URBAN HEALTH INDICATORS IN THE CONTEXT OF "HEALTHY CITIES" CONCEPT - A NEW PUBLIC HEALTH ISSUE IN ROMANIA

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Abstract: *As long as the urbanization and health have been always linked and the growing proportion of the population that lives in urban centers with the goal of creating healthy cities for all poses the major public health challenge of the 21st century, the purpose of this paper is getting an overview on some urban health indicators (population, education, fertility and morbidity) and healthy cities concept in Transylvania, Romania. Our results showed that the areas covered as demography, mortality and the quality of the environment offer basic, but good starting point information in providing the city health profile in order to identify current health challenges and indicate de health priorities at urban level. Most of all, this paper emphasizes the importance of urban health and urban planning nowadays, which open a new action field of public health.*

INTRODUCTION

Due to the fact that starting with 2007 the rural population was exceeded by the urban one, one of the biggest trends in our century is the urbanization, which has also been one of the most important demographic shifts during the past century worldwide.(1)

According to World Health Organization (WHO), by 2050, over 70% of the world's population will live in cities.(2) In this century, urban change is predicted to be in three directions. First, more people will move into urban centers, that will result in an ever-growing proportion of the global population living in urban areas. Second, slums will become home to a higher proportion of the world's poor, with profound implications for population health. Third, cities will spread spatially with dramatic effects on the environment and human health.(3) Despite the fact that urbanization can bring people lots of opportunities, it comes with a series of negative consequences on the urban health status. Key factors considered to be affecting human health can be: the physical environment, the social environment, and the access to health and social services.(1) Specifically, the factors influencing urban health include urban governance, population characteristics, the natural and built environment, social and economic development, services and health emergency management and food security. The population growth, along with urbanization and industrialization, had its consequences on urban health, which could lead to endemic problems as poor water supply, sanitation and air quality.(4,5)

The methodological and conceptual challenges facing the study of urban health are arising both from the limitations of the research to date and from the complexities inherent in assessing the relations among complex urban systems, disease causation, and health.(1,6)

The diversity of challenges that is faced by the European cities consists in ageing population caused by migration and urban sprawl, but also counteracting climate change. The cities are both the source and the solution for economic, environmental but also social challenges.(1,7)

There is a strong link between urban planning and health.(6) There is a clear need for urban planners to integrate health considerations fully into their work, both in policy and practical terms.(8,9,10) Taking that in consideration, a healthy city is one that is continually creating and improving physical and social environments and expanding those community resources which enable people to mutually support each other in performing all the functions of life and developing to their maximum potential.(11) Urban health is based on core healthy cities principles of equity, intersectoral cooperation, community involvement and sustainability. The concept of Healthy Cities was inspired and supported by the WHO European "Health for all" strategy and the "Health 21 targets". As a concept, it is known in some parts of the world and it has been growing rapidly since 1986. Now, there are 18 national networks and hundreds of towns and cities actively involved in Europe, North America, and increasing in the developing world. Many movements are done regarding this concept. The European Healthy Cities project can be characterized as a social movement which employs an extremely wide range of political. social and behavioral interventions for the development of urban population health. These movements are inspired by ideological, theoretical and evidence-based perspectives.(12,13)

We refer to urban health as the health status and well-being of the population that works and lives in an incorporated area, such as a town or a city and has the water supply and environmental conditions in common.(14) When it comes to Romania, urban health and healthy cities concept is not implemented. One initiative has been take in Arad, through a campaign promoting healthy city concept.

PURPOSE

As long as urbanization and health have always been linked and also the growing population that lives in urban centers with the goal of creating healthy cities for all poses, these being the major public health challenge of the 21st

century, the purpose of this paper, is getting an overview on some urban health indicators and healthy cities concept in Transylvania, Romania, as important steps to urban planning and finally to the new public health policies.

MATERIALS AND METHODS

The evidences presented in this paper are based on public database analysis and on a literature research of scientific articles. In order to measure urban health, a series of indicators are being used. In Europe we have the European System of Urban Health Indicators that is identifying and describing features that may affect the residents from urban areas. According to the EUROSTAT Regional Year Book we can take into account the following indicators: population, health, education, labour market, economy, structural business statistics, research and innovation, information society, tourism, transport, agriculture and the quality of life.(4,15,16)

We gathered data from EUROSTAT database regarding the values of some urban health indicators (population, education, fertility and morbidity) for Cluj-Napoca compared to other cities (between 50000 and 500000 inhabitants) in Transylvania (Oradea, Arad, Sibiu Tîrgu-Mureş, Alba Iulia, Braşov, Baia Mare, Satu Mare, Bistriţa) for a period of five years (2010-2014). The data on environmental issues, particularly on urban air quality and noise level were gathered only for Cluj-Napoca from the Cluj-Napoca Environmental Protection Agency (2010-2014) and Cluj-Napoca City Hall public reports.

