



## Introduction

Nowadays our life is full of stress, bad food (most of it), not enough vitamins which affects the average length of life of the people on the planet. Our food is produced in greenhouses, using a lot of chemistry to preserve the food's "perfect" look or to produce bigger vegetables/fruits than their normal size, the animals that are being bred for food are fed with low quality or inappropriate food for their species, which affects the meat once they are slaughtered. That also has its influence over man's life. Food is produced for the mass without taking so much care about its quality. In addition to this, there's pollution, people breathe polluted air, which affects them slowly, but surely. Pollution causes respiratory and heart problems. All these factors together with stress, lack of physical activity etc. affects man's health in many different ways. People get sick of horrible diseases like different types of cancer, for example. People also eat a lot of fat, oils etc., which is a reason for coronary heart disease to be one of the most common reasons for death all around the Globe and unfortunately this does not even happen when the person is old, it happens often to people in middle age.

## Abstract

In this paper, we will be studying and analyzing the "black" statistics for causes of death and average expectancy (length) of life, depending on the country. Facts will be included about prevention from bad diseases that usually end with death. Data will be visualized and it will be interactive (in the excel files at the end of the paper) in order for the reader to be able to understand how dangerous is the way we live and to DO something TODAY to change their own life to make it healthier. These statistics are scaring and this is the greatest motivation for people to act immediately. The project will show an overview of the average life for all the countries in the world, but will concentrate on Europe for the rest of the analysis. The "white" analysis includes data for birth rate as well as European countries population review.

## Data Collection & Tools used

The raw data for the project has been collected from three main sources:

- World Bank Data (CSV) - <http://databank.worldbank.org/>
- World Life Expectancy (Manual download) - <http://www.worldlifeexpectancy.com/>
- Fertility statistics for EU (XLSX) - <http://ec.europa.eu/>
- Reasons for death per country - [http://ec.europa.eu/eurostat/statistics-explained/index.php/Causes\\_of\\_death\\_statistics](http://ec.europa.eu/eurostat/statistics-explained/index.php/Causes_of_death_statistics)

The tools, used for visualization:

- Bing Maps
- Graphs

## Tasks

1. Find the total number of children that would be born if every woman was to live to the end of her childbearing years and bear children in accordance with current age-specific fertility rates. Visualize male vs female population. Visualize total population vs population at the end of the year
2. Compare length of life in the earliest year for which there is available data to the latest year with data. Visualize this data by regions on a map. Collect, analyze and visualize deaths per year.
3. Analysis and visualization on the main causes of death in every EU country and number of casualties for each of them. Research on what can make us sick of some of the main diseases and medical advices for prevention for 3 of the main causes.

## Realization

### TASK 1

Find the total number of children that would be born if every woman was to live to the end of her childbearing years and bear children in accordance with current age-specific fertility rates. Visualize male vs female population. Visualize total population vs population at the end of the year

### Data

#### Available data:

- Death number per country in Europe, per year
- Fertility rates per woman per country in Europe

#### Additional data, collected for the analysis:

- Population by country - <http://data.worldbank.org/indicator/SP.POP.TOTL>
- Female population per country - <http://data.worldbank.org/indicator/SP.POP.TOTL.FE.ZS/countries>

### Method

Since there was no direct way to compare the birth rate to the death rate and the data I collected for fertility is per woman per year, a few additional steps were taken:

1. Search of data for the total number of people per country
2. Search of data of number of women per country. The data found was in percentage, instead of in number, so a few sub-tasks we done:
  - a. Combine the total population and female population in one Excel file
  - b. Select one year to work with (in this case 2013) and collect the population from the Total world population and the female population sheets into one single sheet with VLOOKUP formula
  - c. Convert the percentage of the women into a number by following the formula  $(\text{womenPercent} * \text{totalPopulation}) / 100$
3. Since we want to analyze just Europe, not the whole world, the region of every country was put in the analysis sheet, then all countries that were not in the region of Europe, were removed from the table.

