HEALTHCARE QUALITY DEVELOPMENT  
IN THE LIGHT OF THE DEMOGRAPHIC SITUATION OF HUNGARY

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INTRODUCTION

As the theme of my doctorate research I aim to deal in detail with the quality development of the Hungarian healthcare system. Any kind of quality development program in the field of healthcare requires a good working knowledge of the demographic situation of the population; such knowledge should include the demographic base data, mortality and morbidity information and some of the indicators dealing with health in general, like the life expectancy and healthy life expectancy at birth.

To demonstrate the demographic state of the Hungarian population I used data from the past 50-60 years, which is a sufficiently long time to observe the trends and changes that have already taken place. The most recent data is used to represent the current state of the populace. Using these data it becomes possible to appraise some of the changes and their direction that are due to take place in the health state of the population. The healthcare system in general and the quality-management systems of healthcare institutions can contribute to having a positive effect on these changes. When one is in possession of all these information important conclusions can be reached regarding the actual functioning of health services. It is paramount to any plans of healthcare development to have – as a starting point – an in-depth knowledge of the health state of the population. Analysis of the publicly and professionally accepted economic and social correlations of health can also be carried out. All of these analyses are crucial to solving any problems that may occur and in realizing the goals that were set in the area of the planned development.

In addition to the review of the demographic data and indicators I believe that a comparison of the Hungarian data to relevant EU databases and East-Central European countries (Czech Republic, Poland, Slovakia) – that have similar or comparable history, geographic, natural and economic attributes – is also expedient. My doctoral work will focus primarily on locomotor disorders and the quality development of their rehabilitation methods. For the establishment and evaluation of the quality development processes it is necessary to further analyze the effects of these healthcare technologies and their improvement possibilities and also to collect more data. My goal is to explore these possibilities of quality development and to formulate proposals by creating representative indices and indicators from the acquired data using relevant statistical methodologies. It is for this reason that in addition to the presentation of the Hungarian demographic situation in general, I will discuss the status of locomotor disorders in more detail.

In both the domestic and international literature two main structures dominate the usage and presentation of demographic data. On the one hand, the crude databases are used in the creation of demographic portraits, statistical summaries, social atlases...
and forecasts [1] [2] [3] [4]. On the other hand they are used as a basis for economic and social correlations, often approaching these issues from the direction of health status [5].

POL and THOMAS call attention to the correlation between demographic attributes, the state of health and health services, which is rooted in the parallel development of these three factors [6].

In his doctoral thesis FORGÁCS identifies death rate, life expectancy at birth, healthy life years, infant mortality, and early life mortality as the most commonly used indicators when measuring the general state of health [7]. These are the indicators – along with morbidity data – that are used by GKI Economic Research Co. as well [8].

ROBINE emphasizes the role of life expectancy as an indicator further punctuating the possibility of comparing populations using this index [9]. WHO adds that on top of this index, consideration of healthy life years is also crucial [10].

GŐDÉNY writes: “Without knowing the demographic situation, mortality and morbidity ratios of Hungary it is impossible to design, implement and operate quality development programs that would effectively improve the most important result of all quality-management systems in healthcare: the health state of the population.” [11]

### POPULATION CHANGE

The demographic situation of a country can basically be typified by the changes in population, namely its increase and decrease. Because in Hungary immigration and emigration are not significant factors when compared to birth-, and death-rates, I studied the natural increase and decrease¹. When looking at the past one hundred years, the population of Hungary was the highest during the 1980s (10.709 million), after that it started to decline and the rate of the decline only increased over the years (population decrease was only 19,981 in 1990, but by 2013 it rose to 38,089). The number of people living in our country first dropped below the 10-million line in 2010 and it remained there since then: in 2014 the population numbered 9.877 million people. A big part of the decrease of population in Hungary is the fact that there are fewer and fewer births each year. In 1998 the number of births dropped below 100,000 and it hasn’t climbed above that figure again. The crude birth rate² showed significant fluctuations in the past 60 years. Its lowest point (8.8) was in 2011 but it has been increasing since then. In 2013 it was 9.2, still below the EU average of 10.0 and also below the average of East-Central European countries that was 9.78 at the time. The other major factor that determines population is the death rate. Beginning in the mid-20th century an epidemiological crisis emerged in Hungary but from the early 1990s the death rate started to show a decreasing trend. The Hungarian crude death rate was 12.8 in 2013 which was higher than the EU average (9.9). Infant mortality³ is a defining piece of information as it allows for conclusions to be drawn regarding the development level of the entire society as well as the healthcare system

