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Regional Healthcare Infrastructure Development and Its Implications for Medical Tourism: A Case Study of Bukhara Region, Uzbekistan

Khaydarova Dilara Ikhtiyorovna^{*1}

1. Department of Tourism and hospitality management, Faculty of Economy and tourism, Bukhara State University, Bukhara, Uzbekistan.

* Correspondence: dilara.kh.95@gmail.com, d.i.xaydarova@buxdu.uz

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Abstract: This study analyzes the developmental tendencies of healthcare infrastructure in the Bukhara region of Uzbekistan and its potential ramifications for the burgeoning medical tourism sector. This research uses a regional statistics time-series data through a secondary data analysis registered from 2020–2024 in an urban and rural district-level as an overview of the deconcentrating of healthcare facilities, medical personnel, and patient treatment capacity. The results showed 50.5% lacks of hospital facilities over five years, with significant inter-regional differences: 47.8% of hospitals and 52% of physicians are located in the Bukhara city with the faraway regions such as Karovulbozor still having only 1.5% of the total HCW. This research identifies four key challenges: concentration of healthcare resources, the unsustainability of private healthcare provision in rural areas, inadequate bed supply in large urban districts, and quality variation influencing patient migration. Conclusion The results show that even if the Bukhara region has a fast-growing medical health care infrastructure that attracts medical tourists, regional unbalanced development shall be taken into account, which means specific investment in the non-academic private sector and primary care investments as the main approaches to sustainable development of the sector.

Keywords: Medical Tourism, Healthcare Infrastructure, Regional Disparities, Uzbekistan, Central Asia, Healthcare Accessibility.

1. Introduction

Medical tourism has developed into a swiftly growing global sector, with the Asia-Pacific area anticipated to rise at a compound annual growth rate of 15.34%, reaching USD 125.04 billion by 2030 [1]. This expansion is propelled by rising healthcare expenses in affluent countries, reduced waiting periods in destination nations, and the accessibility of specialist treatments at competitive rates [2]. Central Asian Countries, especially Uzbekistan, have recognized this opportunity and started their strategic reforms to become a player in this growing market.

Uzbekistan has progressed to becoming a competitor in the medical tourism sector with inbound medical tourists increasing from 32,400 in 2021 to 48,500 in the first half of the 2025 [3]. Presidential Decree PQ-335 dated September 23, 2024, contained huge steps aimed at developing medical and wellness tourism, including: unified registry of medical/wellness facilities, international certification compliance, and favorable conditions for foreign citizens [4]. According to World Health Organization (2014),

Uzbekiston faces significant system upheaval, with reforms beginning in 2018 focused on decentralization, improvement of primary care, and digitalization.

Despite that, pelvic healthcare inequities present significant challenges for emerging medical tourism countries. According to the International Labour Organization (2024), among all rural residents globally, 56 percent were unable to access essential health services, more than double the urban percentage of 22 percent. In low-resource countries, this disparity is often aggravated by the unequal allocation of health services, human resources shortage, and infrastructure limitations [5]. Understanding, acknowledging, and addressing these regional discrepancies are crucial to the ongoing progress of medical tourism.

For the development of medical tourism in Uzbekistan the Bukhara region is a great place due to its rich cultural heritage and emerging tourist facilities. The area has had significant expansion in tourism infrastructure, with 607 hotels and 186 tourism firms currently catering to guests [6]. This study seeks to examine trends in healthcare infrastructure development in the Bukhara region and evaluate the regional allocation of medical resources as essential components for the expansion of the medical tourism sector.

Review of Literature

A. Global Medical Tourism: Trends and Determinants

Medical tourism, overseas travel for the purpose of receiving medical care has become an essential component of the international health arena. According to Market Research Future, the Asia Medical Tourism Market was worth USD 58.83 billion in 2024, and is anticipated to reach USD 147.30 billion by 2035, growing at a CAGR of 8.70%. Main issues identified in the literature are differences in pricing between developed and poor countries, waiting lists and access to particular specialist treatments not available in the home country.

The study by IQVIA on medical tourism market in seven Southeast Asian countries discovered all key success factors of medical tourism: support from governmental policy, international accreditations of healthcare institutions, and packaging of medical services with tourism products. The medical and wellness tourism market in the ASEAN region reached USD 66.1 billion by 2024, with Thailand capturing a 47.7% share of this market thanks to superior healthcare infrastructure and wellness services [7]. This necessitates the need for having a robust healthcare infrastructure, which is the first step towards presentation of medical tourism competitiveness, which we observed in the study.

