THE TERRITORIAL DISTRIBUTION AND USE OF EMERGENCY HOSPITALS

- Romania, 2007 -

Dr. Marius CIUTAN, MD, public health and health management specialist, NSPHHSM Bucharest
Dr. Nona Delia CHIRIAC, MD, PhD student, researcher, senior physician in public health and health management, NSPHHSM Bucharest

To make the Romanian health system efficient is one of the persistent priorities for policy makers in charge with the management of health institutions during the last 20 years, and also represents one of the reasons of politicians’ persecution.

But looking back, improving the efficiency of hospital activity can be considered as one of the health system challenges, rather overloading with additional tasks the staff involved in such activities and raising the financial burden for the system, than bringing a substantial benefit for the overall efficiency of the hospital and, implicitly, of the whole healthcare system in Romania. In fact, this is one of the main reasons which led to the demission and sequential replacement of several managers from the Romanian health care system; in this respect, the few successful disproofs against some of these relegations appear as exceptions to the general rule. The attempts of the previous governments to improve the healthcare system have failed due to:

- a lack of a constructive vision (in the true sense of the word) regarding the Romanian hospital system or;
- some attempts to improve the quality of healthcare without providing a critical overview on the hospital services provision and on the effective ways to improve it.

One of the possible explanations for this lack of vision is definitely linked to the professional skills of the managers, and it can be attributed largely to the appointment (official or not official) of the managers by using political and not professional criteria; but of course, this is not the only argument and a large part of guilt could be accredited to the incoherent decisions regarding health policy in the last two decades.

Currently, given the general and even global financial crisis, we cannot afford to experiment and improve any more, because this would only allow us to treat the symptoms and not the real cause. Similar with the poor man which, in tough times, decide to exclusively buy expensive and quality things in order to satisfy himself a certain need for an extended period of time, it can be appreciated that the time for improvisation in the Romanian healthcare system has passed and we need to make major decisions based on econometric analyses, taking additionally into account the quality of care; also, we will have to pay attention to a more active involvement of the population and community in the decision-making process.

Regarding the reorganization of the hospital sector, the initial and main concern should be focused on the development and/or reorientation of the provision of hospital services, which is still similar with the older territorial hospital distribution, inherited from the communist system; this improved supply is expected to meet some of the increasing health needs of a population having different characteristics compared to the previous communist period. In fact, the old hospitals have generally kept their previous functions, but partially suffered a lot of inefficient adaptations or financial provisions. Of course, there are exceptions and in a specific context these examples may be considered as models for improving the hospital activity and we should take them into account.

This research is a cross-sectional and descriptive study regarding the Romanian hospitals distribution and the use of emergency hospitals, in 2007.

The GOAL of this study was to provide evidence regarding the availability and use of health services provided in emergency hospitals.

OBJECTIVES:

a. To describe the territorial distribution of hospitals in Romania and to highlight the distribution of emergency hospitals.

b. To describe the level of use for emergency hospitals.
METHODOLOGY:
In order to describe the current situation on the provision of hospital services (mainly on emergency hospitals) we used data from the DRG National database* (all medical units with beds and having contract with health insurance funds and/or providing patient level clinical data); these data were supplemented with data identifying the ambulance services/stations in a public register of medical units (Golden Pages).

The Romanian hospital services provision has been considered on the basis of two parameters in the DRG database: hospital type (county, city, town, communal, emergency, health centre, private centre, etc.) and locality. Using the information submitted by hospitals on the two parameters the following indicators were calculated: -the number of hospitals by hospital type, and -the number of hospitals by administrative-territorial unit to which it belongs: region, county and even city.

In this article, the results of the first objective will be presented graphically (cartograms, cartodiagrams, graphics) and in table form.

Considerations regarding the use of cartograms.

The process of generating evidence, that could be used for political decision, must be planned in advance so that the further analysis of this evidence would provide valid and adequate arguments for intervention.

Regarding the hospital services provision, the cartogram can be useful insofar as it is combined with quantitative and qualitative analysis to complete and validate the information graphically presented and thus outline concrete arguments to support a particular intervention.

RESULTS. DISCUSSIONS.
The territorial distribution of hospitals in Romania, 2007

- current status (in 2007).

In the year 2007, hospital offer was quite diverse; so, there were 487 units with beds, of which: public and private hospitals, county, city, town, community, health centers, or sanatoria, and their territorial distribution was quite uniform (cartodiagram 1); also some counties were better endowed with hospital units (these are primarily the counties comprising university centers: Iași, Cluj, Craiova, Timiș, București, Constanța, Târgu - Mureș), but in others counties the access from the territory appeared to be quite limited (mainly the border: Tulcea, Vaslui, etc., and also the Carpatho-curvature area).

