

Impact of the crisis on health inequalities in the most disadvantaged micro-regions in Hungary

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Abstract

Social inequalities related to health are present in every micro-region and mostly depend on macro economic conditions. The interpretation of the social factors defining health inequalities presumes not only does the labour market position and the level of income count from a health point of view, but also the level and growth of already existing social and health inequalities in Hungary. Health inequalities are always linked to economic inequalities, the unfairness of the distribution system, bad labour market positions, difficulties in the availability of healthcare and education, disadvantaged living and life conditions, and no chance of a healthy life.

My hypothesis is that the crisis would probably result in health deterioration for the social groups who are most affected by unemployment and poverty. On the other hand, decreasing income and low-key consumption would result in limited possibilities for health conscious lifestyle. Thirdly, health might be considered as an asset to maintain one's position on the labour market, but in prevention and health protection large social differences will appear.

My aim is in the one hand to interpret the hypothetical connection between crisis and health through the analysis of the specialised literature, and on the other hand to present the domestic situation with the help of statistical induction, especially with regional indicators such as territorial autocorrelation and weighted relative standard deviation. In the presentation of the impact of unemployment on health, I took the index of average life expectancy at birth, which determines life chances in a complex way, since it is determined by death rates. The main level of examination of the statistical analysis is the micro-region with a special emphasis on the most disadvantaged micro-regions.

The spatial structure of unemployment and life expectancy on the micro-regional level can provide a more sophisticated view on health inequalities. The local differences of unemployment and life expectancy prove the unambiguously unfavourable position of the north-eastern and south-western parts of the county, as well as North-Western and Central Hungary's favourable situation.

The situation is more differentiated in Eastern Hungary. In the north-eastern micro-regions live the most affected poor and vulnerable social groups with their worse labour market positions. There is another 'breaking off' area in the south-western part of Hungary in Somogy county, which is very similar to the north-eastern area. Particularly, the most disadvantageous situation can be experienced in geographically rural micro-regions along the borderline of the country. The micro-regional difference between the most and least favourable average life expectancy at birth is 7.1 years, which is larger than in the counties (3.1 years). The connection between unemployment and life expectancy is medium-strength on the level of micro-regions.

Fundamentally, socio-economic environment and quality of life influence health conditions; therefore, the current task is to interpret the inequalities of health-related quality of life within Hungary, from the national level through the county level to the level of micro-regions and settlements.

Keywords

health inequalities, life span, unemployment, crisis, micro-region, Hungary

Introduction

It is unquestionable that the crisis has been taking effect on the people's state of health, although the impacts are complex. If our starting point is that the crisis is perceptible in all sectors of economic life and employment has decreased while unemployment had increased, we can deduce that the unfavourable processes have directly affected households. We can assume that the behaviour of households has certainly changed in this economic context, their consumer habits have transformed; they diminish some of their expenses while other expenses have necessarily increased. However it is not so univocal that the changes or reform of the structure of households' or individuals' consumption have always been made at the expense of health behaviour patterns connected with health preservation or prevention. Moreover, it is a fact that state revenue fell back in the crisis period of the last years, owing to the decline of households' income. Under such circumstances, the social resources for healthcare and the development of this sector have been exhausted, non-wage based health expenditure has been drastically cut back.

It is a general experience that even the developed countries could not respond with the expected rapidity and efficiency to the health (sanitary) and medical challenges of the crisis. The concrete problem is that we do not have enough knowledge about the background mechanisms originating in the supplier system during the crisis, and we cannot answer the questions: who adapts himself to the new situation and how he does it, or how he should do it. Consequently it seems to be a strategic issue that the mitigation of negative effects requires inter-sectoral interventions, and in the long run health systems have to be prepared to treat the social consequences of similar economic situations more quickly and efficiently.

Most of the European countries should be prepared for the treatment of the direct and indirect social, health and healthcare consequences of the crisis. Particularly Central and Eastern European countries face serious challenges, where already existing healthcare conflicts would re-appear and health inequalities would become more acute due to the recent crisis. The bad health conditions of the region's population and its shorter life expectancy compared to the Western European average, crisis factors of healthcare inherited from socialism, and inadequate financing altogether mean a problem for healthcare policy, which could not find an efficient solution even 20 years after the transition. Therefore, the role of the present economic crisis is to be predicted in the future change of health conditions.