In a bibliometric study on medical tourism in S.E. Asia, researchers identified four topic groups: medical tourism fundamentals, medical tourism predictors, health services quality, and medical tourism economic impact on a national development level (ScienceDirect, 2024). Such themes highlight the complexity of medical tourism development and the need for comprehensive regional assessments.

B. Healthcare Infrastructure and Regional Inequities

Regional inequities in healthcare infrastructure constitute a continual concern in emerging nations. The International Labour Organization (2024) indicates that 56% of rural communities worldwide lack access to vital healthcare services, in contrast to 22% in urban regions [8]. This difference is more pronounced in Africa (83% rural exclusion) and Asia, where the divide between rural and urban healthcare access is most significant. The research highlights inadequate health workforce distribution as a significant issue, with merely 23% of global health workers operating in rural regions that encompass half of the world's population.

The World Health Organization asserts that health disparities in rural populations emerge from detrimental social and environmental variables as well as inadequate health services. Research in developing countries indicates that healthcare inequity exerts mounting pressure on rural and marginalized communities to sustain access to excellent

services. Research on inequality in the distribution of health facilities by region illustrate the importance of planning and management of developments in the health sector by ensuring equitable distribution of resources.

The absence of modified government standards, education about domestic problems, and women entering the field of private healthcare will worsen regional autonomy inequality due to gender differences in healthcare access, which is particularly noticed in technical rural areas of developing nations. Other research shows that women, especially in rural contexts, receive preventive care less often and have longer waits to see a primary care provider. A wide array of regional and demographic factors converges to create several unique challenges for health systems evolution.

C. Advancement of the Healthcare System in Uzbekistan

Since gaining independence in 1991, Uzbekistan's healthcare system has experienced substantial transformation. The WHO Health Systems in Action report (2024) indicates that the country offers a fundamental array of publicly funded health care; nevertheless, coverage does not encompass all needed services or medications. National public expenditure on health is low (USD 673 PPP per capita with high out-of-pocket costs creating access barriers, particularly among poorer households).

Healthcare reforms from 2018 focused on devolution, improving primary care and digitalization [9]. The establishment of the State Health Insurance Fund in 2018 and its piloting in Syrdarya Oblast in 2021 to be soon expanded to Tashkent in 2024 shows systematic progress toward universal health coverage [10]. Methodologically, a two-year evaluation of WHO implementation (2023) considered that: the reform provides actionable guidance for national health system change by 2026.

UNOPS has enabled over \$160 million of modern medical equipment and facility improvement using funds from the Asian Development Bank and Asian Infrastructure Investment Bank [11]. Over time, this has led to a dramatic increase in infrastructure investment.

In 2024, an extra \$200 million in foreign investments and \$94 million in subsidies facilitated the installation of sophisticated diagnostic equipment in regional hospitals [12]. Notwithstanding these efforts, difficulties persist about the equitable allocation of resources among regions and between urban and rural communities.

D. Research Deficiency

Although existing literature thoroughly investigates medical tourism development in established destinations like Thailand, Malaysia, and India, there is a paucity of empirical studies about rising markets in Central Asia. There is a lack of studies investigating the relationship between regional healthcare infrastructure development and medical tourism potential in Uzbekistan. Moreover, the scholarly literature lacks district-level evaluations of healthcare resource distribution that could guide focused development efforts. This paper examines the deficiencies by offering an extensive analysis of healthcare infrastructure trends and regional disparities in the Bukhara region, serving as a case study for the advancement of medical tourism in Central Asia.

2. Materials and Methods

A. Research Methodology

This research utilized a retrospective quantitative design through secondary data analysis. The study analyzed the development of healthcare infrastructure in the Bukhara region during a five-year span (2020-2024), utilizing comparative analysis techniques to evaluate temporal trends and spatial distribution patterns among administrative units.

B. Sources of Data

Primary data were sourced from the Bukhara Regional Statistics Department (buxstat.uz), including: (1) annual counts of hospital facilities categorized by ownership type (2020-2024); (2) distribution of outpatient-polyclinic institutions by district (2024); (3) distribution of medical personnel by specialty, gender, and district (2024); and (4) patient treatment volumes by district (2024). Supplementary data regarding country medical tourism numbers were obtained from official government websites and publications from international health organizations.

