

Data Visualization and Communication

Dementia throughout European Union (2011-2019)

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1. Dataset (Eurostat)



Data retrieved from Eurostat Database.



Data includes dementia death rates of European Countries through the years (2011-2019). Specific information of different age groups and different genders are included.

Main data variables:

- 1) TIME: Year (2011-2019)
- 2) GEO: Geopolitical Entity
- 3) SEX: Gender (Total, Male, Female)
- 4) AGE: Age Group (Total, 65 years or over, Less than 65 years)
- 5) Value: Standardised Dementia Death Rate Value (0-inf)

1. Dataset (Eurostat)

- The **standardised death rate**, abbreviated as **SDR**, is the death rate of a population adjusted to a standard age distribution. It is calculated as a weighted average of the age-specific [death rates](#) of a given population; the weights are the age distribution of that population.
- As most causes of death vary significantly with people's age and sex, the use of standardised death rates improves comparability over time and between countries. The reason is that death rates can be measured independently of the age structure of populations in different times and countries (sex ratios usually are more stable).
- Standardised death rates are calculated on the basis of the ['European Standard Population'](#) revised by Eurostat in 2012 (and published in 2013).
- As method for standardisation, the direct method is applied. Standardised death rates are calculated for the age group 0-64 ('premature death'), 65 years and more, and for the total of all ages.

$$SDR_A = \frac{\sum_x ({}^A m_x {}^S P_x)}{\sum_x {}^S P_x}, \text{ where}$$

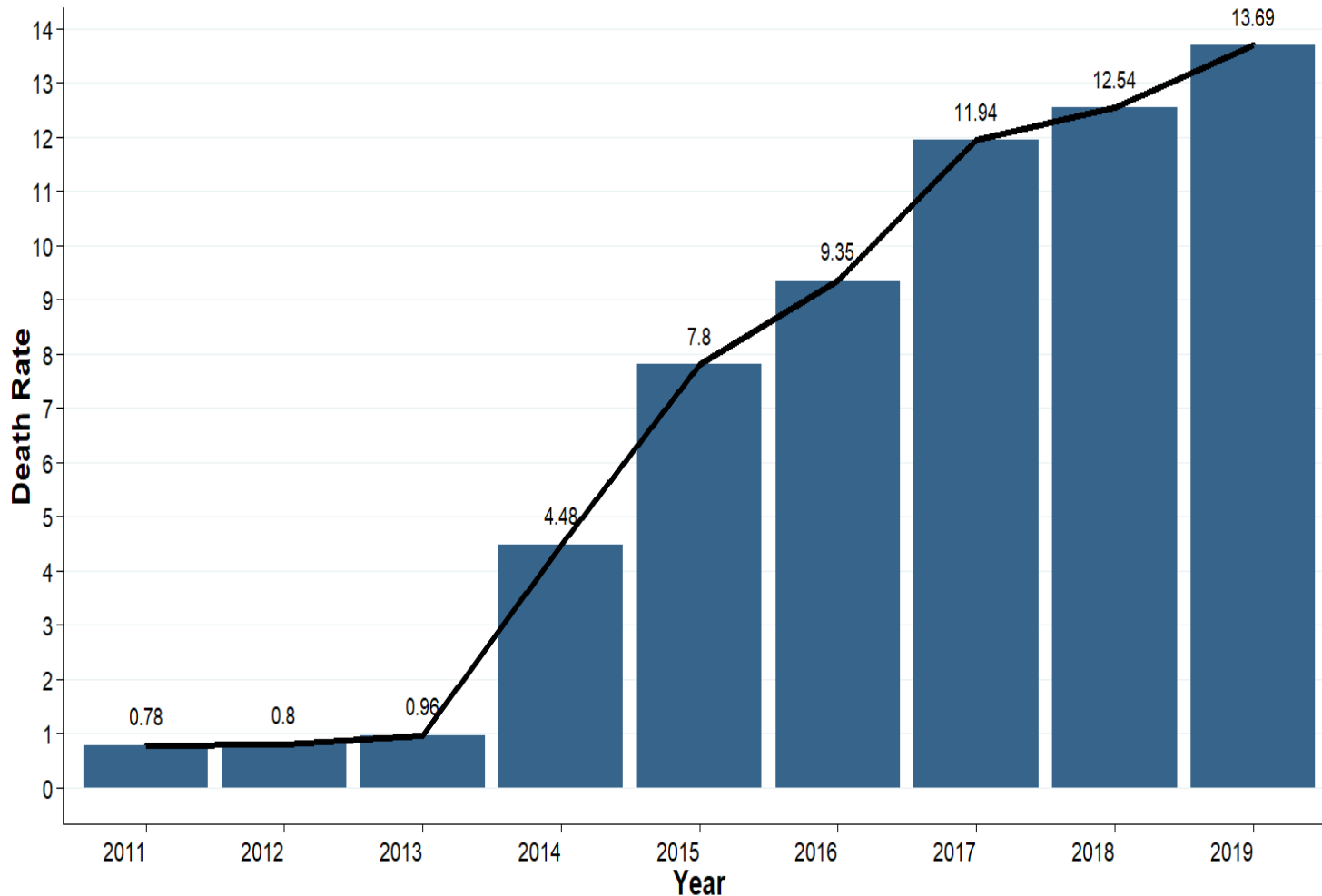
SDR_A = age standardised death rate for population in region A

${}^A m_x$ = age specific death rate at age x last birthday in population in region A

${}^S P_x$ = the population exposed to the risk of death at age x last birth day in the standard population

