

Contemporary “superhospital”: an attempt to define a new architectural idea and form



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The term “superhospital” has appeared in numerous website articles in recent years. New hospital investments have started to be thus named. There is no definition that clearly determines what a “superhospital” is and what its qualities are.

Introduction

Hospitals are a type of a public facility whose forms have dramatically evolved in recent decades. The term “superhospital” is often used to describe a large hospital. But what does it mean? It is futile to look for its definition both in the literature and on the Internet. Consequently, no one knows what exactly the features of such a hospital are, and which facilities deserve this name, and which do not. To determine the qualities of a superhospital and offer its definition, selected hospitals from different countries were studied. The research will make it easier to understand the concept and apply it in relation to specific facilities.

State of research

Although the term “superhospital” is absent in the literature, one often comes across it in descriptions of some hospitals, especially in internet articles about e.g., the construction of a new institution. Interestingly, the concept has also appeared in mass culture in the form of the 2015 documentary series “Superhospital” about the Royal Derby Hospital. The series depicted the behind-the-scenes daily life at

one of the largest and newest hospitals at the time: with over 8,000 staff and one million patients a year [1]. Although the term appears in many places, no official explanation of it has been found anywhere.

The word “superhospital” can be found in the context of centralised state-of-the-art modern hospitals in Scandinavia [2] and in a paper on art in a “super hospital” [3]. In contemporary academic publications, a content-wise similar-sounding phrase – “super-speciality hospital” – has appeared on rare occasions [4–6], denoting a hospital focused on the treatment of a specific disease.

Methodology

The study covered 46 European countries. A review of the literature and websites was conducted, searching for the word “superhospital”. The search engine used was Google and Google Scholar. For each country, approximately 50–100 search results were analysed (3,450 pages in total). The search term was “super hospitals in the name of the country”. Thus, the countries in which the search term appeared were set apart. Next, the occurrence of the expression

“super hospital” on other continents was checked. In the same way as for European countries, a review of websites and available literature was completed. Countries in which the search term appeared were selected for further research. The study covered 62 European superhospitals. Among other things, we investigated how many beds the hospitals provide, whether they are new facilities or extensions to existing facilities, and what medical profiles they have. The aim of the research was to find out where exactly this concept can be found, in which countries, and what its characteristics are. The research is an attempt at defining a “superhospital”.

Results

The study showed that the phrase “superhospital” appeared in five out of 46 European countries (10.9% of the European countries). The highest number of superhospitals was found in the UK (40) and Denmark (16). Isolated superhospitals were also noted in Estonia, Spain, and Hungary. It is important to note that these complexes are mostly in the construction or design phase. 60% of the examined hospitals are completely new facilities, and 40% are extensions of existing hospital complexes with new buildings.

Outside Europe, research was undertaken to find “superhospitals” on other continents. The concept has emerged in China [7] and Canada [8], among others. In Africa, South America, Australia and the United States, the term “superhospital” was not present.

What are the characteristics of “superhospitals”?

The analysis of website articles about the superhospitals under investigation revealed that these are huge complexes designed to improve the quality of healthcare. Their construction is inextricably linked to the health policies implemented at state level. This assumption is seen on a particularly large

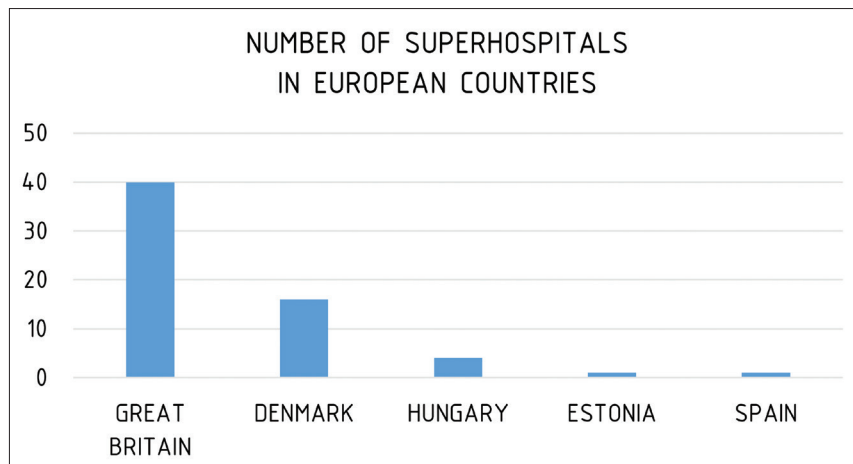


Fig. 1. Number of superhospitals in European countries; source: Author's own work



scale in the UK, whose government intends to spend £3.7 billion on erecting 40 superhospitals by 2030. This is the largest hospital building programme in the United Kingdom at present. The complexes are expected to use new standards that will revolutionise design. The modular construction method is to be applied to speed the work [9]. Denmark has similar plans, with 16 superhospitals planned to be operational by 2025. The evolution of hospitals is connected with the structural reform as a result of which counties were replaced with five regions and assumed political and administrative responsibility for the health sector. Emergency departments, an integral part of the new hospital, should serve a geographical area with a population of at least 300,000. This is a major transformation of the Danish healthcare sector, which primarily aims to reduce patient length of stay in hospitals by providing high-quality treatment. These hospitals are to focus mainly on the critically ill and injured, while non-specialist treatment takes place in outpatient clinics, thus increasing the quality of care [10]. As of the time of the study, 9 superhospitals have already been built in Denmark, the rest of the examined facilities being in the construction or design phase. Therefore, superhospitals can be considered a trend of the 2020s.

