Bachelor Thesis

Life expectancy development
Case Study: Serbia and Slovenia

The Breaking of Yugoslavia: Life Expectancy Differences and Avoidable Mortality

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Summary

Around 30 years ago, Yugoslavia split up into five different and independent nations. Today there are a lot of development differences between these countries, which indicates that there has been divergence between the former republics of Yugoslavia. Two of these former republics, Serbia and Slovenia, form the focus point of this thesis.

It has become apparent in multiple literature studies that life expectancy is a factor that is closely linked to the socioeconomic development of nations. Quality and accessibility of healthcare, good education, available resources for a healthy lifestyle, and good healthcare policies are all factors linked to this. To what extent are people dying from causes which could have been avoided, and which factors are most vital in this? These questions stand central in this comparative study between Slovenia and Serbia.

The objective of this thesis is to see how the life expectancies of both Slovenia and Serbia have developed from the point they became independent.
The following main question is formed to research this matter:

How have life expectancies of Serbia and Slovenia developed, after the collapse of the Yugoslavian republic?

To answer this question, data from the WHO and United Nation Population division is used. This data provides information on how the life expectancies of both Serbia and Slovenia have developed over time, and which causes of death contributed to the convergence and divergence in life expectancy between these two nations. Existing literature is used to give insight on the tendencies relating to convergence and divergence between Slovenia and Serbia.

The results of this research showed that, when Slovenia and Serbia became independent nations, their life expectancy was almost equal. However, in the period after, the life expectancy of the countries diverged. The analysis of data regarding avoidable mortality, suggests that Serbia struggled more to diminish avoidable death rates, than Slovenia did. This resulted in diverging life expectancies. The existing literature also indicates that during the period that both countries became independent, Serbia had more difficulty in establishing an efficient economy for its people than Slovenia, resulting in inferior healthcare, policies, and income per capita.

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1: Introduction

1.1 Background
Eastern European economic- and social developments have long been perceived as secondary in comparison to Western Europe. However, during the last two decades there has been a change in this tendency. More and more Eastern European countries have, for example, joined the European Union, which brought them more economic and political stability (Bideleux, 2009). Slovenia and Croatia were also nations, formerly part of the Eastern European political block, where this tendency of increasing development is visible. However, not all countries of Eastern Europe are this successful, there is a clear divergence going on; some countries are developing in rapid speed, were others are stagnating (Crowley & Stanojevic, 2011). A research of Armenski et al. (2009) showed for example that the perception of tourists about Serbia was relatively negative. The country was associated with words as: 'wars', 'unsafe', 'danger', 'poverty' and 'sadness'. This example suggests that there is a clear divergence in development between on the one hand Slovenia and Croatia, and on the other hand the other countries of former Yugoslavia. How has this divergence come to be, and how grave are these differences in reality?

A tool to investigate this, is the life expectancy concept. Life expectancy, as will be shown in the later chapters, is a concept that is influenced by a multi-variety of factors related to development. Through comparing the life expectancies of both Serbia and Slovenia, a multi-variety of factors will be researched. By doing this, one can gain a better understanding behind the diverging forces of these once united countries.

It will become clear how differences in nation-state policies will affect the life expectancy of these respective countries. On top of this, investigating developments in life expectancy of states formerly part of Yugoslavia will add to the existing literature on this topic. This study fills a gap in the literature by analysing both the present, as the Yugoslavian period of both Serbia and Slovenia. By doing this a possible link between these periods in life expectancy development can be made.

1.2 Research problem
After the fall of the dictator Tito, the different ethnic groups of Yugoslavia were involved in a succession of violent wars. The wars lasted between 1991 and 1999. This conflict lead to the separation of different ethnic groups, and to the formation of different nation-states. The once unified republic, was separated in the following sovereign nations: Slovenia, Serbia, Bosnia-Herzegovina, Croatia and Macedonia (Meier, 1999).

Just after the Second World War, when Yugoslavia was just formed as a new communist republic, the quality of life was poor. The 1950 life expectancy highlighted this, it was 54.8 years for men, and 56.8 years for women. This was significantly lower than the life expectancy of other Eastern European countries. However, through time this situation changed, in 1985, a few years before the republic collapsed, the life expectancy was increased to 68.3 years for men and 73.6 for women (Ananijevic-Pandey, 1994).
After the collapse of Yugoslavia, each separated country developed in a different speed and way. The different countries diverged in development, which was visible in differences in economy and healthcare (Bookman, 1994). This divergence can also be seen through an increasing life expectancy divide. The two extremes regarding life expectancy of former Yugoslavia are nowadays Serbia and Slovenia. With Slovenia being the positive extreme with a life expectancy of 80.1 years, and Serbia the negative with 74.6 years (these numbers are for both sexes combined, and both data are relative to 2015) (UNdata, 2017). The question is: which factors have contributed to the divergence of these two extremes; Serbia and Slovenia?

Life expectancy is a concept that is influenced by numerous factors, mostly related with economy and health (Vallin & Meslé, 2005). So, how did difference in policies, healthcare, and behaviour influence life expectancy divergence between Serbia and Slovenia? The objective of this thesis is to see how the

two nations of Serbia and Slovenia differed within their progress of life expectancy, after their separation of Yugoslavia. This objective will be achieved through comparing these two nations, by answering the following central research question:

How have life expectancies of Serbia and Slovenia developed, after the collapse of the Yugoslavian republic?

The information to answer this central research question will be obtained through answering the following sub questions:

1) How did the situation of Serbia and Slovenia before the collapse of Yugoslavia reflect any differences in life expectancy?

2) To what extent did avoidable mortality affect life expectancy differences between Serbia and Slovenia after their sovereignty?

3) Which were the major factors that influenced differentiated life expectancy between Serbia and Slovenia?

By answering these questions, a comparative analysis regarding life expectancy developments between Serbia and Slovenia can be made. This analysis will provide a better understanding of the differences in development between the countries of former Yugoslavia.

1.3 Structure of the thesis
This thesis is structured as follows: in chapter 2 the theoretical framework will be discussed, in this chapter the relevant concepts and theories to this thesis will be analysed. In chapter 3 the methodology for the thesis will be set out. It will be explained how and which data is used for the analysis. In chapter 4 the results of the research will be discussed, this in order to answer the questions central to this research. Chapter 5: the conclusion, will summarise the results given in chapter 4 to give an answer to the main question of this research.

2: Theoretical framework

Within this theoretical framework, concepts and theories that are important for answering the questions central to this thesis will be explained and connected to one another.

2.1 Life expectancy

Life expectancy is a statistic that approximates the amount of years a person will live on average, when he or she will pass through her life with the sex and age-specific death rates remaining stable. Life expectancy at birth is the most important and useful single overall and standardised measure of mortality in a population. Its means portray the life expectancy for new-borns (World Health Organization, 2019; Pollard et al., 1974). Life expectancy is a summary measure of mortality, by combining many mortality rates, notably by age and cause of death. Mortality data tells something about place, time and cause of the people who die (World Health Organization, 2019).

