Developments In The Vilnius Regional Area Network

Introduction

The materials presented herein are part of the initial working phase of a European Commission supported Interreg-IIIC program research project "Network for Future Regional Health Care". The working team Vilnius Gediminas Technical University, headed by the presenter of this paper, is engaged in this program. The three-year scheduled project of consortia of 20 partners from nine European Union countries aims at setting strategic focuses and practical plans for further developments in the network of health care in the participating European countries. The activities in Lithuania are developed around the visions for optimization of a regional health care network, creating new approaches in planning and design of health processes in new environments, and implementation of these visions in areas and working spaces of real health institutions.

Importance Of The Topic

In a changing political and economic situation the health care sector is experiencing a period of radical change in most European countries. Limited state budgets for health care, the increasing needs of an ageing society, rapid development of medical technologies and the rising expectations of the citizen are the driving forces in this process. In the new member states of the European Union the reform process in health care is even more radical because of the crucial changes in their political systems over the last decade have started to bring inevitable alterations in the social sector and in health care in particular.

For the first time, an intensive international research venture of professionals with relevant medical, architectural, economical and management backgrounds is being put into action. The concentration of knowledge from many partner countries, and cross-professional collaboration in the research process, has a unique challenge to bring immense human and economic impact on this rapidly developing social sector. This research topic has special importance for Lithuania, which is in urgent need of ideas and practical solutions for optimization of network of health institutions, and for organizing and managing health processes in more efficient way in the life cycle of ongoing reforms.

The Goal Of Research

The research activities concentrate on analysis, evaluation[1] and creation of visions and perspectives for further development of the network of health care (HC) in Lithuania, and the Vilnius regional area in particular. The working process deals with close analysis and evaluation of health care processes, development of new territorial and spatial models for optimization of the HC network, as well as creation of visions for the new health environments. The implementation phase of the project aims at applying theoretical models for setting practical examples and pilot projects for improving HC practices at Vilnius University Emergency Hospital.

[1] Hennu Kjisik, Erkki Vauramo, Gintaras Stauskis. Evaluation of Health Care Facilities. Helsinki University of Technology, Helsinki 2002. ISBN 951-22-641-X

Authors: Gintaras Stauskis, Leonardas Streikus, Tomas Saladis

Methodology Of Research

The national resource of the HC sector in Lithuania was analyzed to figure out the existing scope and capacity of the network. The major links and structure of communicational processes were analyzed. In the context of EU-15 countries (before the last extension phase), an average was drawn up for comparative indications, and definitions of vectors for further development (see charts 1-4). The present location of HC institutions in the Vilnius regional area and in Vilnius city was defined (see maps 1-3 and 5-7). Visions of future development of the HC network were drafted and described (see maps 4 & 8).

The Working Process

Organization of the health care system in Lithuania is still based on a strict administrative subdivision and formally based location on national, regional and local level. And the system has hardly seen any noticeable change during the 15-year long history of a re-established independent state. It has clearly proved that this is one of the most stringent and hard-to-change sectors in the whole public administration system. One central hospital in a district of any size, many small HC centres located even in small villages, and a few really big hospital complexes in the biggest cities, sometimes really too big – that is how the still existing HC system could be described in Lithuania and in the Vilnius regional area in particular (see map 1). As for capacity and development of HC resources in figures, the number of beds per 1000 population (the index used by WHO) in Lithuania (9,0) is 50% higher than in EU-15 (6,1), but the total floor area of a hospital for one bed (65 m^2) is less than half of the average of EU hospitals (130 m^2), when WHO recommended average for a new hospital is 100 m^2/bed. The total expenditure on health as a percent of GDP in Lithuania (5,7%) is just 64% of EU-15 (8,9%) and is steadily decreasing. Irrational size and location, uneconomic organization and poor supply of HC institutions are facts which we know and some of us have even unfortunately experienced. All this is more a reflection of fifty-year long history of Soviet social care than a picture of a real system of a health provider.

Vilnius regional area (the county) is no exception to the above rule. Seven districts of the county each have a ***'district central hospital'***, all of them seem to be quite equally spread in the territory of the county. There are 19 institutions in the county (without Vilnius city) which can be referred to as a 'general hospital' with the longest reach distance of 32 km, while the average is just 15-18 km. In most other European counties the latter intake areas are more in common for local community ***health centres*** than for what is called a normal hospital. The location of ***primary health care centres*** makes a dense net: 135 of them seem to have been settled all over the area - even in small villages. They are equally spread in the populated area, more concentrated in settlements along the main roads in directions from Vilnius to Kaunas, Panevėžys, Druskininkai, Šalčininkai and Ignalina. And in addition to this network numerous hospitals in Vilnius city exist very close at hand!

