

DEMOGRAPHIC DYNAMICS OF UZBEKISTAN: TRENDS AND REGIONAL DISPARITIES

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ABSTRACT

This study provides a comprehensive analysis of demographic dynamics in the Republic of Uzbekistan over the period 2010–2025, based on official SDMX data from the State Committee of Statistics. Utilizing a multi-dimensional approach encompassing population growth, vital rates, spatial distribution, and marriage patterns, the research identifies major trends shaping Uzbekistan's demographic landscape. The total population grew from 28.0 million in 2010 to 37.5 million in 2025, representing a 34.1% increase. The general fertility rate (per 1,000 women aged 15–49) rose from 22.0 in 2010 to a peak of 26.4 in 2023 before declining to 23.2 in 2025. Strong inter-regional disparities persist: Surkhandarya (42.0%) and Tashkent city (39.3%) recorded the highest population growth, while Tashkent city reached an urban density of 6,948 persons/km². The natural increase narrowed from 44,083 in 2010 to 8,958 in 2025, reflecting convergence in birth and death rates. These findings have direct implications for spatial planning, social infrastructure policy, and fertility-related health interventions in Central Asia.

Keywords: Uzbekistan demographics; population dynamics; fertility rate; regional disparities; Central Asia; vital statistics; urbanization; natural population increase

1. Introduction

Demographic transitions in post-Soviet Central Asian republics represent a complex interplay of historical legacies, economic reforms, and evolving cultural norms. Uzbekistan, the most populous country in Central Asia, has undergone substantial demographic transformation since independence in 1991. With a young population structure, a diverse regional geography, and ongoing socioeconomic reforms, Uzbekistan provides a compelling case for demographic analysis.

The period 2010–2025 is particularly significant as it encompasses the post-global financial crisis recovery, the 2016–2017 transition to a new governance framework, the COVID-19 pandemic shock of 2020–2021, and subsequent demographic recovery.

Understanding these dynamics is crucial for policy-makers, regional planners, public health authorities, and international development organizations operating in the region.

This paper addresses three core research questions: (1) What are the overall population growth trends in Uzbekistan between 2010 and 2025? (2) How do fertility, mortality, and marriage patterns interact to shape the natural rate of population increase? (3) What spatial and inter-regional disparities exist in demographic indicators, and what are their policy implications?

The analysis draws on disaggregated SDMX-format data from the State Committee of Statistics of the Republic of Uzbekistan, covering all 14 regions (viloyatlar), the Republic of Karakalpakstan, and Tashkent city, as well as their constituent districts (tumanlar) and cities.

2. Literature Review and Theoretical Framework

Demographic transition theory (Notestein, 1945; Davis, 1963) posits that societies move from high birth and death rates toward low rates as economic development proceeds. Central Asian nations, including Uzbekistan, exhibit characteristics consistent with a second or transitional stage of this model — declining mortality rates not yet offset by equivalent fertility reduction — though the pace and regional specificity of this transition is contested in the literature (Agadjanian, 2001; Spoorenberg, 2015).

Prior research on Uzbek demographics has highlighted the role of socioeconomic reforms, female education expansion, and rural-urban migration as key drivers of fertility decline (Buckley, 1997; Falkingham et al., 2010). The Post-Soviet demographic literature emphasizes the significance of the "mortality crisis" of the early 1990s and the gradual recovery thereafter (Meslé & Vallin, 2012). More recently, work by Cornia and Panizza (2000) and Heleniak (2004) has underscored the role of labor migration as a factor in population redistribution across the former Soviet space.

Within Uzbekistan specifically, Ergashev and Umarov (2018) documented accelerating urbanization in the Fergana Valley, while Yuldashev (2020) analyzed fertility differentials between rural and urban areas. However, systematic, multi-indicator analysis of the 2010–2025 period at both national and sub-regional levels remains relatively sparse, particularly using recently released official statistical data in internationally accessible formats.

The present study contributes to this literature by deploying an integrated demographic analysis framework that simultaneously examines population size, vital rates, population density, regional growth differentials, and marriage statistics — thus providing a holistic portrait of Uzbekistan's demographic evolution.