¹ I did not figure in migration effects.
² the number of births per 1,000 inhabitants based on the yearly mean population
³ number of deaths per 1,000 or 10,000 inhabitants based on the yearly mean population
in particular. This index had a value\textsuperscript{4} of nearly 90 in the early years of the 20\textsuperscript{th} century, but a continuous decrease followed after that. In 2013 it was only 5.1 but this is not yet cause for celebration as the rate of decline of this index has slowed down and it is still higher than both the East-Central European (4.48) and the EU (3.8) averages.

![Figure 1](image.png)

**Figure 1**
Natural increase and decrease of the population of Hungary

As it follows from the above detailed data, the Hungarian natural decrease rate of the population\textsuperscript{5} is slowly getting higher over time: in 1990 it was 1.9 but by 2013 it reached a value of 3.6. Population decrease is not unheard-of in Europe but more and more countries tip over the edge and begin to experience population increase (Slovakia, Slovenia).

**MORTALITY DATA**

By connecting the different causes of death with the actual deaths it becomes possible to survey the risk of death for different diseases and other causes. Studying the causes of death provides important information about both the health state of the populace and the reasons behind the changes of it [12]. In the following section I will review changes in the death rate over the past 50 years based on this premise. I will present the most up-to-date information available and the percentages of different causes of death. I will provide an European comparison for the structure of the causes of death since the major causes are the same in most countries of the continent. For this purpose I utilized\textsuperscript{6} the standardized death rate\textsuperscript{7}.

At the beginning of the 20\textsuperscript{th} century, contagious diseases were the leading causes of death in Hungary and also in most of the other countries of Europe. Among women an additional group of causes could be mentioned: issues related to giving birth. These tendencies have changed drastically by our time and the highest-impact factors have become lifestyle choices and the functioning of healthcare systems. Just as in all countries with a highly developed health-culture the most deaths are caused by

\textsuperscript{4} per 1,000 infants
\textsuperscript{5} the difference between the live birth rate and death rate
\textsuperscript{6} Note: When studying the causes of death, differences exist between sexes, age-groups, areas within the country, but in this work I will only mention them and not go into details
\textsuperscript{7} weighted by the age-distribution of the standard European population by WHO, per 100,000 inhabitants
diseases and complications of the circulatory system [13]. From the 1960s, these values were extremely high in our country and by 1970s roughly half of all deaths were caused by some kind of circulatory disease or its complications. It is clearly visible in Table 1 that the Hungarian figure for these causes is basically the double of the EU28 average and exceeds the East-Central European average as well (only Slovakia had a higher number in 2011).

The second place among the leading causes of death in Hungary is held by cancer (or malignant tumors, neoplasms). The number of deaths with such causes behind them has been increasing since the 1950s. The standardized death rate figure is the highest for Hungary among all the European countries (Hungary is the leader specifically in the lung cancer related deaths as well). According to SEFFRIN 8, cancer is one the most easily avoidable and also easily treatable sicknesses [14].

The proportion of respiratory disease related deaths among all the causes of death has been on the increase as well. In 2000 in Hungary 3.8% of all deaths had this as their cause and by 2013 this ratio has grown to 5.5%. This was higher than both the EU and the East-Central European averages.