With many more residents than in the county, Vilnius city (650,000 residents) has an even higher index of beds per 1000 population (11,4) than the county does. But the floor area (m^2) per bed (79,1) (often considered as a treatment quality index) is also higher here. In addition health centres such as Santariškės, Antakalnis and Lazdynai Emergency health campuses, having a size from 500 up to 2000 beds each, have intake areas wider than the city itself - even nation wide, and together make about 50% of the total number of beds of the whole Vilnius regional area.

In the central area of the city the picture is astonishing: hospitals are located within a range of just a few kilometres from each from the other. This could be taken just as a historic heritage but in no sense as something rational and needed (see map 2). Their perspectives are poor and very much limited. Firstly, there are often no possibilities for further spatial development of these centrally located hospital sites, because they are based in dense urban development, and their plots and spaces are limited by the neighboring development. These facilities have

the lowest average floor area per bed (less than 50 m^2/bed). Another problem for the survival of these institutions is the limited architectural reconstruction and renovation possibilities of their estates. Modern medical processes that require modification of their spatial structure often need a common corridor system which essentially amounts to rebuilding. This process is complicated as some of old hospitals are based in the buildings of historic heritage, and therefore their modifications are restricted. The situation of centrally based hospitals in dense urban sites is in addition complicated by the obstructed traffic access of special (emergency), staff and visitor vehicle, and also the very common problem of parking space, for which almost no rational solution can be found. All the listed problems make these hospital sites located in the central part of the city difficult to adapt to modern medical technologies and new spatial organization of health care processes. This is very unattractive for modern health care, but on the other hand it would be still be good to keep a rational number of them as points in the city HC system.

The described picture of HC network in Vilnius area and the city in particular is the real proof of intensively developed infrastructure with dense location of hospitals on one hand and extensive use of medical resource in space and staff on the other. In the whole chain of HC processes, primary care at local level, as well as preventive practices and long term care, are the weakest links. In fact hospital building stock is nothing more than a worn-out, redundant estate with old-fashioned and insecure medical services, where the hospital environment is more impeding than enhancing the goal attainment of the staff[2]. And it still keeps on running because of the professional dedication of well trained and skilled medical staff.

The Vision Of HC Network

The comparison of similar indexes at European level, as well as economic logic, clearly suggests some trends for further development of the complex and socially sensitive HC network. Territorial analysis of intake areas and distances, calculations of space and staff, visions of new integrated process organization suggest that the net of ***acute care hospitals*** in the **Vilnius regional area** (the county) has to be based on two major modern medical campuses - Santariškės University Hospital complex and Lazdynai Emergency Hospital complex. These sites have the physical capacity and potential to develop and extend the necessary medical services to complete the function of real University Clinical and Trauma centres for Vilnius regional area. They also have an excellent connection to city highways. The draft map reveals that as the central HC providers for the county located on the outskirts of Vilnius city, they will manage to deliver the most remote patients from the county area to the hospitals within the so-called two-hour "golden" time to ensure the highest survival rate in severe trauma cases. The highly professional treatment processes for the most difficult patients has to be concentrated here (severe trauma, cardio-surgery, neurology-surgery, etc.). The working knowledge links between these hospitals have to be established with the other HC institutions – local hospitals. These links should include specialist visits, consulting, remote image examination, research, etc. Research activities shall be concentrated here as well.

The other *'hospitals'* of the county should be given a chance to gain the name and service level of a real *community hospitals* located close to their patients. That is, they should stay where they already are, and provide the most needed diagnostic, curing and long term care services for local communities, thus strengthening radically the weak *'primary' health care* chain and disease prevention activities. The major diagnostic and planned (including chronic) HC treatment procedures should be done here. Images should be stored, examined and consulted by visiting specialists from the county's acute care hospitals.

Primary health care centres could stay where they are now, thus serving the so-called community regions. Some of them can be closed or merged together, or new ones can be

[2] Teikari Martti. Hospital Facilities as Work Environments. Academic Dissertation. Research Publications, Helsinki University of Technology. Helsinki, 1995. ISBN 951-22-2798

started, but the important issue about them is that they should maintain their closest possible connection to local community for providing everyday health services for towns and villages.