- Fertility per woman was put in the table and finally converted in numbers by multiplying that per the total female population. This gives us a total fertility rate which represents the number of children that would be born if every woman were to live to the end of her childbearing years and bear children in accordance with current age-specific fertility rates.
- Then the deaths data was imported in the excel file and selected in the analysis table with VLOOKUP again
- Data visualization as per the task requirements was done.

## Outcome

After all the analysis has been done, the outcome of year 2011 is as follows:

	A	B	C	D	E	F	G	H	I
1	Country Name	Total Population	Female Population %	Female Population (number)	Region	Fertility per woman	Fertility Total	Deaths	Population EndOfYear
2	Germany	81,797,673	50.9	41,650,112	Europe & Central Asia	1.4	57,952,798	872,368	80,925,305
3	Italy	59,379,449	51.4	30,532,872	Europe & Central Asia	1.4	42,323,446	610,428	58,769,021
4	Spain	46,742,697	50.8	23,742,591	Europe & Central Asia	1.3	30,241,175	401,458	46,341,239
5	Poland	38,063,255	51.6	19,649,787	Europe & Central Asia	1.3	25,292,420	385,629	37,677,626
6	Netherlands	16,693,074	50.4	8,415,842	Europe & Central Asia	1.7	14,125,401	139,956	16,553,118
7	Belgium	11,047,744	50.9	5,624,533	Europe & Central Asia	1.8	9,847,207	108,435	10,939,309
8	Portugal	10,557,560	52.5	5,541,398	Europe & Central Asia	1.2	6,700,935	107,779	10,449,781
9	Czech Republic	10,496,088	50.9	5,339,717	Europe & Central Asia	1.5	7,771,691	108,085	10,388,003
10	Sweden	9,449,213	50.1	4,733,144	Europe & Central Asia	1.9	8,937,785	91,423	9,357,790
11	Austria	8,391,643	51.0	4,282,791	Europe & Central Asia	1.4	6,150,216	78,562	8,313,081
12	Switzerland	7,912,398	50.6	4,002,012	Europe & Central Asia	1.5	6,065,529	63,987	7,848,411
13	Bulgaria	7,348,328	51.4	3,775,305	Europe & Central Asia	1.5	5,587,149	109,184	7,239,144
14	Norway	4,953,088	49.8	2,464,422	Europe & Central Asia	1.8	4,383,369	42,068	4,911,020
15	Ireland	4,576,794	50.1	2,294,337	Europe & Central Asia	2.0	4,488,434	29,101	4,547,693
16	Lithuania	3,028,115	54.0	1,633,694	Europe & Central Asia	1.6	2,590,647	40,523	2,987,592
17	Macedonia, FYR	2,065,888	50.2	1,037,185	Europe & Central Asia	1.5	1,541,651	NO DATA	NO DATA
18	Latvia	2,059,709	54.2	1,116,806	Europe & Central Asia	1.5	1,700,885	29,099	2,030,610
19	Slovenia	2,052,843	50.4	1,034,671	Europe & Central Asia	1.5	1,599,818	19,031	2,033,812
20	Estonia	1,327,439	53.3	707,482	Europe & Central Asia	1.5	1,076,144	15,484	1,311,955
21	Montenegro	620,079	50.6	313,808	Europe & Central Asia	1.7	543,164	NO DATA	NO DATA
22	Luxembourg	518,347	50.0	259,101	Europe & Central Asia	1.5	401,383	3,842	514,505
23	Iceland	319,014	49.8	158,977	Europe & Central Asia	1.9	307,254	NO DATA	NO DATA
24	Liechtenstein	36,537	0.0	NO DATA	Europe & Central Asia	1.5	NO DATA	217	36,320