In the next three examined countries, superhospitals are planned to be built on a smaller scale, but their very nature and size will not be different from those in the UK and Denmark. A new superhospital in Estonia aims to replace old hospitals built 40–60 years ago. This is intended to be the largest hospital ever built in Estonia, which would combine the activity of all the central hospitals located in Tallinn [11]. The superhospitals designed in Hungary aim to develop healthcare and provide the highest quality of services. They intend to use robots to support personnel in different areas (robots will, for example, carry laundry, monitor patients, assist surgeons, etc.). The hospitals will employ state-of-the-art medical technologies and will be built implementing the latest architectural solutions [12]. Only one of the four superhospitals in Hungary is a greenfield investment, i.e., it will be built from scratch. The South Buda Central Hospital (DBC) is intended to be a green, ecological, and elegant building. Cooling and heating will be provided by geothermal units. Instead of the usual radiators in the wards, there is to be ceiling heating [13]. There will also be many other modern solutions, such as renewable energy to power the complex [14]. Another studied superhospital, Hospital Universitario Ramón y Cajal in Spain, was established in 1977 and currently has 1,250 patient beds and provides treatment in most medical specialties [15].

The profiles of 62 European superhospitals were examined. 54.8% are general hospitals,

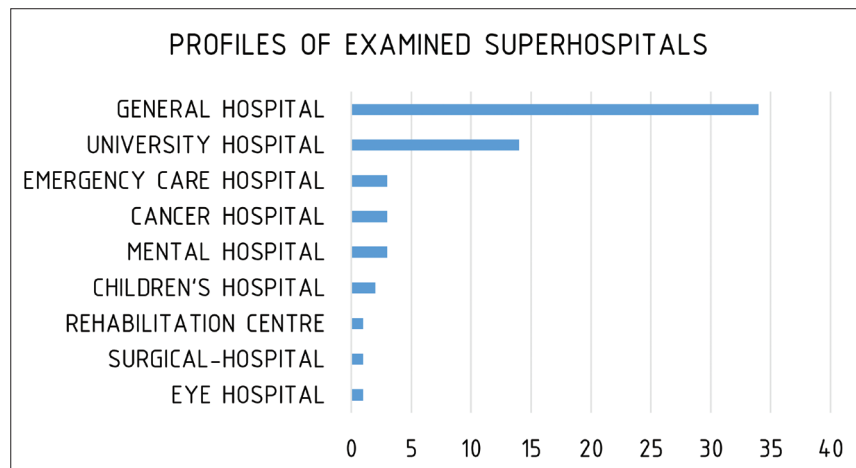


Fig. 2. Profiles of examined superhospitals; source: Author's own work

Table 1. Criteria that superhospitals must meet; source: Author.

CRITERIA THAT SUPERHOSPITALS MUST MEET
1. An innovative highly specialised centre with all medical specialisations, providing a new model of healthcare on a large scale (metropolis, county, region etc.).
2. A building that is part of a large-scale programme to construct hospitals for a new generation in the country.
3. A smart building, maximum digitisation of patient care, procedures, staff work, service and hospital operation.
4. A sustainable building (use of environmentally friendly materials to reduce CO ₂ emissions during construction and operation – aiming for zero CO ₂ emissions, important role of natural light and different types of spaces to improve the comfort and well-being of patients and staff).
5. Use of modern construction methods, full or partial prefabrication, standardised design based on experience gained in the construction of hospitals, automation.

which means facilities offering a wide range of services in most fields of medicine. This type of facilities may have even dozens of bed wards. 22.6% of the superhospitals under examination are of a university profile. These types of hospitals are complexes built from scratch. Specialised hospitals with a single profile are less numerous. Among others, there are emergency, children's, oncology, psychiatric, rehabilitation, surgical, and ophthalmology hospitals. The cases of single-speciality hospitals concern a new building erected in an existing multi-speciality hospital complex. Other buildings in such a complex are modernised. Consequently, superhospitals are characterised by the multi-specialist profile of medical services they provide.

Superhospitals represent a new approach to healthcare by centralising services and aiming to reduce the length of stay in hospital as much as possible. They are intended to provide a more consistent and better flow of patients while improving efficiency, quality of care and safety. Good coordination with primary and secondary healthcare systems is also crucial [10]. Superhospitals, whether newly built or existing complexes expanded with new facilities, are multi-speciality units. Their multi-speciality is linked to the streamlining of the working system through the latest

technology and digitisation. Superhospitals resemble centres that combine a tertiary referral hospital (in Polish nomenclature, this is a provincial hospital offering care in more than 20 medical specialisations, while lower-level referral institutions are district hospitals: primary referral ones with 5 specialisations and secondary referral with 9 specialisations) with a single speciality hospital (as in Poland, e.g. general hospitals, oncology hospitals, paediatric hospitals, etc.). This is a completely new approach to the design of medical centres.

