EVALUATION OF POPULATION HEALTH INDICATORS IN IALOMIȚA COUNTY

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Abstract: There are many inequalities and inequities in health status both at local level and at the level of social groups. Several methods are used for the evaluation of the differences in health status between groups and the terminology can be confusing. This study aims to highlight the spatial inequalities within health status and to overview the main responsible determinants. The analysis of health status in Ialomița county was assessed by using the well-recognized health indicators such as general and specific mortality, general and specific morbidity. In order to analyze these indicators in a comparative and dynamic perspective, multiannual rates were calculated for the periods 1990-2012 and 2008-2012. The results emphasize many territorial differences within the county, ageing being one of the main factors, together with social and economic determinants. The outcome can be useful for future researches, but also for health policies and health funds orientation.

Keywords: population health, health indicators, health inequalities, Ialomița county, Romania

1. INTRODUCTION

Health has been defined in 1948 as being „a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”\(^1\). For people, a good health is necessary in achieving the everyday goals and tasks.

Previous studies focusing on health pointed out territorial inequalities and inequities. There are several methods used for the evaluation of the differences in health status between groups and the terminology can be confusing.

Inequality is the measure of the degree of association between differences in rates and the distribution of the population, while inequity refers to the differences in the distribution or allocation of the resources between groups, like education, health insurance, food, air (Klein, 2010)\(^2\). Shortly, inequality can be associated with disparities/differences (Harper et al, 2010)\(^3\) and inequity is more linked with economic or social disadvantages (discrimination, exclusion).

\(^1\) World Health Organization, (1948), Constitution of the World Health Organization, Geneva
\(^2\) Klein, R. (2010), Defining and measuring disparities, inequities, and inequalities in the Healthy People initiative, National Center for Health Statistics, Maryland
\(^3\) Harper, Sam, King, Nicholas, (2010), Implicit Value Judgments in the Measurement of Health Inequalities, Milbank Memorial Fund Quarterly 88(1): 4-29
Some studies define health inequities as the avoidable inequalities in health between groups (Whitehead, 1998). It was recognized the fact that the poorest countries have the highest infant mortality rate and the lowest rate it is recorded in the most developed countries.

Some of the health inequalities across social groups reflect the unfair distribution of the social determinants of health like access to health care, access to education or social environment (Daniels, 2000).

The well-known determinants of health are related to social, economic and political factors, such as age, born place, living area, occupation, family, education level, income, ethnicity and mentalities (Adler, 1999). Health inequalities emphasize the relation between the socioeconomic position and the access to material elements such as food, shelter, services and facilities (Lynch, 2000). Individual health is influenced both by early life course, when they don’t have enough information (childhood), and by contextual factors from the adult period, as the influenced of others on them (Kawachi et al, 2002).

It was set that health status is influenced by different factors like genetic inheritance, behaviors, attitudes and values, lifestyle, social position. According to studies conducted in Romania, lifestyle has the largest influence on health status with 51%, comparing to 20% of biological factors, 19% of ambient and health services with 10% (Dumitrache, 2004). Each element has its contribution and particularity: the genetic inheritance cannot be changed, the ambient prints individual habits and customs and there are differences between men and women (life expectancy, tastes, predisposition to diseases).

All the elements above mentioned are interdependent: income determine the access to decent living conditions, health services and modern facilities. For example, a person with health problems will have a low yield, will isolate and behave differently. It is a vicious circle in which the financial and health are the main actors (Voicu, 2005).

Worldwide, there are considered to be relevant the following health indicators: life expectancy at birth, infant mortality, and degree of satisfaction with their own health, morbidity and mortality rates, health service costs.

Romania stands out among European countries, in 2011, with a low life expectancy at birth (under 74 years), with a high general and infant mortality (11.8‰ and 9.4‰), while in countries like United Kingdom, Norway and Finland, the life expectancy at birth had

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6 Adler, N.E. (1999), Socioeconomic status and health: what we know and what we don′t, Annual New York Academy Science, 896: 3-15
9 Dumitrache, Liliana, (2004), Starea de sănătate a populației României. O abordare geografică [Health status of the Romanian population, A geographical approach], Editura Univers Enciclopedic, București
values over 78 years, and general and infant mortality registered values under 10‰ and 7‰ (Eurostat Database, 2011)\(^{11}\).