The health status of the Hungarian population has been extremely unfavourable for many decades. Regarding certain diseases and causes of death, Hungary is in a negatively

outstanding position in international statistics. Hungary has one of the lowest life expectancy rates at birth among the member states of the European Union (Michalski, 2005). The low life expectancy mainly originates from a high mortality rate related to cardiovascular diseases. In morbidity patterns, the diseases of the circulatory system have very high share. Hypertension is almost an endemic disease in Hungary, and ischemic heart disease is the dominant factor of mortality in Hungary. The poor ranking of Hungary on the list of life expectancy at birth in the European Union (EU27) has not changed during the last 35 years, but the size of deviation – expressed in years – from other countries has changed substantially (Uzzoli, 2011). Health, social welfare and economy are notions that are tightly interconnected and complement each other; therefore, the health conditions of humans have an essential role in economic and social processes. For the evaluation of risk factors and their prevention, it is of essential importance to analyse the social situation's role regarding health state and its effect on the health system.

Material and methods

The study is also based on quantitative and qualitative methods.

The following logical framework was applied in the main structure of this survey.

The theoretical analysis is based on the approach to define the social determinants of health and health inequalities.

Besides all this the theoretical framework also intends to interpret the supposed relation between crisis and health through the effects of unemployment on health. The main reason to select unemployment as the most important risk factor on health during the crisis was that this is the factor which most endangers directly and indirectly the state of health.

In the presentation of the impact of unemployment on health, I took the index of average life expectancy at birth, which determines life chances in a complex way, since it is determined by death rates.

In order to explain cause-and-effect correspondences, I justified the link between unemployment and life chances with regional analytical methods (e.g. correlation, regression etc.).

Studying the effects of crisis it can be done with data of 2009 and 2010. All calculations were adapted by both of these years, but the results could show 'the typical crisis year' is 2010. The main reasons are:

- There is stronger connection between examined indicators by Pearson's correlation coefficient in 2010.
- There is more sophisticated spatial pattern by unemployment rate and average life expectancy at birth in 2010.
- The spatiality is more effective factor in the run of unemployment and life span in 2010 than in 2009.

The levels of examination of the statistical analysis are the counties (NUTS3) and micro-regions (LAU1).

Besides of applying quantitative methods I also used a qualitative research tool as interview to analyse the role of crisis on health inequalities. Altogether 12 interviews with experts of health and medical sciences (e.g. researchers, policy-makers, visiting nurses etc.) were done during January-February, 2013. The semi-structured interview contained altogether 15 questions, and each interview was ready approximately during 1-1,5 hours. The questions were related to analyse and compare the different results of economic crisis on health in Hungary after the transition.

The most important question is whether the social network protecting the poor and those liable to poverty is appropriate enough, and whether the gap between the availability of health

services is getting larger. Health inequalities are always linked to economic inequalities, the unfairness of the distribution system, bad labour market positions, difficulties in the availability of healthcare and education, disadvantaged living and life conditions, and no chance of a healthy life (Benach et al., 2008).

Social determinants of health are conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality of life outcomes and risks. Health conditions in these various environments and settings have been referred to as 'place'. In addition to the more material attributes of place, the patterns of social engagement and sense of security and well-being are also affected by where people live (e.g. Hyunen et al., 2005). Resources that enhance quality of life can have a significant influence on population health outcomes.

Understanding the relationship between how population groups experience place and the impact of place on health is fundamental to the social determinants of health, including both social and physical determinants (Hamilton and Bhatti, 1996). Some examples of social determinants are: access to educational, economic and job opportunities; access to healthcare services; quality of education and job training; transportation options; socio-economic conditions; social support; social norms and attitudes, residential segregation; culture etc. (Grzywacz and Fuqua, 2000). Examples of physical determinants include: natural environment (e.g. green space, climate change); built environment; work-sites, schools, and recreational settings; exposure to toxic substances and other physical hazards, physical barriers, especially for people with disabilities etc. (Evans and Stoddart, 1990).

Social determinants of health are the economic and social conditions under which people live and which determine their health. They are 'societal risk conditions' rather than individual risk factors that either increase or decrease the risk for a disease.

The concept of socio-economic health differences refers to the systematic differences in health between people with different positions in social stratification. It is important that these differences in health are not confined to differences between the highest and the lowest social class (Willems, 2005). Health follows a social gradient: the higher the position in the social hierarchy, the lower the risk of different diseases and premature death (Marmot and Wilkinson, 2003). Moreover, health inequalities not only imply social or spatial inequalities, but also socio-spatial inequalities as a whole (Jones and Moon, 1987). It is also important to recognise that social inequalities have spatial aspects that reflect the social context of spatial inequalities.