2.2 Causes of death

One thing is certain: life is finite, all people die at one point. However, what is not certain is the process that will lead to these deaths. There is a variety of factors that have impact on health, and through that, cause of death. Causes of death are investigated by the World Health Organization (WHO), an organization directly linked to the United Nations. The WHO classifies health trends and statistics globally, it gives the standard for reporting diseases and health conditions. International classifications of diseases (ICD) are the main tool of the WHO to make accurate mortality and morbidity statistics. This ICD has changed over time to incorporate more causes of death (World Health Organization, 2019). These statistics will be used within this thesis, in order to find out which causes of death have impact on the life expectancy divide between Serbia and Slovenia.

The dominance of certain causes of death change over time. The epidemiological transition model is a model that puts these changes within a theoretic scope (Omran, 1971). Within this model, Omran (1971) argued that societies move through stages in the process of development and modernization. In each stage, different diseases are overcome through which life expectancies rise. When societies enter new stages, new diseases become dominant. This happens through the change of general behaviour (Vallin & Meslé, 2005).

2.3 Avoidable mortality

As pointed above, diseases can become less dominant over time. This happens, because of modernization, healthcare and behavioural change. Diseases that were life-threatening before, can be cured or prevented. However, diseases which are in theory non-fatal still can cause people to die. This tendency can be linked to the concept of avoidable mortality (Olatunde et al., 2016).

The avoidable mortality concept is based on the tendency that certain conditions have impact on premature deaths. This means that people die of diseases, which could have been avoided (Olatunde et al., 2016). The factors that make that avoidable deaths still happen, are linked to behaviour, quality and availability of healthcare, and socioeconomic factors. Behavioural causes of death consist of violence, starvation, consumption of tobacco, poor diet and physical inactivity (i.e. obesity), alcohol consumption, toxicants, illicit use of drug, and vehicle accidents. These activities can cause death, or enlarge the risk on diseases (Tang, et al., 2008). In addition, the availability of sufficient healthcare plays a role in the prevention of avoidable mortality. The presence of timely and effective healthcare will reduce avoidable mortality (Olatunde et al., 2016). Access to high-quality healthcare improves many health outcomes. Improving this access is closely linked to the implementation of public policies, for example the implementation of universal health coverage (Barber et al., 2017).

Within avoidable mortality, there is a division between amenable and preventable mortality. Amenable mortality is the rate of people dying through the lack of availability of quality healthcare. Preventable mortality is related to behaviour, and can be reduced by the change of this health risk inducing behaviour (Preston, 2007; Tang et al., 2008).

Studies show that geographical variation in avoidable mortality rates are caused by socioeconomic differences between regions. Mortality risks can be reduced by advancing technology and increased availability of resources; especially risks that are related to nutrition, safety, and health. This can be related to the study of Omran (1971). Through the improvement in socioeconomic standards, policies to diminish health risk factors and healthcare can also be improved (Tang el al., 2008).

Economic development can be seen as the driver for better healthcare, improving living standards and better education (Zare et al., 2015). To measure how a nation develops economically the best indicator for economic development is the change in national income. National income is the best single indicator of living standards in a country, since it comprises the value of all final products (goods and services) produced in a certain period (Preston, 2007).

The concept of avoidable mortality is thus related to life expectancy, socioeconomic development, and public policies. Analysing the differences within avoidable mortality between Serbia and Slovenia, will give insight on the background tendencies that give rise to difference in life expectancy. In contrast with non-avoidable mortality, avoidable mortality is directly affected by behaviour, healthcare and socioeconomic development.

2.4 Conceptual model

Within the conceptual model (Figure 1) the concepts described within the theoretical framework are interlinked to each other. The lines represent relations between the concepts in the blocks.
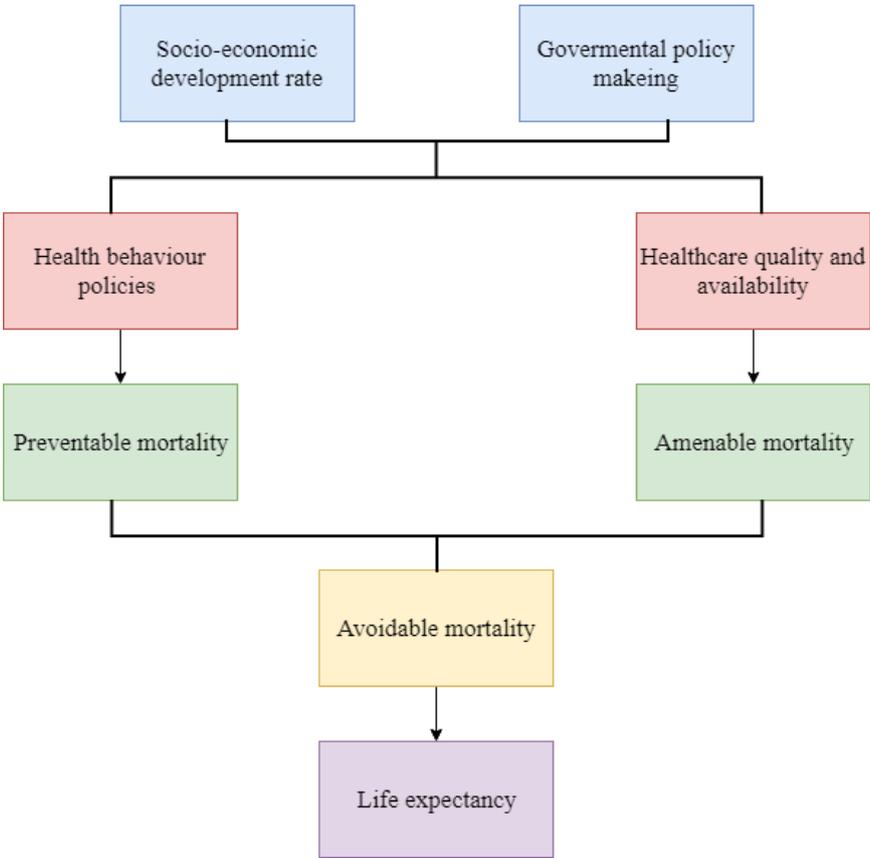

Figure 1: Conceptual model, own source.

The socioeconomic situation and the governmental policies of a country, influence the impact of healthcare and policies related to health behaviour. These factors directly influence the preventable and amenable mortality rates. Preventable and amenable mortality combined, form the avoidable mortality, which has direct effect on the life expectancy of a country. By looking at the preventable and amenable mortality rates, it is possible to see where life expectancy differences between Serbia and Slovenia come from.

3: Methodology

The question that stands central to this thesis is:
How have life expectancies of Serbia and Slovenia developed, after the collapse of the Yugoslavian republic?

To answer this question, the sub questions, that are elaborated upon in the following section, will be answered. The following aspects will be discussed per sub question: the data that will be used, the background of these data, and how these data will be used to answer the specific question.

3.1 Sub question 1

How did the situation of Serbia and Slovenia before the collapse of Yugoslavia reflect any possible differences in life expectancy?
The following data is used:
- Data on life expectancy development of Serbia and Slovenia, before they became independent.
- Data on regional differences within Yugoslavia, which reflect regional development differences in Serbia and Slovenia.

