Part A

Data Visualization & Communication

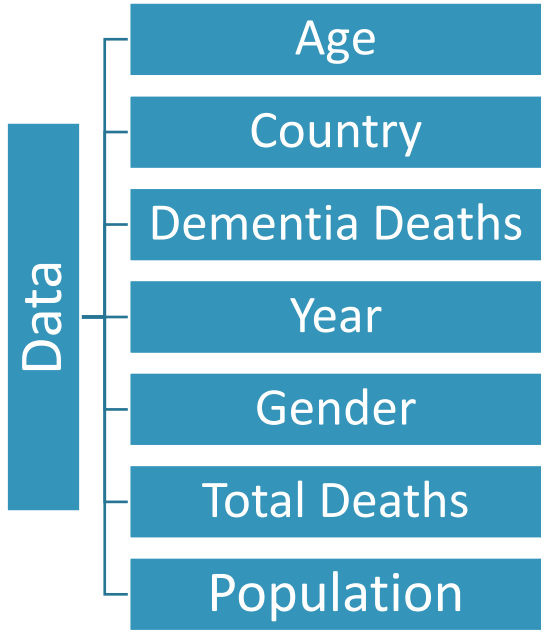
Dementia Deaths : Europe VS Greece

Despoina Angelonidi

F3352201

Introduction

- This study aims to investigate whether there is an increasing trend in dementia-related deaths in Greece and to determine if the behavior of Greece differs from the rest of Europe.
- The data used for this analysis span the years 2011 to 2020 and is sourced from Eurostat.
- The following plots were constructed using R.



Important Notice

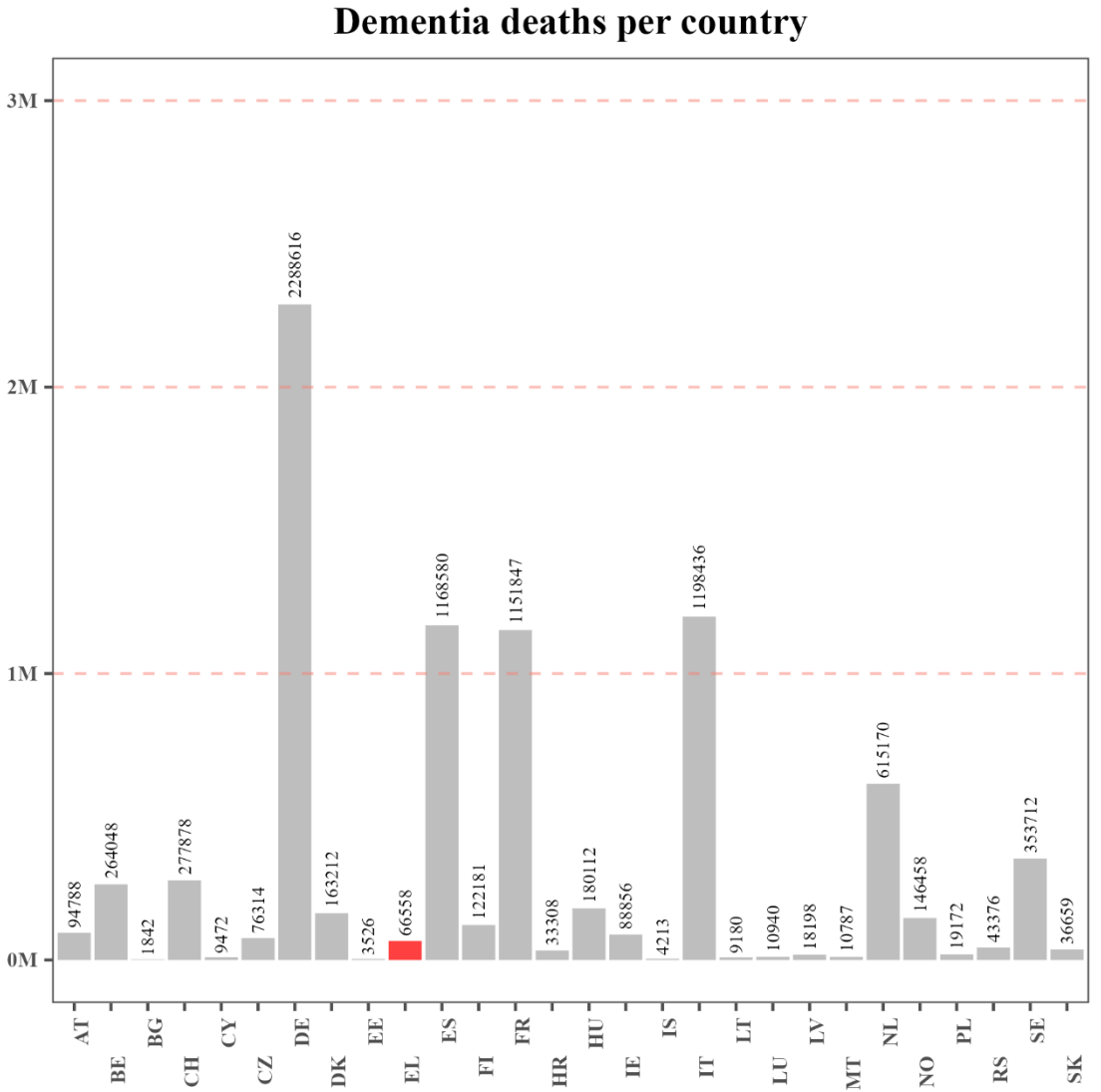
Throughout the preprocessing stage it became evident that, for certain countries, the dataset does not include data for all years. Thus, these countries were removed.