It was possible to obtain data on the number of beds for 50 facilities out of the 62 superhospitals examined. The research shows that the number of beds in superhospitals ranges from 116 to 1,300, with a lower number of beds in single speciality hospitals which are part of a larger complex. The average number of beds determining the size of superhospitals is 662. New facilities that are extensions of existing complexes most often have fewer beds. However, the size of a superhospital also depends on location and population density.

The concentration of hospital treatment in the countries under examination results from the need to adapt medical care to modern circumstances. This may be connected, inter

Table 2. Advantages and disadvantages of superhospitals; source: Author.

ADVANTAGES OF SUPERHOSPITALS	DISADVANTAGES OF SUPERHOSPITALS
1. All specialisations together in one place	1. Complex logistical challenge in terms of both the design, construction and operation of the facility
2. New ways of working and comfort thanks to the facilities used and modern technology	2. The scale of the facility can be overwhelming for some patients and staff – high anonymity
3. Concern for the environment (green, sustainable, self-sufficient buildings, minimizing CO ₂ emissions and waste	3. High level of digitalisation of hospital services, procedures and operation requires very high energy (and financial) outlay
4. Buildings able to adapt to changing clinical needs (flexible hospital design)	4. Temporary energy shortage will completely paralyse the operation of the superhospital
5. Energy optimisation	5. Construction and maintenance costs
6. Prefabrication –reduced design time and waste, costs	
7. Increased patient flow, better patient and staff experience	

alia, with increasing urban population density and the ageing of the European population (longer life expectancy can lead to multiple comorbidity in one patient). The centralisation of specialised medical services in a single location reduces the need for transport between different centres and enables multi-dimensional care in one building or hospital complex.

The study also reveals that superhospitals mostly aim to centralise and replace several smaller hospitals providing medical care over a large area. One example of this is the planned construction of a hospital in the county of Kent in the UK. The status of old hospitals in the area will be reduced to facilities for diagnostics and routine planned operations [16]. In Denmark, on the other hand, the idea is to create a new hospital infrastructure with fewer hospitals and to reduce the number of hospitals with emergency departments from 40 to 21 [10].

Regardless of the country, superhospitals are characterised by state-of-the-art architectural, technological, and ecological solutions in addition to their scale. One example is the Midland Metropolitan University Hospital in Birmingham, which is to benefit from smart energy and infrastructure solutions, thus being called a digital superhospital [17].

It seems that a facility can be qualified as a superhospital only if all 5 criteria are fulfilled (Tab 1.).

Conclusions

Based on the research conducted, a "superhospital" can be defined as: a centralised multi-specialty hospital offering a wide range of medical services in most fields of medicine. It has an average of 660 beds

and provides medical care for large regions. Superhospitals are an element of the modernisation plans of the health sector in 21st century European countries. Their designs adopt the latest architectural, technological, and ecological solutions.

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DOI: 10.5604/01.3001.0015.9582

PRAWIDŁOWY SPOSÓB CYTOWANIA
Strojny Rafał, 2022, Contemporary "superhospital": an attempt to define a new architectural idea and form, „Builder” 9 (302). DOI: 10.5604/01.3001.0015.9582

Abstract: The term "superhospital" has appeared in numerous website articles in recent years. This is how new hospital developments have come to be defined. There is no definition that clearly determines what a "superhospital" is and what its qualities are. The aim of the research is to characterise a superhospital. Few scientific publications mentioning superhospitals can be found. An analysis of more than 3000 websites helped distinguish the characteristics of superhospitals, and the countries in which they are situated to be identified. As a result, a definition of the contemporary superhospital as a new phenomenon in the architecture of healthcare facilities has been proposed.

Keywords: superhospital, multi-specialty hospitals, architecture of healthcare facilities

Streszczenie: WSPÓŁCZESNY „SUPERSZPITAL” – PRÓBA ZDEFINIOWANIA NOWEJ IDEI ORAZ FORMY ARCHITEKTONICZNEJ. W ostatnich latach w licznych artykułach na stronach internetowych pojawiło się pojęcie „superszpitala”. W ten sposób zaczęto określać nowe inwestycje związane z budową szpitali. Nie istnieje definicja, która jednoznacznie określałaby, czym jest „superszpital” i jakie są jego cechy charakterystyczne. Celem badań jest scharakteryzowanie takiego obiektu. Znalaziono nieliczne publikacje naukowe, w których pojawił się superszpital. W oparciu o analizę ponad 3000 stron internetowych wyodrębniono cechy „superszpitali” oraz określono, w jakich państwach się pojawiły. W rezultacie stworzono definicję współczesnego „superszpitala” jako nowego zjawiska w architekturze obiektów służby zdrowia.

Słowa kluczowe: superszpital, szpitale wielospecjalistyczne, architektura obiektów służby zdrowia