

HEALTH INEQUALITY AND ITS REGIONAL DISTRIBUTION IN HUNGARY WITH SPECIAL FOCUS ON ACCESS TO HEALTH CARE

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ABSTRACT

Most research on health inequality is focused on accessibility especially on national level, but there is a need to advance current understanding to regional scales.

The accessibility of health care services is a key dimension in health inequality. In this paper, the concept of spatial accessibility is basically applied to analyse health inequality and its regional distribution in Hungary. I view access to health care services as resulting from the interaction of determinants pertaining to characteristics of individuals, of health care services and of spatial effect. This case study is a part of a three years research project which presents the connection between health inequality and access to health care regarding regional differences in Hungary.

This study examines morbidity and mortality data of acute myocardial infarction (AMI) which is one of leading death causes in the developed countries. The paper also contains an analysis focusing on regional features of cardiac care.

The specific objectives of this study are:

- 1) to examine the regional distribution of AMI data across Hungarian micro-regional units;*
- 2) to investigate the differences between regional characteristics of accessibility.*

The most important results of this research are suitable to make some proposals for decision-making.

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KEYWORDS: *Health inequality, Access to health care, Hungary*

INTRODUCTION

Health inequalities can be defined as social inequities in health are systematic differences in health status between different socio-economic groups (Whitehead, 1992; Wilkinson and Pickett, 2007). These health inequalities are the systematic, avoidable and unfair differences in health outcomes that can be observed between populations, between social groups within the same population or as a gradient across a population ranked by social position (McCartney et al., 2019). Health inequalities are influenced by different factors (e.g. socio-economic, socio-cultural) and one of them is access to health care (Dahlgren and Whitehead, 1991). Access to health care is generally defined as access to a health service or a health provider, thus defined as the opportunity with which consumers or communities are able to use appropriate services in proportion to their needs (Daniels, 1982; Whitehead, 1992; Stankunas et al., 2019). It is also defined as the use of health care, qualified by need for care (Waters, 2000). Conditions of access to health care depend on the following objectives (e.g. Whitehead, 1992; Gulliford et al., 2002; McIntyre et al., 2009; Vitrai, 2011):

- supply needs,
- willingness in use of health care,
- health services with its capacity,
- availability,
- quality of health care.

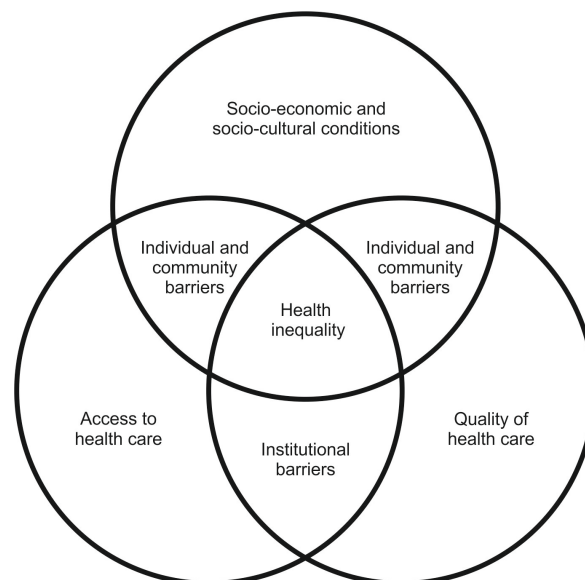
These objectives of access to health care can realize the timely use of personal health services to achieve the best health outcomes (Healthy People 2020, 2017).

Based on the main objectives of access to health care, it can be summarized the relevant triggering and mediating risk factors and barriers of access to health care regarding health inequalities (Figure 1). Individual barriers mean low level of health culture, while community barriers are based on lack of sense of security and social support, weakness of local resilience. Institutional barriers are for example, lack of health care capacity, weakness of integrated health care.

The remarkable Hungarian health inequalities are based on poor health conditions of the population as well as the functional and financial disorders of health care system (Gaál et al.,

2011). In general, Hungary's international position is worse than the average of the most developed Western European countries based on the most important health indicators (Uzzoli, 2016). Especially, the rate of premature death due to non-communicable diseases is internationally high in the country (Plasek et al., 2020). There are typical barriers in access to Hungarian health services. To measure Hungarian health inequalities and its regional distribution regarding accessibility, we applied morbidity and mortality data of a cardiovascular disease such as acute myocardial infarction (AMI). It is one of relevant chronic diseases and leading death causes in developed countries which gives comprehensive information about the short-term and long-term survival chances (Hagen et al., 2015).