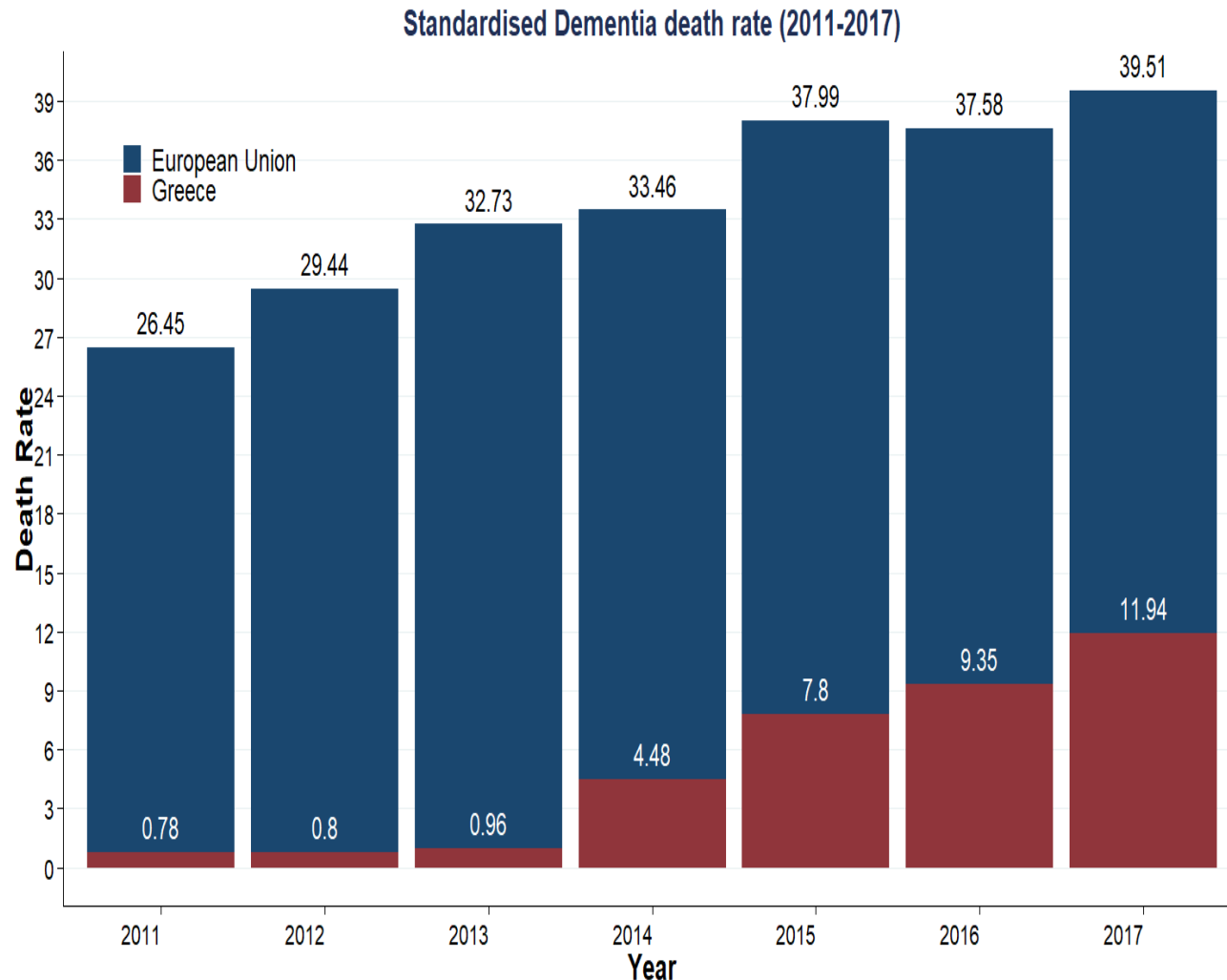
2. Dementia Death Rate in Greece (2011-2019)

Standardised Dementia death rate in Greece (2011-2019)



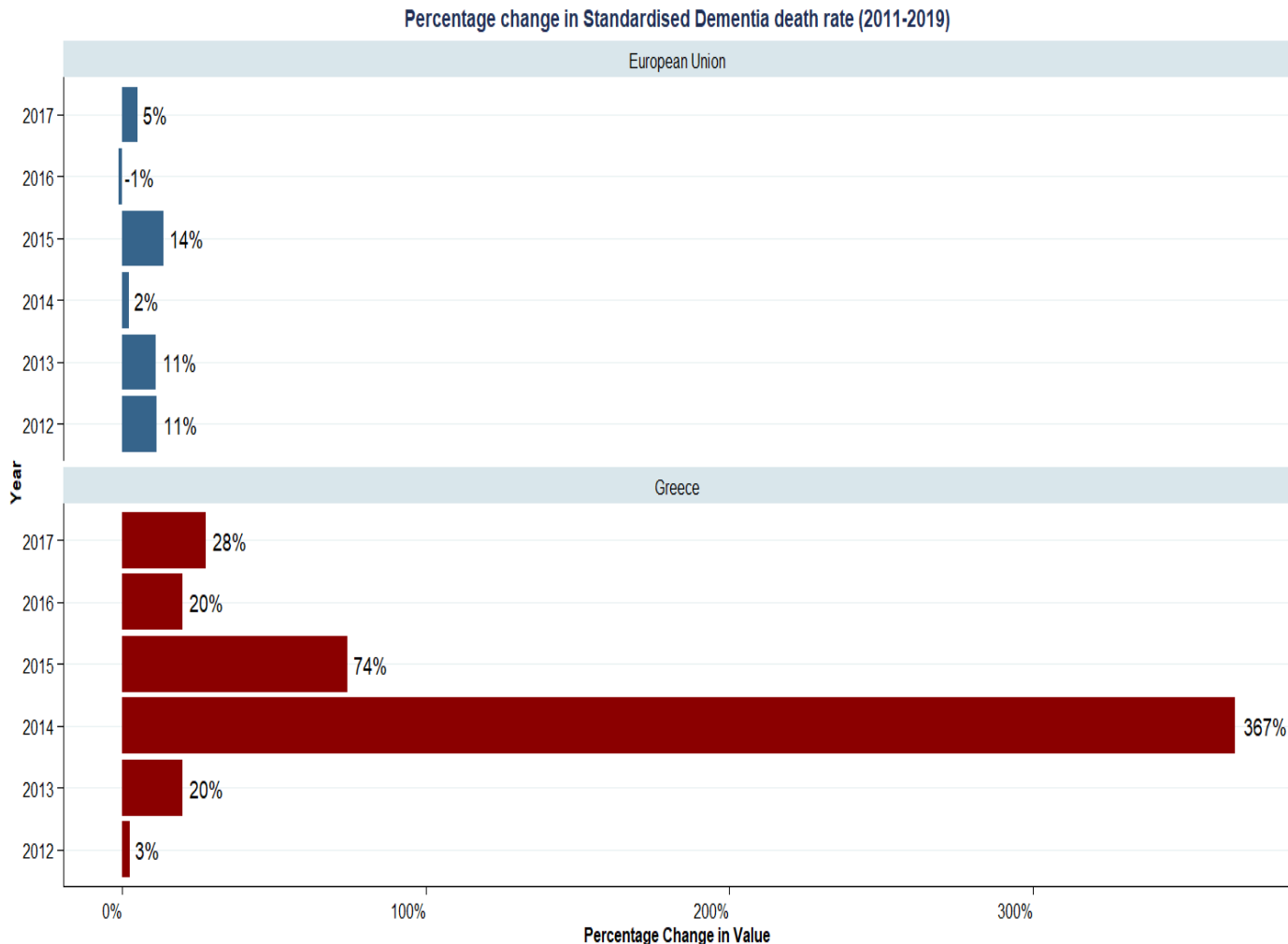
- Greece's death rates seem to have an upward trend.
- There is a big increase in death rates between 2011 and 2019
- An abnormal big increase is observed from 2013 to 2014