In 2011 Hungary was in the first place among all EU countries regarding the number of deaths related to diseases of the digestive system.

There is one other internationally prominent cause of death for which Hungary has the highest ratio: death by suicide. It is roughly twice as frequent as it is in the EU on average.

### Table 1

Mortality rates in Hungary and in the European Union

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<tr>
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</thead>
<tbody>
<tr>
<td>Circulatory disease</td>
<td>62979</td>
<td>49.8</td>
<td>4021</td>
<td>212</td>
<td>372.9</td>
</tr>
<tr>
<td>Cancer</td>
<td>33274</td>
<td>26.2</td>
<td>242.6</td>
<td>171.3</td>
<td>207.1</td>
</tr>
<tr>
<td>Lung cancer</td>
<td></td>
<td>71.3</td>
<td>38.4</td>
<td>48.9</td>
<td></td>
</tr>
<tr>
<td>Breast cancer</td>
<td></td>
<td>25</td>
<td>22.6</td>
<td>22.4</td>
<td></td>
</tr>
<tr>
<td>Respiratory diseases</td>
<td>7009</td>
<td>5.5</td>
<td>42.5</td>
<td>41.3</td>
<td>41.3</td>
</tr>
<tr>
<td>Digestive system diseases</td>
<td>6590</td>
<td>5</td>
<td>36.3</td>
<td>29.2</td>
<td>42.7</td>
</tr>
<tr>
<td>Accidents</td>
<td>3654</td>
<td>2.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>transport</td>
<td>540</td>
<td>8.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suicide</td>
<td>2093</td>
<td>1.7</td>
<td>21.3</td>
<td>102</td>
<td>7.4 UK: 3.4</td>
</tr>
<tr>
<td>Others</td>
<td>10473</td>
<td>8.2</td>
<td></td>
<td></td>
<td>15 Cyprus: 3.4</td>
</tr>
</tbody>
</table>

* Number of deaths (persons)  
** Hungarian population mortality data  
*** Standardized death rate, per 100 000 inhabitants  
**** East-Central European countries: Czech Republic, Hungary, Poland, Slovakia

### LIFE EXPECTANCY, HELATHY LIFE YEARS

Life expectancy is a synthetic indicator of mortality that is calculated from the death order of the population taking into account the death rates according to age. The most comprehensive and best-known indices are the life expectancy at birth and expected

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8 John R. Seffrin, president of the International Union Against Cancer
healthy life years, the latter being used to measure the number of expected years without health restraints.

From the early 1960s the improvement of the quality of life became an important goal for the modern societies of developed countries. To be able to better understand and study the factors – and their effects – influencing quality of life, numerous new models were created along with new indices; these include healthy life expectancy.

From a general point of view, quality of life is a measurement of personal well-being in different, personally important physical and psychological areas [15].

At the turn of the 19th-20th century, mortality was in bad shape in Hungary; the country’s numbers were well below the European average in both life expectancy and healthy life expectancy at birth. After the Second World War, life prospects began to dramatically increase in all European countries, mortality decreased significantly. This upward trend broke down in the mid-1960s and mortality again started to change for the worse – which was a common problem in all socialist nations, not just Hungary. (This change affected mostly the male population while the mortality of women stagnated or improved very slowly.) The main reason behind this change was the drastic deterioration of the mortality of middle-aged men. While in Western-Europe a marked mortality-improvement was evident from the 1970 this was not the case in Hungary. A serious mortality crisis struck the country in the early 1990s, when the life expectancy at birth was 65.13 and 74.71 years for men and women respectively (these numbers were 6.4 and 4.8 years below the European average at the time [16]). A slow improvement can be observed in the data beginning in 1994 but still, the Hungarian figures are far below the EU averages. In 2012 Hungarian men and women could look forward to 71.06 and 78.7 years respectively, while the EU averages were 77.5 and 83.1 years and the East-Central European averages were 73.8 and 80.8 years.