The first variable can be found in the United Nations Population division of social and economic affairs (2017). This source will provide data on life expectancy development of both sexes, with intervals of 5 years. The years that are available range from 1950 to 2015. The breakup of Yugoslavia happened during the beginning of the 1990s, therefore the years from 1950 to 1995 will be taken into account, when answering this sub question.
Literature will be used to explain socioeconomic and mortality differences between Serbia and Slovenia before their sovereignty. This method is chosen due to the lack of available statistical data on healthcare and behavioural tendencies of Serbia and Slovenia before they were independent.

3.2 Sub question 2

To what extent did avoidable mortality affect life expectancy differences between Serbia and Slovenia after their sovereignty?
The following data is used:
- Data on avoidable mortality rates in Slovenia and Serbia.
- Data on life expectancy development in Slovenia and Serbia.

The data that stands central to answering this question can be found in the World Health Organization (WHO) database. The WHO mortality database provides insight on mortality data by age, sex, and cause of death. These data are reported annually by member states from their civil registration system (World Health Organization, 2019). The WHO uses its own classifications regarding mortality data, these are called International classification of diseases (ICD). This ICD classifications form the foundation for identifying and classifying causes of death worldwide. The WHO uses life tables in order to compare mortality rates across age ranges (World Health Organization, 2019). Life tables express the chance of dying at particular ages and the numbers that would survive, if a particular set of age specific death rates were held constant for a population (Holdsworth et al., 2013). Data on these classifications give the opportunity to compare mortality data of Slovenia and Serbia of different time periods, and of different age-groups.
WHO sent queries to member states, asking various questions regarding the registration of mortality, to let researchers know how the data of each specific country is selected. However, Serbia and Slovenia did both not respond to this request, making it not possible to find out the source of available data on the basis of these questionnaire (World Health Organization, 2019). However, a research of Luy (2011) points out that the mortality data of both Serbia and Slovenia belong to a group of countries with complete and reliable vital registration based on census data. Also a research of Mikkelsen et al. (2015) shows that the reporting of cause specific deaths of both Slovenia and Serbia scores very high on the VSPI score, meaning that their data on mortality is of high level based on different mortality components. Based on these notions, the results coming from the data of the WHO can be seen as reliable.

The ICD codes that will be used to analyse the avoidable mortality come from the Office of National Statistics (2011), and can be found in the appendix (Appendix 1).

The objective of the second sub question is to see what the impact of avoidable mortality is on the life expectancy divide between Serbia and Slovenia. To get a broad view, the avoidable mortality data will be divided into causes of death that are only amenable, only preventable, and both amenable and preventable. This measure ensures that specific death rates are not doubled, and no data is lost.

The aggregated categories of only amenable, only preventable, and both amenable and preventable causes of death will be used to make a decomposition of difference in life expectancy between Serbia and Slovenia. These decompositions will be done for each year that data is available (1998-2018), this to see if there is any development visible within the life expectancy difference. Furthermore, the dataset of avoidable mortality will be decomposed without using the different age boundaries, in order to gain a complete image of the impact of avoidable causes of death for people aged 75 and older.

By doing this, it will become clear to what extent avoidable mortality has impact on the difference in life expectancy between Serbia and Slovenia.

3.3 Sub question 3

Which were the major factors influenced differentiated life expectancy between Serbia and Slovenia after their sovereignty?
The following data is used:
- Literature on quality and accessibility of healthcare, and policies tackling unhealthy behaviour, for both Slovenia and Serbia.
- Data on economic development of both Serbia and Slovenia.

To answer this question, there will be built upon the results of the second sub question. The statistics that come forward out of answering the second sub question will show to what extent avoidable mortality has impacted life expectancy differences between Slovenia and Serbia over time.

Existing data, like policy reports and literature will be used to gain insight on the development of life expectancy differences in Slovenia and Serbia. These forms of data will form the basis in explaining the differences in amenable and preventable mortality rates between Serbia and Slovenia. Through the analysis of these data, there can be given an overview to what extent the difference in life expectancy can be linked to differences in healthcare and policymaking. The healthcare quality and accessibility index will be used to compare Serbia and Slovenia. Through this indicator, a statistical indication can be made of the process of healthcare improvement of both Serbia and Slovenia. The quality and accessibility index is based on factors related to amenable mortality risks. The index uses a rating were 100 is the highest and best observable score and 0 the lowest and worst observable score (Barber et al., 2017).

The divide in socioeconomic development between Serbia and Slovenia will also be analysed, in order to see if there is any relation between the economic and life expectancy developments. As stated in the theoretical framework, the best indicator for economic development is the change in national income. National income is the best single indicator of living standards in a country, since it comprises the value of all final products (goods and services) produced in a certain period (Preston, 2007).

4: Results

4.1 Regional difference within Yugoslavia
In this first section of the analysis, the sub question: '*How did the situation of Serbia and Slovenia before the collapse of Yugoslavia reflect any differences in life expectancy?'* will be discussed.

During the post-war period, Yugoslavia was a very heterogeneous state, the peoples that lived within Yugoslavia where very much divided along ethnic, religious, historical, cultural, and linguistic lines. Within the multinational state of Yugoslavia there was also an administratively division, the country was divided into six republics, Slovenia and Serbia were two of these regions (Milanovic, 1985).

Figure 2 shows the development of life expectancy of both Slovenia and Serbia between 1950 and 1995. There was a clear divergence between Slovenia and Serbia with respect to their life expectancy, especially during the 1950s to 1960s period.
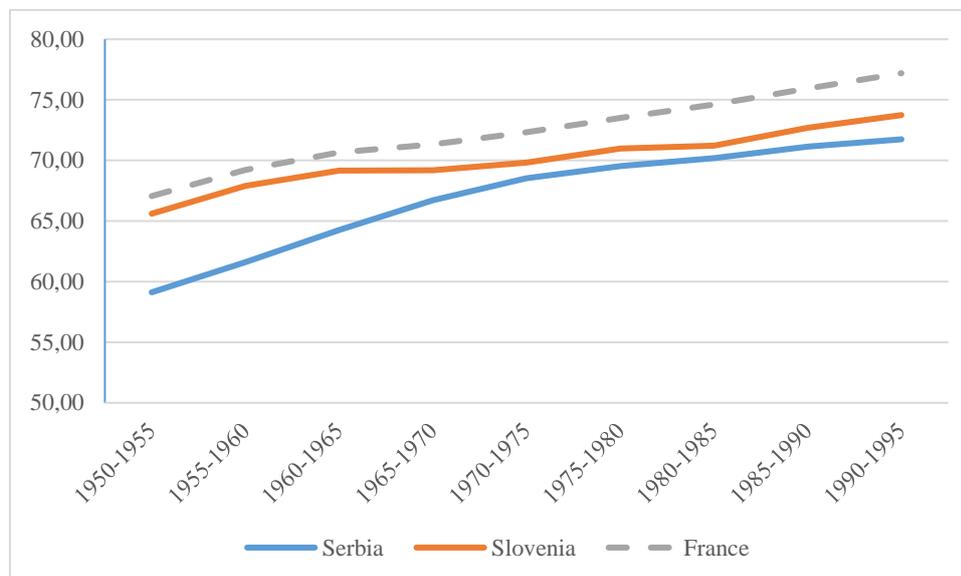

Figure 2: Life expectancy Serbia and Slovenia 1950-1995, Source data: United nations population division (2017).