3. Data and Methodology

3.1 Data Sources

This study utilizes six datasets obtained from the official SDMX portal of the State Committee of Statistics of the Republic of Uzbekistan (stat.uz). The datasets include:

- SDMX_246: Total resident population by administrative unit (thousands), 2010–2026
- SDMX_2834: Territory area by administrative unit (thousand km²)
- SDMX_236: Population density (persons per km²), 2010–2025
- SDMX_241: General fertility rate (per 1,000 women aged 15–49), 2010–2025
- SDMX_239: Number of registered live births, 2010–2025
- SDMX_238: Number of registered deaths, 2010–2025
- SDMX_223: Number of registered marriages, 2010–2025

The data cover 14 regions, the Republic of Karakalpakstan, and Tashkent city, as well as over 180 districts and sub-regional units, providing unprecedented spatial resolution for this type of analysis.

3.2 Analytical Methods

The study employs both descriptive and inferential demographic methods. Temporal trends are analyzed using time-series visualization and growth rate calculation. Regional disparities are examined using comparative regional analysis and coefficient of variation. The natural rate of population increase (NI = Births – Deaths) is computed annually to capture the demographic momentum. The general fertility rate (GFR), expressed per 1,000 women aged 15–49, serves as the primary fertility measure.

Population density ($D = P / A$) is computed and compared across regions to assess spatial concentration. Inter-regional growth heterogeneity is evaluated through the range and standard deviation of growth rates. All data processing was conducted in Python (pandas, NumPy) and visualized using Matplotlib.

4. Results

4.1 National Population Growth

Uzbekistan's total resident population increased from 28.0 million in 2010 to 37.5 million in 2025, representing a net growth of 9.5 million persons (34.1%) over the fifteen-year study period (Figure 1). Annual population growth rates averaged approximately 2.1% during 2010–2019 and accelerated slightly to 2.2% during 2020–2025. This rate substantially exceeds the global average of approximately 0.9% (UN World Population Prospects, 2024) and reflects the persistently youthful age structure of Uzbekistan's population.

The general fertility rate per 1,000 women (aged 15–49) rose from 22.0 in 2010 to a peak of 26.4 in 2023, followed by a moderation to 23.2 in 2025. This trajectory suggests a fertility rebound during the early 2020s — potentially influenced by post-pandemic compensatory

births — which has begun to normalize in the most recent period. The parallel upward slope of both population and fertility curves through 2023 confirms that fertility remained the primary engine of demographic growth.

Figure 1: Population Dynamics and Fertility Rate in Uzbekistan (2010-2025)

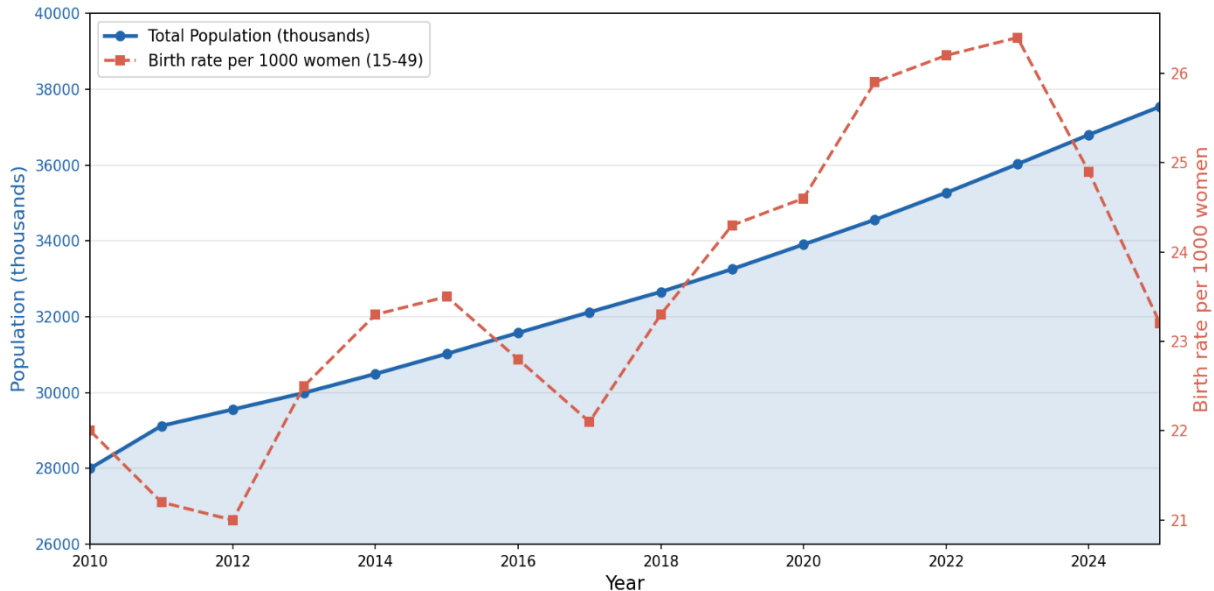


Figure 1. Total population (thousands) and general fertility rate (per 1,000 women, 15–49) in Uzbekistan, 2010–2025. Source: SDMX data, State Committee of Statistics of Uzbekistan.