The whole process will cut radically the number of beds in *acute care hospitals,* re-organize the local hospitals and strengthen radically the linking primary HC element. The whole HC network will gain a three-stage structure for providing different services in different cases. And the patient-benefit economic effect which seems to be logical and evident because of the radical cut in the number of beds in ***acute care*** will be accounted and presented in the following phase of research.

As the ageing society is a major challenge for Vilnius area as well as for the whole of our country, a special attention should be drawn to elderly and disabled care. The strategic focus should be that people who in any case could take care of themselves (including help from their families), should in no case be put into elderly homes but encouraged to stay in their usual family environment. Certainly special input needs to be made into upgrading accessibility and service for dwellings, as well as taxation and insurance benefits for those taking care of the elderly and the disabled in the local community.

Vilnius city is another big challenge for community and local politicians. The goal of the reform and re-structuring should be to bring a much higher standard of HC services and save resources for a more rational use. This should encourage the needed courage, persistence, and political strength to national and local politicians that is needed to proceed and complete these socially-sensitive but welfare-bringing shifts in territorial location of HC network elements. As described above the Santariškės University Hospital and Lazdynai Emergency Hospital are the strongest and strategically based ***acute care hospitals*** in the HC system of Vilnius County and Vilnius city (map 2). Antakalnis medical campus, with three hospitals of different potential and possibilities is to be turned soon into the ***'city hospital'*** complex, with a wide range of high standard medical services for the local community. However shocking and incredible it may sound, almost all the centrally based *general function* and *specialized city hospitals,* such as Šv.Jokūbas', Žygimantų Red Cross, Misijonierių, Tyzenhauzų, Žvėrynas' Infection and some others, should be and certainly will be simply closed because of the abovementioned reasons. The only exception which could let them stay on the map of HC infrastructure in Vilnius could be their ability to take over the role of long term treatment or rehabilitation in favor of the city community, and they should be given a chance. That notion most concerns Kaunas', Tyzenhauzu, and Vilkpedes hospitals. The main medical functions and services as well as the bulk of patients mass of the closed or transformed institutions should be gradually transfered for acute care to the regional (Santariškės and Lazdynai) and city (Antakalnis) hospital centres. That also means that redevelopment plans and projects have to be started immediately for these sites, to make them capable of taking over the additional task of providing proper services for the additional patients. This is also an excellent chance to audit the existing medical processes in these hospitals, and to use the case to improve the layout of existing flows and processes, as well as to add to the general quality of the built environment.

The whole HC network will form a multi-level integrated health knowledge centre with central hospitals for highly specialized care, local hospitals for constant care, and local health centres for everyday contact with the local community. An **Integrated hospital management system** is the new organization and service network to set a new approach to providing health care services in society. The only result that should be measured in order to evaluate quality of health activities should be improvement of a public health.

The whole process will cut radically the number of beds in *acute care hospitals,* re-organize the local hospitals and strengthen radically the links with the primary HC element. The economic effect - which seems to be logical and evident - will be presented in the following phase of our research. Of course, a reasonable period of time is needed to let this process happen, the length of which depends on the decisiveness and wisdom of politicians on the one hand and the ability to take the reform for the city community on the other.

Development Perspectives

The materials presented here are the first working phase of the whole research program which is ongoing. The following steps will pay a lot of attention to optimization of working processes in optimal working environments, development of a new level of aesthetic quality in hospitals, making use of the most important design elements so often used with a great success in other architectural practices. The comfortable organisation of space, clear signage, different combinations of colors, location of pictures, green plants and flowers, water elements, good lighting and the other elements are on the way to be used for setting the principles for new treatment environments in future hospitals.

The whole trend in health of society is greatly dependent on related topics, such as promoting healthy life habits, promotion of active leisure activities, sustainable development of the region`s environment, preserving use of natural resources in favor of human health, development of diverse system of transportation, etc. These aspects are analyzed in the other research projects.

The next and consequent working phases will cover analysis and visions of new processes and space organization, proposals for new planning and design as well as implementation of new spatial models for Vilnius area.

Vilnius City Hospitals' Campuses:

Appendix 1 - Vilnius University Santariskiu Hospital Campus

- About **¼** of all hospital beds number in Vilnius county;
- Relatively high average rate of floor space m^2/bed (86,6);
- Relatively low average rate of plot space m^2/bed (175);
- Further development and extension is possible;
- Good location near city highway and country road.