This divide in life expectancy between Serbia and Slovenia was however diminishing over time. The life expectancy of Serbia grew at a fast rate during the 1950 to 1970 period (e0: from 59 to 68 years), through which, from the 1970s onward, life expectancy of Slovenia and Serbia was almost equal.

The big gap between Slovenia and Serbia in the 1950s can be related to the gap in economic development. Before the Second World War, the northern part of Yugoslavia, Slovenia included, were industrialised. The other parts of Yugoslavia, parts of Serbia included, were much more impoverished, and relied mostly on agrarian activities. This tendency can be connected to Figure 2; around 1950 Slovenia's life expectancy was almost equal to the developed and modern country of France, while Serbia was much more behind.

After the Second World War, the Yugoslavian government wanted to reduce the large interregional differences within the country. This was done by transferring resources from the more developed republics to the less developed republics (Bateman et al., 1986; Milanovic, 1995). Bateman et al. (1986) point out that this economic policy did diminish the economic differences within Yugoslavia. The economic improvement of the poorer regions of Yugoslavia was visible in the improvement of measures like mortality and literacy (Kunitz et al., 1987). This history is in line with the theory that life expectancy is closely related to the socioeconomic development rate of a region. Hence, Figure 2 indeed shows that after the Second World War the life expectancy in Serbia grew at a fast rate (Tang et al., 2008).

However, what the graph also shows, is that in the period between 1970 and 1990 the growth of life expectancy in both Serbia and Slovenia stagnated. This stagnation of life expectancy is a trend that was not only visible in Yugoslavia, but in whole Eastern Europe. This was due to the fact that former communist countries were not able to complete the epidemiologic transition by reducing cardiovascular diseases, for example because of the heavy alcohol consumption within Eastern Europe. The nations within Western Europe were more successful in reducing deaths that were caused by cardiovascular diseases (Aburto & van Raalte, 2018). This is visible in Figure 2, were France's life expectancy is diverging from Serbia and Slovenia after 1970.

Alcoholism also became a problem within Yugoslavia. According to Petrovic (1960), alcoholism increased in Yugoslavia, because of changes in social circumstances and economic standards. Hereby, an increased amount of people died from cardiovascular diseases.
Another phenomenon that could explain the stagnation of life expectancy within Yugoslavia are the economic reforms Yugoslavia had to make from the 1960s onward. This was needed because Yugoslavia had to pay off their debts. These economic reforms included reductions in price supports for food, cutbacks in health and welfare programs, and devaluation of the currency which made imported food and medicine more expensive. These reforms had impact on the health of the Yugoslavian population (Kunitiz et al., 1987). These aspects could explain the stagnating growth of life expectancy of both Serbia and Slovenia in the period between 1970 and 1990.

4.2 Avoidable diseases and life expectancy in Serbia and Slovenia
In the following section the following sub question: '*To what extent did avoidable mortality affect life expectancy differences between Serbia and Slovenia after their sovereignty?*' will be discussed.

Figure 3 shows the developments of life expectancy in the period between 1995 and 2015, so after Serbia and Slovenia became independent nations.
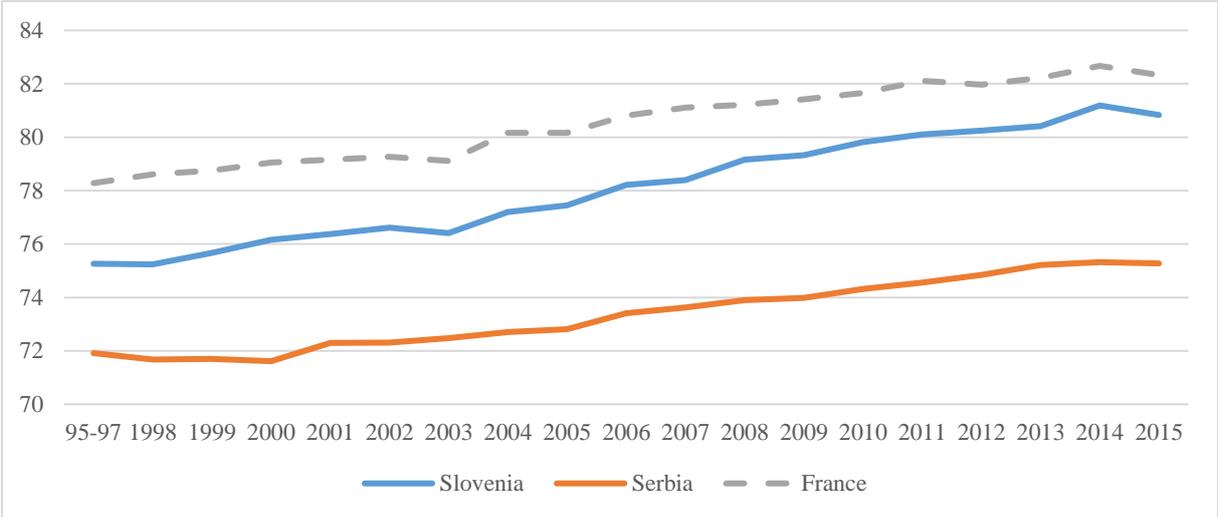

Figure 3: Life expectancy at birth Serbia and Slovenia 1995-2015. Source data: WHO (2019); United Nations Population division (2017).

Figure 3 shows that the divide in life expectancy between Slovenia and Serbia grew over time, from about 3.5 years to about 5.5 years, because the growth of life expectancy of Slovenia was greater than the one of Serbia. Slovenia converged towards Western Europe (e.g. France), while Serbia lacked in this development. In the following paragraphs the source of the divide in life expectancy gap between Serbia and Slovenia will be discussed.