The issue of 'health inequalities' has been becoming more and more serious a social problem and therefore a topical research focus since the 1980s. The leading experts of the topic in Great Britain brought up the issues in question in the so called Black Report (Black et al., 1985). The life chances are socially determined as inequalities are present in both the quality of life and in the life prospects as the impact of the social conditions: the differences are caused by morbidity in the first and by mortality in the second case.

Social inequalities related to health are present in every country and mostly depend on macro economic conditions. The interpretation of the social factors defining health inequalities presumes that during a crisis, not only the labour market position and the level of income counts from a health point of view, but also the level and growth of already existing social and health inequalities.

Results and discussion

Hungary's economy has been experiencing significant transitional difficulties after 1990. Its social effects, such as the acute problems of unemployment and poverty among low-income population groups have gone together with a 'health recession'. Jointly the role of the epidemiological, the demographic and the new economic crisis have shown some unique

trends in the Hungarian health indicators over recent years. The spatial dimension of the socio-spatial inequalities in health are justified by means of regional inequality indicators. Significant relationship can be detected by the examination of the impact of economic conditions on health state characteristics. The post 1990 transformation of the economic spatial structure of the country greatly affects the arrangement of the counties and regions with favourable and unfavourable general health.

There are significant mortality differentials among the Hungarian counties and according to life expectancies the probability of survival have greatly deteriorated over the last decade. This fact is also clear in adult and infant mortality. Trend surface of the Hungarian mortality by standardised death rate (SDR) can also prove that there is north-eastern–south-western gradient or axis in the spatial structure (Figure 1). Budapest has the best position (SDR=86), and Transdanubia except for Somogy and Komárom-Esztergom county is below the Hungarian average. Counties from Southern part of Eastern Hungary as Csongrád or Békés are due to the average value of SDR. Borsod-Abaúj-Zemplén and Szabolcs-Szatmár-Bereg counties have 10 per cent higher SDR value than the average of the country. The Southern part of Transdanubia has a disadvantageous position.

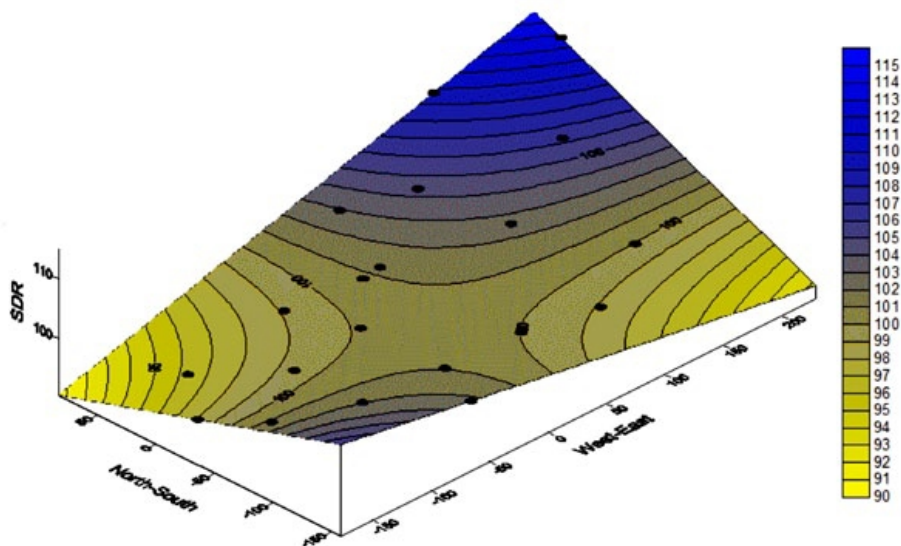


Figure 1. Trend surface of the Hungarian mortality by SDR, 2007 ($SDR=Z(x,y)=100.814+0.028x+0.000xy+0.004y$) (bi-linear)

Source: Uzzoli and Szilágyi, 2009. p. 134.

[Standardised death rate (SDR) is a death rate (usually per 100,000 population) adjusted to the age structure of a standard population, and because of it, it is more suitable to measure the spatial pattern of health inequalities.]