Given that in these counties there are several isolated communes/villages located in areas where access is limited by a poor development of road or railway network, it can be affirmed that the access is restricted, particularly in the Delta and mountain areas.

This distribution, characterized by dispersion of hospitals in some areas with lower percentages of the population comparing to the national average (the frontier and the Carpathian curvature) and their concentration mainly in university centers was rather the consequence of previous urban development and territorial allocation of health services policies that led to the development of hospital supply depending on the country’s urban development and, to a lesser extent, it can be attributed to a selective use of the hospital services by population.

- the relationship between the hospital availability and activity

By strictly analyzing the data in terms of number of hospitals to which people address and number of discharges, we find (diagram 1) that in only 10% of hospital units were recorded 40% of discharges, and in only 40% of hospitals were recorded 80% of discharges, in 2007.

The preliminary conclusion can be that hospital activity can be summed up in just less than half of existing hospitals, and this hasty conclusion leads to the need to explore in more details this type of approach. Even in these conditions of analysis, this image is not accurate, because the variable quantifying the hospital availability should be adjusted by the number of beds in each hospital.
Cartodigram 1. Territorial distribution of hospitals providing data to the patient level, Romania, 2007
As the list of the 10% (first 48 hospitals ordered descending by the number of discharges) of hospitals contains almost all emergency hospitals and district or city ones, having a large number of beds, the graphic curve synthesizing the relationship between the hospital availability and activity would be a logarithmic curve moved down so that the point representing less than 10% of hospital beds would indicate 40% of discharges.

As can be seen from diagram 2, about 37% of hospital activity (number of discharges) was recorded in the 62 emergency hospitals; on the basis of a preliminary and raw analysis, which would not take into account all factors leading to an optimum accessibility of population to hospital care, one could recommend to maintain such hospitals with a large number of beds (county, city, university) in the context of a reorientation, or reorganization of small hospitals. Some research studies show that the optimal efficiency is about 50 beds for small hospitals and about 200 beds for large hospitals [1]. Due to the fact that the Romanian small hospitals are located in small cities and even in communes, we have to take into account both the assurance of an optimal hospital efficiency and an optimal level of accessibility to these hospital services.

**The territorial distribution of the emergency hospitals in Romania**

- current status (in 2007).

In Romania there were 62 emergency hospitals distributed mainly in the big cities, and preponderantly in the academic centers (Table 1): in Bucharest, the capital of Romania, were concentrated 14 emergency hospitals (about one quarter - 23% - of all Romanian emergency hospitals); more than 3 emergency hospitals were recorded in Iași (5), Cluj (4) and Timișoara (4). There are also some counties with no emergency hospital (see cartodiagram 1).

This distribution explains the concentration of the emergency hospitals around large cities that can provide and ensure efficient health resources (academics, efficient equipment, etc.) by some clinical centers, universities, but also rather explains a regional distribution of these hospitals; in this sense, each of the 8 development regions contains reference centers of (generally represented by a county emergency hospital) emergency services and is focused on a regional university centre.

Although the emergency services territorially cover uniform enough the national surface (cartodiagram 2), there are geographical areas with low accessibility induced by the existence of isolated villages with no roads access or long distance to the first service/station/hospital providing emergency healthcare.

Cartodiagram 2 and 3 allow a better visualization of the spatial distribution of hospital units and a better appreciation of the accessibility level, defined in terms of real distance to a hospital.

**Diagram 2. Hospital availability curve in relation to hospital provision by type of hospital; Romania, 2007**

Data source: Romanian DRG National database, 2007, NSPHHSM of Bucharest.

Thus, one can estimate the distance and combine it with the ways of access to a particular hospital and thus can focus the attention on the access time to hospital emergency services.