Moreover, it is necessary to mention that there is a suspicion of underreporting regarding the following countries:

- Bulgaria (BG)
- Poland (PL)
- Greece (EL)

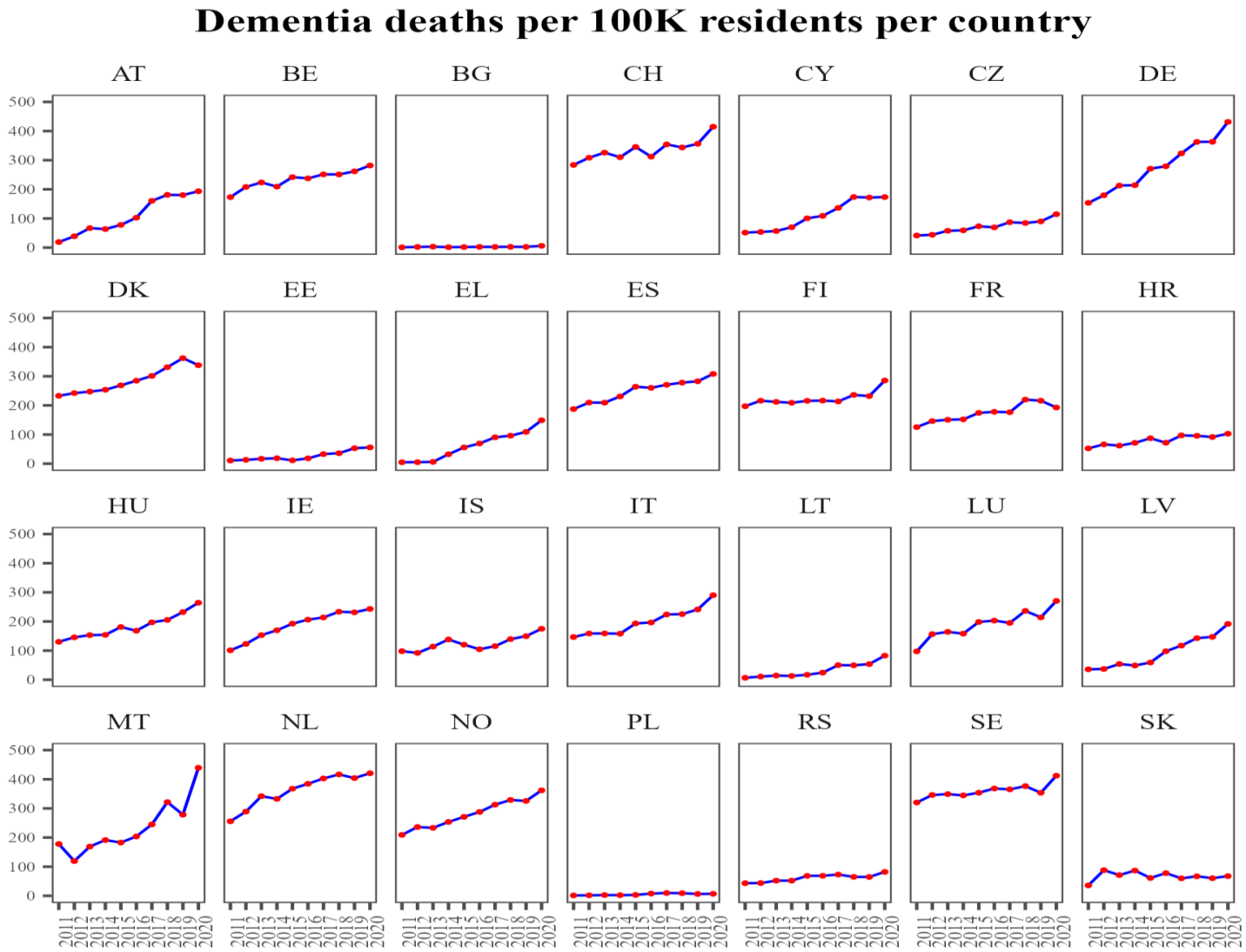
Bar Plot

We begin our analysis by constructing a bar plot that portrays the total number of Dementia Deaths for each country with the length of each bar representing the total number of deaths from 2011 to 2020. As one can notice, the tallest bar is assigned to Germany (DE) while the shortest one to Bulgaria (BG). As far as Greece is concerned, it appears that the number of cumulative Dementia Deaths is not high. Though, it is important to further examine this assumption taking the **population** of each country under consideration.