C. Variables and Indicators

The study examined the following principal indicators: total hospital facilities and annual growth rates; private sector (small business) hospital facilities; outpatient-polyclinic institutions per district; total physician counts by gender (male and female); distribution of mid-level medical personnel; hospital bed capacity by district; and annual patient treatment volumes. Regional concentration indices were computed as percentage shares of regional totals for each administrative unit.

D. Analytical Techniques

Descriptive statistical analysis was utilized to delineate the spread of healthcare infrastructure. Growth rates were determined via year-over-year percentage change methods. The spatial concentration analysis assessed the allocation of resources among 13 administrative units, comprising 2 cities and 11 districts. A comparative analysis revealed differences between metropolitan centers and periphery districts. The results were analyzed in relation to national health policy frameworks and worldwide norms for medical tourism development.

3. Results

A. Hospital Infrastructure Growth Trends (2020-2024)

The data indicated significant expansion in hospital infrastructure over the study period. The number of hospital facilities rose from 89 in 2020 to 134 in 2024, indicating a cumulative growth of 50.5% (Table 1). Annual growth rates exhibited considerable variation: a modest increase of 1.12% was recorded in 2021 amidst the pandemic, succeeded by a gain of 5.55% in 2022, which surged to 24.21% in 2023, and subsequently stabilized at 13.55% in 2024.

Table 1. Hospital Facility Growth in Bukhara Region (2020-2024) [13].

Year	Total Hospitals	Growth (%)	Private Sector	Growth (%)
2020	89	—	58	—
2021	90	+1.12	59	+1.72
2022	95	+5.55	62	+5.08
2023	118	+24.21	66	+6.45
2024	134	+13.55	66	0.00

Source: Bukhara Regional Statistics Department (2024).

Private sector hospitals (small business enterprises) exhibited concurrent expansion, rising from 58 to 66 facilities, reflecting a cumulative increase of 13.8%. Nonetheless, private sector expansion halted in 2024, indicating either market saturation or regulatory limitations.

B. Geospatial Distribution of Healthcare Facilities

The analysis of 2024 data suggested that hospital facilities were highly centralized. A total of 134 hospitals attending the study, of which 64 institutions and 47.8% were in Bukhara city and another 8 facilities (6%) were in Kogon city. Of the other 46.2%, 11 districts were assigned percentages ranging from 7.5% (Gijduvan) to 0.7% (Karovulbozor). Out of the 593 institutions of outpatient-polyclinic in the region, 34.7% (205 facilities) in the metropolitan areas, and 65.3% (388 facilities) in districts. The Gijduvan district had the largest percentage of outpatient facilities at 12.5%, whereas Karovulbozor had the lowest at 1.3%. The total bed capacity has reached 9,800, with 50% located in Bukhara city.

C. Medical Personnel Distribution

The region utilized 6,700 physicians and 22,600 mid-level healthcare professionals. Spatial concentration in physician distribution was particularly evident: Bukhara city housed 52% (3,500) of all physicians and 36.3% (8,200) of mid-level workers. The gender breakdown revealed 55% male and 45% female physicians regionally, whereas rural districts demonstrated a reduced ratio of female physicians (Table 2).

Table 2. Medical Personnel Distribution by District (2024) [13].

District	Physicians (thousands)	Share (%)	Mid-level Staff (thousands)	Share (%)
Bukhara city	3.5	52.0	8.2	36.3
Gijduvan	0.5	7.5	2.4	10.6
Jondor	0.4	6.0	1.6	7.1
Karovulbozor	0.1	1.5	0.4	1.8
Other districts	2.2	33.0	10.0	44.2
Total	6.7	100.0	22.6	100.0

Source: Bukhara Regional Statistics Department (2024).

The districts with the lowest concentrations of physicians were Karovulbozor (1.5%), Olot (3.0%), and Kogon (3.0%). The physician-to-mid-level worker ratio of 1:3.3 indicates sufficient support staffing, while disparities in distribution remain.

D. Patient Treatment Quantities

In 2024, the total number of patients treated was 454,300, with Bukhara city representing 46.8% (212,800 patients). District-level analysis indicated that Gijduvan managed 8.6% of the regional patient volume, whilst Karovulbozor accounted for merely 1.0%. This distribution pattern signifies substantial patient movement into central institutions, possibly indicating both service concentration and patient inclination for specialist care.