Figure 1 The role of access to health care in health inequalities regarding its barriers



Source: own work.

1 METHODS

The most relevant facts and results of this paper are part of a three and a half years research project (<https://egeszsegugyihozzaferhetoseg.wordpress.com/>). The aim of this project is to analyse Hungarian health inequalities focusing on accessibility and their regional distribution. The basic questions of this research are the following:

1) What are relevant barriers and supporting factors of access to adequate health care services regarding epidemiologically important non-communicable diseases presently in Hungary?

2) What are the features of access to health care and its geographical distribution?

3) What is the specific role of spatiality in health inequalities and conditions of access to health care?

Methodologically, the research is integrated both of quantitative and qualitative techniques as mixed methods (Figure 2). Using mixed methods to evaluate health services is increasingly often applied in health research (Király et al., 2014; Tariq and Woodmann, 2013; Wisdom and Creswell, 2013). In quantitative approaches, official statistics are used such as health and socio-economic indicators as well as regional and geographical data, completed data from other sources, such as internet or institutional medical database was also used. Desk research was applied to create content-analysis and secondary data analysis. Qualitative approaches tend to generate non-numerical data, using methods such as semi-structured and expert interviews as part of a local case study (scientific fieldwork).

To measure Hungarian health inequalities and its regional distribution, it is applied morbidity and mortality data of a cardiovascular disease such as acute myocardial infarction (AMI). It is one of relevant chronic diseases and leading death causes in developed countries which gives comprehensive information about the short-term and long-term survival chances.

Based on the main outputs of reviewing technical literature, the objectives of access to health care were selected such as supply needs, willingness in use of health care, health services with its capacity, availability, quality of health care. These objectives have appeared in the statistical analysis such as indicators (e.g. geographical distance, number of physicians etc.). To analyse territorial aspects in the objectives of access to health care, a local case study was realized in 2018 based on semi-structured interviews with medical stakeholders (professionals and patients) in cardiac care (N=54). To summarize and synthesize all results of the research, we highlighted some marked viewpoints in our suggestions for evidence-based and informed decision-making.

2 CONNECTION BETWEEN ACCESS TO HEALTH CARE AND REGIONAL DISTRIBUTION OF HEALTH INEQUALITIES

The number of deaths caused by diseases of circulatory system was 64.695, while mortality caused by AMI was 5.758 in 2018 in Hungary (National Infarction Register, 2019). In the past years, AMI deaths generally caused nearly one fifth of all circulatory system mortality. Hospital treatment due to AMI was 15.082 in 2018, 38% of them ending with death (Jánosi, 2019).

AMI is the leading death cause among cardiovascular diseases in the developed countries. A continuous improving tendency has started in infarction mortality from the beginning of the

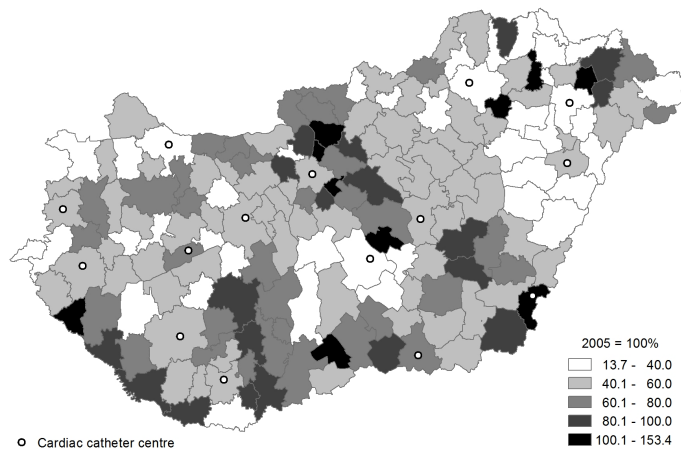
2000s years in the European countries, but this improved tendency was just the most moderated in Hungary. This is the main reason that Hungary is lagging behind the most developed European countries due to this death cause. The Hungarian infarction mortality rate is one of the highest rates in Europe. There is a paradoxical consequence in improving cardiac care in the country which is based on the following facts (Uzzoli et al., 2019).

Firstly, there was a continuous improving tendency in AMI mortality in Hungary from the beginning of the 2000 years. It could result that the Hungarian AMI mortality rate decreased with almost 50% between 2005 and 2015. Secondly, there are significant differences in AMI mortality based on gender distribution: male AMI mortality rate is double of female AMI mortality rate. Thirdly, improving tendency from the middle of the 2000s has gone together with a huge infrastructural investment in health care: new cardiac catheter centres were founded in Hungary which could result better short-term chances. Fourthly, improving AMI mortality rate, there is a high number in AMI morbidity (incidence) in every year which is coupled with marked spatial inequalities within the countries.