3. Dementia Death Rate in Greece vs European Union (2011-2017)



- The European Union death rates is the average rate of 28 European countries
- Greece seems to follow the rising trend of European Union
- European Union has a lot higher death rates than Greece in every year
- However, the gap between death rates of Greece and European Union seems to tighten every year

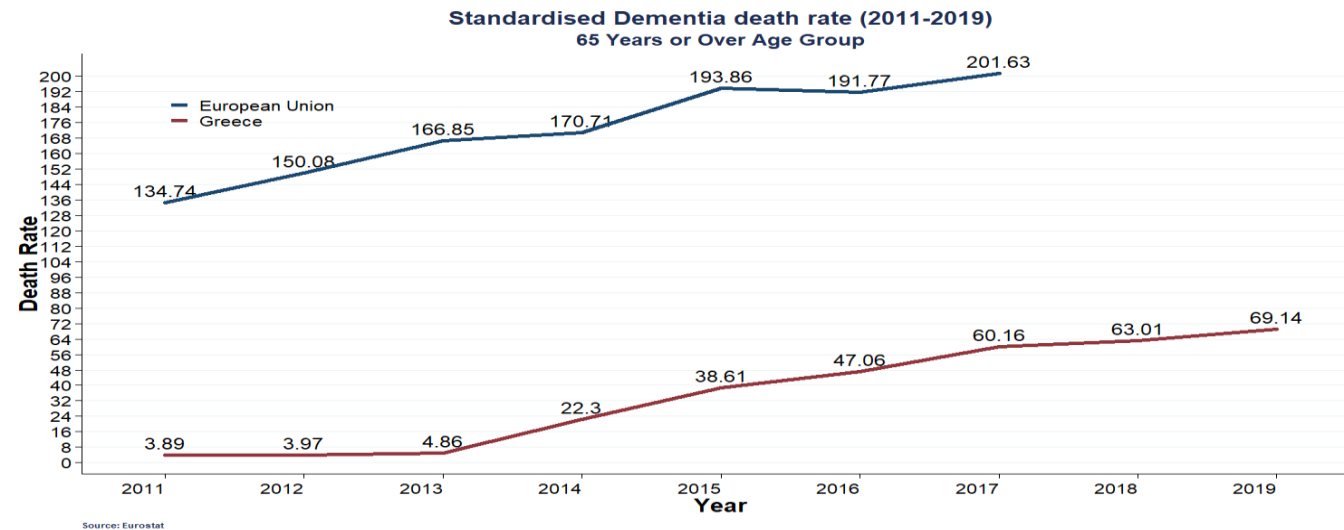
4. Percentage Change in Dementia Death Rate in Greece vs European Union (2011-2017)



Source: Eurostat

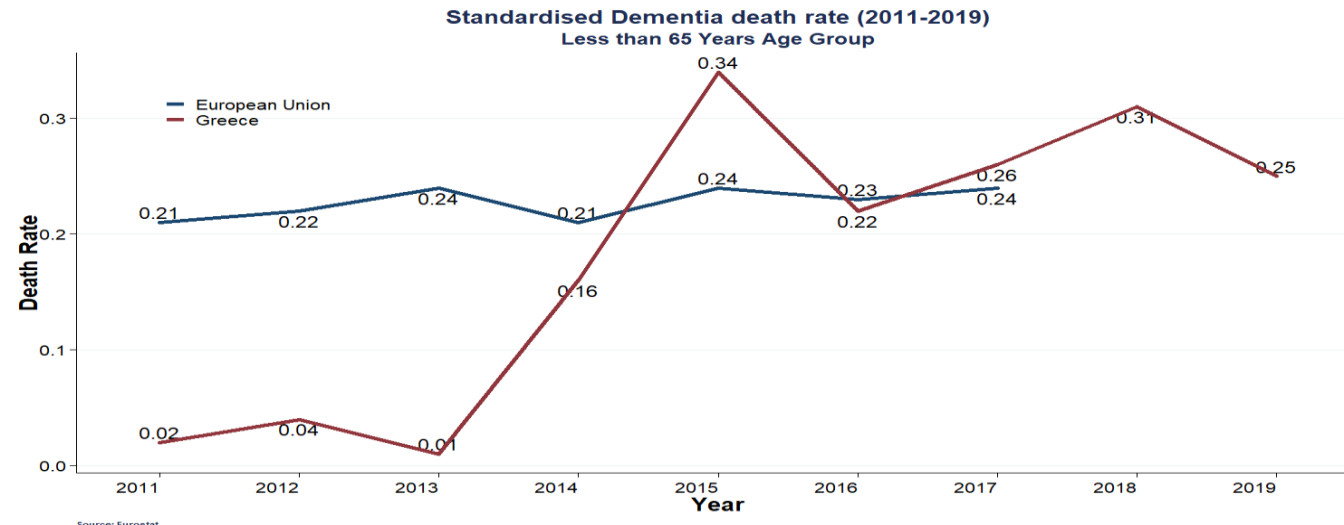
- Greece has higher percentage increase in death rates each year than European Union, except for 2012
- In 2014, Greece had an abnormal increase of 367% compared to 2% of Europe
- In 2016, Greece had an increase of 20%, while Europe had a decrease of 1%