As stated within the problem statement, the avoidable mortality rate comprises the people that die of diseases that could have been avoided through adaptation of behaviour, or the right healthcare. The extent of people dying from avoidable diseases can have great impact on the life expectancy of a population (Tang et al., 2008). Figure 4 shows the difference of life expectancy between Serbia and Slovenia, decomposed in the causes of death which form these differences.
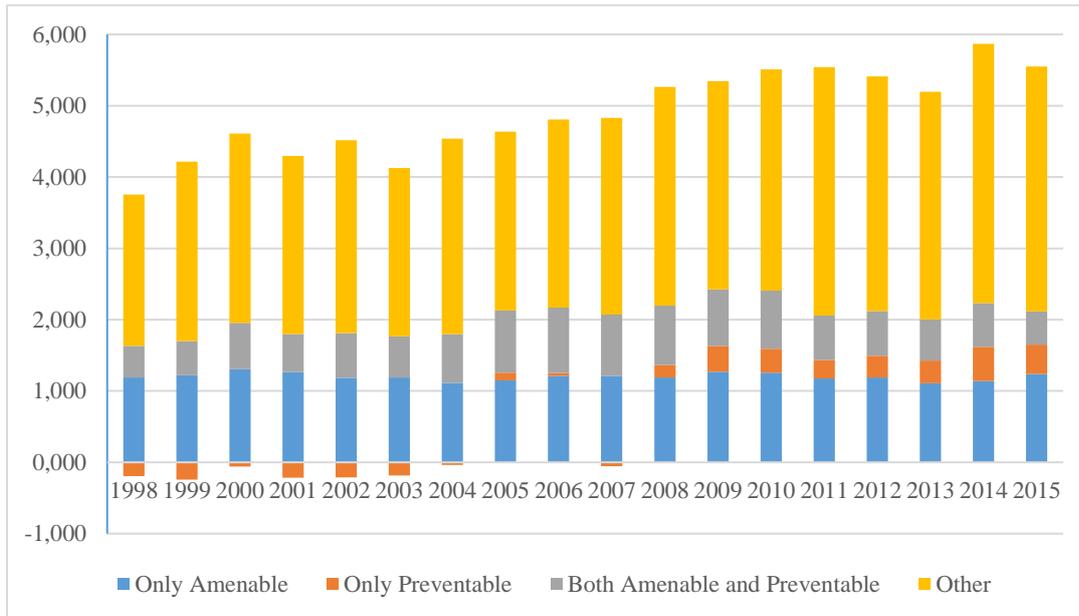
Figure 4: Decomposition of differences in Life expectancy between Slovenia and Serbia. Source data: WHO (2019).

The differences in life expectancy between Serbia and Slovenia are relatively stable during the turn of the century. However, there is divergence at the end of the time period. The graph makes clear that, within the concept of avoidable mortality, amenable mortality has the greatest impact on the life expectancy divide between Slovenia and Serbia. Amenable causes of death are deaths that could have been avoided through the intervention of healthcare (Olatunde et al., 2016). Figure 4 shows that the impact of only amenable, and both amenable and preventable categories do grow over time. This suggests that the Slovenian healthcare quality and efficiency relatively improved in comparison to the one of Serbia.

Figure 4 shows that the other category, so causes of death that are non-avoidable, creates a large part of the life expectancy divide between Serbia and Slovenia. A reason for this is the age boundary that is embedded within the definition of avoidable causes of death. The list of avoidable causes of death (Appendix 1) includes many diseases that are only seen as avoidable for people aged between 0 and 75. However, this border can be seen as rather artificial, because people aged older than 74 still can be cured from these diseases.
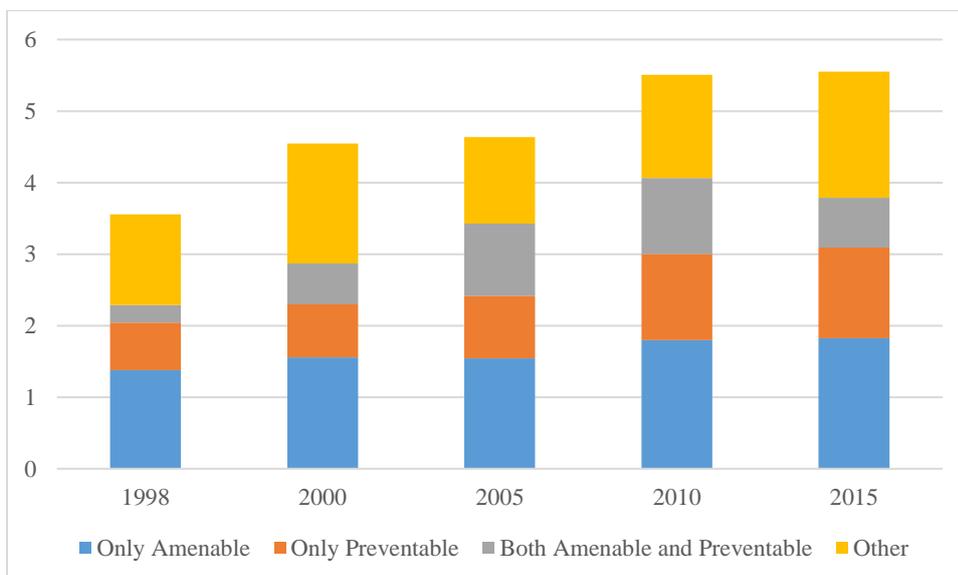

Figure 5: Life expectancy difference without age boundary

Figure 5 shows the decomposition of the divide in life expectancy between Serbia and Slovenia for five different years. What Figure 5 makes clear, is that when the avoidable causes of death are applicable for the entire lifespan of a person, the other category has less impact on the life expectancy divide between Serbia and Slovenia. The avoidable categories have more impact because of this, especially the preventable category. Ageing is closely connected to increasing susceptibility to diseases (Mahishale, 2015). Figure 5 indicates that Slovenia is better than Serbia in countering this increase of susceptibility, especially in the category of preventable causes of death.

4.3 Factors influencing life expectancy divide between Serbia and Slovenia
The analysis of the following section will be built directly on the previous paragraphs. In the previous sections, it has become clear where the differences of life expectancy between Serbia and Slovenia come from. Within this chapter, the tendencies that explain differences and development of life expectancy will be analysed.

Figure 2 makes clear that at the end of the Yugoslavian period, the life expectancy of Slovenia and Serbia was almost equal. However, Figure 3 shows that the life expectancies of Serbia and Slovenia diverged when the two nations became independent. According to various scholars (Tang et al., 2008; Zare et al., 2015), life expectancy development is closely linked to the socioeconomic development rate of a country. According to this theory, the increasing divide in life expectancy between Slovenia and Serbia after their sovereignty, should be accompanied by a divide in socioeconomic development.

When Slovenia and Serbia became independent nations, both struggled to find a new way of regulating their economies. Both Slovenia and Serbia had to transform from an economy based on communism, to one that was based on capitalism. Slovenia was one of the most successful post-communist countries, in terms of creating a successful economic system with relatively good labour and social standards. This was mostly due to Slovenia creating strong coordinated labour institutions. The EU membership of Slovenia was another impulse for the economy of Slovenia, for it attracted more foreign investments (Crowley & Stanojovic, 2011).