Trellis Plot

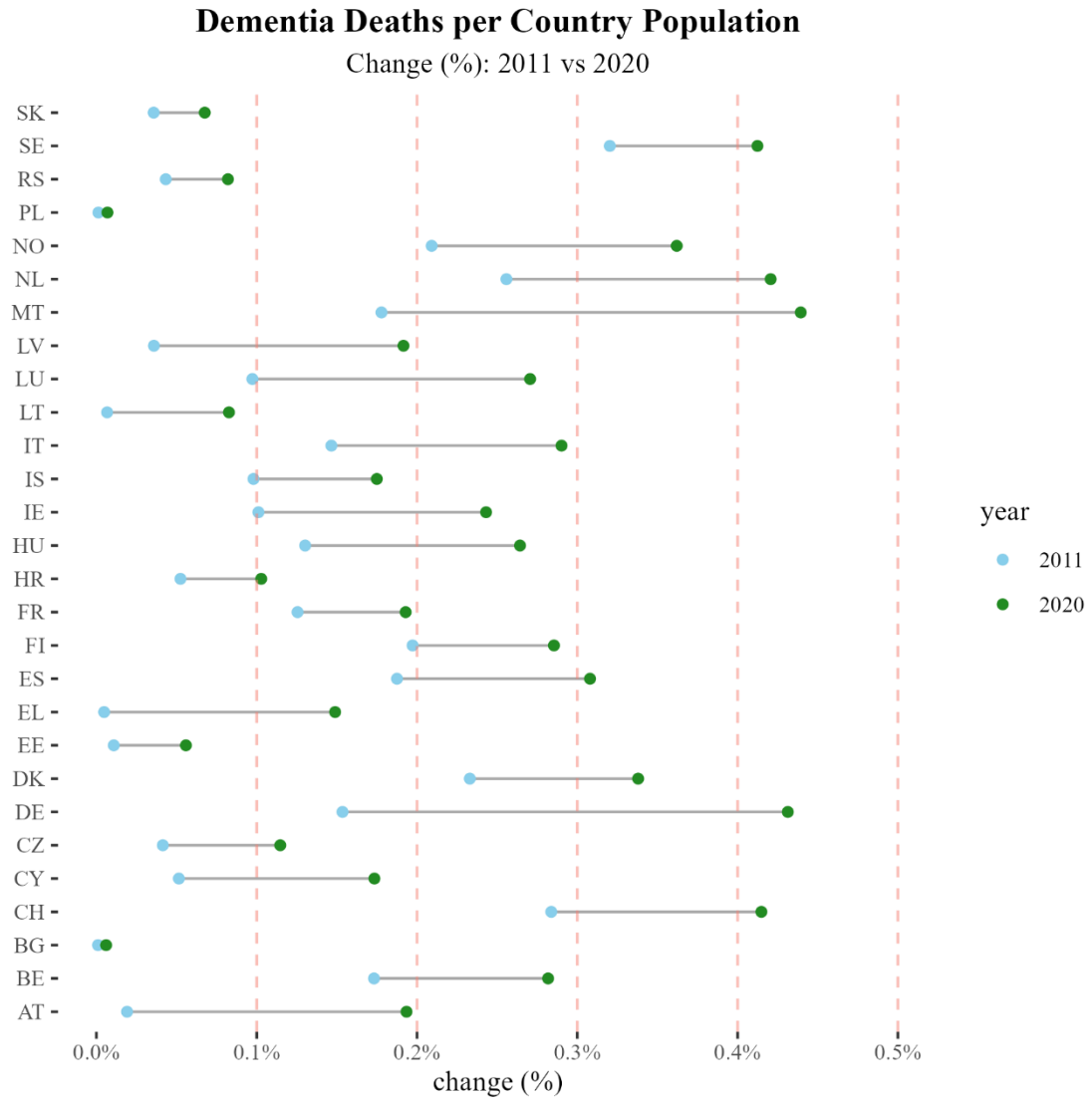
Next, we construct a trellis plot that captures the temporal trends of Dementia Deaths per 100K Residents across different European countries. It arises that there is an increasing trend for almost all countries including Greece.



Dumbbell Plot

To continue, a dumbbell plot is presented to show how the Dementia Death rate per country population changed between 2011 and 2020.

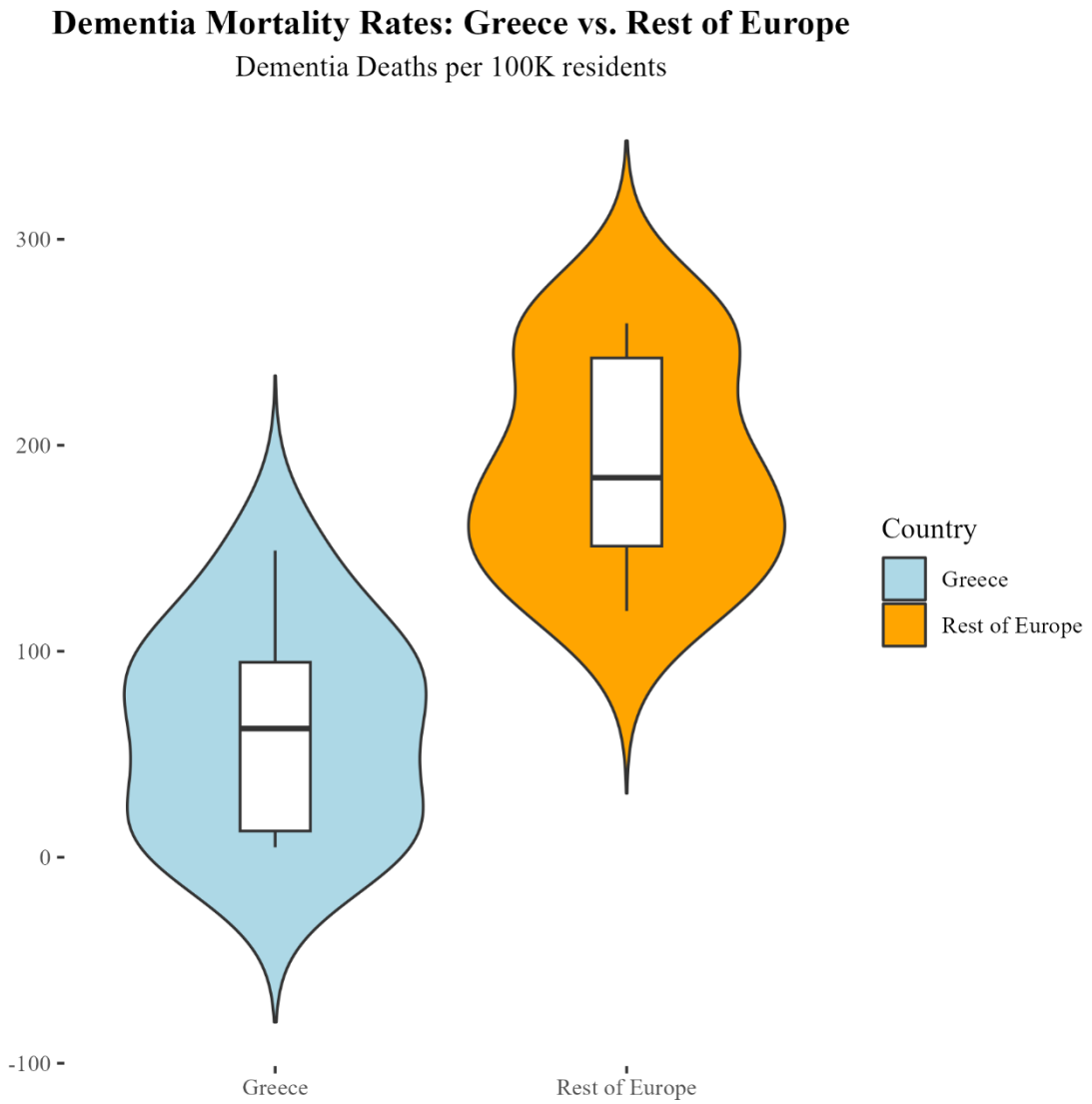
There is a noticeable overall increase in dementia deaths per country population, with Germany and Malta exhibiting the highest augmentation. Regarding Greece, an increase of approximately 0.15% is noted which seems to be average in comparison with the other countries.