The health indicators of the Hungarian population have been reflecting a particularly unfavourable tendency for a number of decades. The mortality statistics sadly qualify the country for the international vanguard. The unfavourable health status of the Hungarian population is characterised partly by mortality and morbidity data which are outstandingly high in international comparison, and partly by the high occurrence of risk factors (e.g. smoking, alcohol consumption, drug use, nutrition, obesity, lack of physical exercise, unhealthy environment).

The average life expectancy at birth and its changes continuously depended on the improvement or the worsening of the mortality situation in Hungary in the second half of the 20th century. The life chances and its spatial differences within Hungary are influenced by the

socio-economic situation of the counties. The relative position of territorial units has not or hardly changed in the past 15 years. The most advantaged and the worst disadvantaged counties were the same at the beginning of the 1990s as they are today. The examination of the average number and divergence of life expectancy at birth in the last decade shows us a very typical spatial structure (Figure 2, Figure 3).

The most favourable life chances include North-Western Transdanubia (Győr-Moson-Sopron, Vas and Veszprém counties) and Budapest, while the most disadvantageous area can be found in North-Eastern Hungary (Szabolcs-Szatmár-Bereg and Borsod-Abaúj-Zemplén counties). Mortality trends have remained disadvantageous for these, and for Southern Transdanubian counties (especially Somogy county). The county with the best indicators in the fairly bad context of the east of the country is Csongrád. Budapest in general has favourable values regarding the examined indicators; nevertheless, it has a bad reputation for the high rate of deaths caused by malignant tumours. The spatial inequalities of health even more articulated within the boundaries of the capital than those of the country itself (Uzzoli, 2008).

In the comparison of Figure 2 and Figure 3, what can be seen is a very close connection in the spatial structure of life expectancy in the 1990s and the 2000s. During a ten-year period, there was more than 3 years increase in the national average of life chances on the level of counties. Studying the spatial inequalities in life expectancy, the following relation is found: broadly, the best and worst values of life expectancy could be experienced in the same counties – also in the capital – during the examined periods.

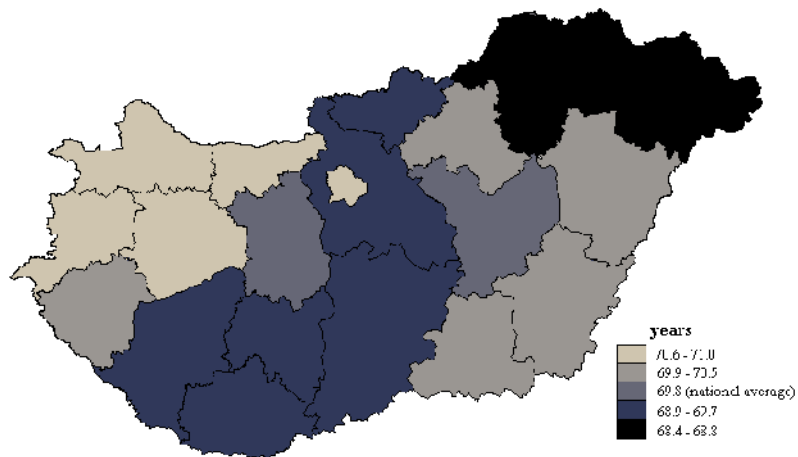


Figure 2. Average life expectancy at birth and its divergence from the national average in Hungary, 1990-1999

Source: Uzzoli, 2012. p. 24.

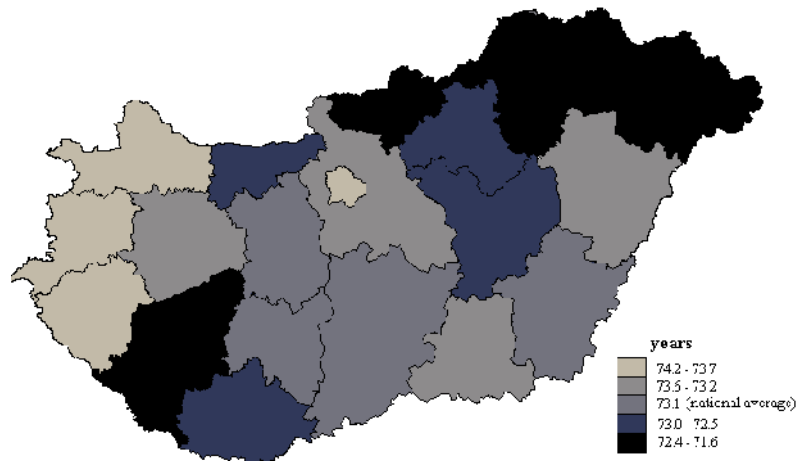


Figure 3. Average life expectancy at birth and its divergence from the national average in Hungary, 2000–2009

Source: Uzzoli, 2012. p. 25.

