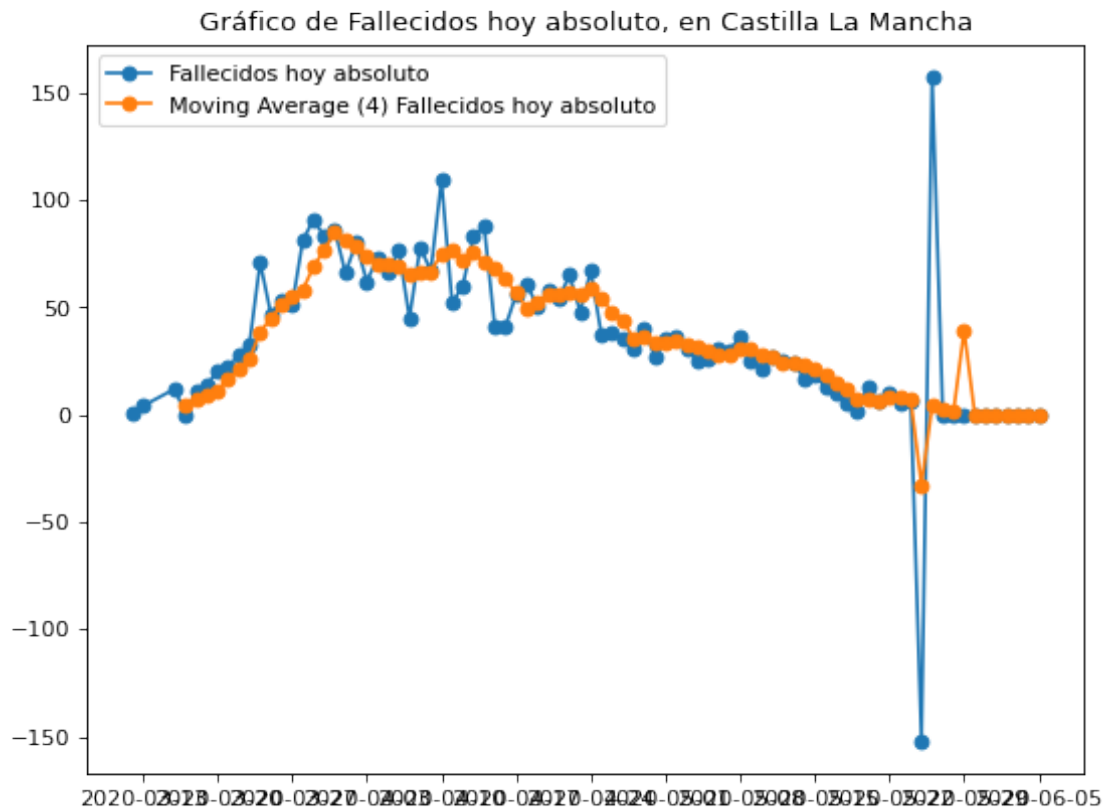
<IPython.core.display.HTML object>

<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 )
```

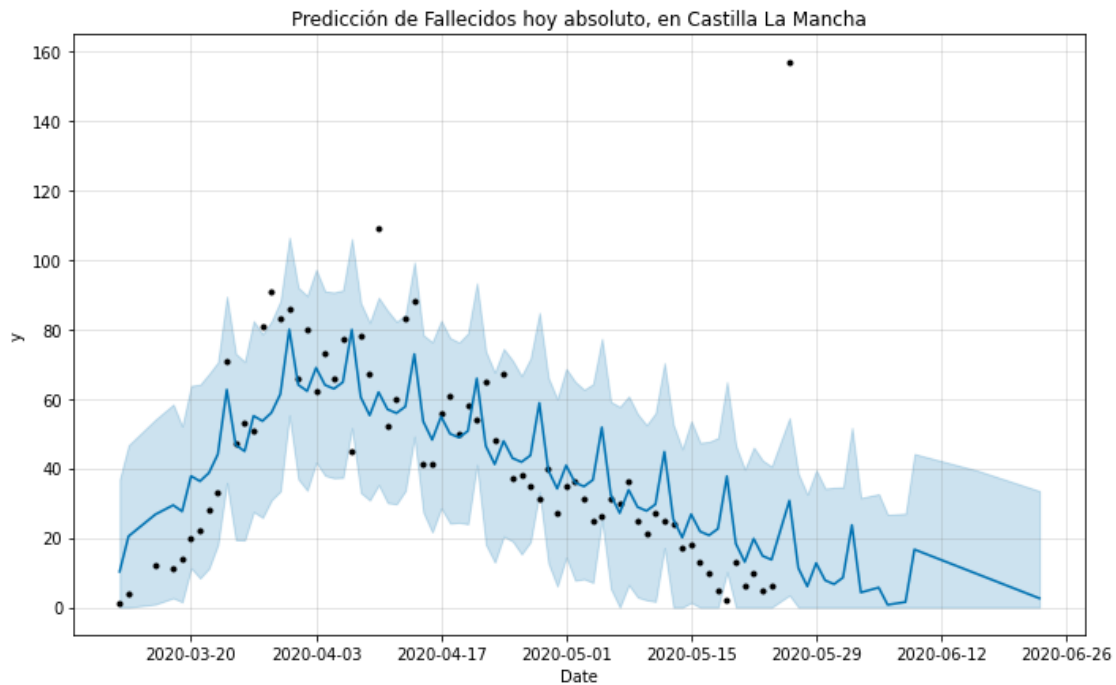
INFO:fbprophet:Disabling yearly seasonality. Run prophet with yearly\_seasonality=True to override this.