Healthy life expectancy – as calculated according to the methodology valid since 2004 – has increased for both sexes. In 2012 this was 59.2 and 60.5 years for men and women respectively – these were not the worst numbers in the EU but they were nevertheless below the average (61.5 and 62.1 years). Figure 2 presents the above described data; in E-C. Europe only the numbers for Slovakia were worse than ours.

Figure 2
Life expectancy and healthy life expectancy at birth, 2012
MORBIDITY DATA

Morbidity data include the statistical data and indices that describe the observable frequency of different diseases or disorders in a population. In this context a disease is any deviation from the socially accepted picture of health that will shorten the life-span or abate the quality of life and can be perceived by the individual or his/her environment (including perception by persons, healthcare providing systems and diagnostic devices as well) [17]. A disease will diminish not only the physical but also the mental well-being and many ailments will bring hardships to everyday life for years. In Hungary the occurrence of diseases that would otherwise be avoidable (through screening examinations, lifestyle changes, or some sort of medical interventions) is markedly high. It is advisable to collect morbidity data from numerous different sources: public surveys, surveys based on examinations, databases of GPs, morbidity monitoring (and it can still happen that a disease will not be recorded). The morbidity data presented below show the number of disease cases reported to GPs and family paediatricians per 10,000 inhabitants. The common thread in most surveys is that in Hungary the most frequent ailment is high blood-pressure and resulting from this, different ischaemic-9, and cerebrovascular diseases or other complications that can arise from the core issue of high blood-pressure. It is a worrisome fact that the number of cases continues to rise each year. While in 2003 high blood-pressure was recorded 2,345 times among adults, in 2013 this figure was already 3,683. This means that more than one third of the adult population in Hungary is affected by high blood-pressure (the ratio is slightly higher for women than for men).

The second most common type of ailments are locomotor diseases – this is a worldwide phenomenon. These issues are a rising national health problem casting a serious burden on the individual, the surrounding family, the healthcare system and the state as well. In Hungary the number of reported locomotor disease cases among the adult population rose from 665 to 2,272 over a 10-year period. In the U18 generation the most common issues are spinal-deformations (294.5 cases in 2013). In the OLEF10 data the most commonly mentioned locomotor diseases were: rheumatism, arthritis (more than 27% of the surveyed people), joint wear-out (24%), and backache or other chronic spinal problems (31%). The combined frequency of neck-, back- and other spinal issues exceeds 50%. Roughly 8% of people reported problems due to the degradation of bone-tissue (mostly in the older generations). All population surveys confirm the general practice of not seeking out professional help when dealing with spinal diseases but rather just coping with the consequences at home [18]. The number of people affected by bone- and cartilage-diseases continuously grows, a phenomenon that is probably rooted in the enhanced life expectancy coupled with strengthened civilizational issues. Vertebrae diseases are noticeably high in the statistical data taken from GPs. Women are affected at a higher percentage than men in all age-groups. At least 25% of the population at the age of 75 years and up has some sort of vertebrae disease. The fact must be stressed that locomotor diseases have an effect on other ailments as well and through these effects

9 a restriction in blood supply or blood-flowthrough problem
10 data from the Population Health Survey of 2003
they impact life expectancy. Polysystemic autoimmune diseases and RA-patients have a much higher risk of death (the average life-span of RA-patients is ten years shorter than that of the general population), and femoral fractures due to osteoporosis are responsible for an additional 15-20% bump in mortality (when compared to similar-aged population that never suffered a fracture like this). Quality of life for a rheumatic patient is decreased significantly already from the outset of the condition. Among the causes of short-term incapacity for work and permanent disability and the resulting direct and indirect healthcare costs locomotor diseases are dominant factors [19]. More than 100 million citizens of the EU are affected by different rheumatic diseases, the same being responsible for 50% of the short-term incapacity for work and 60% of permanent disability cases, resulting in more than 240 billion Euros of direct and indirect healthcare costs [20].