4.2 Vital Rates: Births, Deaths, and Natural Increase

The absolute number of registered live births peaked at 275,079 in 2021, compared to 183,858 in 2010, before slightly declining to 261,750 in 2025 (Figure 2). This peak coincides with the COVID-19 pandemic recovery period and the post-pandemic "baby boom" observed across several lower-middle-income countries. Registered deaths also increased over the study period, from 139,775 in 2010 to 252,792 in 2025 — an increase attributable to both population aging and the elevated mortality during the 2020–2021 pandemic period.

The natural increase (NI = Births – Deaths) presents a striking narrowing trend: from 44,083 in 2010 to only 8,958 in 2025. This convergence does not signal a demographic crisis per se, but rather reflects the gradual balancing of vital rates as Uzbekistan advances through its demographic transition. Notably, 2022 recorded the most compressed NI (6,498), reflecting the aftershock of pandemic-elevated mortality.

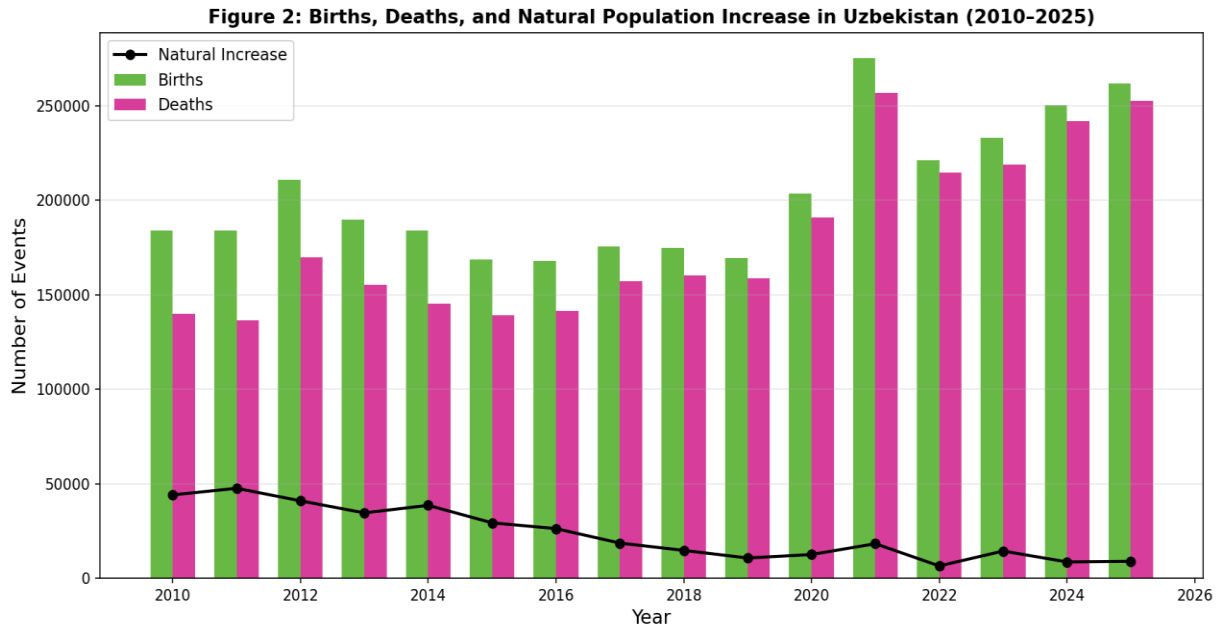


Figure 2. Annual registered births, deaths, and natural population increase in Uzbekistan, 2010–2025. Source: SDMX data, State Committee of Statistics of Uzbekistan.