Table 1: Data about HC institutions in 2003

No.	**HC institution**	**Plot area, M^2**	**Total floor area m**	**Number of beds (average)**	**Number of employees (med/other)**	**No. of admissions per annum**	**Floor(m²)/bed Plot(m²)/bed Med. staff/bed**
1	2	3	4	5	6	7	8
1.	Vilnius University Hospital „Santariskiu klinikos" Santariskiu str. 2, Vilnius	178598	94012	958	1348/612	28.391	**98m²/bed 186,4m²/bed 1,4/bed**
2.	Vilnius University Oncology institute Santariskiu str. 1, Vilnius	61155	27280	413	468/378	10.806	**66m²/bed 148m²/bed 1,1/bed**
3.	Vilnius University Paediatric Hospital Santariskiu str. 7, Vilnius	98330	43200	480	802/387	21.833	**90m²/bed 204m²/bed 1,7/bed**
4.	Tuberculosis and Infection Diseases University Hospital Santariskiu str. 14, Vilnius	3701	4477	100	57/46	683	**44,8m²/bed 37m²/bed 0,6/bed** (redevelopment)
SELECTED ALL:		341784	168969	1951	2675/1423	61713	**86,6m²/bed 175,2m²/bed 1,37/bed**

Appendix 2 - Vilnius Antakalnis University Hospitals

- All located in one area, but in separate campuses, distance one to the other 1,3 km;
- Highest plot area m^2/bed rate (261);
- Smallest floor space m^2/bed rate (63);
- I hospital: good location close to city highway and country road;
- II, III hospitals: located inside the residential district, access is stuck;
- Limited plot areas for additional development (5-10%);
- II hospital: plot areas for additional development available (25-30% of the plot);
- III hospital: historic site and buildings, redevelopment restricted;

Table 2: Data about HC institutions in 2003

No.	**HC institution**						**Floor(m²)/bed Plot(m²)/bed Med. staff/bed**
		Plot area, M^2	**Total floor area M^2**	**Number of beds (average)**	**Number of employees (med/other)**	**No. of admissions per annum**	
1	2	3	4	5	6	7	8
1.	Vilnius University Hospital Antakalnio str. 57, Vilnius	82 609	30 430	611	760/366	20.489	**49,8m²/bed 135m²/bed 1,24/bed**
2.	Vilnius University Antakalnis Hospital Antakalnio str. 124, Vilnius	93 907	23 120	230	369/242	5.241	**100,5m²/bed 408,3m²/bed 1,6/bed**
3.	Sapiega Hospital Antakalnio str. 17, Vilnius	80 925	8 452	145	84/84	3.560	**58,3m²/bed 558,1m²/bed**
	SELECTED ALL:	257441	62002	986	1213/692	29290	**62,9m²/bed 261m²/bed 1,23/bed**

Appendix 3 - Vilnius Emergency University Hospital

- Relatively high rate of floor area m^2/bed (81,7);
- Plot areas for additional development are available (185 m^2/bed, 20% of the existing plot area still available);
- The excellent logistical location – on two city highways connected to country roads;
- Additional medical services have to be transferred to this campus soon;
- Additional floor area will be needed for organizing additional functions and placing extra patients;
- The empty uncompleted block exists on site, capable of hosting additional load.

Table 3: Data about HC institution in 2003

No.	HC institution	Plot area, M^2	Total floor area M^2	Number of beds (average)	Number of employees (med/other)	No. of admissions per annum	Floor(m^2)/bed Plot(m^2)/bed Med. Staff/bed
1	2	3	4	5	6	7	8
1.	Vilnius University Emergency Hospital Šiltnamių str. 29, Vilnius	98.445	43.500	532	749/426	18.221	**81,7m²/bed 185m²/bed 1,4/bed** (one block - redevelopment)