5. Dementia Death Rate in Greece vs European Union per Age Groups (2011-2019)



65 Years or Over

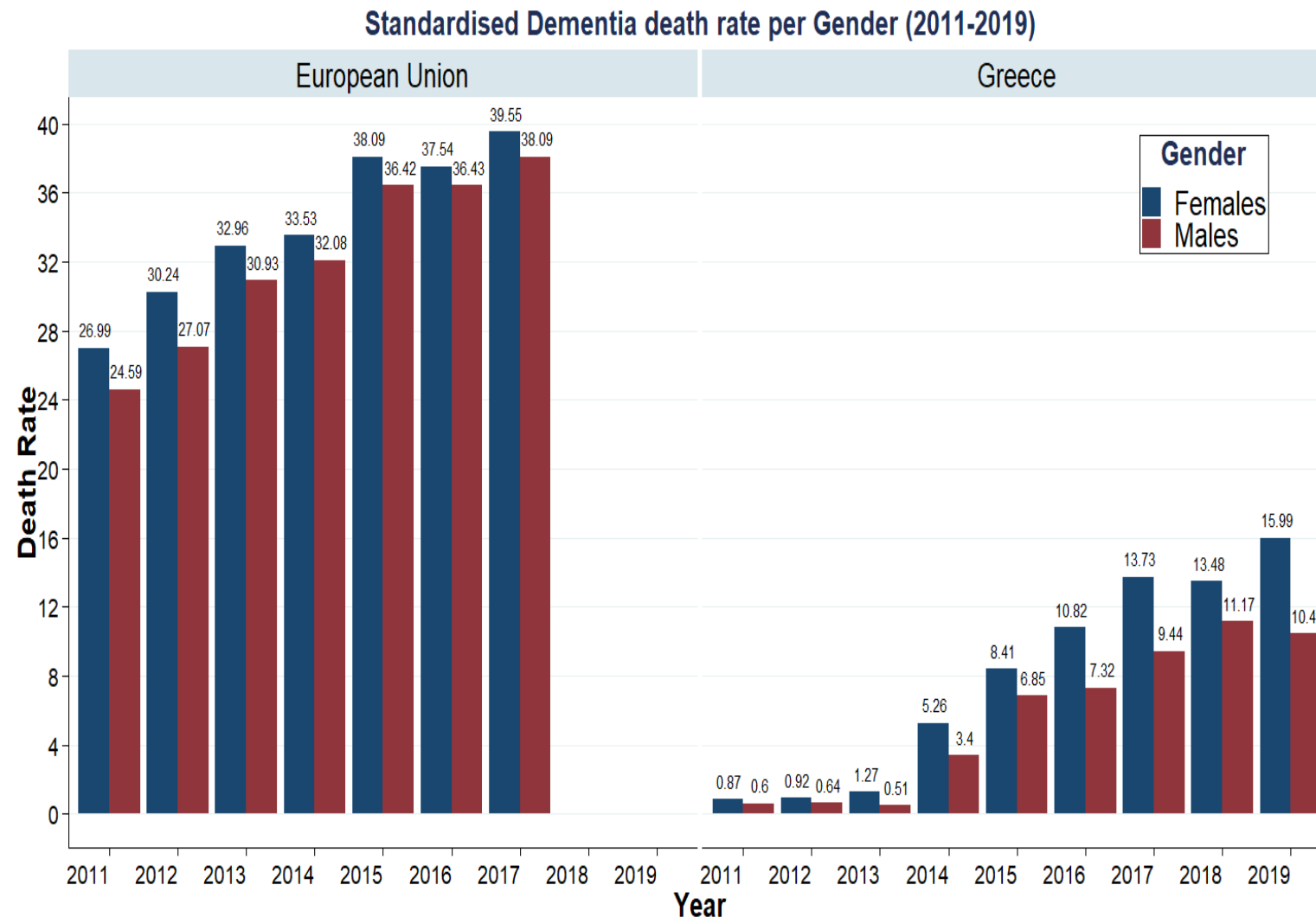
- Both Greece and Europe follow the same upward trend
- However, European Union has way higher death rate values



Less than 65 Years

- Death Rate of Europe remains steady throughout the years
- The death rate of Greece starts at low levels, but it passes over Europe's rate in 2015
- Greece has an abnormal increase in 2014 and 2014
- In 2016 and 2017, European Union and Greece have similar death rates

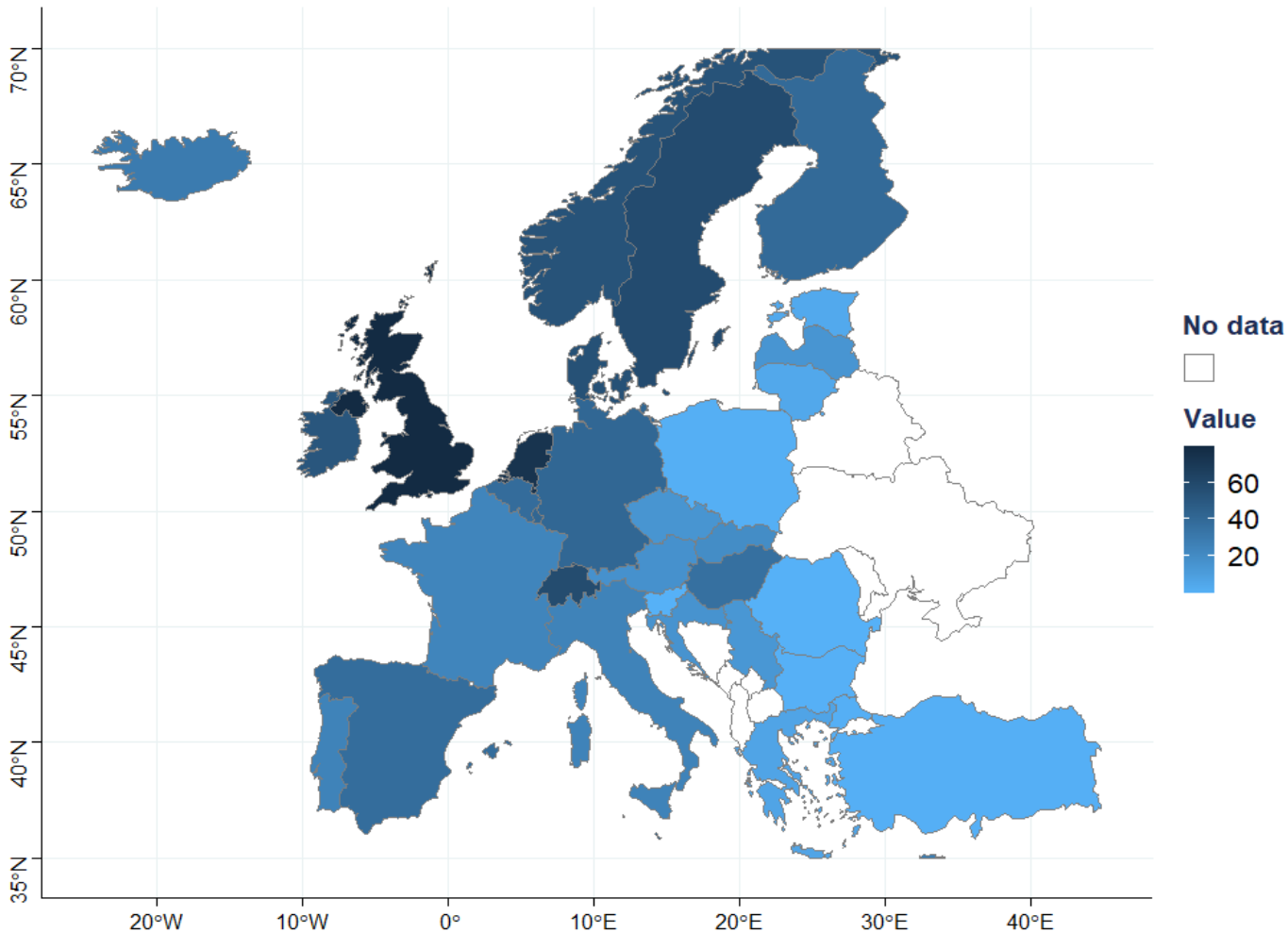
6. Dementia Death Rate in Greece vs European Union per Gender (2011-2019)