There are significant differences among the different parts of the country according to AMI morbidity and mortality (Figure 1). The scale of these inequalities is influenced by changes in time, spatial distribution and gender balance. Lower level of AMI mortality rate can be detected in the neighbourhood of cardiac catheter centres. Despite of this fact there are some areas where opposite situation can be experienced. In other words, there is higher level of AMI mortality rate in the vicinity of cardiac catheter centre of these counties.

Homogeneous clusters were also detected according to the highest or the lowest AMI morbidity and mortality rates changed in space and time between 2005 and 2015. There was a spatial spreading of the most disadvantaged neighbourhood areas defined them with lowest level of those AMI patients who received cardiac catheterization during this period. This highlight is especially valid for female patients. Majority of those clusters defined with the most unfavourable AMI morbidity and mortality can be found in inner and geographical peripheries, or along the Eastern borderline of the country. These geographical areas are the most disadvantaged neighbourhoods based on their poor data of AMI morbidity and mortality as well as other health indicators such as average life expectancy at birth.

Figure 1: Mortality rate of acute myocardial infarction in 2015 compared to the average of 2005 in Hungary at micro-regional level (LAU 1)



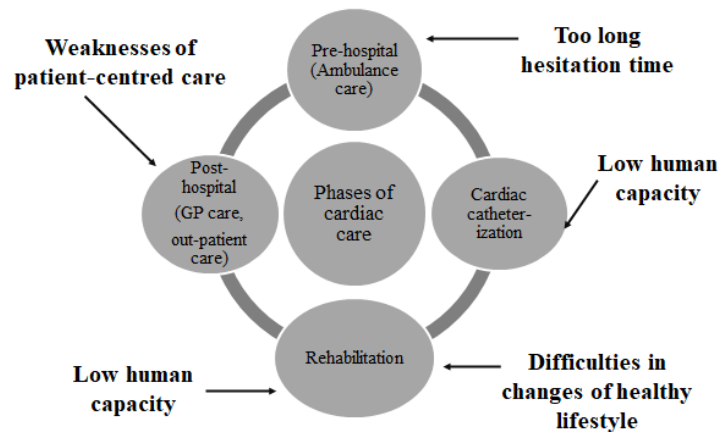
Source: own work.

Based on all results of semi-structured interviews in local case study, it can be easily discovered primary narratives to highlight those factors which are supporting access to health care as well as those ones which are barriers in accessibility.

Firstly, the supporting factors are related to the improvement of availability (e.g. founding new ambulance care centres), the infrastructural investments (e.g. founding new PCI centres), and to the development of patient-centred health care (e.g. strengthening primary health care or the cooperation between primary health care and out-patient care). Secondly, the experiences of interviews also could highlight the most important barriers in access to health care. These are for example, geographical distance, lack of material and human resources, lack of capacities, weak education which can influence health behaviour, low level of health literacy which can influence healthy lifestyle.

In addition, it is still worth mentioning that the role of difficulties or barriers in access to health care depend on different phases of cardiac care. In other words, barriers significantly differ in pre-hospital, hospital and post-hospital phases of cardiac care (Figure 2). For example, in pre-hospital care it can be experienced that majority of patients are waiting for too long for calling medical care. This is too long hesitation time which can reduce the short-time survival chance. Or for instance, the efficiency of rehabilitation and post-rehabilitation care depends on patient's health literacy. Especially in peripheral areas, for those who living in small villages, the conditions for prevention and health care for a healthy lifestyle are less insured. The lack of local opportunities to support the successful lifestyle changes and their limited availability is determinative in urban-rural relation. Local conditions in social norms and healthy behaviour completely differ in cities and villages, which can significantly influence the efficiency of national prevention programs.

Figure 6: Barriers in access to different phases of cardiac care



Source: own work based on semi-structured interviews (N=54), 2018.

According to the outputs of statistical analysis and local case study, there are 4 relevant conditions or factors which can contribute to increasing health inequalities in Hungary:

1. socio-economic differences of health literacy,
2. lack of human and material capacity in health care,
3. weaknesses in spatial optimization of resource allocation,
4. regional differences in the spatial distribution of supply-demand.