Life expectancy in Hungary shows characteristic regional variation, a feature which is also typical of other indicators of health status. Life expectancy in Hungary has been increasing recently, but in a geographically uneven distribution. Broadly speaking, the life chances in the Eastern part of the country are a great deal worse than that of the population in the Western part of Hungary.

For 2010, the difference between the average life expectancy of the counties of the best and the worst values is more than 3 years (for males 4.3; for females 1.6 years), while in the capital it is a 7.5 years difference (for males 8.5; for females 6.6 years) between the most and the least ‘healthy’ districts. On the county level, the highest values of life expectancy are found in Budapest and Győr-Moson-Sopron county (74.5 years), for males, it is in Budapest (72.4 years), and for females, it is in Veszprém county (78.9 years). On the level of counties, the lowest value of life expectancy at birth can be experienced in Borsod-Abaúj-Zemplén county (71.4 years), which is also the case for males in general (68.1 years), while the minimum for females is in Jász-Nagykun-Szolnok county (77.3 years). Among Budapest districts, the best value of life chances is found in the 2nd district (79.8 years), also applying for males and females (77.5 and 82.1 years), while the worst value is in the 23rd district (72.3 years) also by both sexes (69.0 and 75.5 years).

One of the most interesting things about the widening health gap between the eastern and western halves of Hungary is that it had already begun to evolve during the 1970s and 1980s, so it is not exclusively the result or a new health process of the transition. Considering the significant mortality and life chances data, it is impossible to disregard the fact that in the eastern part of Hungary the number of people in a multiply-disadvantaged position is very high, and they are struggling with several concurrent economic (e.g. unemployment) and social problems (e.g. ethnic minority groups). In the eastern half of Hungary, the number of people belonging to the upper strata of the social hierarchy is the lowest in the country.

During the period of the crisis, we can see both ‘losing’ and ‘winning’ positions on the level of counties due to both unemployment and life expectancy (Figure 4). From 2009 to 2010, there had been a massive ‘loss position’ via increasing unemployment in Zala and Veszprém counties, while there is a nearly ‘loss position’ by stagnating life expectancy in Baranya county, and by marginally decreasing life expectancy in Vas county – all in the western part of the country. ‘Winning positions’ can only be detected in life span, because it was increasing during one year in all counties (except for Baranya and Vas).

Disadvantageous life expectancy in Hungary presently affects the whole adult population, but its spatial inequalities are influenced by the connection between life expectancy and economic development.

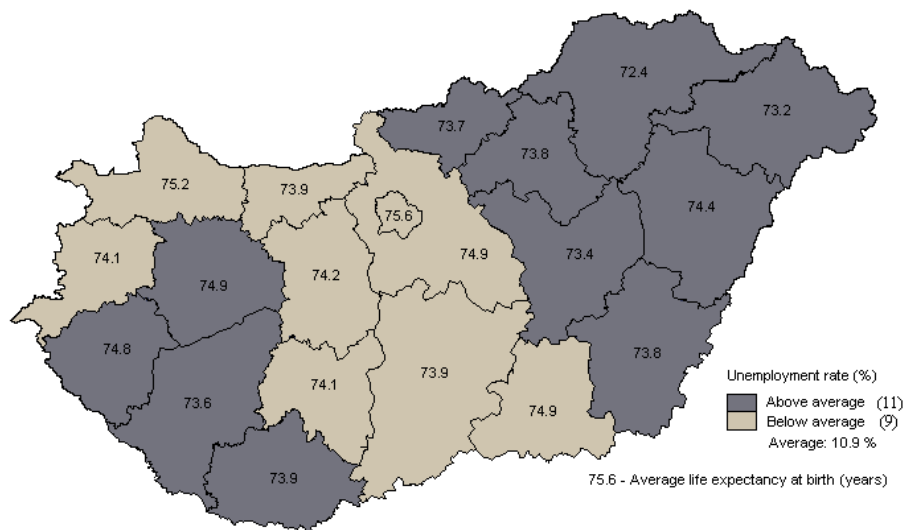


Figure 4. Unemployment rate (%) and average life expectancy at birth (years) in the Hungarian counties, 2010
 Data source: www.ksh.hu

The direct and indirect consequences of the crisis go hand in hand with the deterioration in the affected group’s life circumstances. Based on the analogy of the transition period after 1990 the main issue was what kind of structural changes the economic crisis caused in the variations in the Hungarian unemployment and regional changes in health inequalities. Based on a correlational matrix (Table 1), we can have an overview of the connection between health and economic indicators. Employment rate shows middle-strong close connection with health, but it is more significant for men. Thus employment determines men’s ‘healthy’ life expectations more. It is justified by the fact that men’s healthy life expectancy is in close connection with the unemployment rate. From the examined economic factors, unemployment rate determines life chances the most significantly, mainly for middle-aged males, as 60% of unemployed in Hungary are men.