Table 1. Key National Demographic Indicators, Selected Years (2010–2025)

Indicator	2010	2015	2020	2023	2025
Population (thousands)	28,001	31,023	33,905	36,025	37,543
Live Births	183,858	168,579	203,629	233,175	261,750
Deaths	139,775	139,280	191,086	218,794	252,792
Natural Increase	44,083	29,299	12,543	14,381	8,958
GFR (per 1,000 women)	22.0	23.5	24.6	26.4	23.2
Marriages registered	634,810	734,141	841,817	961,962	879,599

Note: GFR = General Fertility Rate per 1,000 women aged 15–49. Source: State Committee of Statistics (SDMX, 2025).

4.3 Marriage Patterns and Their Demographic Implications

Registered marriages increased from 634,810 in 2010 to a peak of 961,962 in 2023, before declining to 879,599 in 2025 (Figure 4). This pattern broadly mirrors the fertility rate

trajectory, consistent with the dominant role of marriage as the institutional context for childbearing in Uzbekistan. The 2023 peak in both marriages and fertility rate suggests a post-pandemic normalization and "catch-up" effect in family formation.

The decline in marriages in 2024–2025, accompanied by a corresponding reduction in the fertility rate, may reflect emerging trends toward delayed family formation or shifts in household economic calculations — a pattern increasingly documented in the younger cohorts of rapidly urbanizing societies. This warrants close monitoring in forthcoming data cycles.

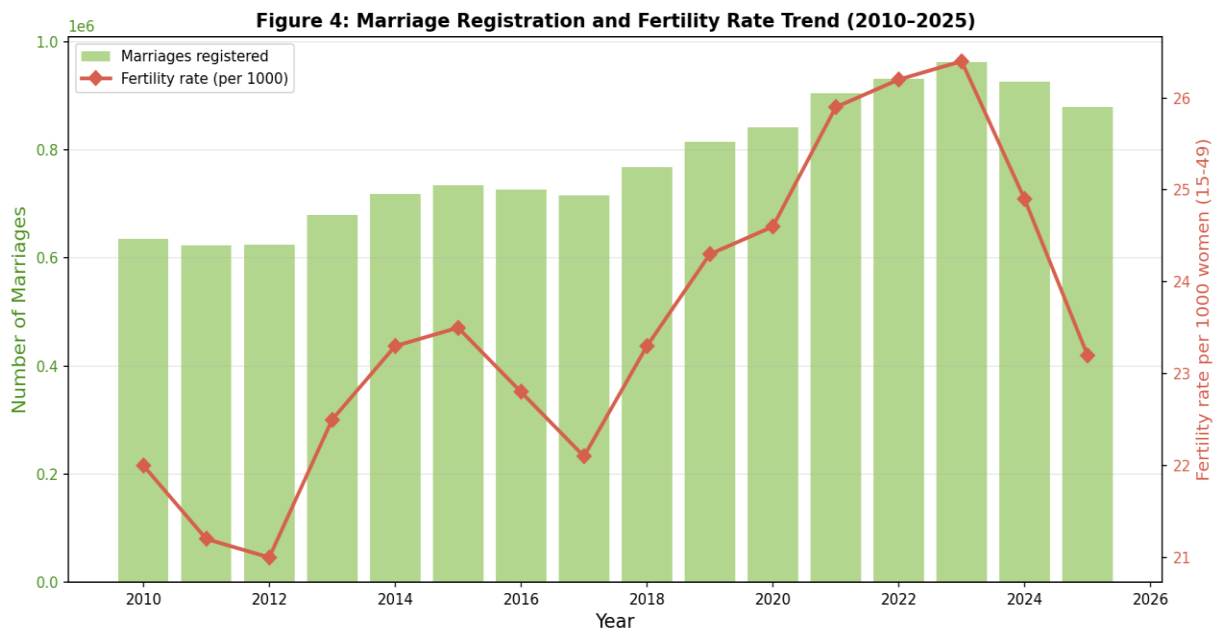


Figure 4. Number of registered marriages and general fertility rate (per 1,000 women, 15–49) in Uzbekistan, 2010–2025. Source: SDMX data, State Committee of Statistics of Uzbekistan.

4.4 Regional Population Distribution and Growth

Uzbekistan's population is distributed unevenly across its 14 administrative regions, the Republic of Karakalpakstan, and Tashkent city (Figure 3). In 2025, the most populous regions were Samarkand (4.30 million), Fergana (4.14 million), Kashkadarya (3.64 million), and Andijan (3.46 million). Tashkent city, as the national capital, had a population of 3.11 million.

