DOI: 10.18427/iri-2017-0134

Hungarian Health Inequalities regarding Accessibility

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It can be experienced continuous improving tendency of some health indicators in Hungary in the last more than 15 years resulting a paradox situation in the run of health indicators. On the one hand, the improvment of health is moderated, so Hungary is lagging behind the most developed European countries. On the other hand, reducing mortality data goes together with spatially increasing health inequalities.

The aim of the study is to describe health inequalities in Hungary in a way how different facilities in access to health care can influence regional disparities of mortality and morbidity. The paper contains a case study about acute myocardial infarction (AMI) to define the role of access to health care in the Hungarian health inequalities with its regional differences. AMI morbidity and mortality data is appreciate for examination access to health care, beacuse a quick diagnosis in prehospital care, timely interventions and efficient rehabilitation can increase the survival chances of AMI.

One of the most important results of this case study is that there are significant differences among the different parts of the country according to AMI mortality and morbidity data with its spatial inequalities. The scale of these inequalities is influenced by changes in time, spatial distribution and gender balance. There is a remarkable improvement in AMI mortality in Hungary from 2005, but it is associated with increased regional inequality.

Introduction

The remarkable Hungarian health inequalities are based on poor health conditions of the population and the functional and financing conflicts of health care system. One of determinative factors in health inequalities is the difficulties in access to health care services (e.g. Laki, 2017; Pál, 2017).

The relationship between equal opportunity and health that is present in every country mostly depends on macro-economic conditions. Behind health inequalities there are socio-economic inequalities, injustices of distribution, barriers in access to education and health care, bad housing and life circumstances, and a lack of opportunities for a healthy life (Benach et al., 2008). Thus, socioeconomic trends and factors basically influence the state of health, and, as a consequence of methodological negotiations, the importance of social environment clearly emerged in the research of health inequalities (e.g. Dunn, 2000; Mackenbach, 1993; Mackenbach & Bakker, 2002).

Basically, access to health care means those potential facilities which can help people obtain appropriate health care resources in order to preserve or improve their health. Equity of access may be measured in terms of the availability, utilisation or outcomes of services (Gulliford et al., 2002). Access is a complex and multifaceted concept with many factors influencing the opportunities to obtain health care services. These determinative and influencing factors are part of horizontal and vertical dimensions of equity in access to health care. Access measured in terms of utilisation is dependent on the affordability, availability and acceptability of services and not merely adequacy of supply (Samuels, 2005).

In our project we defined and measured access to health care with the following dimensions and factors:

- The existence of different health care services with its capacity (e.g. spatial distribution of hospitals).
- Need of different health care supply (e.g. due to chronical diseases).
- Socio-economic status (e.g. health behaviour of communities).
- Willingness of use different health care services (e.g. individual health culture).

Aims and Methods

The examinations in our research project were qualitative methods (e.g. literature and content-analysis) as well as quantitative methods (e.g. statistical analysis).

To define the role of access to health care in health inequalities with its spatial differences is necessary to analyse morbidity and mortality data of acute myocardial infarction (AMI). AMI is one of relevant chronical diseases and typical death causes in developed countries and gives important information about the chances of accessibility as well as availability.

Firstly, AMI as an ischemic heart disease remains a leading cause of cardiovascular morbidity and mortality all over the world. Secondly, short term survival chance can increase if after the first symptoms of heart attack the patient receives modern interventions as soon as possible. Modern interventions in acute care mean percutaneous coronary intervention (PCI) and coronary artery bypass grafting (CABG) besides the well-known thrombolysis. Thirdly, long term 30 days survival chance can increase if the patient receives the rehabilitation care as soon as possible after finishing the acute care period.

Our statistical analyses were based on AMI mortality and morbidity data (ICD I21-I23) by gender and age structure between 2005 and 2015 at the territorial level of country, counties (NUTS-3) and administrative units as districts (LAU-1). ICD I21 means incidence of AMI, I22 gives information about recurring AMI, and I23 represents the medical consequences of AMI. Mortality database was created by KSH (Hungarian Central Statistical Office) and NEFI (Institute for National Health Development). Mortality database is based on standardized AMI data for 100,000 (AMI SHA). Morbidity data was calculated by using in-patient care data (hospitals) and database was created by ÁEEK (National Healthcare Services).