- Males and Females seem to have a climbing trend both in European Union and Greece
- As expected, European Union has higher death rates both in Males and Females compared to Greece
- Each year the dementia death rate is higher in females than males both in Europe and Greece
- Greece has bigger difference between the genders each year than the European Union
- Greece has an unusual increase after 2013 in death rates of both genders

7. Average Dementia Death Rate (Map)

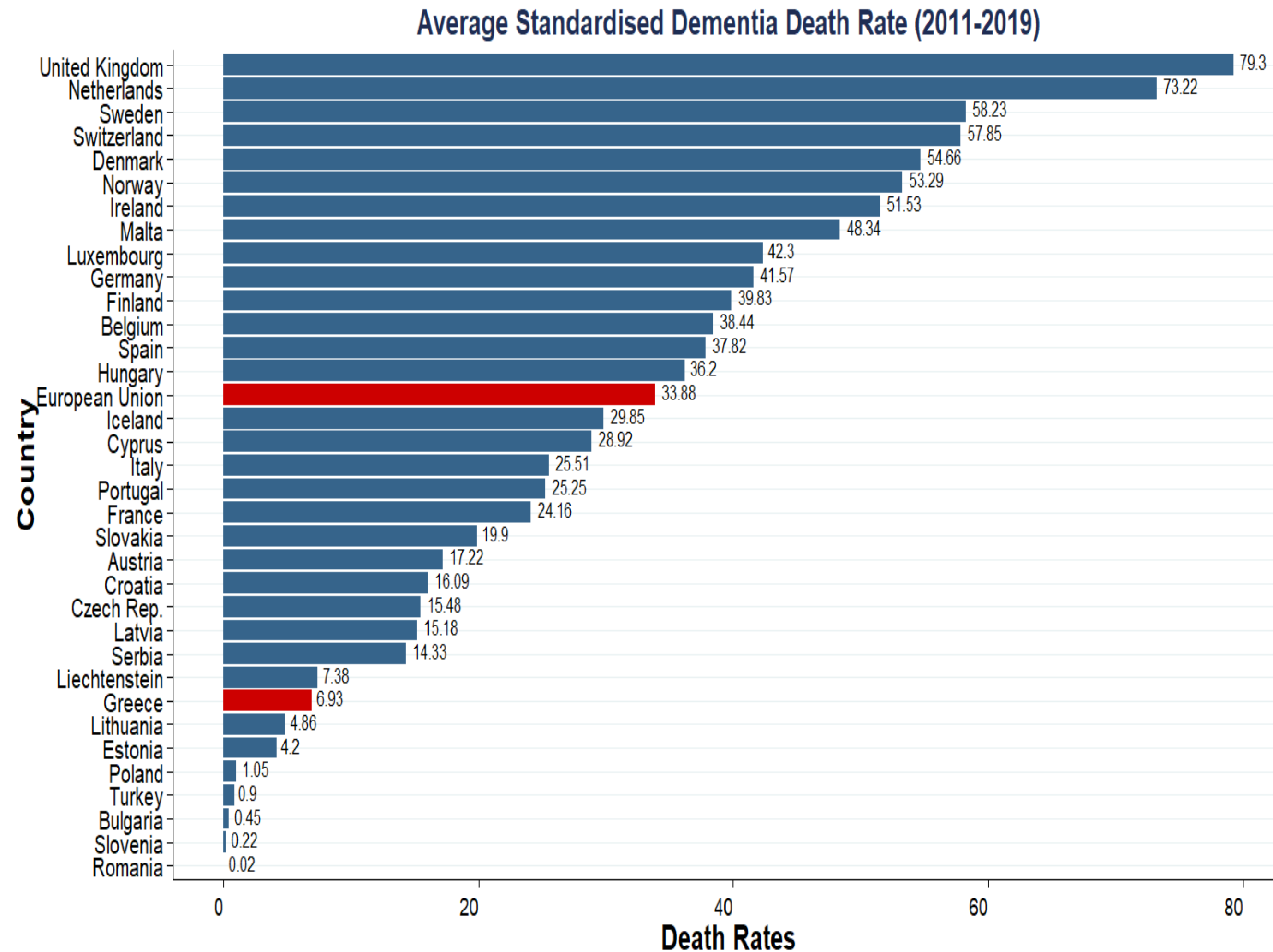
Average Standardised Dementia Death Rate (2011-2019)



Source: Eurostat

- The map depicts the average dementia death rate from year 2011 to 2019
- Greece belongs to countries with an average value below 20
- There are multiple countries with average value higher than Greece
- North-West countries have higher average values