Violin Plot

Next, a violin plot is constructed with the aim to showcase the comparison of Dementia Mortality Rates per 100K residents between Greece and Europe. It emerges that the median of Greece is around 70 whereas the one of Europe is around 180. Thus, we can assume that the rate of Europe is higher than the one of Greece.

As far as the distribution of each group is concerned, it manifests that in both cases it is bimodal. This indicates that there are certain subgroups within the data that behave differently. Probably factors such as different age groups or gender is to blame.

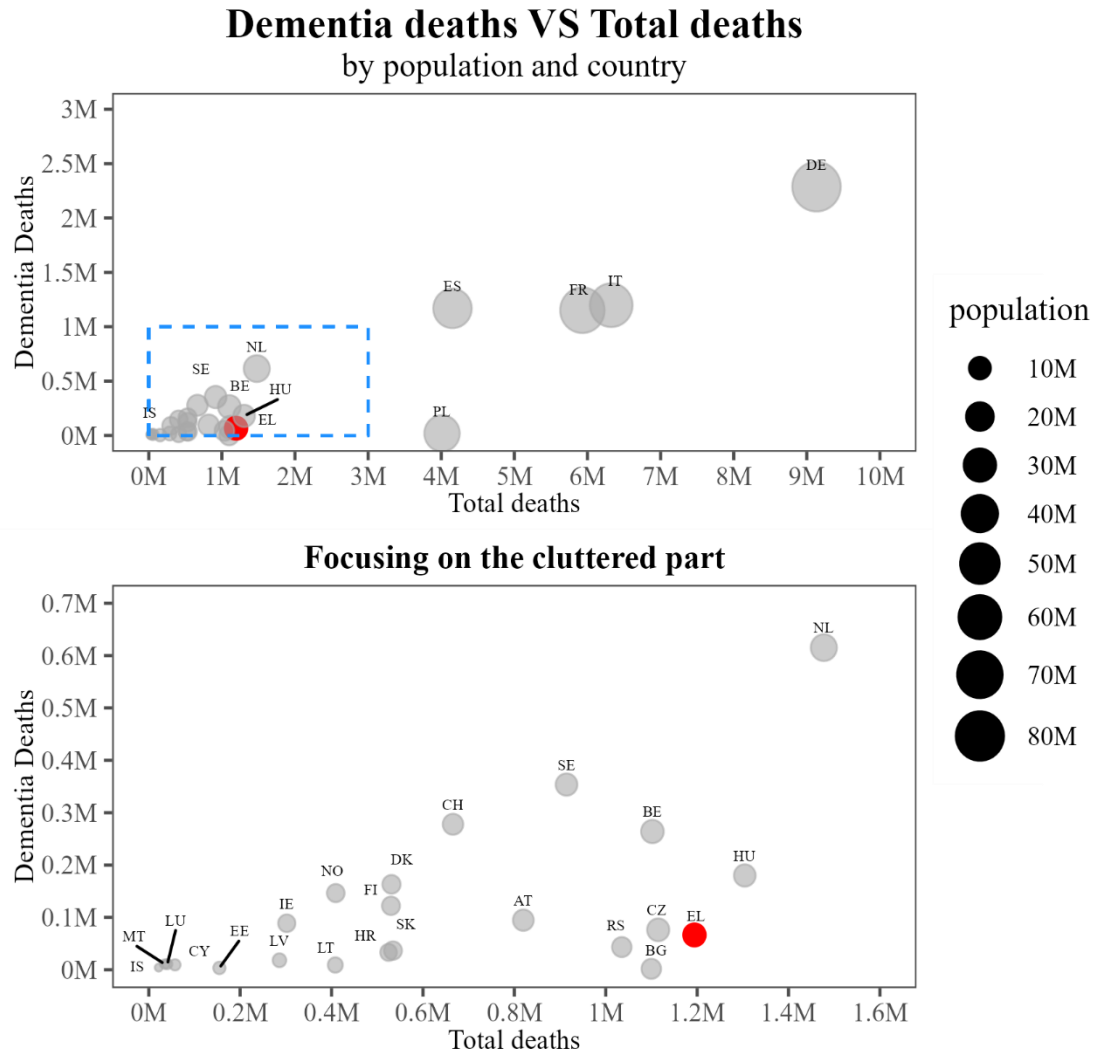


Bubble Plot

Onward, a bubble plot is implemented aiming to examine if there is any trend between Dementia Deaths and Total Deaths over the years, considering the population of each country.