Two periods (2005-2008 and 2012-2015) were compared to each other. Statistical comparison also contained the explanation of health effects of the latest economic crisis after 2008-2009. Besides of using mortality and morbidity data it was also made a database about the institutional infrastructure of AMI care (e.g. PCI centre, acute care in hospitals, rehabilitation services etc.) with some additional information about the material resources of telecardiology care.

Spatial inequalities were examined with some selected inequality indicators (e.g. Gini coefficient, Pearson coefficient etc.). The neighbouring impact was examined by spatial autocorrelation, while spatial impact was analyzed by spatial simultaneous autoregressive lagged model (SAR Lag) estimation. Our applied statistical methods could realize an international comparison between Hungary and European countries (EU-28) and also could achieve a comparison between mortality and morbidity data.

Results

The most important results and experiences of our examinations are based on literature and statistical analyses too. Current highlights of preliminary researches based on Hungarian literature are the followings. Literature analyses could strengthen our hypothesis that among cardiovascular diseases AMI morbidity cases and the temporal scale of AMI mortality can give comprehensive information about accessibility. Mortality within 7 days after the first symptoms of heart attack is mainly based on the length of prehospital time and/or the weaknesses of acute emergency care (Belicza et al., 2016). On the other hand, mortality between 30 and 365 days after the heart attack depends on medical instructions and its observing by patients, efficiency of rehabilitation care, patients' socio-cultural (e.g. health behaviour) and socio-economic position (e.g. lifestyle) (Belicza & Jánosi, 2012). It can be also seen that effeciency of early and late interventions in AMI care can affect the probability of AMI mortality one year after the heart attack (Jánosi et al., 2017). These results and facts were demonstrated by EuroHOPE. We can conclude that successfulness of AMI care is belonging to timely interventions, therapies which are based on official cardiology guidelines (MÉRTÉK Review, 2017).

Previous Hungarian researches on AMI have already discovered that more heart attacks can hit men in all age-group; from 2000 the number of PCI interventions increased significantly in Hungary; more men can receive PCI intervention in all age group; premature mortality generally occurs within 30 days after heart attack; AMI mortality of women is higher than men (e.g. EuroHOPE International Research, Hungarian National Infarction Register; MÉRTÉK Review, etc.).

It must be mentioned that there is a continuous improving tendency in AMI mortality in Hungary from the beginning of the 2000 years. It is based on increasing number of PCI centres in the country, but it can be also seen the spreading of telecardiology services with its easier availability (e.g. in primary health care, ambulance care, telecardiology centres etc.) which could also improve the access to AMI care (Bán, 2017).

The most informative facts of our statistical analyses are the followings. AMI is the leading death cause among cardiovascular and ischemic heart diseases in the European countries as well as in Hungary. There was a continuos improving tendency in ischemic heart diseases, and in AMI in the last one and a half decades in Europe, but this advantaged tendency was the most moderated currently in Hungary. On the one hand, the Hungarian AMI mortality rate decreased with almost 50% in the last 15 years, but on the other hand, the country is lagging behind the most developed European countries due to this death cause. The paradox situation is based on the following facts: firstly, decreasing AMI mortality could result also decreasing national mortality rate and rising life expectancy in the country, but secondly, these favourable processes went together with increasing spatial inequalities within the country (among counties and micro-regions). The improving tendency was coming from increasing number of PCI centres in Hungary which could be experienced at the same time of spreading telecardiology services with the result of its improving availability (from the beginning of the 2000s).

Nationally, relevant improving tendency could hit the following morbidity indicators: AMI morbidity rate at 60 years old and youngers, female AMI morbidity, AMI morbidity based on PCI supply. This latter indicator increased with more than 100% between the period of 2005-2008 and 2012-2015. Unfortunately, slight increasing tendency has happened in male AMI morbidity from 2005-2008 to 2012-2015.