Diagram 1: Floor area m²/bed

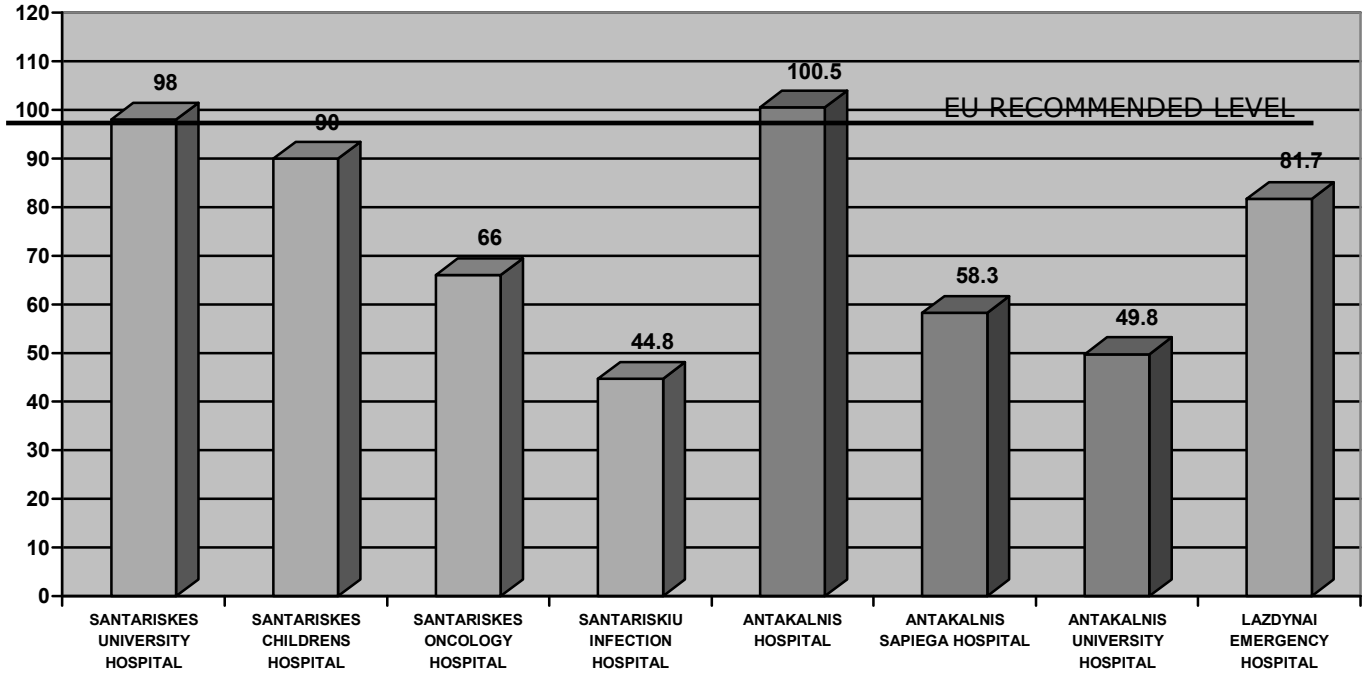

Diagram 2: Plot area m²/bed

