

The Role of Healthcare Facilities in Urban Planning

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Abstract: This article analyzes the role of healthcare facilities in urban planning, their location, and their impact on infrastructure. The author highlights the importance of population needs, the transportation system, ecological factors, and the principle of territorial equality in the placement of medical institutions. The article explores ways to efficiently organize healthcare services in modern urban planning using GIS technologies and smart city approaches. It also covers the impact of ecological sustainability and green spaces on the efficiency of medical facilities.

Keywords: healthcare facilities, urban planning, healthcare infrastructure, placement principles, urbanization, ecology, planning.

Introduction

Healthcare facilities are one of the most critical infrastructural elements of cities, playing a decisive role in ensuring public health and in the process of urban development. Healthcare institutions not only treat diseases but also serve to improve the quality of life and life expectancy of people by organizing preventive and prophylactic services. Furthermore, the location of healthcare facilities, their proximity to residential areas, and their connection to the transportation system directly impact the convenience and efficiency of urban life.

In urban planning, the planning of healthcare facilities must be based on population growth, ecological requirements, transportation infrastructure, and principles of social equality. The main goal of the article is to study the significance of healthcare facilities in urban planning, analyze their placement principles, and review modern approaches.

Main Body

The correct placement of healthcare facilities within an urban area is a crucial factor in enabling the population to effectively utilize healthcare services, providing prompt assistance in emergencies, and ensuring social well-being. When placing medical institutions, not only their functional efficiency must be considered, but also the city's overall infrastructure, transportation system, population density, and future development prospects. Urban planners must adhere to a number of important principles when locating healthcare facilities. First, medical institutions should be located in areas of greatest need, i.e., in newly built residential complexes, near major transport routes, and in strategically important areas. This, on one hand, facilitates access to medical services for the population, and on the other hand, allows for prompt medical assistance in emergencies.

Second, it is important to adhere to the principle of territorial equality when placing healthcare facilities. Each micro-district or neighborhood should have at least one polyclinic, emergency

care point, or medical center. This ensures that medical services are accessible and comprehensive for all segments of the population. Furthermore, in large cities, central hospitals can have a network of branches across districts, eliminating the need for patients to travel long distances.

Third, medical institutions must work in harmony with the infrastructure and transportation system. For example, hospitals should be located near main roads, next to public transport stops (bus, metro, tram). This



creates convenience not only for patients but also for hospital staff and visitors. For large hospitals, access to wide roads, as well as the availability of a helipad for emergencies, is important.

Fourth, when placing healthcare facilities, it is necessary to consider environmental and ecological factors. For instance, hospitals should be located away from high-

noise industrial zones or polluted areas, as this can negatively affect patients' recovery. Additionally, the presence of green spaces, recreational areas, and rehabilitation centers around medical facilities helps create a healthy environment.

In modern cities, innovative technologies, including Geographic Information Systems (GIS) and the smart city concept, are widely used in the placement of healthcare facilities. GIS technologies help accurately analyze population density, demand for medical services, the efficiency of existing institutions, and optimal locations for new facilities. Smart city systems, through telemedicine centers, remote monitoring, and sensor systems, make healthcare services more convenient and efficient.

International experience shows that in developed countries, the placement of healthcare facilities considers transportation infrastructure, population density, and long-term urban planning strategies. For example, in Singapore and Japan, hospitals are often located near major transport hubs, facilitating travel for patients and staff. In Germany, universal medical centers exist in every settlement, catering to the basic needs of the local population.

For the efficient operation of healthcare facilities, their service scope must be clearly defined. It is necessary to consider how many patients a major hospital can admit per day, its service radius, and the level of need for medical care. According to statistical data, large hospitals can admit thousands of patients daily, which requires proper distribution of their infrastructure and human resources. Medical institutions are important not only for treatment but also from the perspective of job creation. Large hospitals, polyclinics, and specialized medical centers create thousands of jobs for doctors, nurses, and auxiliary technical staff. This positively impacts the stability of the city's infrastructure and its economic development.

Rehabilitation centers and sanatoriums are important facilities for recovery and rest. They are aimed at restoring the physical and mental health of patients and should be located in ecologically clean areas. In Uzbekistan, sanatoriums are mainly built in mountainous areas and regions rich in natural healing resources. In particular, sanatoriums located in Chimyon, Zaamin, and Sariosiyo provide extensive medical services to the population.



It is necessary to ensure connection to public transport, roads, and pedestrian pathways, creating conditions for emergency services to arrive quickly. The development of the transport network determines the quality and speed of medical services. Healthcare facilities must be located away from industrial areas and places with high levels of environmental pollution. Green spaces and landscape design around hospitals accelerate the recovery process of patients. In particular, medical institutions surrounded by parks and gardens also have a positive impact on the psychological state of the population.

In Uzbekistan, serious work is also being done to develop medical infrastructure. In newly built residential complexes (e.g., the "New Tashkent" project), medical facilities are being placed based on modern standards. Furthermore, measures such as modernizing existing hospitals, equipping them with new technologies, and opening additional medical centers in convenient locations for the population are being implemented.

Conclusion

The role of healthcare facilities in urban planning is an integral part of the urbanization process, and their optimal placement ensures the population's ability to effectively utilize medical services. Hospitals, sanatoriums, and rehabilitation centers, as important components of infrastructure, directly impact not only the development of the healthcare system but also the overall convenience of urban life. Therefore, in modern urban planning, the planning of healthcare facilities is directly related to improving public health and quality of life. Placing healthcare facilities based on population density and infrastructural conveniences expands opportunities for quality and prompt medical services and strengthens the social stability of cities.

The impact of healthcare facilities on urban ecology is one of the important factors. The presence of green spaces around hospitals and polyclinics is not only beneficial aesthetically and psychologically but also serves to ensure air purity, reduce noise, and improve the microclimate.

Furthermore, the proper disposal of medical waste is crucial for the ecological safety of institutions. Harm to the environment must be prevented through special processing systems and waste management strategies. The use of solar panels, rainwater harvesting systems, and solutions aimed at increasing energy efficiency in modern hospitals helps enhance ecological sustainability.

Based on world experience, a trend towards building ecologically sustainable hospitals is observed. For example, many hospitals in Europe operate based on green certification systems, implementing developments to reduce carbon dioxide emissions and optimize energy consumption.

If healthcare facilities are planned based on ecological standards and principles of sustainable development, the ecological balance of cities is maintained, and a positive impact on public health is ensured.

References:

1. Charlton, M., Fotheringham, S., & Brunson, C. Analysing Access to Hospital Facilities with GIS. Springer, 2001.
2. Biu, P. W. et al. GIS in healthcare facility planning and management: A review. World Journal of Advanced Research and Reviews, 2024.
3. MDPI. Spatial Accessibility to Hospitals Based on Web Mapping API: An Empirical Study in Kaifeng, China. Sustainability, 2019.
4. Abbosova M. Problems of Urbanization and Sustainable Urban Planning in Uzbekistan. Journal of Web of Semantics, 2024.
5. World Health Organization (WHO). Uzbekistan: Health System Review. Health Systems in Transition series, 2014.
6. Ministry of Health of the Republic of Uzbekistan and the World Health Organization. Concept for the Development of the Healthcare System for 2019-2025.