Table 1. Connection between health and economic indicators by Pearson’s Correlation Coefficient (R^2), 2010

Economic indicators	Health indicators			
	Average life expectancy at birth (year)	Average life expectancy at birth, male (year)	Average life expectancy at birth, female (year)	Mortality rate (‰)
Unemployment rate (%)	-0.727	-0.722	-0.720	0.339

Data source: <https://teir.vati.hu/>

The scale of health differences within Hungary is surprising. The following regional analysis finds a medium-strength relationship between unemployment and life expectancy. These health differences structure is not confined to differences between the poor and the rest of society, but instead run right across society with every level in the social hierarchy having worse health than the one above it. This is the main point where health differences have a

typical pattern due to the socio-economic spatial position of the Hungarian counties. I also found what I expected, which is that huge gaps in health exist between eastern and western counties according to the regional inequality of Hungary

The spatial structure of unemployment and life expectancy (Figure 5) on the micro-regional level can provide a more sophisticated view on health inequalities. The local differences of unemployment and life expectancy prove the unambiguously unfavourable position of the north-eastern and south-western parts of the county, as well as North-Western and Central Hungary's favourable situation.

The most advantageous life span and socio-economic environment can be found in the Northern – except for Szobi micro-regions – and Western part of the region, and also in the capital, with its local population's better life circumstances. The situation is more differentiated in Eastern Hungary. In the north-eastern micro-regions live the most affected poor and vulnerable social groups with their worse labour market positions. At the same time, in South-Eastern Hungary, Csongrád county and the Szeged micro-region positively differs from the average level of Great Plain. There is another 'breaking off' area in the south-western part of Hungary in Somogy county, which is very similar to the north-eastern area. Particularly, the most disadvantageous situation can be experienced in geographically rural micro-regions along the borderline of the country. The urban environment ensures special life conditions that fairly strongly influence the local population's life chances. From Gödöllő micro-regions through Budapest and Győr micro-regions to e.g. Mosonmagyaróvár micro-regions is outlined Between Budapest and Vienna, we find an axis based on many favourable health, environmental and other socio-economic factors or indicators (Szilágyi and Uzzoli, 2013).

The micro-regional difference between the most and least favourable average life expectancy at birth is 7.1 years, which is larger than in the counties (3.1 years). The connection between unemployment and life expectancy is medium-strength on the level of micro-regions, and from 2009 to 2010 it has become stronger, especially in the case of males' life span. If the micro-regional differences of life span and unemployment rate are compared to the national average (Figure 5).

