

The between the x  
and y values. this



The Relationship Between Life Expectancy at Birth and Income Index in The Netherlands

Geography and Mathematics IDU Amélie Van Craen IS9a8

pages Word count: 1488

Life expectancy at birth shows the overall mortality level of a population of a certain country. It indicates the expected average age a newborn will reach if the current mortality rates continue to apply to him/her. The table below shows the life expectancy at birth in the Netherlands between 1980 and 2015.

Table 1: Life expectancy at birth in the Netherlands (1980-2015)

Year	Life expectancy at birth (in years)
1980	75.7
1985	76.5
1990	77.0
1995	77.7
2000	78.0
2005	79.2
2010	80.1
2015	81.0

5199077. 0199577. 0200078. 2200579. 4201080.

6201581. 0

The scatter graph below shows the relationship between the life expectancy at birth in the Netherlands and the year (1980-2015).

(Scatter)

Graph 1: Life expectancy at birth in the Netherlands (1980-2015) (Scatter)

Graph 1. 1: Life expectancy at birth in the Netherlands (1980-2015) (zoomed in with best-fit line)

This graph shows that there is a strong positive correlation between the x and y values.

This means that when the x-value increases (a year goes by), the y-value increases as well. This can be proved by calculating  $r$ , which is positive 0.979.

To determine the strength of the correlation, which means how strongly one variable affects the other, I must calculate  $r^2$ , which is 0.9584 in this data's case. The data plotted on the scatter graph (see: graph 1 and graph 1. 1) follows the best fit line fairly well. There do not seem to be any visible outliers in this data set, but this can also be proved using an equation. IQR =

Interquartile range  $IQR = Q3 - Q1$  Now using the life expectancy at birth data:

$$Q1 = (8+1)/4 = 2.25 \text{th number} = 76.9 \quad Q3 = (3 \times (8+1))/4 = 6.$$

75th number = 79.7  $IQR = 79.7 - 76.9 = 2.8$  years Now to find if there are any outliers: Lower fence:  $Q1 - IQR \times 1.5$

$= 72.7$  Upper fence:  $Q3 + IQR \times 1.5 = 83.9$  As the lower fence is smaller than the lowest data in the data set for life expectancy at birth in the Netherlands ( $75.7 > 72.7$ ), and the upper fence is larger than the highest data in the data set for life expectancy at birth in the Netherlands ( $81.0 < 83.9$ ),

there are no outliers in this data set. Graph 2: Life expectancy at birth in the Netherlands (1980-2015) Box & Whisker Plot This data has no outliers, and has a very strong and steady positive correlation between the x and y values. This is because the Netherlands is one of the leading countries in Europe in the field of medicine with 2 universities ranked in the top 30 in the world for the subject medicine, and 2 universities following behind in the top 60 of the world. ("QS World University Rankings by Subject 2016 - Medicine.") For healthcare in general, the Netherlands was ranked number one in Europe, due to many factors.

One of the reasons healthcare is so successful in the Netherlands is that more and more Dutch residents have been learning and speaking English, making it easier for foreigners to access healthcare easily as there is less of a language barrier. The Netherlands also puts a lot of importance on health insurance, so much so that it's mandatory to have in the Netherlands. Dutch residents spend around 1,200 euros on health insurance each year. ("

Healthcare in the Netherlands.”)Predicting the life expectancy at birth for the years 1950, 2025, and 2050To get a prediction as to what the life expectancy at birth would be for the year 1950, 2025, and 2050, you must extrapolate the values from the best fit line according to the x-values, as those are the values that you already know. According to the best-fit-line, in 1950 the life expectancy at birth in the Netherlands would be 70. 7 years, in 2025 the life expectancy at birth would be 82.

5 years, and in 2050 the life expectancy at birth would be 86. 5. However, in 1950 there was a Cold War going on, which means that there were a lot of young male soldier dying on the battlefield, affecting the average data greatly and unfairly, as they didn't die of health issues but of manslaughter. This was was the reason that there is not much data on the life expectancy and the years of schooling, for example, as it was such a hectic and tough period in history to be able to collect valid and reliable data. Also, with the way technology is said to be in the future, it is unknown if we will have some form of technology to lengthen our life expectancy or to allow us to live an immortal life. It is always difficult to give reliable predictions for the future as it is unknown what events might occur at that point in time in the future.