Population growth rates over the 2010–2025 period show significant inter-regional variation, ranging from 20.2% (Tashkent region) to 42.0% (Surkhandarya). High-growth regions — Surkhandarya, Tashkent city, Kashkadarya, Namangan, Samarkand, and Jizzakh — all exceeded 37% growth, reflecting higher fertility rates and/or immigration from other regions. Tashkent region's relatively low growth rate likely reflects outmigration of residents to Tashkent city and suburbanization processes.

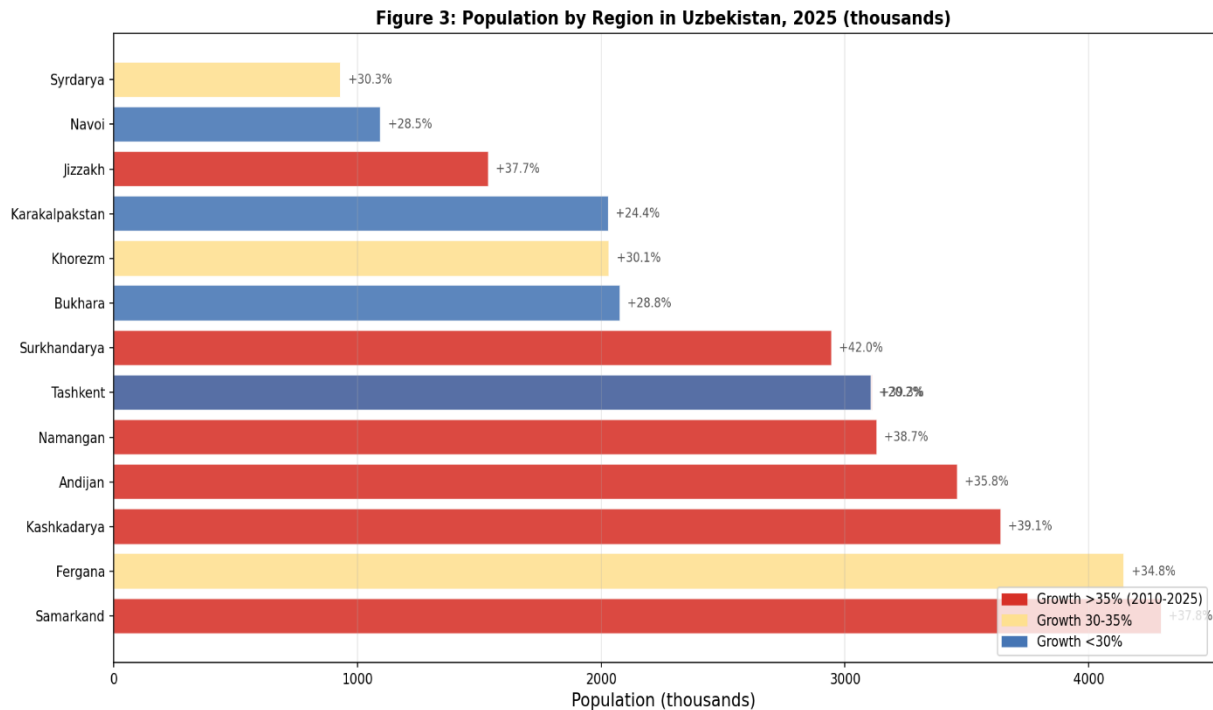


Figure 3. Regional population distribution in Uzbekistan, 2025 (thousands), with 2010–2025 growth rates. Source: SDMX data, State Committee of Statistics of Uzbekistan.

4.5 Population Density: Spatial Concentration and Imbalances

Population density in Uzbekistan is one of the most sharply differentiated in Central Asia, reflecting the strong concentration of settlement in irrigated agricultural valleys alongside vast arid desert territories (Figure 5). Tashkent city recorded an extraordinarily high density of 6,948 persons/km² in 2025, followed by Andijan region (805 persons/km²) and Fergana region (613 persons/km²). These three administrative units account for a disproportionate share of the country's total population relative to their territory.

At the other extreme, Navoi region (9.9 persons/km²) and the Republic of Karakalpakstan (12.2 persons/km²) represent some of the most sparsely populated territories in Central Asia, largely due to the Kyzylkum Desert and the aftermath of the Aral Sea ecological disaster. Bukhara region (51.6 persons/km²) and Jizzakh region (72.5 persons/km²) similarly reflect arid territorial conditions.