Notwithstanding that there is an increasing trend between Dementia Deaths and Total Deaths for most countries, there are some exceptions.

Regarding Greece, the incidence of Dementia Deaths in relation to Total Deaths, considering Population, is comparatively low. Furthermore, it emerges that Hungary, Serbia, Czech Republic, and Bulgaria are the most similar to Greece.

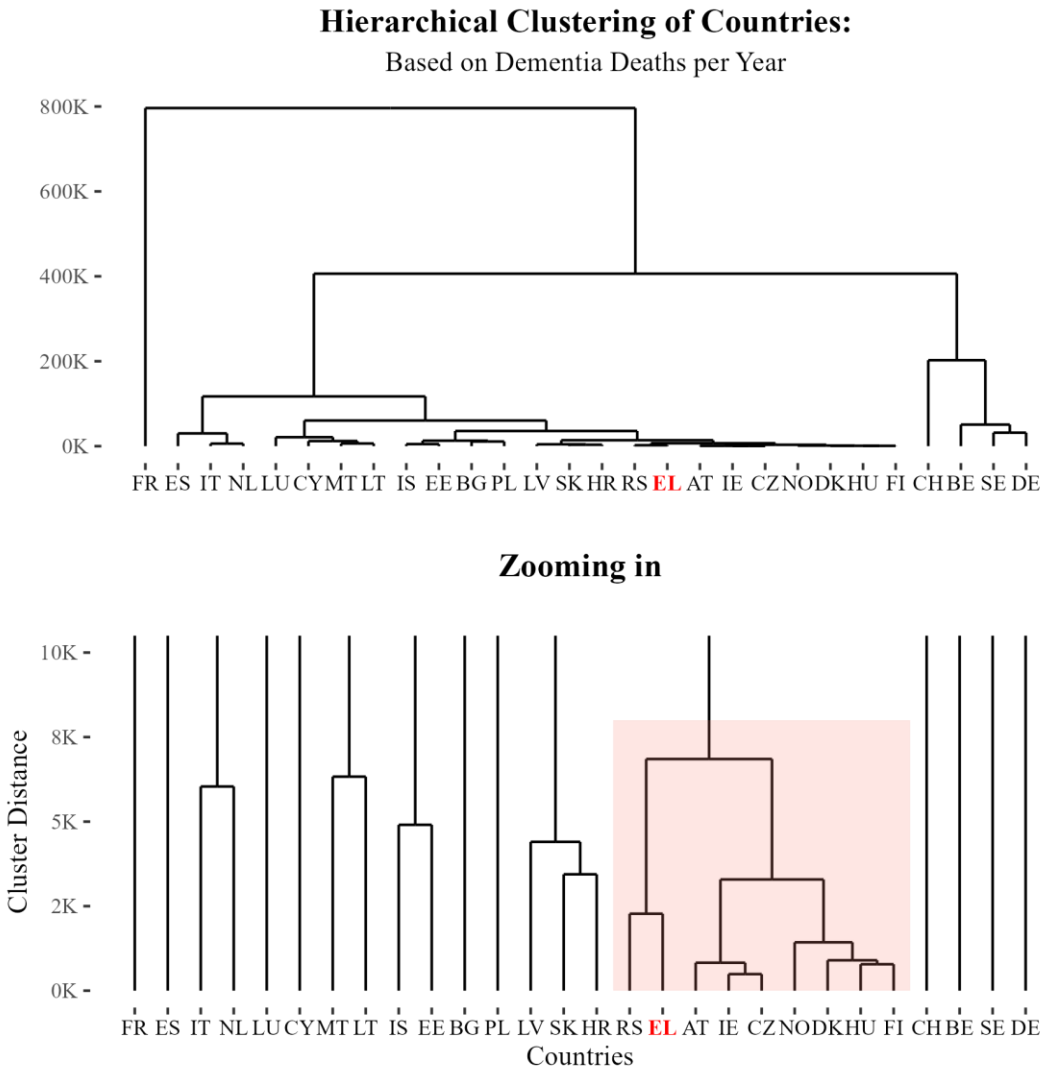


Dendrogram

Let us now delve further by performing a Hierarchical Clustering of the countries based on the occurrences of Dementia Deaths per Year.

According to this dendrogram, the country that resembles Greece the most is Serbia as it was the first country that formed a group with. Other countries with similar behavior appear to be the ones inside the red surface.