The databases were analyzed using Excel software.

RESULTS

Population structure. In the period 2010-2014, Cluj-Napoca had a relatively stable number of inhabitants, having a slightly increasing trend, with a population number extent between 318442 (2010) and 320819 (2014), thus being the second largest city in Transylvania area. As an average, the males represented 47.058% from the total population, while the females 52.942%.

Nine out of ten cities studied in Transylvania reported the total number of population for both 2011 and 2013. Cluj-Napoca was the city with the lowest growth rate (0.26%) compared with the highest ones calculated in Baia Mare (10.05%) and Brasov (8.40%). The only city with a negative growth rate for the studied period was Satu Mare (-9.17%).

The population structure in Cluj-Napoca showed a decreasing percentage for the 0-19 years old group, from 17.1% in 2010 to 16.4% in 2014 (figure no. 1). The age subgroups had a various evolution. If the proportion of the age groups 0-4 and 10-14 was pretty constant, a decreasing was observed for the 15-19 years old group, compared to the increased percentage of the 5-9 years old group. Regarding the 1-19 years old population group, the evolution in the other studied cities was similar to Cluj-Napoca, increasing from 2010 to 2014 in half of them. In 2014, the highest percentages of 0-19 years old group were recorded in Baia Mare (18.7%) and Alba Iulia (18%) and the lowest in Braşov (15%).

Fertility and mortality. The general health status of the population can be characterized by fertility and morbidity. The number of live births per year, expressed as percentages, have had a descendent trend in Cluj-Napoca for the studied period, with a markedly decrease between 2010-2013. It is mentionable that this indicator increased in 2014 at the magnitude of the year 2011 (figure no. 2). On the other hand, the infant mortality, while decreasing in the period between 2010-2012, had a higher proportion in 2013-2014 (figure no. 2), the general trend of this indicator being an ascendant one.

Figure no. 1. Proportion ($^0/_{00}$) of population 0-19 years old in Cluj-Napoca between 2010-2014
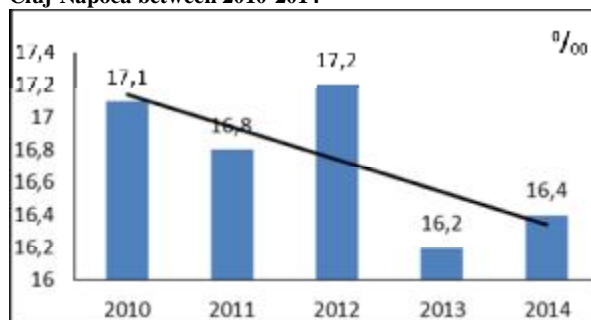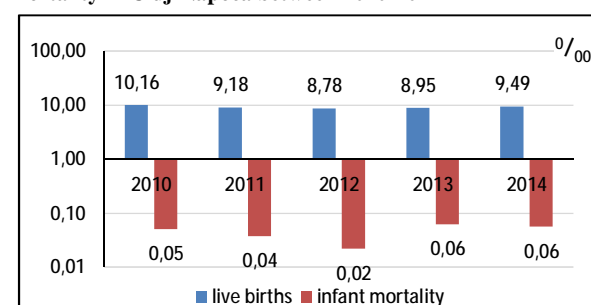

Figure no. 2. Proportion ($^0/_{00}$) of live births and infant mortality in Cluj-Napoca between 2010-2014

The mortality under 65 years in 2010-2012 (no available data on EUROSTAT for 2013 and 2014) showed an important decreased proportion for 2012 compared to 2010-2012. As observed in Figure 3, the proportion of deaths underage of 65 years due to cardiovascular or respiratory diseases ($^0/_{00}$) evolution was very similar to the proportion of total death under 65, with the acknowledgement that the percentage of deaths due to cardiovascular or respiratory diseases decreased more.