Figure 1 – Collected data

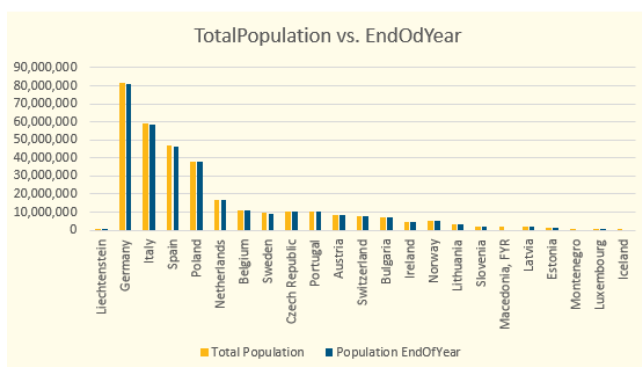


Figure 2.1 – Total Population vs. End of Year

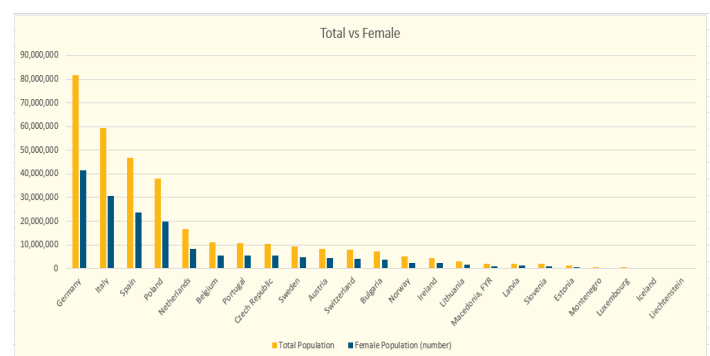


Figure 2.2 – Total Population vs. Women

The first analysis includes the population by country at the beginning of year 2013 and at the end of the same year, based on the reported number of people who passed away that year. Clearly visible is that a

small percent or no loss has happened in most of countries which is generally a good sign. As expected, the biggest loss happened in the countries with biggest population.

Another, more interesting fact, is that women are a higher percent in most countries, except for Norway and Iceland where they are 1% less than men. This statistics is visualized on figure 2.2.

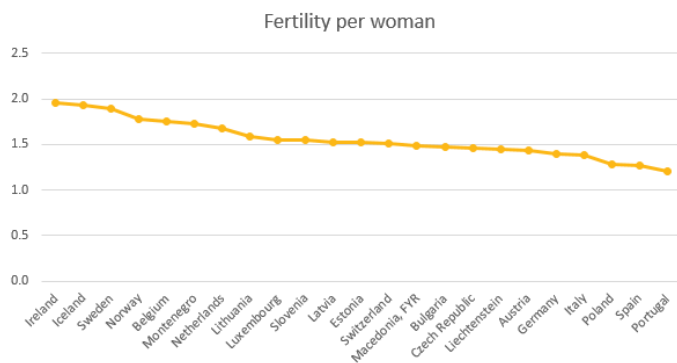


Figure 3.1 – Fertility per woman in 2013

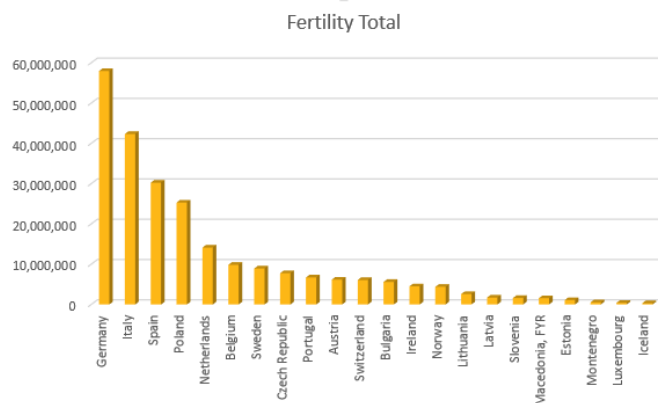


Figure 3.2 – Total fertility rates

In regards to the “white” side of the statistics for people’s life, there’s room for births analysis, i.e. fertility analysis. In Europe, the average for giving a birth of a child is approximately 1.55 per woman (data from 2013). What drags down the line, are countries with lower standard of life, where people cannot afford to have more than one kid due to financial issues. In contrary, countries with higher income such as Ireland, Sweden, Norway, can afford to have more kids and thus their average “kid per woman” rate is around 2.