Serbia on the other hand was less successful than Slovenia in creating an economic system where the nation could develop on. According to Stanojevic (2003), Serbia's transition from a communist to a capitalist society was extremely unsuccessful. This was due to bad politics and policymaking, which led to economic recession and an economic system unable to practice within the capitalist market.
These tendencies of economical differences can be visualised within a graph that showcases the GNI per capita development (Figure 5). The GNI per capita gap between Slovenia and Serbia grows over time, just like the life expectancy gap between the two countries.
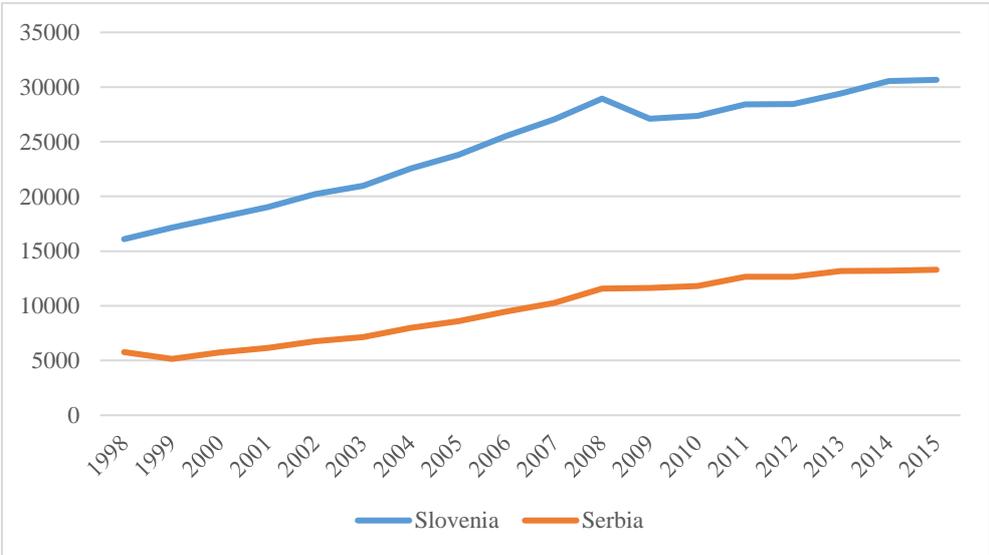

Figure 6: GNI per capita Slovenia and Serbia. Source data: WorldBank (2018).

Thus, it seems to be that the economical differences between Slovenia and Serbia can be an explaining factor for the diverging life expectancies of the two countries. Economic development can be seen as the driver for better healthcare, improving living standards, and better education, which are related to economic improvement (Zare et al., 2015). As already stated within the introduction, Eastern European countries like Slovenia are converging towards Western European economic and development standards (Bideleux, 2009). Figure 3 shows that this is also true for life expectancy. The life expectancy of Slovenia is converging towards the life expectancy of France. This shows that life expectancy and economic development are closely interrelated.

In chapter 4.2, it has become clear where the big differences in life expectancy come from. In the following paragraphs the impact of policies and healthcare of both Serbia and Slovenia are assessed.

Amenable mortality can increase due to the lack in quality and accessibility of healthcare within a country (Tang et al., 2008). As Figure 4 shows, within the concept of avoidable mortality, amenable causes of death have the largest impact on the life expectancy difference between Serbia and Slovenia. This would indicate a gap in healthcare quality and accessibility between Serbia and Slovenia.

A research of Jovic Vranes et al. (2014) shows that Serbia's healthcare system was struggling after the nation became independent. The Serbian civil war, ethnic cleansing, sanctions, and NATO bombing negatively impacted healthcare services. Consequently, vulnerable groups experienced problems in receiving quality healthcare. The Serbian government tried to reform their healthcare system around 2002, and some parts of healthcare improved. This resulted for example in a decreasing infant death rate. However, through the social change and the deterioration of the socioeconomic situation within Serbia, chronic and non-infectious diseases increased, due to increased behaviour like smoking and obesity. Policies to prevent this behaviour were introduced at a marginal level. Due to the bad economic situation, the poorer population within Serbia experienced also financial barriers to access healthcare (Vlahovic & Radojkovic, 2010; Klančar & Švab, 2014). This tendency is visible in Figure 4; the relative impact of causes of death that are both preventable and amenable increase over time.

In Slovenia the development of healthcare is of a much higher level. The World Health Organization (2016) points out that Slovenia is one of the leaders in healthcare of its region. Slovenia succeeded in reducing premature mortality from key causes of death. This suggests that the healthcare policies within Slovenia are of higher quality than the ones of Serbia. Table 1 visualises different indicators regarding healthcare quality and accessibility quality, it confirms the divide in healthcare quality between Serbia and Slovenia. The divide is mostly visible in economic terms, the public health expenditure per capita from Slovenia is much higher than the one of Serbia, and the Serbians have to pay much more healthcare out of their own pockets than the Slovenians.

	Slovenia	Serbia
Public health expenditure per capita	1,768.4 dollars (2008)	546 dollars (2008)
Hospital beds per 1000 people	4.6 (2012)	5.7 (2012)
Physicians per 1000 people	2,764 (2012)	2,463 (2012)
Out-of-pocket expenditure (% of total health expenditure)	35.43% (2012)	12.4% (2012)

Table 1: Healthcare indicators Serbia and Slovenia, Source: WHO (2018)

Figure 7 confirms this tendency; it portrays the development of the healthcare accessibility and quality index over time. The development of this index indicates that the factors related to the diminishing of amenable death rates are improving. Figure 7 points out that the healthcare quality and accessibility in both Serbia and Slovenia have improved over time, however Slovenia is improving relatively more than Serbia (Barber et al., 2017). This development is indeed in line with the tendencies described in the paragraph above.
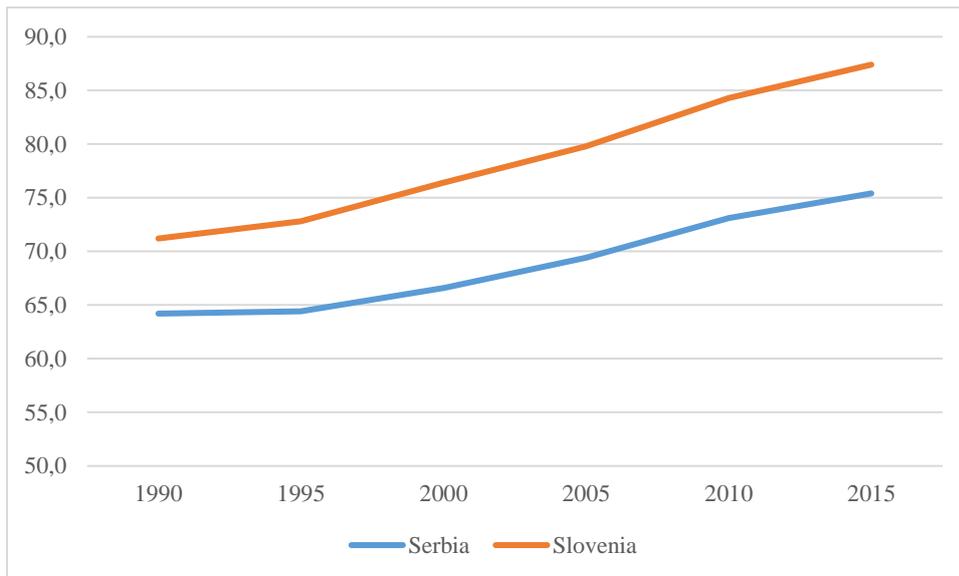
Figure 6: Healthcare accessibility and quality index Serbia and Slovenia, Source: Barber et al. (2017)

Figure 4 indicates that preventable causes of death have little impact on the life expectancy divide between Serbia and Slovenia. However, Figure 5 makes clear that, if the definition of avoidable mortality is altered, preventable mortality does have impact. This infers that the preventable death rates for older generations within Serbia are relatively higher than the ones in Slovenia. Blümel (2018) even indicates that most gains in life expectancy since 2000 have been after the age of 65. Slovenia has indeed for example implemented stricter legislation regarding one of the leading causes of preventable mortality, namely smoking. Policies to diminish smoking were successful, this is reflected by a decline in lung cancer mortality (Blümel, 2018). In Serbia, smoking is one of the biggest risk factors regarding preventable mortality. Serbia has one of the highest shares of smokers in the geographical region. There has been a lack of policy making to reduce this share, the number of deaths associated with tobacco use has even grown. This difference in policy making to reduce smoking, is reflected within the difference in preventable death rates between Serbia and Slovenia (Marinković, 2017).