An endemic disease of the 20th-21st century is diabetes. Based on a survey of the population of Europe, in the U65 segment of the populace Hungary had the highest ration of diabetes; every tenth adult in the country was affected by this disease in 2013. Additionally it is a sad fact that Hungarian diabetes patients die at an earlier age than anywhere else in the EU [21]. When discussing the treatment of this disease, accessibility to the healthcare services and the professional standard of ambulatory care are the defining factors.

The reported number of various cancerous disease cases has increased significantly in Hungary over the past few decades, in the 35-44-year age-group the ratio of the affected people has already reached 1%. Noticeably high numbers have been recorded of malignant neoplasm of breast (166) and lung cancer cases (149). Furthermore, among diseases of the digestive system liver ailments are prominent (due to – in at least third of the cases – excessive consumption of alcohol).

On top of the above mentioned we must also cite allergic diseases (asthma, bronchitis), high cholesterol, stomach-, and duodenal ulcers, and depression. Hungary is considered a low infection-rate country when referring to HIV, the number of reported AIDS patients is low in international comparison [22]. Most diseases have a higher prevalence as age progresses, the exceptions being asthma and migraine headache which occur more frequently in younger people.

![Occurrence of the most frequent diseases in Hungary](image)

**Figure 3**

Occurrence of the most frequent diseases in Hungary
CONCLUSION

It is an undeniable fact that the population of Hungary has been decreasing for the past thirty-five years and at a quickening pace. The drastic drop in the number of births and the high rate of mortality together are the main reasons for this and a number of troubling consequences arise as a result (e.g.: the aging of society leads to higher dependency ratio). The demographic status of the population is defined primarily by the mortality and morbidity figures plus the life expectancy and healthy life expectancy at birth. Hungary’s indices of these categories are unfavorable when compared to the EU or East-Central European averages. Hungary is the leader in the number of deaths caused by cancer (especially lung cancer), diseases of the digestive system and suicide, and is among the top-ranked in many other causes of death. It is an additional problem that we lose our citizenry to avoidable and early deaths far too often. According to both Hungarian and international experts and professionals, this is primarily due to the lack of screening and prevention activities and secondarily to the out-of-date practices, medication and other treatment options that are coupled with a serious lack of organizational framework for all of the above. Stemming from all this is the simple fact that the life expectancy at birth in Hungary is low when compared to the EU average – men are 5.7 years, women are 4.3 years behind in this indicator, but the situation is the same if we look at healthy life expectancy at birth. High blood-pressure and its complications are the leading diseases in the EU. In Hungary the second most common ailments are the locomotor diseases, which have tripled in occurrence among the adult population over the past ten years. These diseases represent a growing general health problem worldwide so it should go without question that serious attention needs to be paid to this area. Other leading diseases in Hungary include diabetes, cancers – the number of patients suffering from various forms of it has increased significantly over the past decade – diseases of the digestive system (especially liver diseases), allergic ailments and depression. The sheer existence and frequent occurrence of these diseases is regrettable but they also have a serious effect on the individual, the healthcare system, society and the economy as well. A good general health status serves as the foundation for personal development and the economic stability of the future whereas a weak health status will have many negative results. Bad health status, diseases and recurring cases will result in more work for and higher pressure on the healthcare system. The number of cases of otherwise avoidable diseases is markedly high in Hungary. The treatment of these diseases means extra costs (medical services, medication costs, incapacity for work).

The stability of the structure of the population, achieving and maintaining better general health state and more favorable indices in all indicators described in this work are of paramount importance. Thus it should be a basic requirement and strategic national direction to increase the rate of birth, decrease the avoidable early death rate and improve the general health state. Since healthcare plays a major role in all of the above, providing for the needs of the healthcare system and the refinement of its services are of unquestionable importance. The latter is the area where the resources of quality development can and should play a huge role.
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WHO: Health for all adatbázis (WHO, Koppenhága); The figures are self-made (based on this data).