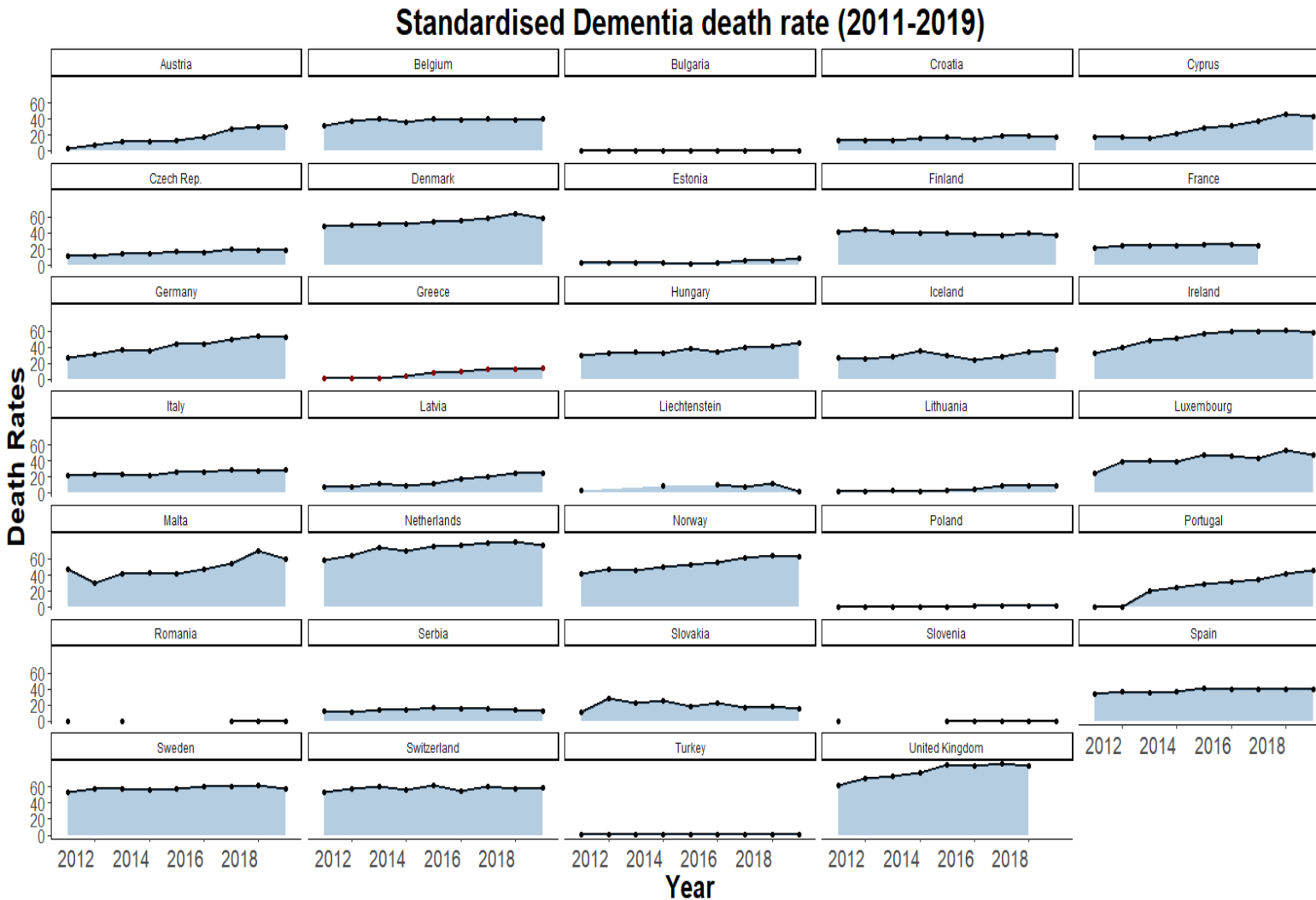
8. Average Dementia Death Rate (Barplot)



Source: Eurostat

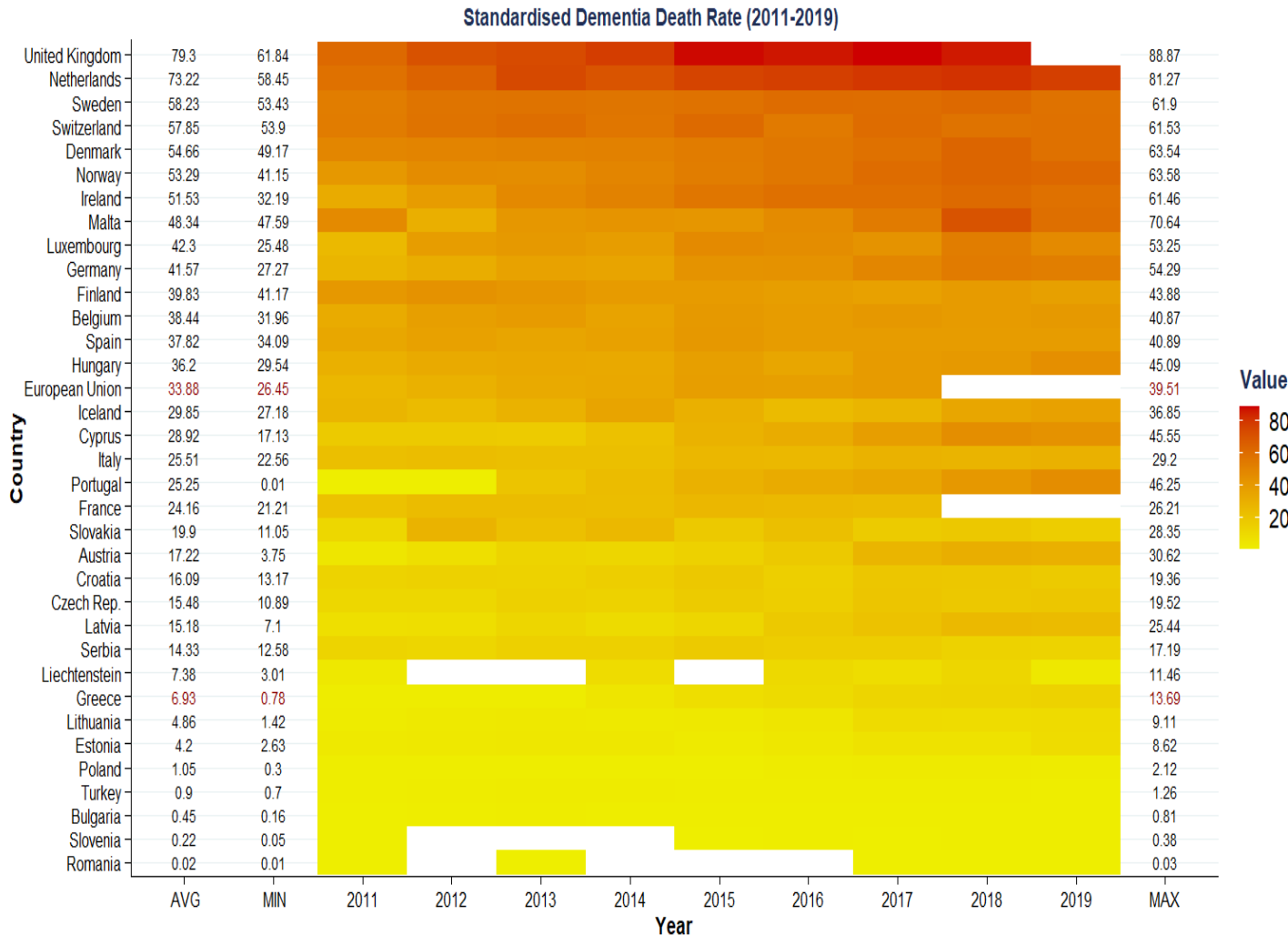
- A more detailed plot depicts the average dementia death rate with countries ordered by descending value
- Greece is one of the 8 countries with the lowest average value (6.93)
- It is also ranked way lower than the average value of European Union (33.88)