Graph 3: Life expectancy at birth in the Netherlands (1980-2015) scatter graph with best-fit-line The GNI per capita (Gross national income) is the dollar value of a country's income in a year divided by the country's population. This gives a good overview of the average income of the citizens in a certain country.

The table below shows the GNI per capita in the Netherlands between 1980 and 2015. Table 1: GNI per capita in the Netherlands (1980-2015)YearGNI

<https://assignbuster.com/the-between-the-x-and-y-values-this/>

per capita in the

Netherlands 1980 26145 1985 26979 1990 30365 1995 35209 2000 40063 2005 41

0662010422942015 42397 The scatter graph below shows the relationship

between the GNI per capita in the Netherlands and the year (1980-2015).

(Scatter) Graph 1: GNI per capita in the Netherlands (1980-2015) This graph

shows that there is a very strong positive correlation between the x and y values, as the best fit line seems to be going up almost completely vertically.

This means that when the x-value increases (a year goes by), the y-value

increases as well. The data plotted on the scatter graph (see: graph 4)

follows the best fit line seemingly perfectly, but you can always check for

outliers with the same equation as with the life expectancy data:  $IQR =$

Interquartile range  $IQR = Q3 - Q1$  Now to find if there are any outliers: Lower

fence:  $Q1 - IQR \times 1.5 = 19701.5$  Upper fence:  $Q3 + IQR \times 1.5 = 92205.5$

5 As the lower fence is smaller than the lowest data in the data set for GNI per capita in the Netherlands ( $26,145 > 19701.5$ ), and the upper fence is

larger than the highest data in the data set for GNI per capita in the

Netherlands ( $42,397 < 92205.5$ ), there are no outliers in this data set.

Graph 5: GNI per capita in the Netherlands (1980-2015) Box & Whisker

Plot This data has no outliers, and has a very strong and steady positive

correlation between the x and y values. The reason for this is that the

Netherlands has the 4th most wealthy population in the world.

This is mainly due to the world famous harbor in Rotterdam which brings in

hundreds of millions of euros each year through trade, exporting, and foreign

investments. Many countries rely heavily on this port in the Netherlands,

especially Germany for example, who uses that port in Rotterdam to

<https://assignbuster.com/the-between-the-x-and-y-values-this/>

transport their goods very regularly. This kind of trade has always been part of the Netherlands, for example the VOC which was also an economical breakthrough at the time. ("Why Is the Netherlands so Rich?") Predicting the GNI per capita for the years 1950, 2025, and 2050 To get a prediction as to what the GNI per capita would be for the year 1950, 2025, and 2050, you must extrapolate the values from the best fit line according to the x-values, as those are the values that you already know. According to the best-fit-line, in 1950 the GNI per capita in the Netherlands was 9656, in 2025 the GNI per capita would be 50447, and in 2050 the GNI per capita would be 63976. However, in 1950 there was the Cold War, which dramatically affected the economic standing of the residents in the Netherlands. A GNI of 9656 is extremely unrealistic when taking the time period and the events that took place in that year into account. The Cold War was the reason that there is not much data on the GNI per capita and life expectancy at birth, for example, as it was such a hectic and tough period in history to be able to collect valid and reliable data.

Citations: "A Peaceful Europe - the Beginnings of Cooperation - European Union - European Commission." European Union, 9 May 2017, [europa.eu/european-union/about-eu/history/1945-1959\\_en](http://europa.eu/european-union/about-eu/history/1945-1959_en).

"Healthcare in the Netherlands." Healthcare | Expatica the Netherlands, [www.expatica.com/nl/healthcare/Healthcare-in-the-Netherlands\\_100057.html](http://www.expatica.com/nl/healthcare/Healthcare-in-the-Netherlands_100057.html). "QS World University Rankings by Subject 2016 - Medicine.

"Top Universities, 22 Nov. 2016, [www.topuniversities.com/university-rankings/university-subject-rankings/2016/medicine](http://www.topuniversities.com/university-rankings/university-subject-rankings/2016/medicine)." Why Is the Netherlands

<https://assignbuster.com/the-between-the-x-and-y-values-this/>

so Rich?" Tourist Maker, [www.touristmaker.com/blog/why-is-the-netherlands-so-rich/](http://www.touristmaker.com/blog/why-is-the-netherlands-so-rich/).