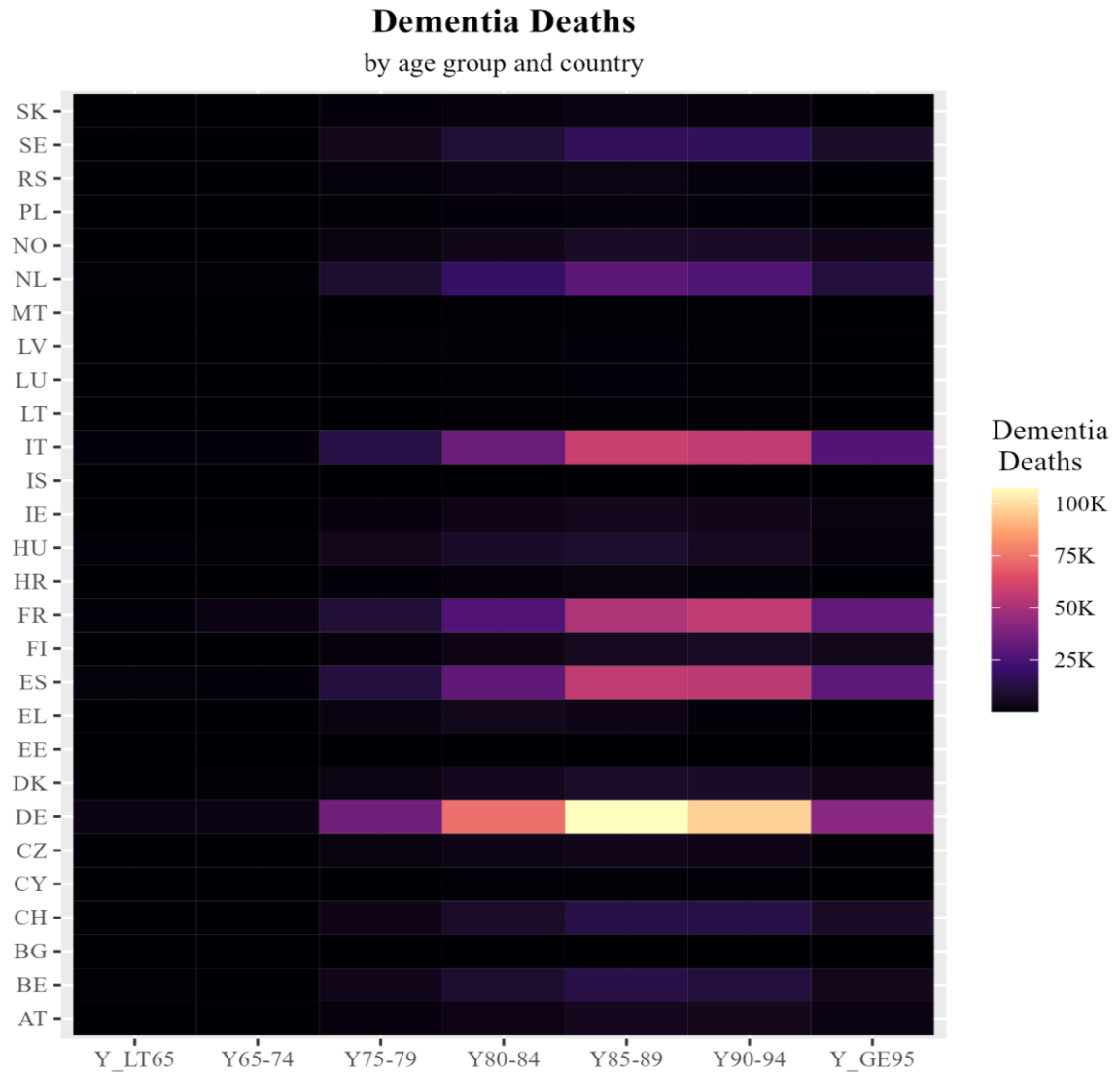
It would be interesting to proceed to a further investigation to unravel the reason why France stands alone but this exceeds the scope of this course.



Heatmap

After attaining a wholistic perspective, we will now explore the relation between the Age factor and Dementia Deaths across European Countries.

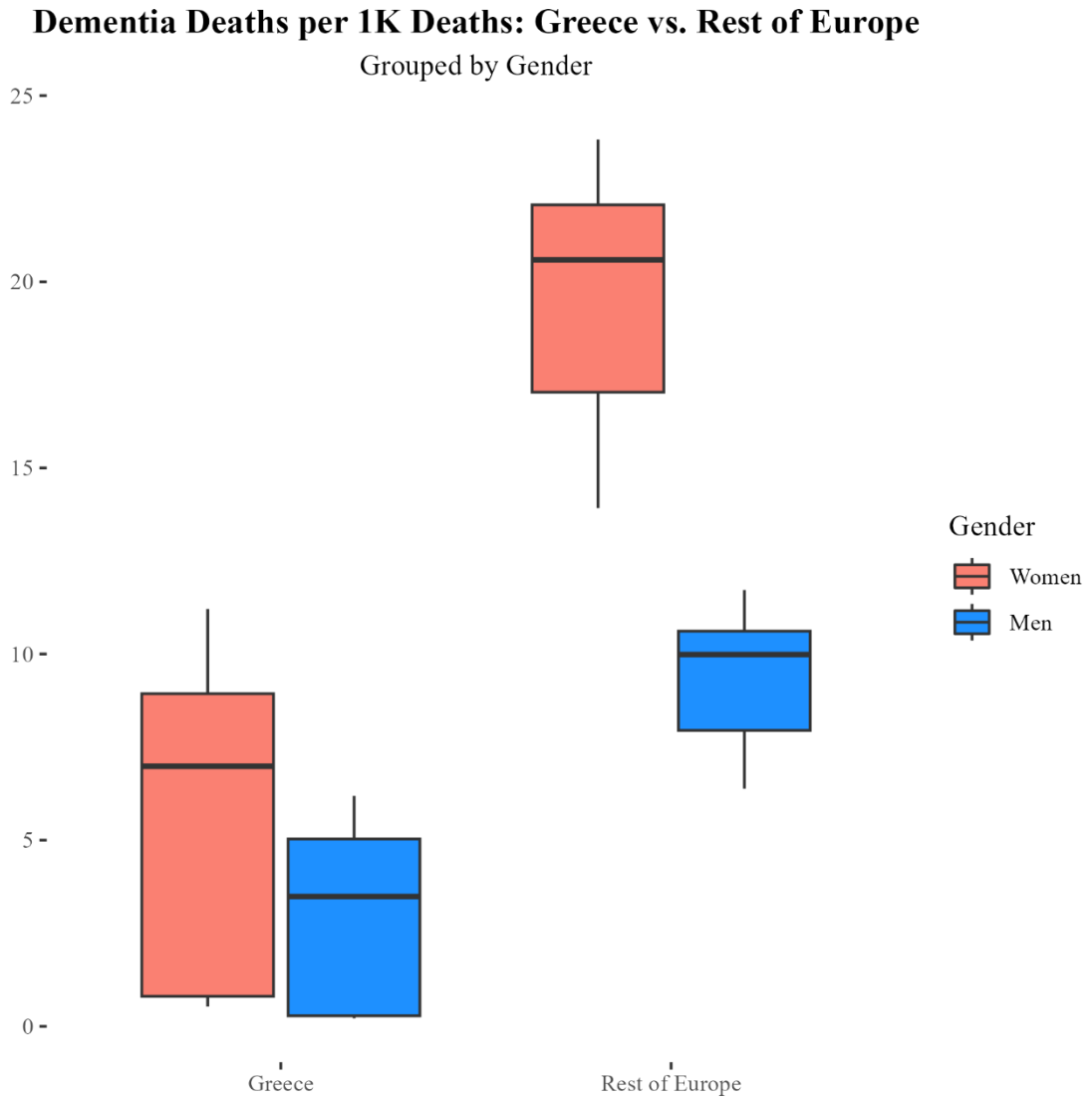
By observing the given heatmap, it appears that the most populated category is the age group of [85,89] years concerning the country of Germany. Furthermore, the darker sections of the plot indicate a notable absence or rare occurrence of dementia-related deaths within the age range of (0,74].