Eurostat compiles information for a large range of demographic data and the data, exported from there helped to make a statistic about the total fertility per country if we assume that every woman would have a child as per the current fertility rates. The total fertility rate was 1.47 live births (meaning babies born alive and surviving after birth) per woman in the EU in 2003. A slight increase was subsequently observed in most EU Member States, with the EU average increasing to 1.62 live births per woman up to 2010, but then decreasing to 1.55 in 2013.

## TASK 2

Compare length of life in the earliest year for which there is available data to the latest year with data. Visualize this data by regions on a map. Collect, analyze and visualize deaths per year.

### Data

Statistics was made over the average length of life in the countries around the world. The statistics on the total number of people who died are concentrated mainly on the recent years.

#### Available data:

- Average length of life for period 1960-2013
- Countries with regions

#### Additional data, collected for the analysis:

- Number of people died in 2011 and 2013

### Method

Due to a lack of more recent information on the researched aspects, the most recent year with data is 2013 and most of the statistics are about 2013.

Data collected for average length of life is for the period of years 1960 – 2013. As the difference is not so big for the recent 5 years, the data was filtered for years 1960 and 2013 to get the biggest possible time frame to analyze on. The data was separated in regions, analyzed with Pivot tables and visualized on a World map with an add-in for Excel, called Bing Maps. A few steps were performed in the process:

1. The Table with the countries was connected through a VLOOKUP function to the regions from the sheet with the Regions.
2. The data for average length of life was added in a pivot table as well as the data for the regions with the countries.
3. The analysis was separated in regions, so every region has its own sheet with the region of countries selected, and years 1960 and 2013 filtered for the analysis.
4. The data was visualized with the help of the “Bing Maps” plug-in for Excel

### Outcome

As most of the analysis is for Europe, we will show results from the data analysis of this task for the whole world (figure 4.1 and 4.1) and for Europe (figure 5).

The average length of life was visualized on a world map for 1960 and for 2013 years to get the biggest possible time frame, so that the difference would be visible as the change happens slowly and is not so well visualized in the years 2000-2013, for example.

A good fact is that the expected years of life has increased for the past 50 years. Although most babies born in 1900 did not live past age 50, life expectancy at birth now exceeds 84 years in Hong-Kong, China, which is the current leader - and is above 80 years in 33 other countries. Less developed regions of the



world have experienced a steady increase in life expectancy since World War II and there are a few countries where the expectancy of life has not increased at all or has decreased. Only one country has it's expectancy of life decreased as per our data and that is Botswana. For the countries with no data for 1960, I have compared with the earliest possible year with data and fortunately, there were no more decreasing results.



Figure 4.1 – World Life Length / part 1



Figure 4.2 – World Life Length / part 2

Country	Years Life (1960)	Years Life (2013)
Albania	62	78
Austria	69	81
Belgium	70	80
Bosnia and Herzegovina	60	76
Bulgaria	69	74
Croatia	65	77
Cyprus	70	80
Czech Republic	70	78
Denmark	72	80
Estonia	68	76
Faeroe Islands		81
Finland	69	81
France	70	82
Germany	69	81
Greece	68	81
Hungary	68	75
Iceland	73	83
Ireland	70	81
Italy	69	82
Kosovo		71
Latvia	70	74
Liechtenstein		82
Lithuania	70	74
Luxembourg	68	82
Macedonia, FYR	61	75
Moldova	62	69
Montenegro	64	75
Netherlands	73	81
Norway	74	81