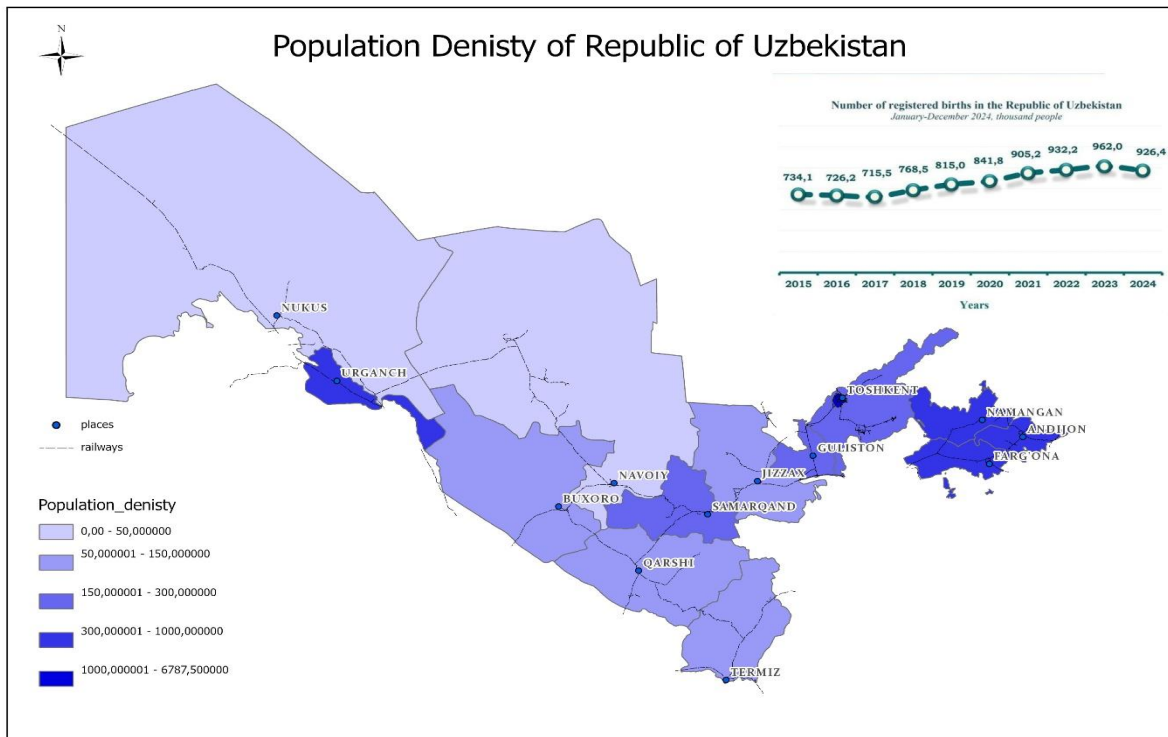


Figure 5: Population Density by Region in Uzbekistan, 2025 (persons/km²)