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

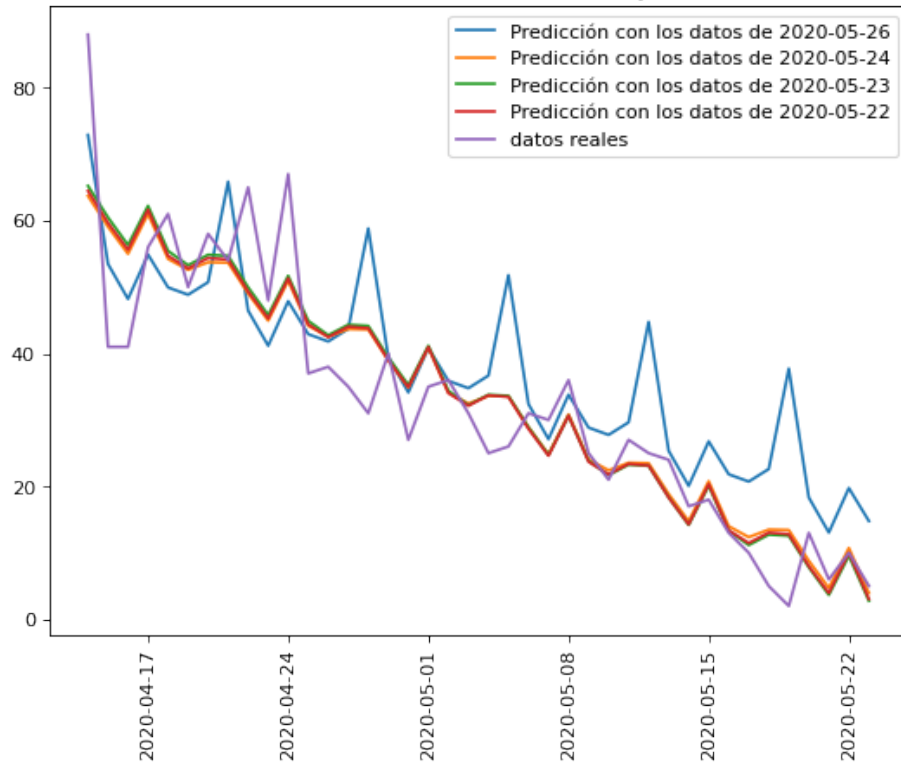
2020-04-14	65.215850
2020-04-15	60.477493
2020-04-16	56.312186
2020-04-17	62.218689
2020-04-18	55.440744
2020-04-19	53.278765
2020-04-20	54.858851
2020-04-21	54.685427
2020-04-22	49.946964
2020-04-23	45.781648
2020-04-24	51.688141
2020-04-25	44.910196
2020-04-26	42.748217
2020-04-27	44.328302
2020-04-28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