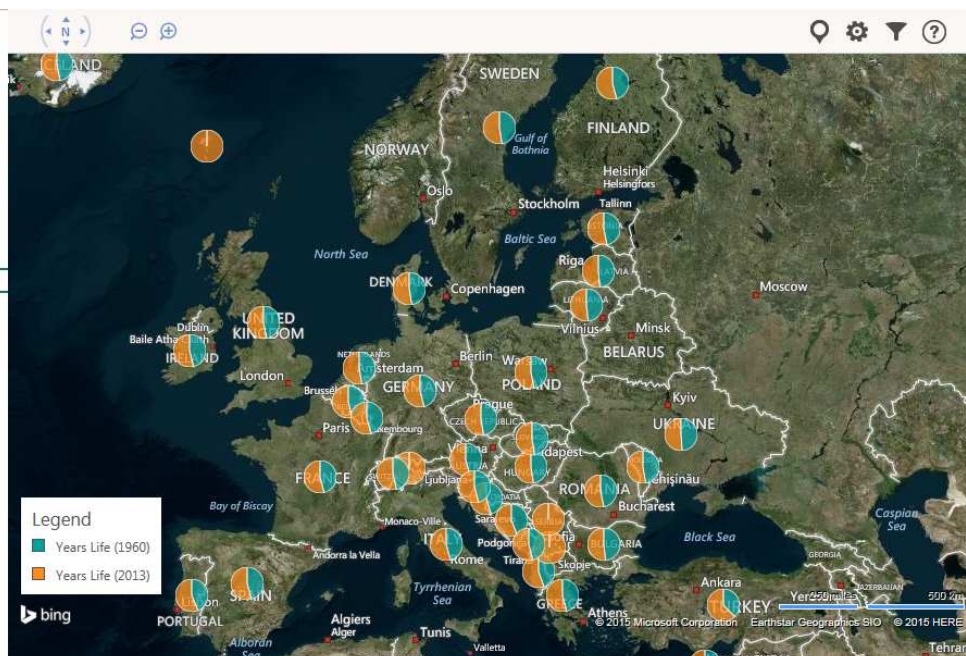


Figure 5 – Europe Life Length



Data for total deaths per country for 2013 was visualized on figure 5.1 – Total, Figure 5.2 – Men and Figure 5.3 – Women.

Germany is leading, followed by United Kingdom, Italy and France. This order is normal since the order is the same when talking about the total population in each one of these countries.



Figure 5.1 – Death rates Women

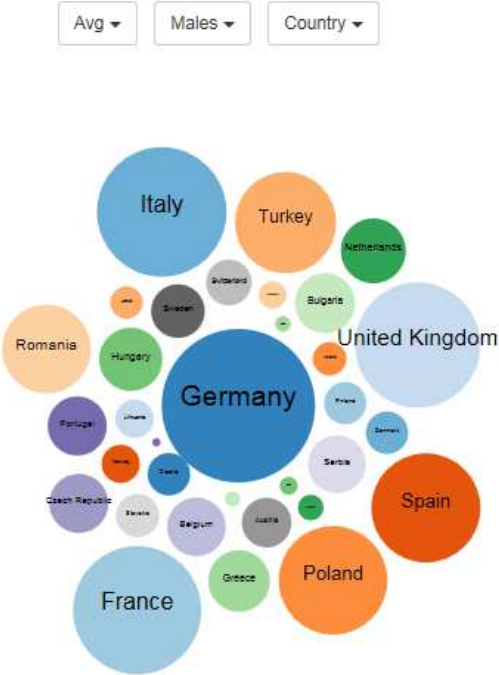


Figure 5.2 – Death Rates Men



Figure 5.3 – Death Rates Total

### TASK 3

Analysis and visualization on the main causes of death in every EU country and number of casualties for each of them. Research on what can make us sick of some of the main diseases and medical advices for prevention for 3 of the main causes.

