



EPIDEMIOLOGICAL TRENDS AND DETERMINANTS OF MATERNAL MORTALITY IN THE ANDIJAN REGION, UZBEKISTAN (2017–2024)

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ABSTRACT

Maternal mortality remains a crucial public health indicator that reflects the quality and accessibility of obstetric care. Despite national improvements, regional disparities persist, and preventable direct causes continue to dominate maternal deaths in Uzbekistan. According to the World Health Organization, approximately 810 women die every day from preventable pregnancy-related causes, and 94% of these deaths occur in low- and middle-income countries (1,2). In Uzbekistan, despite steady improvements, the maternal mortality ratio (MMR) has fluctuated between 18.5 and 21.0 per 100,000 live births over the past decade. National confidential enquiries report that over 70% of maternal deaths are preventable, with hypertensive disorders, hemorrhage, and sepsis being the leading causes (3).

Objective

Background. Maternal mortality remains a crucial public health indicator that reflects the quality and accessibility of obstetric care. Despite national improvements, regional disparities persist, and preventable direct causes continue to dominate maternal deaths in Uzbekistan. According to the World Health Organization, approximately 810 women die every day from preventable pregnancy-related causes, and 94% of these deaths occur in low- and middle-income countries (1,2). In Uzbekistan, despite steady improvements, the maternal mortality ratio (MMR) has fluctuated between 18.5 and 21.0 per 100,000 live births over the past decade. National confidential enquiries report that over 70% of maternal deaths are preventable, with hypertensive disorders, hemorrhage, and sepsis being the leading causes (3).

Objective. To analyze the clinical characteristics, etiological structure, and contributing factors of maternal mortality in the Andijan region between 2017 and 2024, and to propose targeted clinical strategies for reducing preventable deaths.

Methods. A retrospective descriptive study was conducted using official regional medical and statistical records. All maternal deaths registered during 2017–2024 ($n = 89$) were included. Annual maternal mortality ratios (MMRs) were calculated per 100,000 live births, and deaths were analyzed by cause, age, parity, and place of residence. Sources included hospital case records, ICU documentation, autopsy reports, referral system logs, and

regional health databases. Evaluated variables: maternal demographics, gestational age, parity, comorbidities, type and timing of complications, level of facility, and referral pathways. Mortality trends were compared with national indicators from the Uzbekistan Confidential Enquiry System (KISMS).

Results. The MMR fluctuated during the study period, with annual values of 12.6 (2017), 14.4 (2018), 14.9 (2019), 13.1 (2020), 13.1 (2021), 14.1 (2022), 11.3 (2023), and 12.9 (2024).

The average MMR was 13.3, with a range of 3.6 and a standard deviation of 1.15, indicating moderate variability over the eight-year period.

Direct obstetric causes accounted for 69.7% of all deaths, with preeclampsia and obstetric hemorrhage being the leading causes (24% each). Indirect causes, including pneumonia and COVID-19-related complications, contributed 13% of cases. Mortality was higher among rural women (MMR 14.6 vs. 12.0 urban). The highest risk was observed among women <19 years and >35 years, with relative risks of 5.55 and 22.71, respectively, compared to the 20–29 age group. Primiparous women represented 40.4% of all deaths.

High-risk clinical groups: adolescents <19 and women ≥35 years (nationally, mortality increases to 72.3 per 100,000 at 35–39 years and 170.1 per 100,000 at ≥40 years); primiparous women (40.4% of deaths); women with chronic hypertension, anemia, obesity, and other comorbidities; patients with unrecognized or poorly controlled preeclampsia; rural residents (regional MMR 14.6 rural vs. 12.0 urban).

Systemic Factors. Consistent with national findings, major preventable factors included:

- delayed identification of hypertensive complications
- inadequate management of postpartum hemorrhage
- lack of standardized emergency protocols
- insufficient antenatal risk stratification and screening
- late referral and poor stabilization before transfer
- limited ICU capacity in district hospitals

Conclusion. Maternal mortality in the Andijan region shows year-to-year fluctuations without a stable downward trend. Strengthening early detection of preeclampsia, enforcing standardized protocols for hemorrhage and sepsis management, enhancing antenatal risk screening, and improving emergency referral pathways are critical measures. Capacity-building for primary-level providers and systematic maternal death audits are essential to reducing preventable mortality and aligning regional outcomes with international standards.

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