5: Conclusion

In this thesis the development of life expectancy of both Slovenia and Serbia is researched. The objective is to see where the life expectancy divide between these two countries comes from, and how this divide is developed over time. Within this conclusion the main question: *'How have the life expectancies of both Serbia and Slovenia developed, after the collapse of the Yugoslavian republic?'* will be answered.

Slovenia and Serbia have a joint history, because of the fact that they were both part of the Republic of Yugoslavia. During the Yugoslavian period, there was great regional economic difference within Yugoslavia, which resulted in life expectancy divides between Slovenia and Serbia. This follows the theory that life expectancy is closely linked to the socioeconomic development of a region (Tang et al., 2008). However, at the end of the Yugoslavian period the life expectancy of both Serbia and Slovenia stagnated, due to the increase of certain causes of death that were caused by a change of the socioeconomic fabric of the societies. This is broadly in line with the epidemiological transition of Omran (1971), which states that societies move through modernization in which they are challenged with new diseases that have to be overcome.

At the start of the 1990s Yugoslavia collapsed, and Slovenia and Serbia became independent nations. During this period, the life expectancy divide between Serbia and Slovenia was relatively small (2 years in the period 1990-1995). However, this divide increased quickly in the first two decennia after the breakup of Yugoslavia. The concept of avoidable mortality is used to see what the causes of this divide were. The analysis of WHO data (2018) indicated that this growing gap was mostly coming from amenable causes of death. From these results, one can assume that the quality and accessibility of healthcare within Serbia is worse than in Slovenia. Different literature studies back this statement (Jovic Vranen et al., 2014; Vlahovic & Radojkovic, 2010; Klančar & Švab, 2014). These papers show that after Slovenia and Serbia became independent, Serbia's healthcare sector struggled, while the one of Slovenia improved. The healthcare accessibility and quality index supports this; the index indicates that Slovenia has improved its healthcare quality and accessibility much more than Serbia (Barber et al., 2017).When the definition of avoidable mortality was altered (all age borders were removed), preventable causes of death also seemed to play a part in the life expectancy divide. This is supported by studies on health behaviour policies (Blümel, 2018; Marinković, 2017).

The difference in socioeconomic development between Serbia and Slovenia is also an explaining factor behind the life expectancy divide. Difference in socioeconomic development has effect on the extent in which health risks can be diminished (Zare et al., 2015). This is visible in the life expectancy divide between Serbia and Slovenia. Slovenia was much quicker in adapting to a capitalist market than Serbia, which made the two economies diverge. Serbians were, because of this, more challenged in improving their healthcare, living standards, and education than the Slovenians. This divide in economic development is at the same time also visible in the divide in life expectancy. Slovenia is developing towards a Western European standard of live, while Serbia is lacking in this tendency.

All in all, the life expectancy of both Slovenia and Serbia has increased from the point that they became independent. Slovenia's economy and healthcare has improved more than in Serbia, which can explain the increasing divergence in life expectancy between the two nations.
Through this analysis an image can be formed about which factors influence the divergence of split up nations like Yugoslavia, and how this has impact on life expectancy.

For further research one could look at the other nations that were part of the Yugoslavian republic, in order to see if the tendencies of Serbia and Slovenia are comparable to the rest of former Yugoslavia.

6: Bibliography

Aburto, J. M., & van Raalte, A. (2018). Lifespan dispersion in times of life expectancy fluctuation: the case of Central and Eastern Europe. *Demography*, *55*(6), 2071-2096.

Ananijevic-Pandey, J. (1994). Premature mortality in former Yugoslavia. *European journal of epidemiology*, *10*(3), 339-341.

Armenski, T., Zakić, L., & Dragin, A. (2009). The perception of foreign tourists on the image of Serbia. *Bulletin of the Serbian geographical society*, 89(1), 39-63.

M. Barber, Ryan & Fullman, Nancy & J. D. Sorensen, Reed & Bollyky, Thomas & Mckee, Martin & Nolte, Ellen & Abajobir, Amanuel & Abate, Kalkidan & Cristiana, Abbafati & M. Abbas, Kaja & Abd-Allah, Foad & Abdulle, Abdishakur & Abdulahi, Ahmed & Abera, Semaw & Abraham, Biju & Fisseha Abreha, Girmatsion & Adane, Kelemework & Lukman Adelekan, Ademola & Adetifa, Ifedayo & J. L. Murray, Christopher. (2017). Healthcare Access and Quality Index based on mortality from causes amenable to personal health care in 195 countries and territories, 1990–2015: a novel analysis from the Global Burden of Disease Study 2015. The Lancet. 390. 10.1016/S0140-6736(17)30818-8.

Bateman, D. A., Nishimizu, M., & Page Jr, J. M. (1988). Regional productivity differentials and development policy in Yugoslavia, 1965–1978. *Journal of Comparative Economics,* 12(1), 24-42.

Bideleux, R. (2009). Introduction: Reconstituting Political Order in Europe, West and East. *Perspectives on European Politics and Society*, 10(1), 3-16.

Blümel, M. (2018). State of Health in the EU. Slovenia. Country Health Profile 2017. *European Journal of Public Health*, 28

Bookman, M. Z. (1994). War and peace: The divergent breakups of Yugoslavia and Czechoslovakia. *Journal of Peace Research*, 31(2), 175-187.

Crowley, S., & Stanojević, M. (2011). Varieties of capitalism, power resources, and historical legacies: explaining the Slovenian exception. *Politics & Society, 39*(2), 268-295.

Jovic Vranes, A., Mikanovic, V. B., Vukovic, D., Djikanovic, B., & Babic, M. (2014). Education on human rights and healthcare: evidence from Serbia. *Health promotion international*, 30(1), 101-105.

Klančar, D., & Švab, I. (2014). Primary care principles and community health centers in the countries of former Yugoslavia. *Health Policy*, *118*(2), 166-172.

Kunitz, S. J., Simić, S., & Odoroff, C. L. (1987). Infant mortality and economic instability in Yugoslavia. *Social Science & Medicine*, *24*(11), 953-960.

Mahishale, V. (2015). Ageing world: Health care challenges. *Journal of the Scientific Society*, *42*(3), 138.

Marinković, I. (2017). Smoking as the Main Factor of Preventable Mortality in Serbia. *Stanovništvo*, *55*(1), 87-106.

Meier, V. (2005). *Yugoslavia: a history of its demise*. Routledge.