Box Plot

Let us now construct a boxplot regarding Dementia Deaths per 1K Deaths. It arises that:

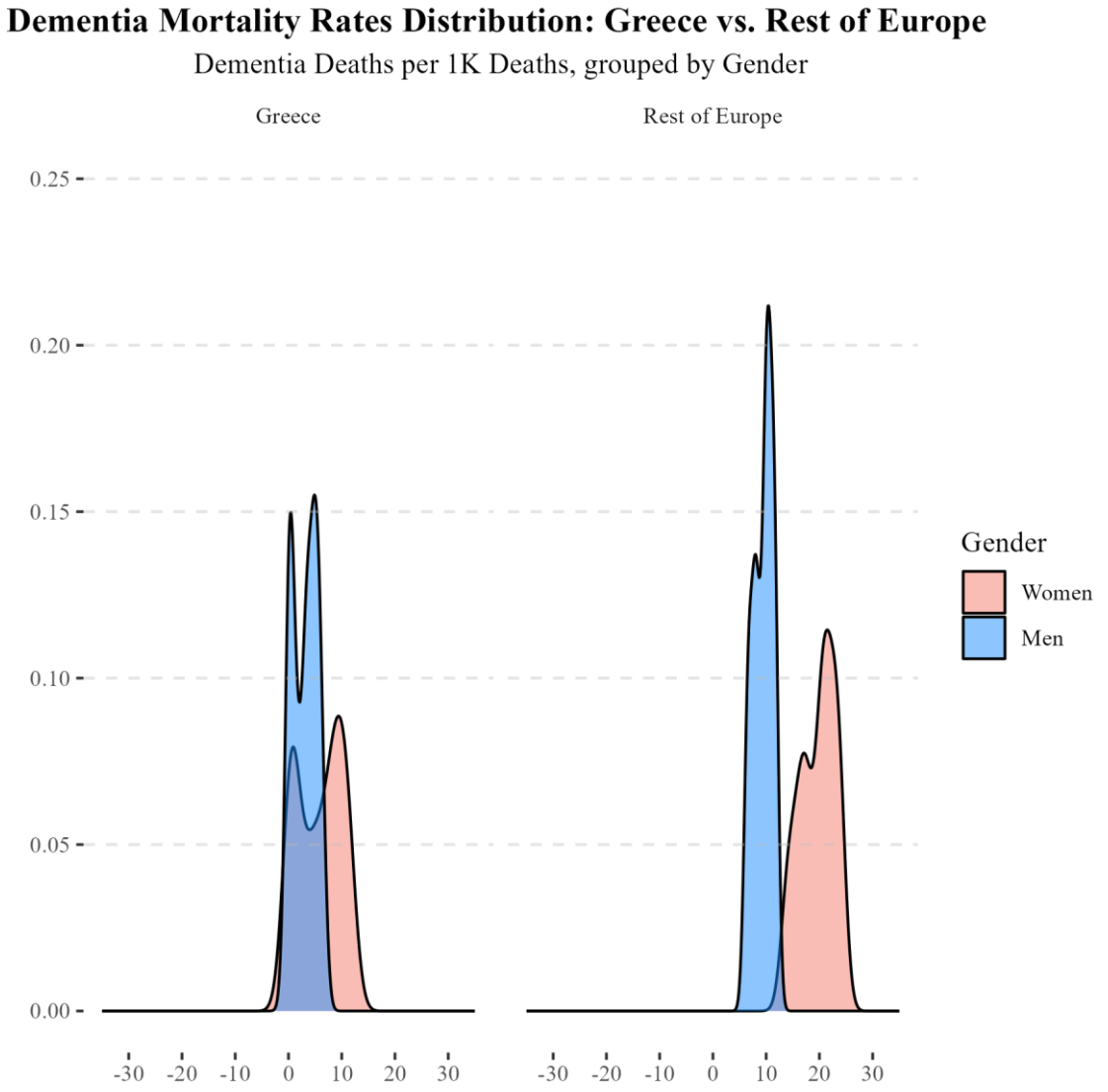
- Greece has fewer Dementia Deaths than Europe, indicated by the corresponding gender-specific medians.
- Europe's median for women is a lot higher than Greece's with a shorter box that signifies lower IQR.
- both for Greece and rest of Europe the median of women is higher than the one of men.