Figure no. 3. Proportion ($^0/_{00}$) of deaths/year due to cardiovascular and respiratory diseases
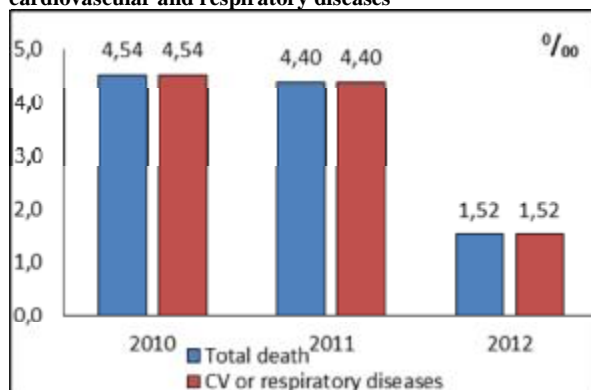
The fertility (live births) and mortality (infant and under 65 years of age) trend in the other eight studied cities was not much different, having a similar trend compared to Cluj-Napoca. In the table below (table no. 1), we present the average values (2010-2014) of the fertility and mortality proportions in the studied cities and the rank for each city according to this. Compared to the other cities, Cluj-Napoca was characterized by a low rate of live births, medium rate of infant mortality and very low percentage of mortality under age of 65 years (the lowest rank position from the infant plus under 65 years

mortality point of view). Oppositely, the city of Arad had a medium rank fertility and the highest mortality less than 65 years.

Table no. 1. Fertility and mortality in studied Transylvanian cities (2010-2014 average values)

| | Live births | | Mortality | | | | | | | |
| | | | Infant mortality | | Total deaths under 65 | | Deaths by CV or resp. diseases | | Average mortality rank |
	$^0/_{00}$	Rank	$^0/_{00}$	Rank	$^0/_{00}$	Rank	$^0/_{00}$	Rank	
Cluj Napoca	**9.2**	**7**	**9**	**5**	**3.4**	**9**	**3.1**	**8**	**7.33**
Oradea	9.4	5	7.3	9	4	7	3.5	3	6.33
Arad	9.3	6	9	5	4.9	1	4.5	1	2.33
Sibiu	10.3	2	10.1	2	4.2	6	4.1	2	3.33
Tîrgu-Mureş	10.2	3	10	3	4.8	1	3.2	6	3.33
Alba Iulia	10.3	1	10.3	1	3.6	8	3.1	7	5.33
Braşov	8.9	8	8.7	7	4.3	5	3.3	5	5.66
Baia Mare	9.9	4	9.7	4	4.4	4	3.1	9	5.66
Satu Mare	7.6	9	7.4	8	4.5	3	3.3	4	5

Education. We took into consideration two aspects: the percentage of children 0-4 years old in day care centers or schools and the percentage of students in higher education. Based on the available information on EUROSTAT database for the 0-4 years old children (2011-2014) the calculated percentage (%) of children 0-4 years old in day care centers or schools increased from 0.298 % in 2011 to 2.386 % in 2014, the same trend being noticed in all the other investigated cities. The number of students in higher education (ISCED 5-6) importantly decreased in Cluj-Napoca, from 82400 students in 2010 to 48691 students in 2014, as well in the other studied cities, all of them being new or traditional high level educational centers. In spite of the EUROSTAT official data it might be a bias related to data reporting.

Environment – Urban air quality and noise. In Cluj County, air quality is being monitored by the Cluj Environmental Protection Agency by using five fix stations, out of which four of them are placed in different points of Cluj-Napoca. There are measured the concentrations of sulphur dioxide, nitrogen oxides, carbon oxide, ozone and the particulate matter PM10 and PM2.5. Some other chemical compounds/xenobiotics like benzene, toluene, ethyl-benzene, xylene and heavy metals (Pb, Cd, Ni,As) are measured. The values of these concentrations were compared with the limit values established in the legislation. The air quality is characterized on an index scale from 1 to 6 (based on at least three measured indicators), 1 representing an excellent air quality, while 6 refers to a very bad quality.

In 2013, the air quality indexes in Cluj-Napoca were between 1 and 5, especially because the values for PM10 and NO2 were higher than the regulations. In 2014, the air quality in Cluj-Napoca was mostly "good" and "medium". There were reported values of daily PM2.5 concentrations higher than the limit in the suburban area representative point. In 2015, the suburban area air quality was "medium", while in the industrial area of Cluj-Napoca, the air quality was 55% "very good", 23% "good" and 17% "medium".