Mikkelsen, L., Phillips, D. E., AbouZahr, C., Setel, P. W., De Savigny, D., Lozano, R., & Lopez, A. D. (2015). A global assessment of civil registration and vital statistics systems: monitoring data quality and progress. *The Lancet*, *386*(10001), 1395-1406.

Milanovic, B. (1987). Patterns of regional growth in Yugoslavia, 1952–83. *Journal of Development Economics*, *25*(1), 1-19.

Olatunde, O., Windsor-Shellard, B., & Campbell, A. (2016). *Revised definition of avoidable mortality and new definition for children and young people*. Office for National Statistics

Omran, A. (1971). The epidemiologic transition: a theory of the epidemiology of population change. *Milbank Memorial Fund Quarterly*, *49*(4), 509-538.

Petrovic, D. (1960). Recent Progress in Yugoslavia in the Treatment and Prevention of Alcoholism. *Mental Health*, *19*(2), 51.

Pollard, A. H., Yusuf, F., & Pollard, G. N. (1974). *Demographic techniques*. Rushcutters Bay: Pergamon.

Preston, S. H. (2007). The changing relation between mortality and level of economic development. *International journal of epidemiology*, *36*(3), 484-490.

Stanojevic, M. (2003). Workers' power in transition economies: the cases of Serbia and Slovenia. *European Journal of Industrial Relations*, *9*(3), 283-301.

Tang, K. K., Chin, J. T., & Rao, D. P. (2008). Avoidable mortality risks and measurement of wellbeing and inequality. *Journal of health economics*, *27*(3), 624-641.

United Nation Population Division. (2017). *Life expectancy at birth both sexes*. Retrieved on 15 April 2019 from https://population.un.org/wpp/Download/Standard/Mortality/.

Undata (2017). *Life expectancy at birth for both sexes combined (years)*. Retrieved on 22 February 2019 from http://data.un.org/Data.aspx?q=life+expectancy&d=PopDiv&f=variableID%3a68/

Vallin, J., & Meslé, F. (2005). Convergences and divergences: an analytical framework of national and sub-national trends in life expectancy. *Genus*, 83-124.

Vlahovic, Z., & Radojkovic, D. (2010). Healthcare in Serbia in transition period. *EPMA journal*, *1*(4), 601-606.

WorldBank (2018). *Health*. Retrieved on 6 June 2019 from https://data.worldbank.org/topic/health.

WorldBank (2018). *GNI per capita, PPP (current international $)*. Retrieved on 14 May 2019 from https://data.worldbank.org/indicator/NY.GNP.PCAP.PP.CD

World Health Organization (2019). *Classification*. Retrieved on 9 March 2019 from https://www.who.int/classifications/icd/en/

World Health Organization (2019). *Infectious diseases*. Retrieved on 1 March 2019 from https://www.who.int/topics/infectious_diseases/en/.

World Health Organization (2019). *Life expectancy at birth*. Retrieved on 25 February 2019 from https://www.who.int/healthinfo/indicators/2015/chi_2015_24_life_expectancy.pdf

World Health Organization (2019). *Mortality*. Retrieved on 27 February 2019 from https://www.who.int/topics/mortality/en/

World Health Organization (2016). *Slovenia: Highlights on health and wellbeing*. World Health Organization Regional Office for Europe

Zare, H., Gaskin, D. J., & Anderson, G. (2015). Variations in life expectancy in Organization for Economic Co-operation and Development countries–1985–2010. *Scandinavian journal of public health*, *43*(8), 786-795.

7: Appendix
Appendix 1: List of avoidable diseases

Condition group and cause	ICD-10 codes	Age	Amenable	Preventable
Infections				
Tuberculosis	A15-A19, B90	0-74	•	•
Selected invasive bacterial and protozoal infections	A38-A41, A46, A48.1, B50-B54, G00, G03, J02, L03	0-74	•	
Hepatitis C	B17.1, B18.2	0-74	•	•
HIV/AIDS	B20-B24	All	•	•
Neoplasms				
Malignant neoplasm of lip, oral cavity and pharynx	C00-C14	0-74		•
Malignant neoplasm of oesophagus	C15	0-74		•
Malignant neoplasm of stomach	C16	0-74		•
Malignant neoplasm of colon and rectum	C18-C21	0-74	•	•
Malignant neoplasm of liver	C22	0-74		•
Malignant neoplasm of trachea, bronchus and lung	C33-C34	0-74		•
Malignant melanoma of skin	C43	0-74	•	•
Mesothelioma	C45	0-74		•
Malignant neoplasm of breast	C50	0-74	•	•
Malignant neoplasm of cervix uteri	C53	0-74	•	•
Malignant neoplasm of bladder	C67	0-74	•	
Malignant neoplasm of thyroid gland	C73	0-74	•	
Hodgkin's disease	C81	0-74	•	
Leukaemia	C91, C92.0	0-44	•	
Benign neoplasms	D10-D36	0-74	•	
Nutritional, endocrine and metabolic				
Diabetes mellitus	E10-E14	0-49	•	•
Drug use disorders				
Alcohol related diseases, excluding external causes	F10, G31.2, G62.1, I42.6, K29.2, K70, K73, K74 (excl. K74.3-K74.5), K86.0	0-74		•
Illicit drug use disorders	F11-F16, F18-F19	0-74		•
Neurological disorders				
Epilepsy and status epilepticus	G40-G41	0-74	•	
Cardiovascular diseases				
Rheumatic and other valvular	I01-I09	0-74	•	

heart disease				
Hypertensive diseases	I10-I15	0-74	•	
Ischaemic heart disease	I20-I25	0-74	•	•
DVT with pulmonary embolism	I26, I80.1-I80.3, I80.9, I82.9	0-74		•
Cerebrovascular diseases	I60-I69	0-74	•	
Aortic aneurysm and dissection	I71	0-74		•
Respiratory diseases				
Influenza (including swine flu)	J09-J11	0-74	•	•
Pneumonia	J12-J18	0-74	•	
Chronic obstructive pulmonary disorder	J40-J44	0-74		•
Asthma	J45-J46	0-74	•	
Digestive disorders				
Gastric and duodenal ulcer	K25-K28	0-74	•	
Acute abdomen, appendicitis, intestinal obstruction, cholecystitis/lithiasis, pancreatitis, hernia	K35-K38, K40-K46, K80-K83, K85, K86.1-K86.9, K91.5	0-74	•	
Genitourinary disorders				
Nephritis and nephrosis	N00-N07, N17-N19, N25-N27	0-74	•	
Obstructive uropathy and prostatic hyperplasia	N13, N20-N21, N35, N40, N99.1	0-74	•	
Maternal and infant				
Complications of perinatal period	P00-P96, A33	All	•	
Congenital malformations, deformations and chromosomal anomalies	Q00-Q99	0-74	•	
Unintentional injuries				
Transport Accidents	V01-V99	All		•
Accidental Injury	W00-X59	All		•
Intentional injuries				
Suicide and self inflicted injuries	X60-X84, Y10-Y34	All		•
Homicide/Assault	X85-Y09, U50.9	All		•
Misadventures to patients during surgical and medical care	Y60-Y69, Y83-Y84	All	•	•