9. Dementia Death Rate (Trellis Plot) (2011-2019)



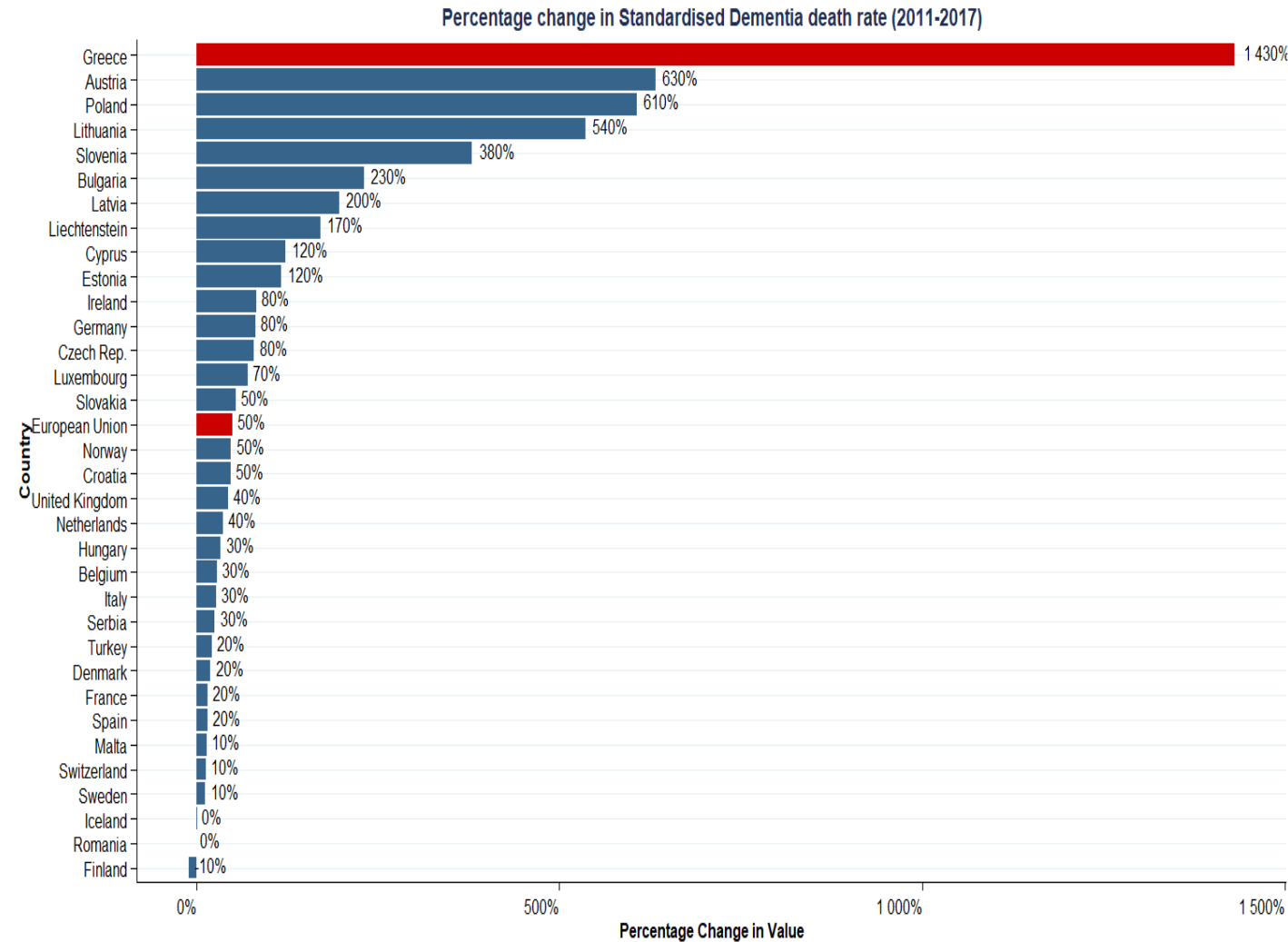
- The trellis plot depicts the trend line of standardized dementia death rate through the years of each Country
- It is observed that most countries have an uptrend
- Also, most countries have way higher values through the years compared to Greece based on the colored area of each graph

10. Dementia Death Rate (Heatmap) (2011-2019)



- The heatmap provides information about the minimum, maximum and average standardised dementia death rate value of each country
- The countries are ordered descending based on their average value
- The gradient colors depict the values throughout the years
- Again, Greece starts in 2011 with a low value and remains relatively low until 2019 compared to the most countries

