



# Inequalities in Hungarian adolescents' health, health behaviour and well-being, based upon the results of a cross-sectional survey at settlement level, using the Health Behaviour in School-aged Children questionnaire



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## ABSTRACT

The aim of our study was to assess the impact of horizontal inequality on adolescents' health and behaviour within a country and to check the usability of the questionnaire of Health Behaviour in School-aged Children (HBSC) survey at local level. Sampling and data collection was carried out in accordance with the protocol of the HBSC survey among the 5th, 7th, 9th and 11th grade students in Debrecen ( $N_{\text{sampling frame}} = 11,765$ ,  $N_{\text{sample}} = 1310$ ), the second largest city of Hungary. Data on socioeconomic status of the families, variables related to well-being and health behaviour of the children were involved in the analysis. Horizontal inequality was measured by comparison of the local data with the national average, and for this purpose, a *t*-test and two-sample test of proportion was used. The families of the involved children in Debrecen are in better socio-economic status, and the health-related behaviour, as well as the well-being of the school-aged citizens of Debrecen is favourable than the national average. Based on the results, it is submitted that horizontal inequalities relating the place of residence in school-aged children's health and behaviour exist in Hungary and the effect of socio-economic conditions is well demonstrated. The HBSC questionnaire is appropriate to obtain information on the health behaviour of children at settlement level and the gathered data can be used for planning health promotion interventions, tackling problems identified at local level.

## 1. Introduction

Over half of the world's population live in urban areas and the urban population is increasing by about 2% annually (United Nations, 2015a). Urbanisation presents opportunities and risks, with enormous challenges for maintaining and improving human health and wellbeing (ICSU, 2011). This in itself appears connected to environmental justice in relation to the urban and rural population has to face with different health hazards and non-identical services are available. Within urban areas, there is a “triple threat of disease”, taking into consideration the rising prevalence of non-communicable diseases, the infectious disease outbreaks and an increased risk of violence and injuries. With this in mind, however, the cities provide opportunities to prosper and provide valued access to services (WHO, 2016). Therefore the question whether the health and well-being is better or indeed worse within cities cannot be easily answered. In high-income European countries the prevalence of tuberculosis in big cities was 2.5 and homicide rates in the 10 biggest

cities of Brazil were 3.5 times higher than the national value, while in the 10 largest cities in Japan the average total mortality among the cities was about the same as the national average (WHO, 2016).

Urban governance and decision-making structures associated with managing various factors affecting – among others – adolescents' health are usually comprised of variable elements in different regional and local contexts. The challenge for the scientific community is to generate knowledge useful to inform local policy makers on specific problems in their settlements. It is for planning interventions to improve health of school-aged children via changing their lifestyles, creating programmes based on the realities of their health behaviour and local environment. These interventions should target to minimize health inequities clearly explored in surveys.

Health inequalities are measurable differences in health outcomes between different population groups according to socioeconomic status, geographical area, age, disability, gender or ethnic group (Whitehead, 1992). They are used to designate disparities in the health status of

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individuals and groups, whereas health inequity refers to those unevenness in health that are considered to be unfair or unjust (Kawachi, Subramanian, & Almeida-Filho, 2002). There are inevitable health inequalities due to biological and genetic features of the individuals or their lifestyle, while other health inequalities are caused by factors that are out of the control of the individual. These are designated as the health inequities.

Inequalities can be measured vertically (between individuals) and horizontally (among groups). The first is usually used in relation to income, while the latter is more multidimensional - including political, social and economic dimensions -, which is more suitable if we would like to assess well-being. Horizontal inequality can be detected by comparison of the group with the national average and this can be used to identify major policy issues. For this purpose grouping can be made based on age, gender, disability, ethnicity, race, religion, region etc. depends on what is relevant in the given context (Stewart, 2013).

Adolescence is a crucial period of life, because the health status and lifestyle of adolescents has far-reaching effects on their future adult life which means that this group needs more attention and action (Patton et al., 2016). This was one of the reasons for launching the Every Woman Every Child: Global Strategy for Women's, Children's, and Adolescents' Health (2016–2030) which puts women, children and adolescents at the heart of the new UN Sustainable Development Goals (United Nations, 2015b). The aim here is to address inequities within and between the countries. In accordance with the WHO EURO Investing in children: European Child and Adolescent Health Strategy (2015–2020) (WHO, 2014) it is very important to support growth during adolescence in order to be able fully realize the children's health and well-being potential. To reach this goal efforts are needed to close the health inequalities gap for which the improvement of our knowledge in this field is essential. One potential tool for this can be gathering data for situation analysis at local level in order to be able to plan municipality actions.