Ialomița county, the study area, show up among other Romanian counties with a lower life expectancy at birth (72.59 years in 2010), a higher general and infant mortality (13.6‰ and 12.7‰ in 2011), and higher mortality due to cardiovascular diseases (803.3 cases/100,000 inhabitants in 2004) compared to 734.8 cases/100,000 inhabitants at the national level, and higher mortality due to cancer (232.8 cases/100,000 inhabitants) compared to 203 cases/100,000 inhabitants at the national level (Ialomița Directorate of Statistics, 2010)\(^{12}\). At local level there are also important differences.

In Romania, the main death causes are: circulatory system diseases, digestive diseases, respiratory diseases and injuries (with poisonings included)\(^{13}\).

Ialomița county is located in the south-east part of Romania, in the Romanian Plain, close to Bucharest area. In 2011, the county population was 285,733 inhabitants, from which 53.9% was represented by the rural population.

2. METHODOLOGY

This study aims to highlight the spatial inequalities within health status and to point out the main determinants of these health differences.

In order to achieve the main objective of the study, bibliographical research, statistical and spatial analysis were used. Statistical analysis was based on health data, obtained from Ialomița Directorate of Statistics and Ialomița Public Health Directorate. These data were processed and analyzed for the period 1990-2012 (general mortality, infant mortality) and 2008-2012 (specific morbidity, specific mortality). In order to analyze these indicators in a comparative and dynamic perspective, multiannual rates were calculated.

Spatial analysis, based on thematic maps, using the open source program Quantum GIS 2.2, was useful to highlight the territorial differences existing in Ialomița county.

3. THE ANALYSIS OF THE MAIN POPULATION HEALTH STATUS INDICATORS

To point out the health inequalities at territorial level, the main health indicators have been analyzed: general mortality, specific mortality (infant mortality, mortality due to circulatory system diseases) and specific morbidity (morbidity due to respiratory system diseases).

- **General mortality**

  During 1990-2012, the general mortality recorded values over the county average, these values being characteristic for almost 70% of the territory, meaning that 36 localities, from a total of 66, registered a general mortality over 14.3‰: from the west part of the county (Dridu, Sinești, Movilița, Bărcănești), central part (Ciochina, Reviga, Gheorghe

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\(^{11}\) European Commission, Eurostat Database 2010, available online: http://ec.europa.eu/eurostat/data/database

\(^{12}\) Ialomița Directorate of Statistics, Ialomița county database 2010, Slobozia

\(^{13}\) idem 14
Doja) or east part (Mihail Kogălniceanu, Vlădeni, Făcăeni). In some rural localities, general mortality registered values over 21.2‰: Balaci, Drăgoești, Adâncata, Brazi (Fig. 1).

In the urban area (Slobozia, Urziceni, Fetești, Căzănești, Amara, Țândarei) the general mortality is lower than the rural area (values under 14.3‰), with one exception (Fierbinți-Târg) where the general mortality is similar with the one from the rural area (over 14.3‰).

Worldwide it was determined the fact that the urban population has better health status than the rural population. In Ialomița county, the rural population has a significant share (53.9% in 2011), and these differences can be explained by a bad access to healthcare, lower level of health education, smaller incomes, different mentalities, bad addressability to medical services, and ageing population.

In some rural localities (Balaci, Drăgoești, Brazi, Adâncata), the high mortality coincide with the high share of aged population, revealing the importance of age in health status. The rural localities situated close to cities registered low values of mortality (Coșereni, Manasia, Moldoveni, Sterlina, Movila), as the access to healthcare is easier.

Political and economic changes that took place in Romania after 1990 (renouncing to restrictive migration policies and discharging pronatalist policies) generated many demographical changes that have influenced general mortality.

According to the mortality values, one can identify three different areas: the urban areas (mortality under 14.3‰); the central-east part of the county (moderate values, between 14.3-21.2‰) and the east part of the county (high rates, over 21.2‰).
**Infant mortality**

Together with general mortality, infant mortality influences life expectancy at birth. The analysis of infant mortality can reveal important characteristics related to education, healthcare, economic and social status, of the population. Also, mother’s education has an important role in case of reducing infant mortality.

After 1990, the decrease of general natality determined lower values of infant mortality, although the values were over the national average (14‰). The infant mortality registered higher values both in urban and rural areas in Ialomița county during 1990-2012: only 15% of the county recorded low values of infant mortality (under 11.4‰). Localities with an infant mortality rate between 11.4 and 34.2‰ are spread all over the county (Dridu, Movilița, Manasia, Balaciuc, Periești, Slobozia, Gheorghe Lazăr, Vlădeni, Fetești) and there are six localities with an infant mortality rate over 34.2‰: Țândărei, Grivița, Reviga, Sâlcioara, Valea Mâcrișului (Fig. 2).