The most important air pollutant in Cluj-Napoca was the particulate matter, which had a significant contribution to air quality index, the main pollution sources being the road traffic

for PM2.5 and residential fuel combustion for PM10.In the 2010-2014 period, the PM2.5 fraction monthly average concentrations have reached values as follow: 2010 – 9.809-33.133 µg/mc; 2011 – 14.008-41.975 µg/mc; 2012-10.57-35.23 µg/mc; 2013-4.61-21.61 µg/mc and 2014 – 2.96-108.2 µg/mc. While the annual concentration average of PM10 did not exceed de maximum admitted concentration (MAC 40µg/mc) in none of the investigated years, the daily concentrations exceeded MAC (50µg/mc): 73 times in 2010, 5 in 2011, 9 in 2012, 6 in 2013 and 9 times in 2014.

According to Romanian legislation in force, Vibrocomp SRL Company updated in 2012 the noise maps for Cluj-Napoca city. The results are available on the Cluj-Napoca City Hall website. The Cluj-Napoca noise maps showed that the most important urban noise source was the road traffic. The noise level along and near to the main roads reached 75-80 dB, meaning a level over the admitted limit with 5-10 dB (the noise levels over 70dB during de day and a night noise levels exceeding 65 dB are common to almost all main roads in the city).

DISCUSSIONS

Based on official and public data, our paper analyzed three main urban health indicators for Cluj-Napoca, the second largest city in Transylvania, and very important aspects have been noticed. The population number increasing was not a significant trend, and the population's structure showed an ageing phenomenon due to a low rate of live births with or without a slightly increasing infantile mortality (the population's ageing had an ascendant trend at national level in Romania). In the meantime, the decreasing number of premature deaths (under 65 years), mostly by cardiovascular or respiratory diseases, also contributed to the population's ageing in the studied cities. The improved quality of life in urban areas and the access to better health services influence the morbidity and mortality by certain causes, but the decreasing more substantially of the premature mortality by cardiovascular or respiratory diseases compared to total premature mortality shows that the causality is going to change. At NV regional level, according to National Register of Cancers, there is a significant increasing trend of cancers, and Cluj-Napoca city is not an exception. The environment has long been recognized as a key determinant of health and in large urban communities, the link is stronger. Even though Cluj-Napoca is not an industrial city, the quality of urban environment is affected by the community itself, in particular air quality is influenced in a negative way mostly by road traffic and residential fuel combustion and noise levels by the road traffic.

The studied cities in Transylvania have not been the subject of a perception survey on urban environmental quality. An European survey on this topic has shown that among EU capital cities in 2015, at least three-quarters of inhabitants were very or rather satisfied with the air quality in their city in Dublin, Vienna and Helsinki (all 88%), followed by Luxembourg (83%), Stockholm (77%), Ljubljana (76%) and Tallinn (75%). In contrast, the lowest shares of the resident population satisfied with the urban air quality were observed in Bucharest (22%), Sofia (28%), Paris (30%), Madrid (31%) and Rome (32%). Regarding the level of perceived noise, Dublin registered the highest rate of the population very or rather satisfied (82%), ahead of Helsinki (81%), Luxembourg (79%), Vienna (78%), Riga (77%), Vilnius (76%) and London (75%). Conversely, Bucharest recorded the lowest share of people globally satisfied with noise level in the city (31%), followed by Sofia (36%), Athens (43%), Madrid, Rome and Valletta (all 45%) as well as Warsaw (46%).(7)

A 2009 study of Barton et al. (16) clearly stated that "The health-related professions increasingly recognize that promoting health solely through programs of changing the behaviour of individuals or small groups is not very effective, reaching only a small proportion of the population and seldom being maintained in the long term. What is needed is a more fundamental, social, economic and environmental change". In this context healthy cities concept is needed to be implemented. As the European Healthy Cities project started in 1996, city health profiles have become an important tool in the work of creating healthy cities. They have been produced in many different forms, reflecting the varied needs and different approaches of cities.(17)

CONCLUSIONS

Detailed information on health linked to geographic, socio-demographic, and environmental data are required to monitor health and its determinant factors. Our results showed that the areas covered as demography, mortality and the quality of the environment offer basic, but good starting point information in providing the city health profile.

The city health profile is an ideal way of bringing together a wide range of health information in order to identify current health challenges and indicate de health priorities at urban level.

It may be useful to consider public health reports as "a visible manifestation of the public health function".

Good urban planning and governance, exchange of best practice models are necessary actions supporting the urban health.

Most of all, this paper emphasizes the importance of urban health and urban planning nowadays, which open a new action field of public health.

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