CONCLUSION

There are 4 viewpoints or aspects to conclude the most important results. These are such as theoretical, methodological, professional and regional (Table 1). Highlighting conclusions based on regional aspect, we can declare the following. There are remarkable regional inequalities at micro-regional level in Hungary. Increasing regional inequalities mainly affect female mortality. Spatial pattern of morbidity and mortality data is based on Western-Eastern gradient and core-periphery relation. The role of geographical distance and its subjective evaluation depends on socio-economic inequalities. For many patients the role of distance between residence and hospital is appreciated from the point of individuals' view (Beke, 2019).

Table 1. Main conclusions of the examinations in the first half of the research

Viewpoint	Main conclusion
Theoretical	- There is a wide range of different approaches of health inequalities which are not sharply separated from each other - Different health models and their results can complete each other
Methodological	- There are a lot of advantages and disadvantages of quantitative and qualitative methods

	- Examination of a multidimensional phenomenon such as health inequality and accessibility is suitable to apply mixed method
Professional	-Chronic diseases can reduce quality of life and ability to work among middle-aged population - Role of gender distribution is increasing in health inequalities - Efficiency of health care depends on timely interventions - Weaknesses of integrated health care can become an influencing factor in health inequalities
Regional	- Infrastructural medical investments in cardiac care can increase short-time survival chances - Spatial distribution of new cardiac catheter centres can improve availability - Geographical distance has a relative role in accessibility – for individuals it can influence long-term survival chances

Source: own work based on quantitative and qualitative results of this research.

Among conclusions, I can highlight those ones which have marked geographical/regional aspects. First of all, it is important to emphasize the role of geographical location in health inequalities and barriers in access to health care. Geographical location as well as geographical distance is one of determinative spatial factors in access to health care. The role of geographical location is also appearing in distance between residence and health care institutions as well as regional distribution of socio-economic inequalities. Moreover, the supporting or barrier factor of availability primarily prevails in geographical distance. However, improving availability does not necessarily mean improving accessibility in the disadvantaged regions. In these regions geographical distance is increasing between patients and health services because socio-economically disadvantaged position is a barrier factor in accessibility. In such cases, subjective evaluation of geographical distance does not refer to physical availability, but rather to the conditions of accessibility worsened by social barriers.

Geographical location similarly to geographical distance has primarily role in health inequalities as well as in accessibility. Firstly, geographical concentration of health care institutions may influence availability with the result of complex disadvantages of peripheral regions. Secondly, geographical distance has a relative role based on objective and subjective factors. Objectively, it should not appear as barrier in availability based on an optimal resource allocation. Subjectively, geographical location is at a long distance from health care institutions means more barriers in accessibility and availability based on patients' evaluation. Thirdly, relative role of geographical distance is appearing as a challenge for local population living in inner and geographical peripheries or in borderline areas. Fourthly, in geographical location with small villages touched by deprivation patient-centred health care – especially in prevention and health promotion as the part of primary health care – is missing or has many weaknesses. Fifthly, typical spatial pattern of health inequalities in Hungary (Western-Eastern gradient, core-

periphery relation) can influence regional distribution of material and human resources in health care. Finally, urban-rural context of health inequalities has important role in health literacy.

The most important findings can help us to suggest some recommendations for evidence-based and informed decision-making. Among recommendations there are some which have spatial relevance or contribute to solve regional differences of health inequalities in Hungary.

1. It must be emphasized horizontal aspects in developing integrated health care: It means strengthening cooperation between different health care providers at different geographical areas/levels.
2. It is necessary integrating urban-rural context into the framework of health communication and health promotion: There are significant differences in lifestyle and local facilities in active life between urban and rural environment. It should take into account in health care development strategies as well as in community-based health promotion programs.
3. It is important to develop patient-centred health care: This approach appears especially in preventive health care in peripheral areas. For example, it is possible to provide mobile network for screening for diseases among local population.

The novelty of the project presenting in this paper is based on using mixed method to analyse regional distribution of health inequalities in Hungary. It is still worth mentioning that results and outputs can contribute to create a geographically specialized discussion on health inequalities especially in the context of Eastern Central Europe.

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REFERENCES

- [1] BEKE, SZ. Early treatment of acute myocardial infarction and its regional differences in Békés county. In: *Deturope – The Central European Journal of Regional Development and Tourism*. ISSN 1821-2506, vol. 11, no. 1, p. 182-195.
- [2] DAVIS, Gordon B., OLSON, Margrethe H. *Management information systems: conceptual foundations, structure and development*. 2nd ed. New York; St. Louis; London: McGraw-Hill, 1984. 693 p. ISBN 0-07-566241-X.