In rural localities, the high values of general natality together with low level of mother’s education, poor hygiene, inappropriate nutrition of babies, low incomes and inadequate medical services are the main causes explaining the territorial differences and for the high values of infant mortality in rural areas. That doesn’t mean that in urban area the situation is necessarily better: there are low values of general natality which influence low infant mortality.
During 1990-2012, the decrease of infant mortality reflects the improving of healthcare and living conditions, but in many areas it was determined by natality decrease. Still the values are very high in both urban and rural areas, which reveal problems in both areas, regarding healthcare, medical education and medical infrastructure.

- **Specific mortality**

For a more detailed analysis, specific mortality may be useful in order to reveal the changes from medical, economic and social levels. The structure of mortality due to main causes of death reveals the local mortality model.

Considering the main causes of death (circulatory system diseases, respiratory system diseases, digestive system diseases and cancers), the local mortality model is similar to the national one. In the etiology of diseases are known several determinants: genetics, age, lifestyle and environment.

In developed countries, the main cause of death is represented by circulatory system diseases (ischemic heart disease, cardiovascular disease, arteriosclerosis, hypertension, rheumatic heart disease), although the number of cases decreased compared to cancers. The responsible factors for these diseases are genetics (predisposition to hypertension), unhealthy behaviors (smoking, alcohol consumption, lack of physical activity) and stress level\(^{14}\).

The stress level is associated with cardiovascular disease, which is visible in countries that have experienced strong industrialization (during a recession and unemployment, mortality and stress have increased considerably)\(^ {15}\).

It is also known that age has an important influence on health status: once getting older the metabolism reacts differently (Meade, 1977)\(^ {16}\).

In Ialomița county, the main cause of death are also circulatory system diseases. One can notice a higher mortality due to circulatory system diseases in rural areas from the west part of the county: Brazi, Adâncata, Maia, Movilița, Dridu, Axintele, Grindu, Balaciu (values over 1419.8 cases/100,000 inhabitants). Lower values of the mortality due to circulatory system diseases are recorded in the urban areas (Urziceni, Slobozia, Fetești, Amara, Căzănești, Țăndărei), while moderate values are recorded in the east part of the county: Giurgeni, Mihail Kogălniceanu, Vlădeni, Făcăeni, Stelnica, Boroșani (Fig. 3).

In the present study, the causes of these differences are related to aged population, medical services, health education, medical infrastructure and mentalities that are different in the two areas. It is more important to prevent than to cure, and in rural areas prevention is neglected as periodical control is rare among rural population.

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\(^{14}\) Voiculescu, M., (1986), *Medicina pentru familie*, Editura Medicală, București


One of the main problems of the rural areas is population ageing. When the share of the population over 65 years old is higher than 20% appear the ageing areas. According to studies, the distribution of the elderly population reveals the ageing areas. This fact is also present in Ialomiţa county. The ageing areas are located in central-west part of the county, where the population over 60 years old has a share of 26-40% of the total population (Brazi, Adâncata, Maia, Dridu, Moldoveni, Jilavle, Movilaţa, Fierbinţi-Târg, Balaci, Grindu, Gârbovi, Reviga etc.). The areas with younger population are located in urban areas (Urziceni, Slobozia, Feteşti, Amara, Căzăneşti), but also in south-east part of the county, where are rural localities (Stelnica, Borduşani, Fâcăeni, Movila) (Fig. 4).

There is a strong connection between age and circulatory system diseases. According to Brown (2010), the strongest connection is between age and circulatory system diseases: 83% of those who have died from such diseases were over 65 years old.

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Some of the ageing areas overlap with the areas with high values of mortality due to circulatory system diseases (Gârbovi, Grindu, Balaciu, Cocora, Axintele, Bărcănești), proving that age is an important determinant of health status. But there are also other determinants that should be considered (social, economic and politic determinants).

The correlation between aged population and mortality due to circulatory system diseases can validate the important role of age in health status. The correlation factor is 0.695 which demonstrates a moderate relation between the elderly population and mortality due to circulatory system diseases: the chances are higher to suffer from a circulatory system disease in case of elderly population. But age is not the only determinant in health differences (Fig. 5).