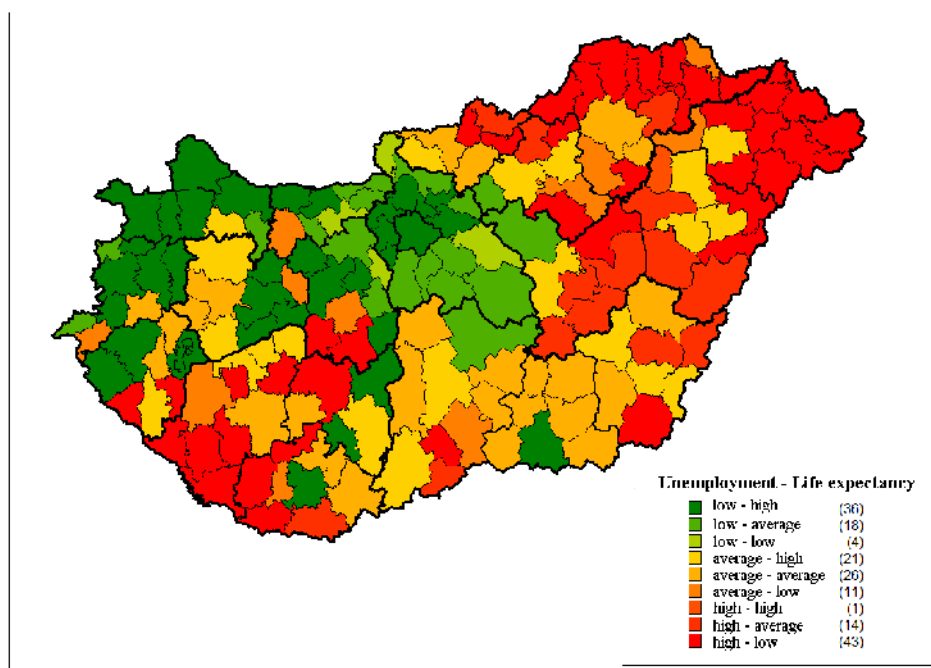


Figure 5. Unemployment rate (%) and average life expectancy at birth (year) above and below of national average in the Hungarian micro-regions, 2010
 Source: Uzzoli and Szilágyi, 2013

Fundamentally, socio-economic environment and quality of life influence health conditions; therefore, the current task is to interpret the inequalities of health-related quality of life within Hungary, from the national level through the county level to the level of micro-regions and settlements. The unearthed information and the statistics carry significant future implication for national health policy. In Hungary the relevant epidemiological challenge is to increase life expectancy and to improve the qualitative parameters of life expectancy.

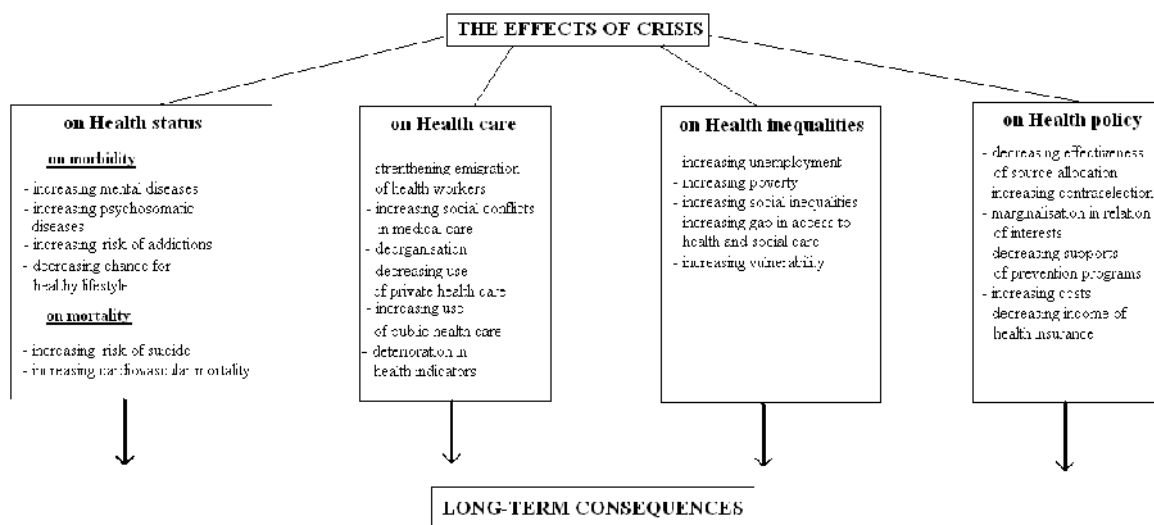
Conclusions

The global economy has been unprepared for the financial crisis, which has also been unexpected by the population. During the deepening of the crisis, the social and healthcare supplier systems have focused on the quick solution of problems; however, the promptness of reactions varied from country to country. But the continuation of crisis, the forecast of new crisis situations, the deepening of negative effects, the radical change of life situation of some social groups attract the attention of health policy to medium-term development, strategic planning and the importance of long-term thinking. During a crisis a lot of changes may occur in the resources of healthcare systems (material and human resources, medication expenses, infrastructure, etc.), the population’s living conditions, social norms, consumption habits and health behaviour.

We face a severe structural crisis and its health consequences in Hungary (Figure 6). The current crisis threatens to become a social crisis according to the increasing socio-spatial inequalities. There are several strong reasons supporting investment in health and the social sector during crisis. First, to promote ‘high’ quality of life: healthy, productive, and stable populations are always an asset, but most especially in a time of crisis. Second, to build security in health care system: robust health systems are essential to maintain surveillance and response capacity in the face of risks and threats. Third, to protect the poor: stronger social safety nets are urgently needed to protect the most vulnerable social groups.