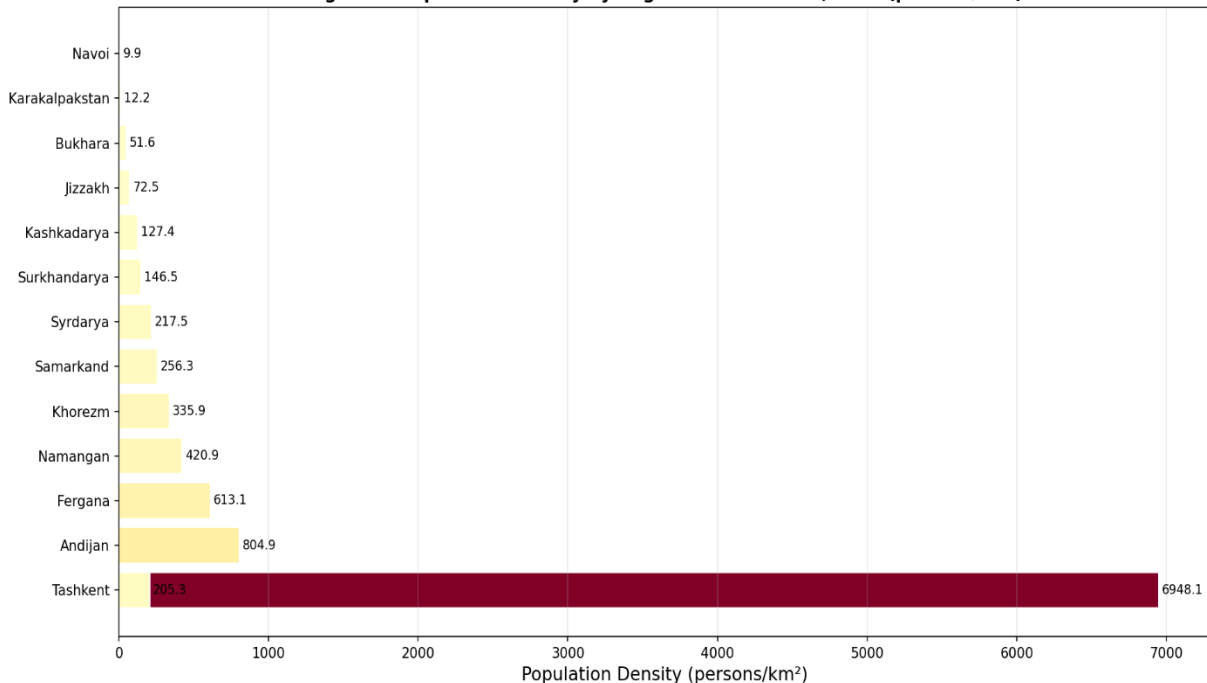


Figure 5. Population density by administrative region in Uzbekistan, 2025 (persons per km²). Source: SDMX data, State Committee of Statistics of Uzbekistan.

4.6 Regional Fertility Differentials

The general fertility rate (GFR) varies substantially across Uzbekistan's regions in 2025 (Figure 6). Surkhandarya (27.5) and Kashkadarya (27.1) recorded the highest fertility rates, exceeding the national average of 23.2 by nearly 20%. Conversely, Tashkent city (19.8) and the Republic of Karakalpakstan (19.2) had the lowest fertility rates, consistent with the typical urban-rural and development gradient observed in demographic transitions globally.

Jizzakh (24.1), Samarkand (24.5), and Namangan (23.9) occupy intermediate positions, while Tashkent region (20.5), Bukhara (20.9), and Andijan (22.8) cluster below or near the national average. These spatial patterns align broadly with economic development indicators, urbanization rates, and female educational attainment — all recognized correlates of fertility decline.