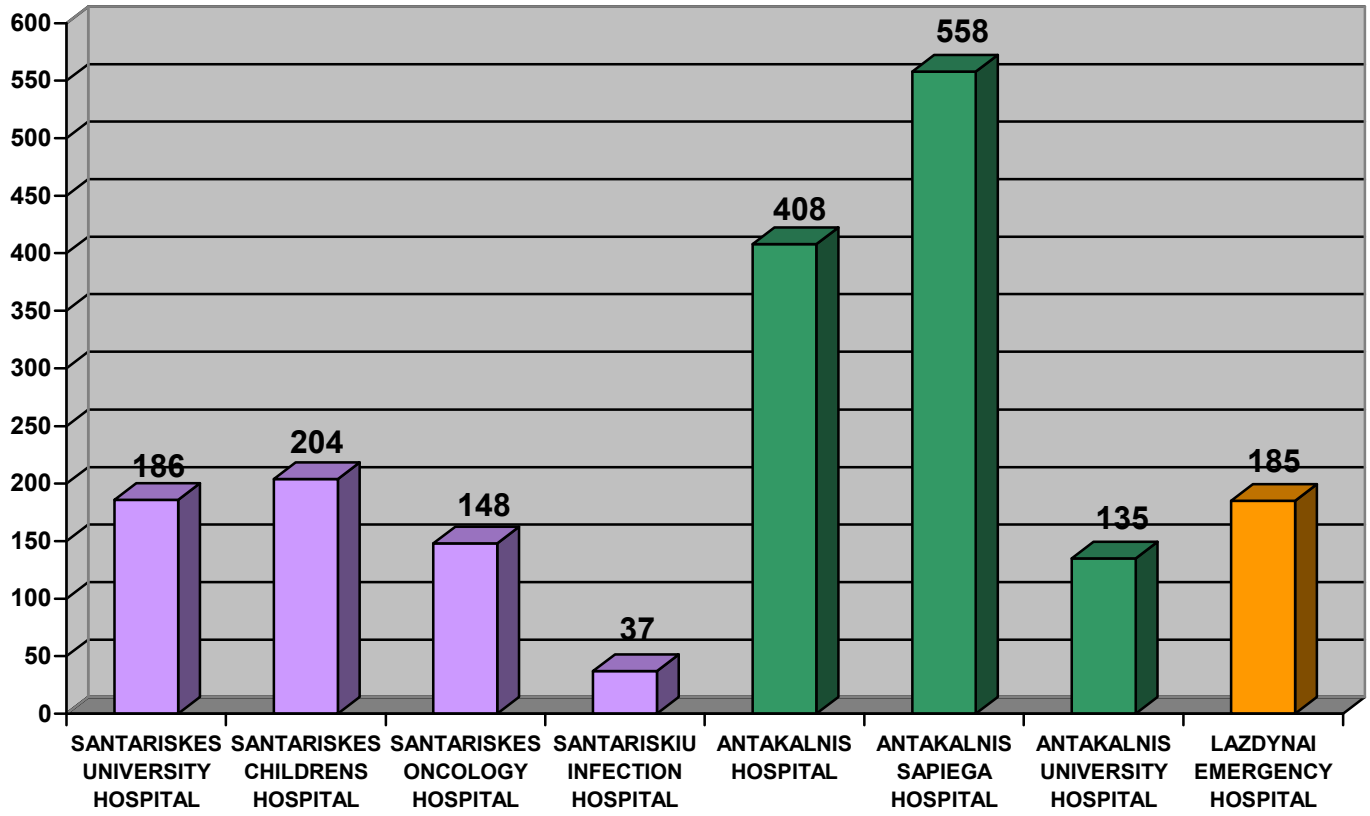

Diagram 3: Floor area m²/bed

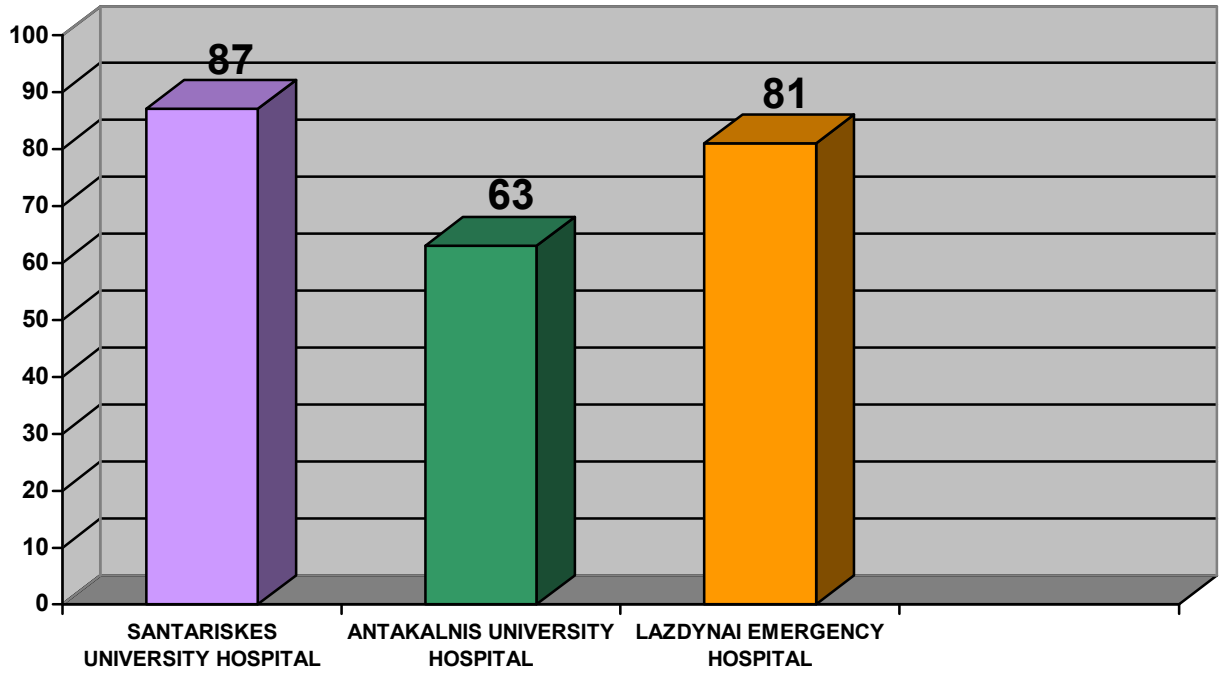

Diagram 4: Plot area m²/bed