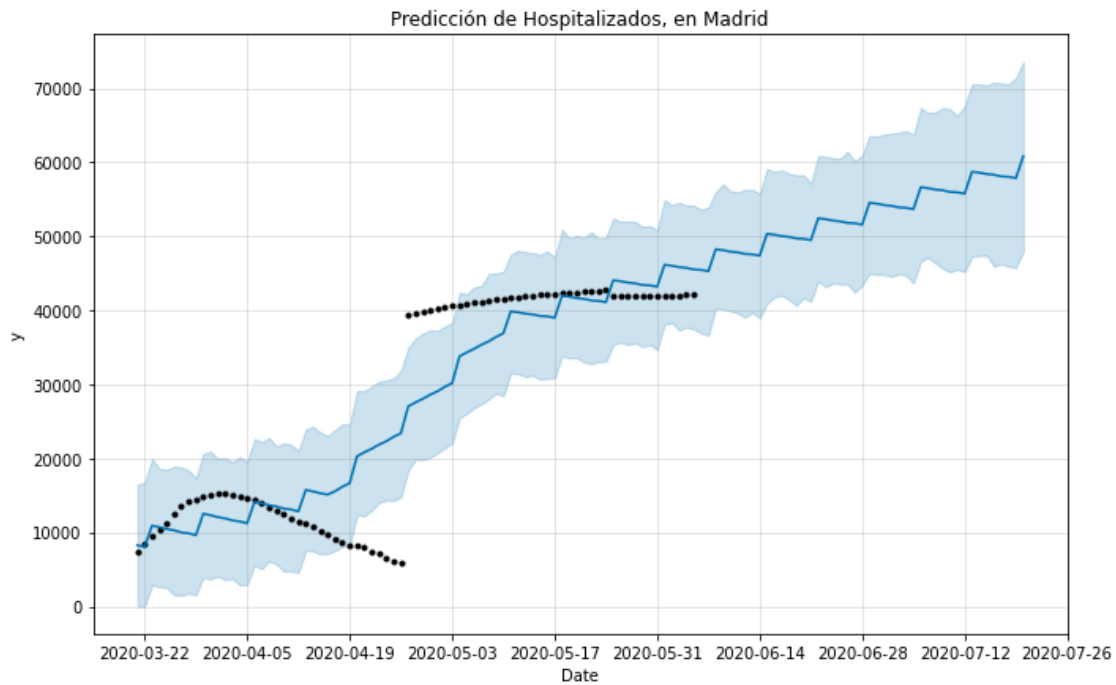
INFO:fbprophet:Disabling yearly seasonality. Run prophet with yearly\_seasonality=True to override this.

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



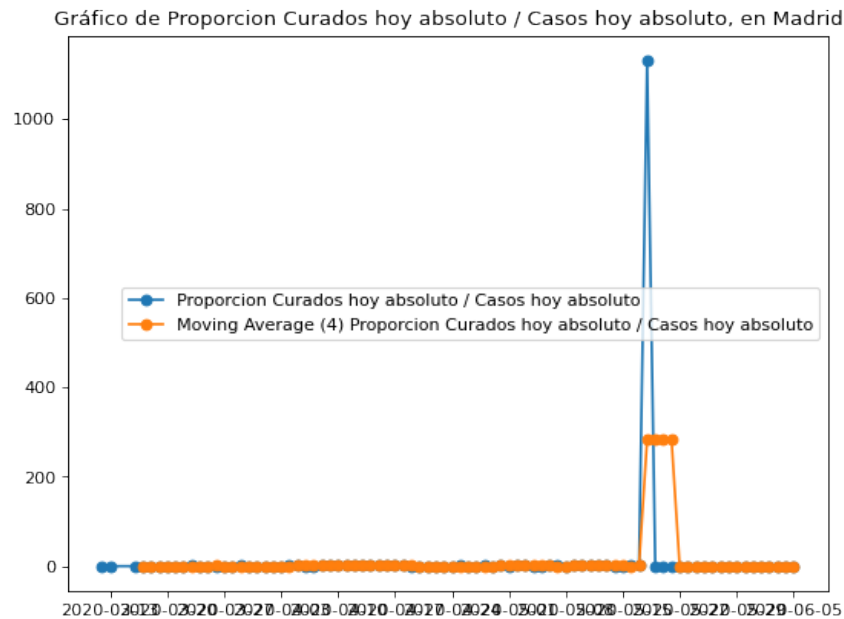
```
[33]: dimension = 'Proporcion Curados hoy absoluto / Casos hoy absoluto'
report_single_location_single_dimension('Madrid',dimension)
```

<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')

