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ECONOMIC AND STATISTICAL ANALYSIS OF THE ECONOMIC INDICATORS OF HEALTHCARE INSTITUTIONS IN THE DISTRICTS OF SURKHANDARYA REGION

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ABSTRACT

This article examines the socio-economic efficiency of healthcare investments in Uzbekistan, drawing on international experience and empirical analysis of data from Surkhandarya region. Based on 2024 statistics, the study calculates key indicators including healthcare investments, per capita expenditures, wage funds, and staff-related costs across districts. Data were processed using logarithmic transformations and normal distribution models, while Kolmogorov–Smirnov, Pearson, and Shapiro–Wilk tests were employed to assess statistical significance. The results reveal considerable regional disparities: some districts report high levels of investment and wages, while others lag behind. The paper concludes with policy recommendations aimed at reducing territorial imbalances, optimizing investment allocation, and fostering greater private sector participation in healthcare.

KEYWORDS

Healthcare system, investment efficiency, regional disparities, Surkhandarya region, economic analysis, statistical modeling, normal distribution.

INTRODUCTION

The volume of investments directed to the healthcare system of Uzbekistan has been steadily increasing year by year. According to the UN, the World Health Organization, and other international experiences, every amount invested in healthcare not only improves public health but also positively affects the overall economic development of the country.

The research was conducted in five stages. At the first stage, data on the economic activities of healthcare institutions in the districts of Surkhandarya region in 2024 were collected and theoretically assessed. Initial databases were formed, including total healthcare expenditures for medical services, overall investments in healthcare, and the average wages of medical personnel. In addition, information on the population size of districts and the average wages across all employees was gathered.

At the second stage, based on these indicators, the values of four key variables were calculated for each district: total investments in healthcare infrastructure (X_1), per capita expenditures on medical services (X_2), average wages in the healthcare sector (X_3), and staff-related expenditures per healthcare employee (X_4).

The third stage was related to mathematical modeling of the distribution of these indicators. Four mathematical models (Y_1, Y_2, Y_3, Y_4) were developed to characterize the territorial distribution of the above-mentioned variables across districts.

Mathematical and statistical methods were applied, including log-transformations and normal distribution models. The statistical reliability of the models was confirmed using the Kolmogorov–Smirnov, Pearson, and Shapiro–Wilk tests.

The results revealed significant regional disparities. In particular, while Termiz city and Denov district showed higher levels of investment and wages, some remote districts (such as Oltinsoy and Sherobod) remained at lower levels. This indicates uneven distribution of healthcare services across the region.

Based on the analysis, it is necessary to adapt investment policies to regional needs, expand the participation of the private sector, and improve the system of fair remuneration for healthcare workers.

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