#### Data

##### Available data:

- Population by country (from Task 1) - <http://data.worldbank.org/indicator/SP.POP.TOTL>
- Reasons for death per country - [http://ec.europa.eu/eurostat/statistics-explained/index.php/Causes\\_of\\_death\\_statistics](http://ec.europa.eu/eurostat/statistics-explained/index.php/Causes_of_death_statistics)

#### Method

Analysis and visualization on the main causes of death in every EU country and number of casualties for each of them. Research on what can make us sick of some of the main diseases and medical advices for prevention for 3 of the main causes.

Statistics on the causes of death are based on two pillars: medical information contained on death certificates, which may be used as a basis for ascertaining the cause of death; and the coding of causes of death following the WHO-ICD system. All deaths in the population are identified by the underlying cause of death, in other words 'the disease or injury which initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury' (a definition adopted by the World Health Assembly) [1]

#### Outcome

The data collected and analyzed shows that by far the most common reasons for death, are circulatory diseases (some of which are angina, arrhythmia, atherosclerosis, cardiomyopathy, congenital heart defect, coronary artery disease, hypertension, hypercholesterolemia, and peripheral vascular disease) and cancers are two of the main reasons for death.

For instance let's take a look at Bulgaria's stats: it is clearly visible that from all the reasons for death more than 60% of the scale is taken by the blue line of the circulatory diseases, which is quite scary as these disease could be prevented if people exercise more often, do not smoke, drink less alcohol and avoid foods like butter, dairy products, etc. Fat and cholesterol get deposited in the arteries, and cause blockages in the proper circulation of blood. People should avoid eating junk food. Reduce the oil consumption, and use only refined oils.

Another example is Liechtenstein which has the highest percentage of deaths because of cancer, compared to the rest EU countries. We should consider of course, that Liechtenstein's population is also much less than in the rest of the countries. Still, this is a scaring statistic which should make us think about our health more. There's no magic bullet to preventing cancer, but research has shown that up to 2/3 of cancer deaths are caused by smoking, physical inactivity and poor diet choices.

Heart Disease where some of the diseases include blood vessel diseases, heart rhythm problems, congenital heart defects and others. Many forms of heart disease can be prevented or treated with healthy lifestyle choices.