The paradox situation which is explained as improving AMI morbidity and mortality with increasing spatial inequalities in Hungary demands more details on a specific research focus with the method of regional studies. AMI morbidity and mortality data proved that rising territorial differences can be experienced especially in female AMI mortality and this increasing tendency has happened after the financial and economic crisis of 2008-2009 (Uzzoli et al., 2017a). This disadvantaged epidemiologic process could result partly changing spatial pattern of AMI mortality within the country. On the one hand, the most advantaged and the most disadvantaged geographical areas based on AMI standardized mortality rate as homogene clusters have transformed in space and time in recent years. On the other hand, some of them were spreading in space, which means a marked spatial expansion of those geographical areas which can identified with the lowest and the highest AMI mortality rate. This tendency or this spatial pattern is very similar to the regional distribution of AMI morbidity, but it is influenced mostly by core-periphery model (with PCI-centres) rather than Eastern-Western gradient.

There are significant differences among the different parts of the country according to AMI mortality. The scale of these inequalities was influenced by changes in time, spatial distribution and gender balance. Our applied statistical analysis could demonstrate the role of neighbourhood at the level of administrative units as districts (LAU-1) on AMI mortality. Development level of districts compared to their surrounding can give a chance for better availability and accessibility. If we examine the role of PCI centre and the role of distance from PCI centre then we can conclude its slight influencing effect in the explanation of territorial differences of AMI mortality. This is the main reason that lower level of AMI mortality rate can be detected in the vicinity of PCI centre. Despite of this fact there are some counties where opposite situation can be experienced (e.g. Békés county). In other words there is higher level of AMI mortality rate in the vicinity of PCI centre of these counties. Moreover, Békés county has a contradictory situation among the Hungarian counties due to AMI morbidity and mortality. On the one hand, new PCI-centre was founded in 2013 which could result increasing number of AMI cases treated by PCI in the last years. On the other hand, improving access to AMI care could not result decreasing tendency in AMI mortality yet (Beke, 2017).

The number of AMI morbidity as generally 155,000 while the number of AMI mortality is more than 6,000 in Hungary in every year (National Infarction Register, 2014). It means approximately one fourth of all AMI cases is ending with death. 98% of all AMI cases treated in hospitals is caused by the first heart attack. 99% of AMI mortality occurs not later than 30 days after the infarction. Moreover, this result is independent from the types of the applied treatment in the acute care of AMI which are certified by European Society of Cardiology. The certified treatment are PCI, CABG and thrombolysis (as a treatment to dissolve dangerous clots in blood vessels). On the one hand, we could see the increasing number of PCI centres from 14 to 19 in Hungary between 2005 and 2015. On the other hand, there are some counties (e.g. Komárom-Esztergom, Tolna, Heves, Pest, Nógrád county) where does not exist yet any PCI centres yet which can decrease the survival chance after the heart attack. The highest rate of PCI intervention - more than 60% - can be found in Bács-Kiskun, Békés, Fejér, Győr-Moson-Sopron, Szabolcs-Szatmár-Bereg, Jász-Nagykun-Szolnok and Veszprém counties, where telecardiology centres are also operating. The significant spatial inequalities can be also experienced at micro-regional level: thus, these territorial differences increased especially among women in recent years. The difference between the highest and the lowest rate of AMI mortality in the districts of capital city is 1.8 times. This difference between the lowest rate of male and female AMI mortality is 2.6 times (Uzzoli et al., 2017b).

Conclusions

Improving conditions of health care on AMI could help to reduce AMI mortality in Hungary. There are many socio-economic factors which can influence access to AMI care through AMI mortality and morbidity rates and its spatial differences. Rising spatial inequalities in AMI morbidity and mortality raises the issue of defining socio-economic determinants which influence or hinder access to AMI care. Reducing spatial inequalities in socio-economic determinants, such as health consciousness and labour market position, can result in declining inequalities in access to AMI care in the future. Analysing these determinants is not part of this paper but they should be examined in the future, especially by local case studies with interviews and questionnaire survey. It must be examined determinative and influencing individual (e.g. health behaviour) and institutional (e.g. supply standards) factors in the future which have effects on barriers in access to health care. Semi-structured and deep interviews will help to explain the role of those individual risk factors which can appear as difficulties in access to AMI care. It is also worth studying the relationship between rising inequalities in female AMI mortality and the long term effects of the latest economic crisis.

Acknowledgement

The study is supported by National Research, Development and Innovation Office - NKFIH (K 119574).

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