Fourth, to generate efficiency in making policy: pre-payment with the pooling of resources is the most efficient way of financing health expenditure.

Figure 6. The effects of structural crisis on health according to the empirical results of expert interviews



Macroeconomic processes have direct impact on the population's state of health. At the beginning of the 90's the transition into the market economy created a similar crisis situation in Central and Eastern Europe. In these countries, the economic and social consequences of change of system resulted in epidemiologic crisis shown by mortality and morbidity statistics decaying for decades. The current prolonged crisis does not attract so much attention to the direct relationships as compared with the crisis twenty years ago. It rather indicates how the mental conception and psychic perception of crisis affect people and their health. The psychic stress accompanying the crisis is much more intense in those countries where the healthcare and social supplier network has to confront several other challenges. Consequently the workplace maintenance, the retention and improvement of employment opportunities could have a health-protecting effect in critical periods. Moreover, these factors are much more favourable from cost-effectiveness point of view compared with the healing of diseases caused by psychic stress.

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References

- Benach J., Muntaner C., Santana V.: Employment Conditions and Health Inequalities. WHO – CSDH, Montreal, 172 p. (2008) Available from:
http://www.who.int/social_determinants/resources/articles/emconet_who_report.pdf
- Black D., Morris J. N., Smith, C., Townsend, P.: Inequalities in health. The Black Report. Penguin Books, Hammondsworth, Middlesex, 1985, 375 p.
- Evans R. G. and Stoddart G. L.: Producing health, consuming health care. *Social Science and Medicine*. (12.): pp. 1347–1363. (1990)
- Grzywacz J. G. and Fuqua J.: The social ecology of health: leverage points and linkages. *Behavioral Medicine*. (3.): pp. 101–115. (2000)
- Hamilton N. and Bhatti T.: Population Health Promotion: An Integrated Model of Population Health and Health Promotion, Health Promotion Development Division. Working paper. Canadian Federal Government Health Promotion Development Division, Ottawa, 87 p. (1996) Available from:
<http://www.courseweb.uottawa.ca/pop8910/Outline/Models/Hamilton-Bhatti.htm>
- Huynen M., Martens P., Hilderink H.: The health impacts of globalisation: a conceptual framework. *Globalization and Health*. Vol 1 (14.): 17 p. (2005) Available from:
<http://www.globalizationandhealth.com/content/1/1/14>
- Jones, K. – Moon, G.: Health, disease and society: A Critical Medical Geography. Routledge and Kegan Paul Ltd., Portsmouth Polytechnic, London–New York, 1987, 376 p.
- Marmot M. G. and Wilkinson R. (eds.): The Social Determinants of Health. Oxford University Press, Oxford, 2003, 133 p.
- Michalski T.: Changes in the Demographic and Health Situation Among Post-Communist Members of the European Union. Pelplin, Gdynia, 2005, 95 p.
- Szilágyi D. and Uzzoli A.: Az egészség-egyenlőtlenségek területi alakulása az 1990 utáni válságok idején Magyarországon. (The run of health inequalities and its spatial dimension during the terms of crisis in Hungary after 1990) *Területi Statisztika*. (2.): 18 pages. (2013) (in print)
- Uzzoli A.: The mortality situation and its spatial dimension in Hungary. *Czech Regional Studies*. (2.): pp. 41–50. (2008)

- Uzzoli A.: The role of unemployment in the run of life chances in Hungary. – International Journal of Population Research. (1.): Article ID 130318. 9 pages. (2011)
- Uzzoli A.: Impact of economic crisis on life span and its spatial inequalities in Hungary. Discussion Papers 87. Institute of Regional Studies, Research Centre for Economic and Regional Studies, Hungarian Academy of Sciences, Pécs, 2012, 43 p.
- Uzzoli A. and Szilágyi D.: A jelenlegi válság területi hatásai a hazi egészség-egyenlőtlenségek alakulásában. (The spatial effects of recent crisis in the run of health inequalities in Hungary.) BGF, Budapest, 2013, 11 p. (in print)
- Uzzoli A. and Szilágyi D. 2009: Life expectancy and its regional inequalities in Hungary. Geographica Pannonica. (4): pp. 127–136. (2009)
- Willems S. 2005: The socio-economic gradient in health: a never ending story? Ph.D. Thesis. University of Gent, Gent, 92 p. (2005) Available from: www.ac612_en.pdf