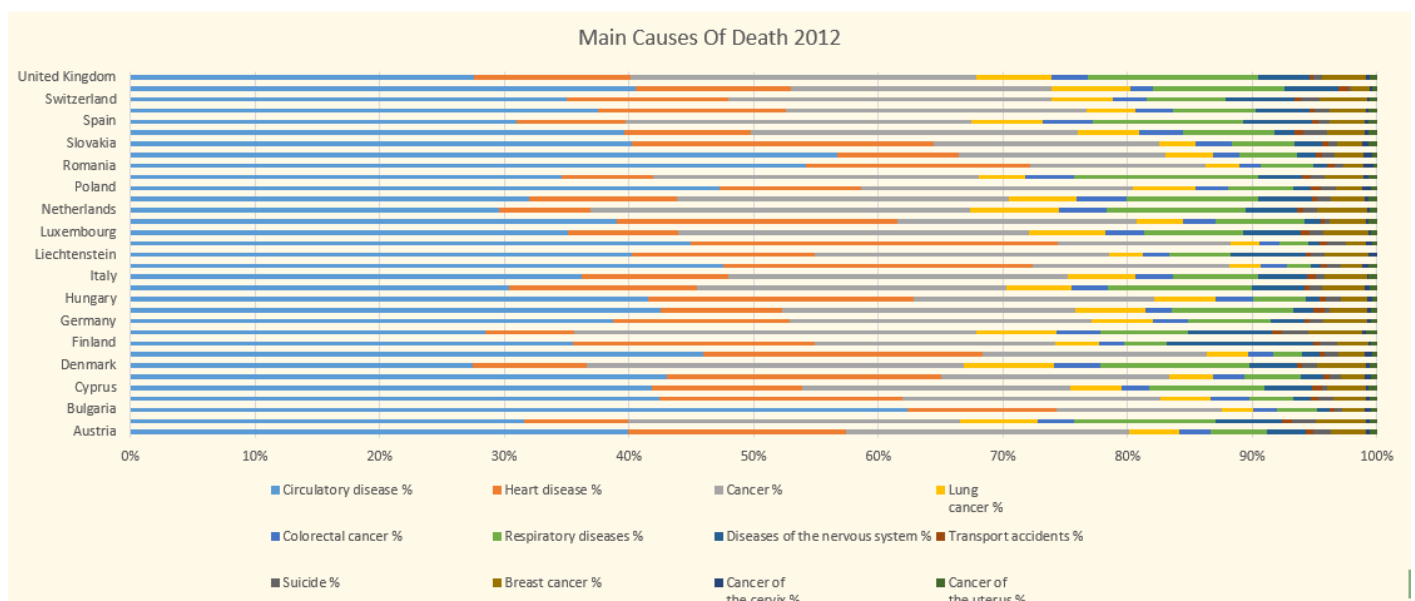


Figure 6 – Causes of Death 2012

## Final Thoughts

Working with open source data might be tricky as collecting various data from different sources, can have its disadvantages in the sense of lack of information, which one needs for research and analysis and in this case and many additional steps should be performed in order to get the desired result.

The demographics of Europe aren't overall as bad as expected, however the death rates could be reduced, specifically when it comes to the healthcare. Today, the medicine is more advanced than ever before, thousands of clinical trials are in progress all the time, testing drugs on sick people and showing progress. It is proven again in these studies that the placebo effect phenomenon really happens and many of the sicknesses are just in the mind of the people and they can beat them if they believe. The way people think can beat or at least stop the spread of a horrible sickness like cancer. The way of thinking stimulates the patient's system to "defend" itself.

Another great fact is that the average life has increased significantly in most of the countries, compared to 1960. During the 20th century, life expectancy rose dramatically amongst the world's wealthiest populations from around 50 to over 75 years. This can be attributed to a number of factors including improvements in public health, food and medicine. Vaccinations and antibiotics greatly reduced deaths in childhood, health and safety in manual workplaces improved and fewer people smoked. [2]

As a final conclusion, we should hope that the fertility rate per country will only increase from now one, which depends on many factors and that cures for some of the worse diseases will be found soon and that would spare millions of lives throughout the whole world.

## Spreadsheets

Spreadsheet with all the analysis	
Task 1	Includes: Formulas and charts
<a href="https://drive.google.com/file/d/oBof_HjNBQoAmZTg1N2xnb3dESGs/view?usp=sharing">https://drive.google.com/file/d/oBof_HjNBQoAmZTg1N2xnb3dESGs/view?usp=sharing</a>	
Task 2	Includes: Macros, Bing Maps add-in
<a href="https://drive.google.com/file/d/oBof_HjNBQoAmU3RVdmR2cU9wU1k/view?usp=sharing">https://drive.google.com/file/d/oBof_HjNBQoAmU3RVdmR2cU9wU1k/view?usp=sharing</a>	
Task 3	Includes: Formulas and charts
<a href="https://drive.google.com/file/d/oBof_HjNBQoAmWDIEFENRQlZaQXM/view?usp=sharing">https://drive.google.com/file/d/oBof_HjNBQoAmWDIEFENRQlZaQXM/view?usp=sharing</a>	

## References

[1] [http://ec.europa.eu/eurostat/statistics-explained/index.php/Causes\\_of\\_death\\_statistics](http://ec.europa.eu/eurostat/statistics-explained/index.php/Causes_of_death_statistics)

[2] <http://www.rgs.org/OurWork/Schools/Teaching+resources/Key+Stage+3+resources/Who+wants+to+live+forever/Why+are+people+living+longer.htm>