Density Plot

To acquire a holistic understanding of Dementia Deaths per 1K Deaths grouped by Gender, a complementary density plot is created.

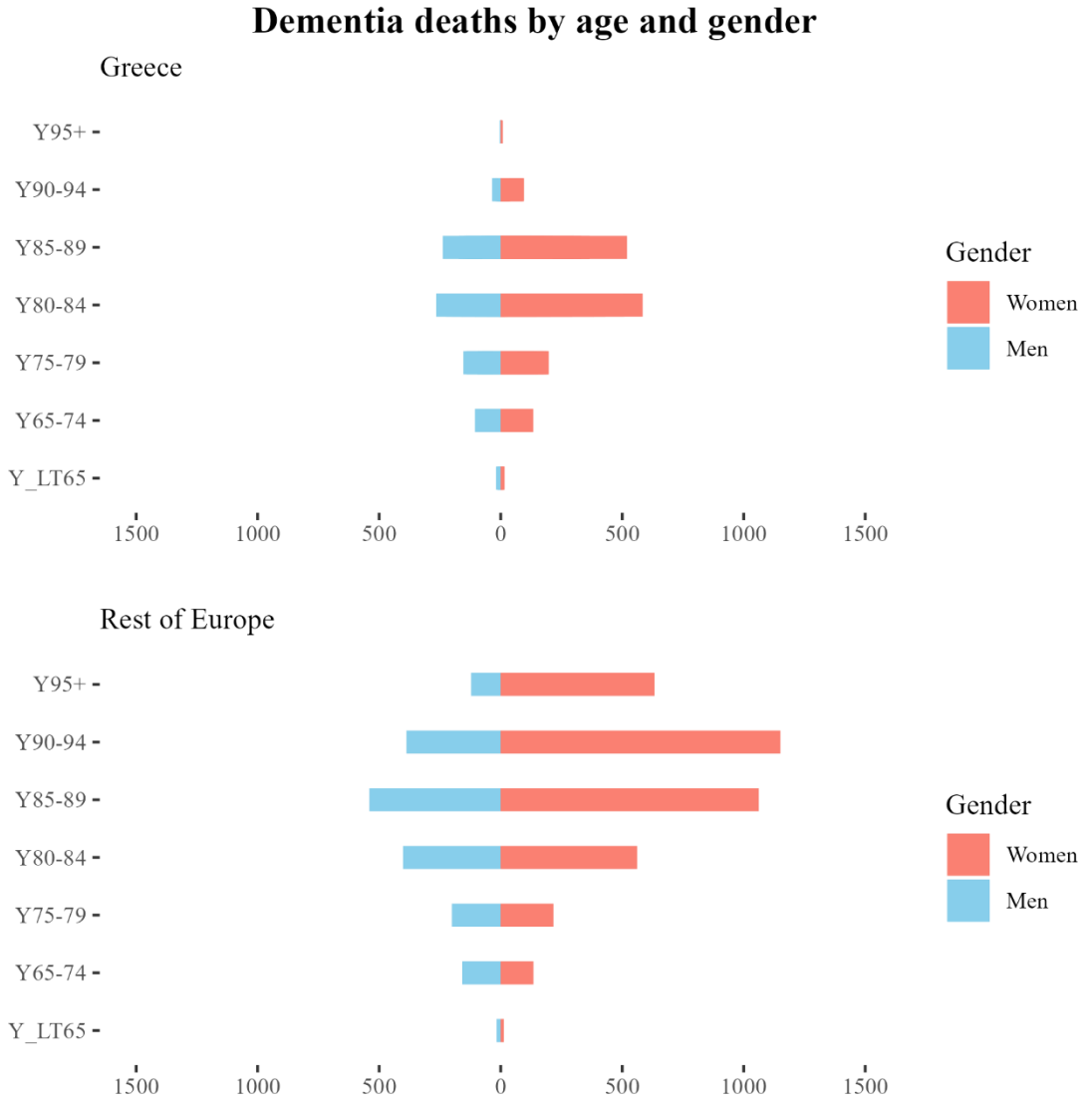
It arises that all distributions are bimodal and the ones of men are narrower and taller compared to those of women. The narrowest curve corresponds to men of Europe which is logical since they have the shortest boxplot (box). Additionally, the curves are skewed as expected by looking at the corresponding boxplots.



Diverging Bars Plot

Finally, we create a plot that illustrates the number of dementia deaths categorized by age and gender. It consists of two sections: one depicting Greece and the other the rest of European countries.

Upon analyzing the plot, it becomes apparent that there are no significant differences between Greece and the rest of Europe in terms of dementia deaths within the age groups YLT65, Y65-74, Y75-79, and Y80-84. However, for the age groups Y85-89, Y90-94, and 95+, the number of dementia deaths appears to surpass that of Greece.



Conclusion

To conclude, an upward trend in dementia mortality rates across Europe can be observed within the year span of 2011 to 2020. This pattern appears to be consistent with the situation in Greece, indicating a similar increase in dementia-related mortality within the country.


END