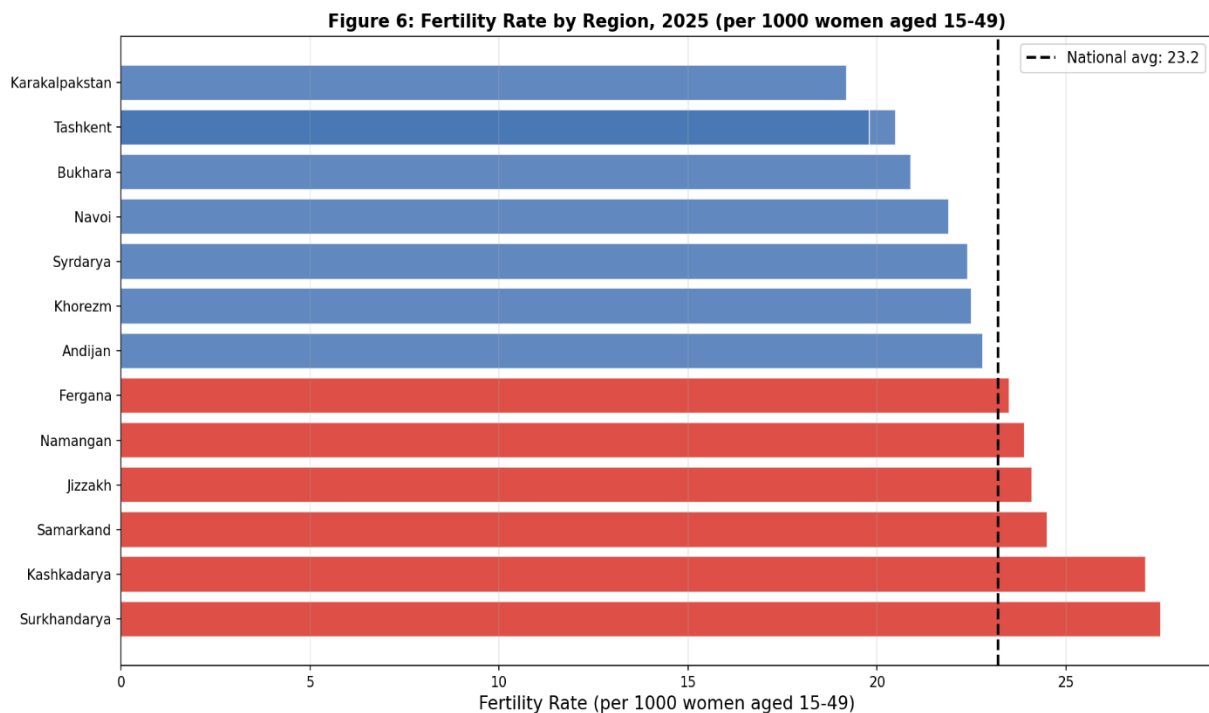


Figure 6. General fertility rate by administrative region in Uzbekistan, 2025 (per 1,000 women aged 15–49). Dashed line indicates national average (23.2). Source: SDMX data, State Committee of Statistics of Uzbekistan.

5. Discussion

The findings of this study confirm several features consistent with mid-stage demographic transition in a lower-middle-income context. First, the sustained population growth — averaging 2.1% annually — reflects the continued demographic momentum embedded in Uzbekistan's youthful population structure. Even if the fertility rate were to immediately drop

to replacement level (approximately 2.1 children per woman), the population would continue growing for several decades due to this momentum.

Second, the convergence of births and deaths into a narrower natural increase band signals long-term demographic stabilization. However, the primary driver of death rate increase appears to be population aging and the size effect of a larger population base rather than deteriorating health conditions per se. The 2020–2021 excess mortality attributable to COVID-19 represents a temporary deviation from this structural trend.

Third, the regional fertility differentials — with southern and south-eastern regions (Surkhandarya, Kashkadarya) recording markedly higher fertility than northern and urban regions — correspond closely with documented socioeconomic gradients. These regions have lower urbanization rates, lower female labor force participation, and less access to family planning services. The policy implication is that universal national demographic targets are insufficient; region-specific approaches are required.

Fourth, the extraordinary population density in Tashkent city (6,948 persons/km²) — nearly 340 times the national average density of 83.6 persons/km² — indicates the primacy of Tashkent in Uzbekistan's urban system. This concentration creates both agglomeration benefits (labor market depth, infrastructure efficiency) and challenges (housing affordability, traffic congestion, pressure on municipal services). Secondary city development in Andijan, Namangan, Fergana, and Samarkand appears necessary to reduce primacy.

Fifth, the trend in registered marriages mirrors fertility trends with a lag of approximately one to two years, suggesting that marriage remains the dominant institutional context for family formation. The post-2023 decline in both marriages and fertility may be an early signal of second-demographic-transition dynamics — characterized by delayed marriage, increased cohabitation, and lower fertility intentions — though Uzbekistan remains substantially more family-oriented than European or East Asian comparators.

6. Conclusions and Policy Recommendations

This study has documented a comprehensive portrait of Uzbekistan's demographic dynamics across the 2010–2025 period. The key findings can be summarized as follows:

- Uzbekistan's population grew by 34.1% (9.5 million) over 2010–2025, reaching 37.5 million — a rate well above global averages.
- The general fertility rate peaked at 26.4 in 2023 before declining to 23.2 in 2025, suggesting a nascent transition toward lower fertility.
- The natural population increase narrowed sharply, from 44,083 in 2010 to 8,958 in 2025, indicating convergence of birth and death rates.
- Stark regional inequalities persist: Surkhandarya leads population growth (42%), while Tashkent city dominates in density (6,948 persons/km²).

• Marriage registrations closely track fertility, with a 2023 peak followed by a 2024–2025 decline suggesting emerging second-transition characteristics.

Based on these findings, the following policy recommendations are offered:

• Regional infrastructure investment should prioritize high-growth, high-density regions (Surkhandarya, Kashkadarya, Fergana Valley) to accommodate population pressures.

• Spatially differentiated family planning services should target high-fertility southern regions, where voluntary family planning access and female education remain priority concerns.

• Secondary city strengthening programs are essential to reduce Tashkent primacy and distribute economic opportunities more equitably.

• Population data modernization — including annual small-area estimation and integration of administrative records — should be prioritized to enable real-time demographic monitoring.

Future research should extend this analysis to include age-sex disaggregated data, migration flows, and household-level fertility surveys to provide a more granular understanding of the demographic mechanisms at work. Comparative analysis with Kazakhstan, Kyrgyzstan, and Tajikistan would further contextualize Uzbekistan's position within the Central Asian demographic landscape.

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