11. Percentage Change in Dementia Death Rate (2011 vs 2019)

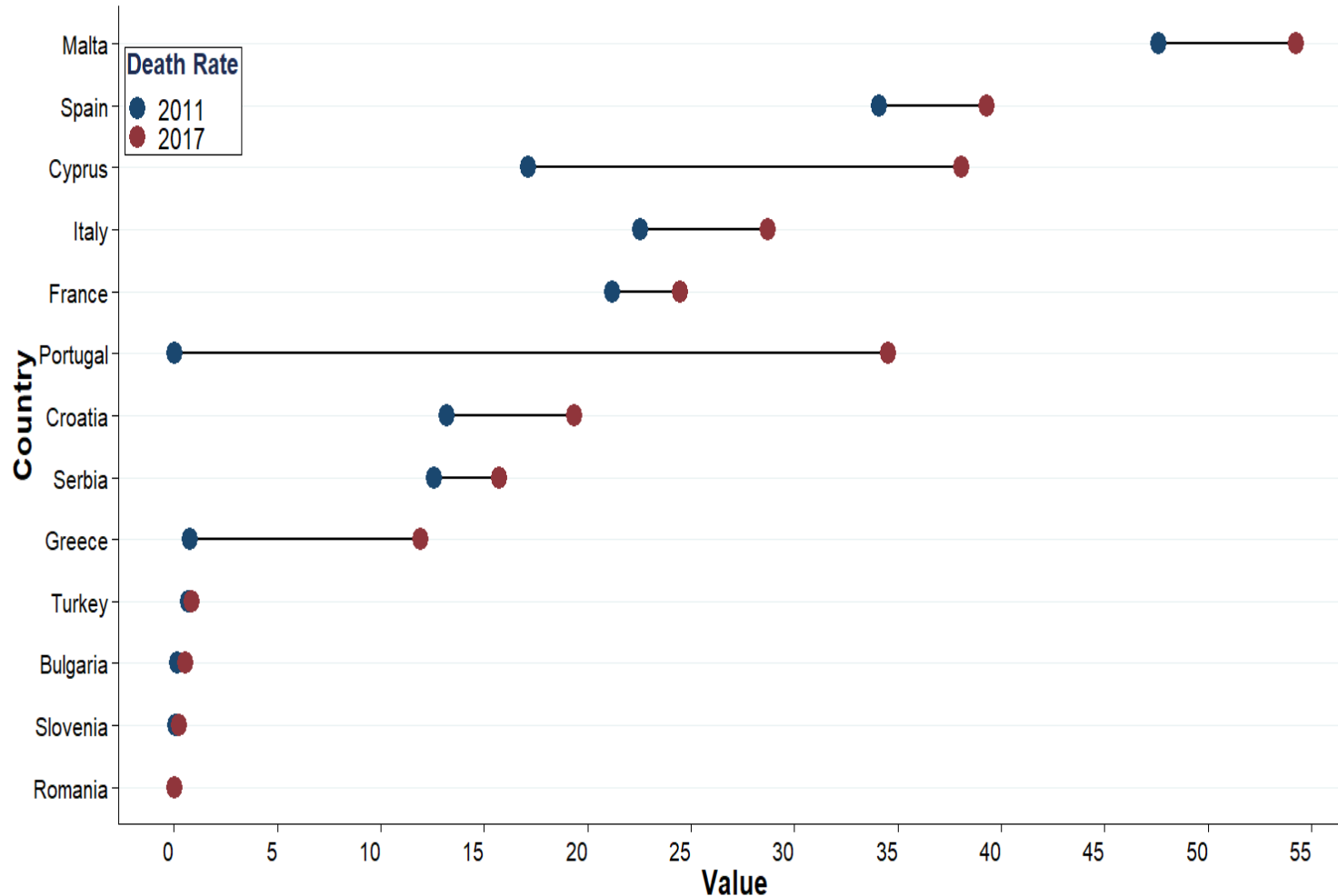


Source: Eurostat

- The percentage changes from 2011 to 2019 fluctuates from -10% to 1430% in the countries
- The percentage increase of European Union from 2011 to 2019 was 50%
- Despite the relatively low death rate values, Greece had its dementia death rate value multiplied 14 times compared to its value in 2011

12. Dementia Death Rate in Countries Similar to Greece (2011 vs 2017)

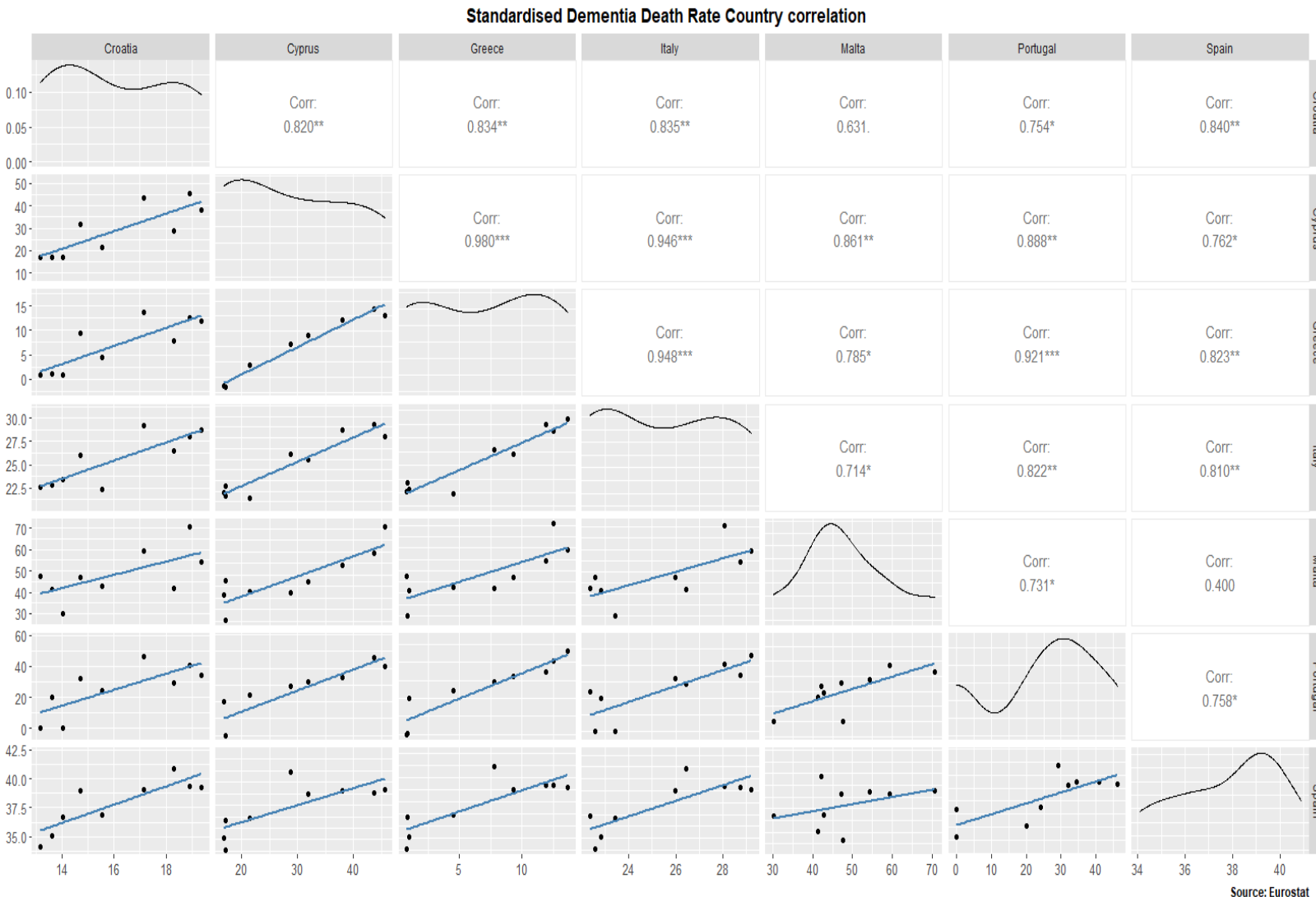
Standardised Dementia death rate in Mediterranean-Balkan Countries (2011-2017)



Source: Eurostat

- Similar countries were considered the European Mediterranean and Balkan countries
- The graph depicts the change of the dementia death rate value between 2011 to 2017 in each country
- We observe that Greece had a big change between these years, but the value of 2017 remained relatively low compared to the other countries
- Portugal and Cyprus had the biggest change in Value
- All the countries had a lower value in 2011 than 2017

13. Dementia Death Rate in Countries Similar to Greece (Correlation Plot)



- This graph is strictly presented for the course purposes, as the data sample is not sufficient for the calculation of correlation (also the relation may not be linear)
- The graph presents the correlation of some of the Balkan and Mediterranean countries
- Indeed, all these countries have a significant correlation with Greece based on the “Corr” value (correlation value)
- The higher the overlap of the points and the line, the higher the correlation between the countries is
- Based on the above, Cyprus and Greece have the highest correlation (follow the same trend)