The Health Behaviour in School-aged Children (HBSC) Survey is conducted every four years in 45 countries and regions across Europe and North America as a cross-national study gaining insight into young people's well-being, health behaviours and their social context for > 30 years (Currie et al., 2009). HBSC findings are widely used not only to characterise international trends and to highlight differences between countries and regions, but to inform policy and practice to develop more targeted and effective interventions relevant for youth at national level. According to the HBSC survey design and research protocol (Currie et al., 2014; Roberts et al., 2009) in the vast majority of countries a nationally (in certain countries regionally) representative sample is drawn (number of participants per country is around 5000), so the impact of achieving a small sample size would have been a severe problem (if not impossible) to obtain data for adolescents of different settlements, areas, sub-regions within a country. Based upon our literature search only a Scottish research group from the national HBSC survey sorted data for Glasgow and compare it with the rest of Scotland (Levin, 2012; Levin, Walsh, & McCartney, 2015a,b). Consequently the results of the national surveys not necessarily represent well the situation in a certain region or city, hence other data collection method is needed to describe the health of the local population.

The majority of previous studies have investigated the relationship between socio-economic status and health from the traditional (education, occupation, income) point of view, whereas the other dimensions of social inequalities, like the place of residence, have been insufficiently researched (Currie et al., 2008). With our study we would like to help to fill this gap. Searching the literature we have not found any other article where the impact of horizontal inequality was approximated from the 'citizens of a better situated town compared to the national average' approach among adolescents. However to tackle inequalities it is vital to collect data at the local level and for this purpose appropriate tool is needed.

Therefore the aim of our present study was at first to assess the

impact of horizontal inequality on adolescents' health and behaviour within a country by comparing data from a health study conducted in the second largest city of the country with the national data and secondly to define whether the questionnaire used in HBSC survey is also suitable to use at local level. According to our best knowledge this was the first time when the HBSC protocol was used to design and carry out a city level representative survey and also when horizontal inequality was approximated from this approach among adolescents.

## 2. Methods

A cross-sectional health survey of the school-aged children population was carried out in Debrecen, which is the second largest city of Hungary. This university city with > 200.000 inhabitants is the scientific, cultural and economic centre of the Eastern part of the country and an (inter)national centre of higher education. Based upon these facts it can be assumed that the socio-economic position of the population is more favourable compared to the national average, for instance the proportion of those who completed maximum primary school was 28.7% in Debrecen and 37.4% in Hungary according to the population census 2011.

### 2.1. Study population and sampling

In order to ensure the comparability of our data with the national data the study protocol of the Hungarian HBSC survey (Németh & Költő, 2016) was followed in the possible highest degree. The study population consisted of 5th, 7th, 9th, 11th grade students who learned in different schools of the city. Multistage, stratified cluster sampling was done where strata were created by school maintainer (municipality, church), by school type (primary and secondary school) and by grades. At the first stage a list was made about the church and municipal schools, then primary and secondary schools were chosen from both, the primary sampling units were the school classes from 5th, 7th, 9th, 11th grade. Finally all pupils from every class within the selected grades were included in the sample. Our sampling frame contained 11,765 students, 19.1% (N = 2246) belonged to the church schools – 744 at primary [No. of students in 5th grade 369, 7th grade 375], and 1502 at secondary [No. of students in 9th grade 779, 11th grade 723] level – and 80.9% (N = 9519) to the municipal schools – 3023 at primary [No. of students in 5th grade 1489, 7th grade 1534] and 6496 at secondary [No. of students in 9th grade 3538, 11th grade 2958] level. With the above described technique 2208 of them were chosen to the sample.

### 2.2. Data collection

The research was performed with the ethical approval of the Medical Research Council Scientific and Research Committee. Documentation was provided to inform parents and children about the aim of the survey, the ways in which confidentiality and anonymity are assured, who has access to the data and how they will be stored and used. Written parental consent was sought, as the involved young people are normally under the age of legal consent. Irrespective of the given parental consent the participation of the pupils was voluntary. The final sample size was influenced by the parental and student refusals, and the number of missing persons on the day of the survey.

The data collection was carried out in 86 classes of 10 schools during November 2015 in class with the online version of the Hungarian HBSC questionnaire. An anonymous self-reported questionnaire was used; the system recorded only the date and the answers provided by the students.

### 2.3. Questionnaire

In accordance with the national HBSC survey, three questionnaires

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