The relation is stronger in Brazi, Balaci, Ciocârlia, Adâncata, and weak in Armășești, Bărbuleşti and Slobozia, revealing the fact that age is not the only determinant in territorial differences in health status.
Fig. 5. Correlation between mortality due to circulatory system diseases and elderly population (2010)

- **General morbidity**

The morbidity model is very important in assessing health status. At national level, the main causes of disease are respiratory system diseases, digestive system diseases, infectious diseases and nervous system diseases. In 2000, in Romania, respiratory system diseases represented 50% of the total diseases (Dumitrache, 2004)\(^9\).

The local morbidity model is similar to Romanian morbidity model, but there are differences in share. In Ialomița county, the main cause of disease are respiratory system diseases: 42.89%, followed by digestive system diseases (12.08%), circulatory system diseases (4.09%) and infectious diseases (3.23%) (Fig. 6a).

It is visible that the morbidity and mortality models are different: the main cause of death are circulatory system disease (63.4%), cancers (19.1%), digestive system diseases (4.5%) and respiratory system diseases (4.1%) (Fig. 6). The reasons are related to medical education and self-care: people go to the doctor when they have visible symptoms (as in case of respiratory system diseases), and they neglect periodical medical control in order to diagnose circulatory system diseases.

\(^9\) idem 9
Specific morbidity

In Ialomița county, the distribution of multiannual rates of morbidity due to respiratory system diseases during 2008-2012 are not uniform. Only 17 localities, from 66, recorded values under 38.9‰, and 17 localities registered values over 194.8‰.
The main cause of disease are respiratory system diseases, but one can notice that the morbidity model is different between the urban and rural area. Morbidity due to respiratory system diseases has higher values (over 194.8 cases/100.000 inhabitants) in rural areas (Dridu, Bârcănești, Axintele, Balaciu, Valea Mâcrișului, Reviga) compared to urban areas (Amara, Fetești, Țândărei, Căzănești) (Fig. 7).

There is also one city (Urziceni) which recorded high values of specific morbidity (over 194.8 cases/100.000 inhabitants) as the industry is present in this city and the air is polluted, but another reason could be the fact that rural population come in Urziceni for medical services and the cases are registered there. A similar situation one can find in Slobozia, where the values of morbidity due to respiratory system diseases are over 100 cases/100.000 inhabitants. Amara city, on the opposite, recorded low values of morbidity due to respiratory system diseases, under 39 cases/100.000 inhabitants, probably due to low pollution (Fig. 7). The causes of respiratory system diseases (asthma, bronchitis, pneumonia, tuberculosis and chronic illnesses) are multiple, but infection is the most important. Some elements can support the infection, like irritating factors (smoke, gases and chemical products) present in crowded cities.

Localities like Maia, Dridu, Bârcănești, Axintele, Cocora, Balaciu or Armășești recorded health problems both in case of mortality and morbidity, which reveals complex determinants that should be considered.
The correlation between aged population and morbidity due to circulatory system diseases is 0.215, which demonstrates a weak relation between the two variables and other determinants should be considered: experience, skills, social environment, mentalities, lifestyle and local legislation (Fig. 8).

The relation is stronger in Bârcănești, Munteni-Buzău, Balaciu, and weak in Bărbulești, Armășești and Drăgoești, revealing the fact that age is not such an important determinant in respiratory system diseases. It is known that these kind of diseases are more related with the living environment, profession and self-care.

**Fig. 8.** Correlation between morbidity due to respiratory system diseases and elderly population (2010)

### 4. CONCLUSIONS

The study focused on health indicators (general mortality, infant mortality, specific mortality and morbidity) in order to formulate future research hypothesis, to determine the existing territorial inequalities in health status of Ialomița county and to reveal the main determinants.

Assessing health indicators is an important step to locate health problems, to identify the main areas with major health issues and start a local research. According to this study, there are health differences between the mortality and morbidity model, between rural and urban areas. In Ialomița county the values of health indicators are higher than the national average, which reveals a poorer health status, and the major risks are related to circulatory system diseases.

Ageing population influence health status, but also other determinants have a large share in health, and they will be analyzed in future studies. Reducing the existing differences between rural and urban must be in the authorities’ attention, in order to reduce territorial disparities. They have to improve the access to healthcare, change the medical technology, and invest in education and information about healthy lifestyles.
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