Of course, in order to more accurately assess the access time we must consider many other factors; the cartodiagram should be improved by projecting also all ambulance stations and number of family doctors (which, at least theoretically, could primarily ensure the provision of emergency services in rural areas by ensuring the continuous healthcare in the permanent healthcare units); because this projection would greatly complicate the diagram, we will try to exemplify this chart only by figuring all emergency hospitals and ambulance stations (cartodiagram 2, completed with roads access ways).
Table 1. Emergency hospitals in Romania (name and no. of analyzed hospitals); Romania, 2007

<table>
<thead>
<tr>
<th>Administrative Unit</th>
<th>Emergency hospitals</th>
<th>Of which: Military</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUCUREȘTI</td>
<td>14</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>BĂIA MARE</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>CARANȘEȘTE</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>CUIVĂNEȘTI</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>IAȘI</td>
<td>5</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>TIMIȘOARA</td>
<td>4</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>GALĂTI</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>CONSTANȚA</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>CRAIOVA</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>BRASOV</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>ORADEA</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>PÖCŞANI</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>ALBA IULIA</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ARAD</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PITESTI</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>BĂCĂU</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>MOINEȘTI</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BOTOSANI</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BĂRAȘI</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>CARĂȘI</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PETROȘANI</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SLOBOZIA</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BAIA MARE</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>TÂRNU MUȘENI</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PIATRÂNEȘTI</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ROMAN</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PLOIEȘTI</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SIBIU</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>SUCÂNĂ</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>TÂRNUȘOARA</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BĂRLEŢA</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>RĂFIPEȘTI</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BĂLĂCEA</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>VASLUI</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>62</td>
<td>12</td>
<td>50</td>
</tr>
</tbody>
</table>

Emergency hospitals/medical units with beds, in Bucharest, 2007:
1. SPITALUL CLINIC DE URGENTA "BAGDASAR-ARSENI" BUCUREȘTI
2. SPITALUL CLINIC DE URGENTA "SF. IOAN" BUCUREȘTI
3. SPITALUL CLINIC DE URGENTA "SF. PANTELEIMON" BUCUREȘTI
4. SPITALUL CLINIC DE URGENTA BUCUREȘTI
5. SPITALUL CLINIC DE URGENTA DE CHIRURGIE PLASTICA, REPARATORIE SI ARSURI BUCUREȘTI
6. SPITALUL CLINIC DE URGENTA PENTRU COPII "GR. ALEXANDRESCU" BUCUREȘTI
7. SPITALUL CLINIC DE URGENTA DR. ION JIANU PITESTI
8. SPITALUL CLINIC DE URGENTA "M. S. CURIE" BUCUREȘTI
9. SPITALUL DE URGENTA "PROF. DR. DUMITRE GEROTA"
10. SPITALUL MILITAR DE URGENTA "ELIAS" BUCUREȘTI
11. SPITALUL UNIVERSITAR DE URGENTA BUCUREȘTI
12. CENTRUL CLINIC DE URGENTA DE BOLE CARDIOVASCULARE "DR. CONSTANTIN ZAMFIR"
13. SPITALUL CLINIC DE URGENTA MILITAR CENTRAL
14. SPITALUL MILITAR DE URGENTA "PROF. DR. AGRIPIA IOANEȘCU"

Military emergency hospitals, in Romania, 2007:
1. SPITALUL MILITAR DE URGENTA DR. ION JIANU PITESTI
2. SPITALUL MILITAR DE URGENTA AFRAM IANCU ORADEA
3. SPITALUL MILITAR DE URGENTA "REGINA MARIA" BRASOV
4. SPITALUL MILITAR DE URGENTA CLUJ-NAPOCA
5. SPITALUL MILITAR DE URGENTA "DR. ALEXANDRUC GAFENCU" CONSTANTA
6. SPITALUL MILITAR DE URGENTA "DR. IONEL SIU" BUCHAREST
7. SPITALUL MILITAR DE URGENTA "DR. SORIN BÂNCILĂ"
8. SPITALUL MILITAR DE URGENTA "DR. CĂTĂLIN BÂNCILĂ"
9. SPITALUL MILITAR DE URGENTA "PROF. DR. AGRIPIA IOANEȘCU"
10. SPITALUL MILITAR DE URGENTA "DR. GEORGE I. MOȘA"
11. SPITALUL MILITAR DE URGENTA "DR. VASILE DUMITRESCU"
12. SPITALUL MILITAR DE URGENTA "DR. IOAN STĂnescu"
13. SPITALUL MILITAR DE URGENTA "DR. ION CANICEA"
14. SPITALUL MILITAR DE URGENTA "DR. OȚILLIU DONCEA"
15. SPITALUL MILITAR DE URGENTA "DR. MĂRIU GÂLICĂ"
16. SPITALUL MILITAR DE URGENTA "DR. NICOLAE TĂIANU"
17. SPITALUL MILITAR DE URGENTA "DR. RADU DÂNCU"
18. SPITALUL MILITAR DE URGENTA "DR. IOAN GRĂBUZĂ"
19. SPITALUL MILITAR DE URGENTA "DR. IOAN DEACĂ"
20. SPITALUL MILITAR DE URGENTA "DR. MĂRIU GÂLICĂ"