4. Discussion

A. Infrastructure Growth and Medical Tourism Potential

The 50.5% increase in hospital facilities over five years indicates substantial state investment in healthcare infrastructure, aligning with the national healthcare modernization initiative backed by the Asian Development Bank and the Asian Infrastructure Investment Bank, amounting to over \$160 million. This increase corresponds with global trends in medical tourism, wherein destination countries enhance facility infrastructure to draw international patients [14].

The 2023 surge in facility expansion (24.21%) aligns with post-pandemic recovery and the heightened execution of healthcare reforms in Uzbekistan. The WHO (2023) two-

year evaluation of Uzbekistan's health system transformation underscored the efficacy of pilot initiatives in Syrdarya Oblast, establishing a basis for universal adoption. These reforms facilitate the expansion of medical tourism by enhancing service quality and establishing international certification requirements.

B. Regional Disparities as Development Constraints

The significant centralization of healthcare resources offers both advantages and obstacles for the advancement of medical tourism. The concentration of 52% of physicians in Bukhara city facilitates specialized services appealing to medical tourists, although it concurrently engenders regional disparities that impact domestic healthcare accessibility. This pattern reflects global findings: the ILO (2024) indicates that merely 23% of global health personnel are assigned to rural regions, despite these areas housing half of the world's population.

Districts like Karovulbozor, which account for under 1.5% of physicians and 1.0% of patient treatment volume, signify high-risk areas for healthcare accessibility. These differences correspond with results from similar developing nation situations, where healthcare inequity exerts escalating pressure on rural communities. The WHO (2024) highlights that health disparities in rural populations come from detrimental socioeconomic determinants and inadequate health services.

C. Private Sector Development

Private healthcare facilities, accounting for 49.2% of hospitals (66 out of 134), are primarily located in Bukhara city, which hosts 31 facilities, or 47% of the private sector. Private healthcare at the district level is undeveloped, with several districts having merely 1-2 private facilities. The halt of private sector growth in 2024 (0% rise) necessitates examination, possibly indicating market saturation in metropolitan regions or legislative impediments to rural development.

Such a trend has an impact on medical tourism since private institutions often deliver more targeted and patient-centric services aimed at foreign clients. As reported previously governments across ASEAN undertaken initiatives to ease medical tourism through public-private partnerships and incentives given to the private sector [15]. Similar strategies could also facilitate better cooperation in order to develop medical tourism in Bukhara.

D. Implications for Medical Tourism Strategy

The Bukhara region's development of healthcare infrastructure, together its established tourism facilities (607 hotels and 186 tourism firms), fosters optimal conditions for comprehensive medical tourism packages that merge hospital services with cultural heritage experiences. The ASEAN experience illustrates that wellness tourism, which integrates medical treatment with traditional healing techniques, constitutes a substantial growing sector.

However, undeniable disparities still exist and it is these that sustainable medical tourism must address. The recommendations stemming from this analysis include (1) targeted infrastructure investment in disadvantaged districts to increase local capacity; (2) private health sector stimulation in rural settings; (3) strengthening of primary care in outer districts to reduce overloading of central facilities; and (4) redistribution of the workforce, including incentives for physicians to move out of rural regions.

E. Limitations

This research possesses multiple limitations. Initially, dependence on aggregate statistics data inhibits the examination of service quality indicators. The cross-sectional study of the 2024 distribution data fails to account for temporal variations in regional disparities. The lack of direct medical tourism data constrains the evaluation of present international patient movements. Subsequent study ought to integrate quality measures, patient satisfaction assessments, and data on medical tourism tracking.

5. Conclusion

The Bukhara region has experienced significant expansion in healthcare infrastructure from 2020 to 2024, marked by a 50.5% rise in hospital facilities, thereby setting the region for the advancement of medical tourism. Nonetheless, considerable geographical discrepancies endure, as Bukhara city houses 47.8% of hospitals, 52% of physicians, and 46.8% of patient treatment volume. The peripheral areas, notably Karovulbozor, Olot, and Kogon, exhibit significant inadequacies in healthcare resources. To foster sustainable medical tourism in the Bukhara region, a dual strategy is essential: ongoing investment in specialized urban healthcare facilities to draw international patients, coupled with systematic initiatives to rectify regional disparities via rural infrastructure enhancement, private sector engagement, and workforce reallocation. This egalitarian strategy will enhance both the medical tourism industry and access to healthcare for the regional populace.

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