- [3] DAHLGREN, G., WHITEHEAD, M. *Policies and strategies to promote social equity in health*. 1991. Available at: <https://core.ac.uk/download/pdf/6472456.pdf> [accessed June 10th 2020]
- [4] DANIELS, N. Equity of Access to health care: some conceptual and ethical issues. In *The Milbank Memorial Fund Quarterly*. ISSN 0887-378X 1982, vol. 50, no. 60, p. 51-81.
- [5] GAÁL, P. et al. Hungary – Health system review. Health systems in transition. *European Observatory on Health Systems and Policies*. vol. 13, no. 5.
- [6] GULLIFORD, M., FIGUEROA-MUNOZ, J., MORGAN, M., HUGHES, D., GIBSON, B., BEECH, R., HUDSON, M. What does 'access to health care' mean? In *Journal of Health Services Research and Policy*. ISSN 1355-8196, 2002, vol. 7, no. 3, p. 186-188.
- [7] HAGEN, T. P., HAKKINEN, U., BELICZA, É., FATORE, G., GOUDE, F. Acute Myocardial Infarction, Use of Percutaneous Coronary Intervention, and Mortality: A Comparative Effectiveness Analysis Covering Seven European Countries. In *Health Economics*. Available at: <https://doi.org/10.1002/hec.3263> [accessed September 7th 2020]
- [8] HEALTHY PEOPLE 2020. Midcourse Review. Available at: https://www.cdc.gov/nchs/healthy_people/hp2020/hp2020_midcourse_review.htm [accessed September 8th 2020]
- [9] JÁNOSI, A. Adatok a szívinfarktus miatt kezelt betegek ellátásának helyzetéről. [Data on cardiac care of infarction.] In *Cardiologia Hungarica*. ISSN 0133-5596, 2019, vol. 49, no. 4, p. 249-254.
- [10] McCARTNEY, G., POPHAM, F., McMASTER, R., CUMBERS, A. Defining health and health inequalities. In *Public Health*. ISSN 0033-3506, 2019, vol. 30, no. 172, p. 22-30.
- [11] McINTYRE, D., THIEDE, M., BIRCH, S. Access as a policy-relevant concept in low-and middle-income countries. In *Health Economics, Policy and Law*. ISSN 1744-1331, 2009, vol. 4, no. 2, p. 179-193.
- [12] NATIONAL INFARCTION REGISTER: 2019. Available at: <https://ir.kardio.hu/ir/fooldal> [accessed June 15th 2020]
- [13] PLASEK, b., LAKNER, Z., KASZA, GY., TEMESI, Á. Consumer Evaluation of the Role of Functional Food Products in Disease Prevention and the Characteristics of Target Groups. In *Nutrients*. ISSN 2072-6643, 2020, vol.12, no. 69, doi:10.3390/nu12010069
- [14] STANKUNAS, M., AVERY, M., OLLEY, R., Barber, G. Health Care Access and Quality Index and Financing of Health Care Systems. In *Population Health Management*. ISSN 19427905, 2019, vol. 22, no. 1, DOI: 10.1089/pop.2018.0142
- [15] UZZOLI, A., BÁN, A., BEKE, SZ., PÁL, V., VITRAI, J. Health Inequality and Its Regional Disparities in Hungary: A Case Study on the Role of Access to Health Care. In Esperanta Rompa, E. (ed.): *An In Depth Look at Hungary*. New York: NOVA Science Publishers, 2019. p. 1-52. ISBN 978-53615-351-4
- [16] UZZOLI, A. Health inequalities regarding territorial differences in Hungary by discussing life expectancy. n: Regional Statistics. ISSN 2063-9538, 2016, vol. 6, no. 1, p. 139-163.
- [17] VITRAI, J. Az egészség és az egészség-egyenlőtlenség egyéni és közösségi szintű befolyásoló tényezői. [Influencing factors of health and health inequality at individual and community level.] In: *PhD Thesis*. Pécs: University of Pécs, 2011. 123 p.
- [18] WATERS, H. R. (2000): Measuring equity in access to health care. In *Social Science & Medicine*. ISSN 0277-9536, 2000, vol. 51, no. 4, p. 599-612.

[19] WHITEHEAD, M. (1992): The concepts and principles of equity and health. In *International Journal of Health Service*. ISSN 0020-7314, 1992, vol. 22, no. 3, p. 429-445.

[20] WILKINSON, R. G., PICKETT, K. E., The problems of relative deprivation: Why some societies do better than others. In *Social Science & Medicine*. ISSN 0277-9536, 2007, vol. 65, no. 9, p. 1965-1978.

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