Data source: Romanian DRG National database, 2007, NSPHHSM of Bucharest.
Cartodiagram 3. No. of inhabitants, emergency hospitals, ambulance services/stations, access road ways; Romania, 2007

Cartodiagram 4. No. of discharges and the percentage of emergency discharges of total; Romania, 2007

Data source: Romanian DRG National database, 2007, NSPHHSM of Bucharest.
CONCLUSIONS.
RECOMMENDATIONS.

The investigation of the supply exclusively by human or structural resources (hospitals, beds, doctors, etc.) is not sufficient to describe the usefulness of each hospital unit, but may focus the attention on areas of intervention or on further in depth quantitative and/or qualitative analysis.

But sometimes, the usefulness of a hospital can be supported, for example, only by one parameter depending on the policy or strategy target; so, for example, to ensure an optimal access to hospital care services we could use the distance/length of time necessary to reach that hospital and in this context cartogram is a tool that can identify (giving us the opportunity to make comparative judgments) localities, zones with problems.

The researchers' role is to provide evidence and also recommendations, but the decision makers should take into consideration all necessary evidence. In this sense, when a political reorganization of the hospital should be planned, we should not necessarily shut down a hospital in that county (where the density of the surface area hospitals served is very small) because in that area would be a deficit; decision must rather be to identify alternative for services provision by a different type of medical unit, so that the emergency services might be provided in that territory.

These solutions may include the reorganization or completing the territorial supply with alternative/services (permanent centers, ambulance stations, access roads and tele-communication, etc.).

The shutting down of hospitals should be the last alternative and requires an act of political courage that must be sustained, however, by solid evidence.

Medical emergencies are a priority for the provision of health care for each country, and ensuring equitable access to services and especially the emergency services should be permanently included on the agenda of the ministry concerned.

The scarcity of financial resources in the health sector leads to an acute need to develop strategies based on prioritization of the needs of the population, and this prioritization must be supported by solid, valid and timely evidence.

In the context of an increasingly and visible endeavor towards a decentralization of the health system (which includes also a hospital system decentralization), to know the emergency hospitals distribution can provide a framework for working effectively; thus, it can be identified disadvantaged areas and designed a coherent plan for equitable regional development in terms of emergency hospital services provision.

Emergency hospital regionalization is no longer a current topic for many Western European countries; instead, in the current Romanian context it becomes a necessary concern and is substantiated by both the old territorialisation of these hospitals and the need to improve physical and functional status of these hospitals.

Failing to provide at least one emergency hospital in every county and in the context of decentralization of the health sector including hospitals, one can foresee to maintain control at the central level at least for the regional emergency healthcare services provision.

Construction of, or at least upgrading some hospitals for becoming regional reference hospital for emergency medical services in a development region is one of the current concerns of the Romanian government.

Thus, the Government Program 2009-2012 states in the chapter "Efficiency and modernizing hospital services" the accomplishment of a regional emergency hospital network at European standards [2].

The network will be composed of emergency hospitals from the university centers (which will be upgraded so that to correspond to the functioning rules in the EU) and it is foreseen even a building process of some new hospitals.

This approach, although it is still unvisible (due to a lack of funds), it seems to be a compromise and would cover (even partially) deficiencies in the emergency medical system in Romania, including:

- Insufficient number of family doctors in rural areas;
- Insufficient number of permanent healthcare units;
- Poor endowment (human resources, materials, equipment) for the services and ambulance stations;
- Lack of any incentives for medical staff to activate in this area.

This series of articles dedicated to the supply of emergency hospital care services will include in the next article a quantitative analysis on the use of the health services provided by emergency hospitals; to preface the next article, we will draw attention the cartogram no 4 with the territorial distribution (at county level) of number of discharges and proportion of emergency discharges of the total number of discharges. As can be seen from cartogram 4 it is shown that counties with the most discharges (shade figured with the dark color) correspond to the counties with a university centre and a proportion of emergency discharges around or over 50% of the total discharges (in the county) recorded in 2007 (see pie charts of cartodiagram 4).

This article will be continued through a series of quantitative analysis that will attempt to provide a model for scientific and analytical approach on hospital supply in relation to factors affecting the supply of hospital services.

Will be continued in our next.

References: