ASSESSMENT OF PERINATAL AND NEONATAL CARE INDICATORS BASED ON ANNUAL STATISTICAL DATA

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Abstract: *Background. Improving perinatal and neonatal care remains a global priority in reducing maternal and infant morbidity and mortality.*

Aim: *To analyze key perinatal and neonatal indicators based on annual statistical data and assess the effectiveness of provided medical care.*

Methods: *A retrospective analytical study was conducted using annual statistical data from a specialized perinatal center. Indicators such as total births, preterm births, cesarean section rate, and maternal mortality were evaluated.*

Results: *The analysis revealed that the majority of births were term deliveries (over 60%), while preterm births accounted for a smaller proportion. Extremely preterm births (22–27 weeks) represented a minimal percentage (~1.3%). Cesarean section rates and maternal mortality indicators reflected both clinical and organizational aspects of care.*

Conclusions: *The obtained data indicate relatively stable perinatal outcomes; however, preterm birth and maternal mortality remain important challenges requiring targeted interventions.*

Keywords: *perinatal care, neonatal outcomes, preterm birth, maternal mortality, cesarean section*

INTRODUCTION

Perinatal and neonatal care represent a cornerstone of modern healthcare systems, serving as key determinants of population health and demographic sustainability. The quality of care during pregnancy, childbirth, and the early neonatal period directly influences maternal and infant survival, long-term health outcomes, and overall societal well-being.

Despite significant advances in obstetric and neonatal medicine, perinatal complications remain a major global health challenge. According to international data, approximately 15 million infants are born prematurely each year, accounting for nearly 1 in 10 live births worldwide . Preterm birth is currently the leading cause of mortality among children under five years of age, responsible for about 1 million deaths annually. Furthermore, global trends indicate that the overall rate of preterm birth has remained relatively unchanged over the past decade, reflecting the persistent nature of this problem .

Neonatal mortality also remains a critical issue, with approximately 2.3 million deaths occurring within the first 28 days of life each year, accounting for nearly half of all under-five mortality. Importantly, the burden of neonatal mortality is unequally distributed across countries. In high-income countries, survival rates of extremely preterm infants exceed

90%, whereas in low-income settings, survival may be less than 10% . This disparity reflects differences in access to advanced neonatal intensive care, timely obstetric interventions, and healthcare system organization.

Maternal mortality remains another key indicator of healthcare quality and equity. Although global maternal mortality has declined over recent decades, progress has slowed, and significant disparities persist between high- and low-income countries. In some low-resource settings, maternal mortality rates remain several times higher than in developed countries, largely due to delayed diagnosis, inadequate emergency care, and limited access to qualified medical personnel.

Comparative analyses from different regions highlight that countries with well-developed healthcare systems (e.g., Northern Europe, Japan, Singapore) demonstrate extremely low neonatal mortality rates (as low as 1 per 1,000 live births), whereas regions such as Sub-Saharan Africa and South Asia continue to experience significantly higher rates . Additionally, socio-economic factors, environmental conditions, and access to prenatal care play a crucial role in shaping perinatal outcomes.

In recent years, attention has increasingly focused on the role of modifiable risk factors, including maternal health status, environmental exposures, and healthcare accessibility. Studies have shown that a significant proportion of preterm births and neonatal deaths can be prevented through cost-effective interventions such as improved antenatal care, timely identification of high-risk pregnancies, and implementation of standardized clinical protocols.

In Uzbekistan, maternal and child health has been identified as a strategic priority within the national healthcare system. Ongoing reforms aim to improve the quality and accessibility of perinatal services, strengthen primary healthcare, and reduce preventable maternal and neonatal morbidity and mortality. However, as in many middle-income countries, challenges related to preterm birth, perinatal complications, and healthcare system efficiency remain relevant.

Against this background, continuous monitoring and comprehensive analysis of perinatal indicators are essential for evaluating healthcare performance and identifying priority areas for intervention. The present study is aimed at analyzing annual statistical data to assess the current state of perinatal and neonatal care, identify key trends, and compare observed outcomes with global patterns.

Aim of the study. To perform a comprehensive clinical and statistical analysis of perinatal and neonatal indicators using annual data, to identify the structure and prevalence of preterm births across different gestational age groups, to evaluate maternal and neonatal outcomes, and to determine their significance in the context of global perinatal health challenges.

MATERIALS AND METHODS

This study was designed as a retrospective analytical investigation based on a 12-month statistical report obtained from a specialized perinatal medical center. The analysis covered all registered deliveries and perinatal outcomes during the study period.

The study included all pregnant women who delivered in the medical institution during the reporting period, as well as their newborns. No selective sampling was applied, ensuring complete coverage of the study population and minimizing selection bias.

The data were extracted from official statistical reporting forms, which included standardized indicators of perinatal and neonatal care. The dataset comprised aggregated information on obstetric and neonatal outcomes.

The following key indicators were included in the analysis:

- Total number of deliveries
- Distribution of deliveries by gestational age
- Term deliveries
- Preterm births categorized by gestational age:
  - 22–27 weeks (extremely preterm)
  - 28–32 weeks (very preterm)
  - 33–37 weeks (late preterm)
- Post-term deliveries
- Cesarean section rate
- Maternal mortality indicators
- Selected organizational indicators of perinatal care

Statistical analysis. Data processing was performed using descriptive statistical methods, including calculation of absolute values and percentages (%). The distribution of deliveries across gestational age categories was analyzed to identify structural patterns.

Comparative analysis between term and preterm birth groups was conducted using the chi-square (χ^2) test to assess statistical significance. A p-value of less than 0.05 was considered statistically significant.

Graphical methods, including bar charts and distribution diagrams, were used to visualize key findings.

Ethical considerations. The study was conducted using anonymized aggregated data from official statistical reports. No personal patient identifiers were used, ensuring confidentiality and compliance with ethical standards.

RESULTS. A comprehensive analysis of the 12-month statistical dataset allowed for an in-depth evaluation of the structure, distribution, and clinical significance of key perinatal and neonatal care indicators.

The overall distribution of deliveries demonstrated a clear predominance of term births, which accounted for 62.9% of all cases. This finding indicates a relatively stable obstetric environment and reflects the effectiveness of antenatal monitoring, timely hospitalization, and clinical management of pregnancy. At the same time, the proportion of preterm births remained substantial, collectively accounting for approximately 37% of all deliveries, thereby representing a significant clinical and organizational burden.

A more detailed stratification of preterm births revealed a non-uniform distribution across gestational age categories. The highest proportion was observed in the late preterm group (33–37 weeks), accounting for 28.9% of all births. This pattern is consistent with global epidemiological trends, where late preterm births constitute the majority of

premature deliveries. Although often considered less severe compared to earlier gestational ages, this group is associated with increased risks of respiratory distress, metabolic instability, feeding difficulties, and prolonged hospitalization, thus contributing significantly to neonatal morbidity.

The proportion of very preterm births (28–32 weeks) was 6.8%, representing a clinically significant subgroup requiring specialized neonatal care, including respiratory support and intensive monitoring. Meanwhile, extremely preterm births (22–27 weeks) accounted for 1.31%, forming the most vulnerable category with the highest risk of mortality and long-term neurodevelopmental impairment. Despite their relatively low frequency, these cases have a disproportionate impact on neonatal outcomes and healthcare resource utilization.

Post-term deliveries were minimal (0.03%), which may indicate effective obstetric surveillance and timely intervention strategies, preventing prolonged pregnancies and associated complications such as fetal distress and placental insufficiency.

In addition to gestational age distribution, the dataset provided important insights into organizational aspects of perinatal care. A high proportion of cases (81.45%) were managed within higher-level perinatal care facilities, suggesting an effective referral system and centralization of high-risk pregnancies. This reflects a structured healthcare approach aimed at optimizing outcomes through specialized care delivery.

The analysis also revealed the presence of maternal mortality cases, with an estimated rate of approximately 17.8‰. This indicator remains critically important, as it reflects not only clinical factors but also systemic challenges such as delayed access to care, severity of obstetric complications, and efficiency of emergency response systems. The persistence of maternal mortality underscores the need for further strengthening of perinatal services, particularly in the areas of early risk identification and timely intervention.

Additional indicators from the dataset demonstrated variability in clinical management approaches, including operative delivery patterns such as cesarean section, which are closely linked to both maternal and fetal conditions. These findings highlight the interplay between clinical decision-making and perinatal outcomes.

From a statistical perspective, the predominance of term deliveries over preterm births was found to be statistically significant ($p < 0.05$), confirming that the observed distribution reflects a stable and non-random trend. However, the relatively high proportion of preterm births indicates that underlying risk factors remain active within the population.

Overall, the obtained results suggest that while the perinatal care system demonstrates a satisfactory level of effectiveness, several critical challenges persist. In particular, the high proportion of late preterm births, the presence of extremely preterm cases, and ongoing maternal mortality collectively indicate the need for targeted preventive strategies, improved antenatal risk assessment, and further optimization of perinatal healthcare delivery.

DISCUSSION. The findings of the present study provide important insights into the current structure of perinatal and neonatal outcomes and allow for meaningful comparison

with global trends. The predominance of term deliveries observed in this study (62.9%) is consistent with data reported from both high- and middle-income countries, where the majority of pregnancies reach full term due to improved antenatal care and monitoring systems.

However, the proportion of preterm births identified in the present analysis (approximately 37%) appears to be higher than the global average, which is estimated at around 10–11% according to international epidemiological studies. This discrepancy may reflect differences in population characteristics, referral patterns, and the concentration of high-risk pregnancies in specialized perinatal centers. Similar trends have been reported in tertiary care institutions, where the proportion of complicated pregnancies is significantly higher compared to the general population.

The distribution of preterm births in this study demonstrates a clear predominance of late preterm deliveries (33–37 weeks), which is in agreement with findings from studies conducted in Europe, the United States, and Asia. According to global data, late preterm births account for approximately 70–75% of all preterm deliveries. Despite being closer to term, this group is associated with increased risks of neonatal complications, including respiratory distress syndrome, hypoglycemia, feeding difficulties, and longer hospital stays. Therefore, their high prevalence represents a significant burden on neonatal healthcare systems.

The proportion of very preterm (28–32 weeks) and extremely preterm births (22–27 weeks) observed in this study aligns with international data, where these categories constitute a smaller but clinically critical subgroup. Studies have shown that extremely preterm infants contribute disproportionately to neonatal mortality and long-term disability, including neurodevelopmental disorders. The presence of such cases in the analyzed dataset highlights the need for advanced neonatal intensive care capabilities and specialized management protocols.

An important aspect of the present study is the high level of centralization of perinatal care, with more than 80% of cases managed at higher-level healthcare facilities. This finding is consistent with international recommendations, which emphasize the importance of regionalized perinatal care systems for improving outcomes in high-risk pregnancies. In countries with well-established referral systems, such centralization has been associated with reduced neonatal mortality and improved survival of preterm infants.

At the same time, the presence of maternal mortality in the study remains a critical concern. Although global maternal mortality rates have declined over recent decades, significant disparities persist between countries and healthcare systems. In high-income countries, maternal mortality ratios are typically below 10 per 100,000 live births, whereas in low- and middle-income settings, they remain substantially higher. The findings of the present study suggest that maternal mortality continues to be influenced by factors such as delayed access to care, severity of obstetric complications, and potential limitations in emergency response systems.

Comparative analysis with international studies indicates that improving maternal outcomes requires a multifaceted approach, including strengthening antenatal screening,

early identification of high-risk pregnancies, timely referral, and the implementation of evidence-based clinical protocols. In addition, organizational factors such as staff training, availability of intensive care resources, and effective communication between healthcare levels play a crucial role.

The statistically significant predominance of term deliveries ($p < 0.05$) observed in this study confirms the overall stability of the perinatal care system. However, the relatively high proportion of preterm births indicates that underlying risk factors remain insufficiently controlled. These may include maternal comorbidities, infections, environmental influences, and socio-economic determinants, which have been widely discussed in international literature.

Overall, the results of this study are in line with global patterns but also highlight specific regional characteristics. In particular, the combination of a high proportion of late preterm births and the persistence of maternal mortality suggests the need for targeted interventions aimed at both clinical and organizational levels.

Future strategies should focus on:

- improving early risk stratification during pregnancy
- enhancing preventive care and antenatal monitoring
- optimizing referral systems and centralization of high-risk cases
- strengthening neonatal intensive care services
- implementing standardized clinical guidelines

Such measures have been shown in international practice to significantly reduce both neonatal and maternal adverse outcomes.

CONCLUSION

The present study provides a comprehensive evaluation of key perinatal and neonatal care indicators based on a 12-month statistical dataset and highlights important clinical and organizational aspects of maternal and child healthcare. The findings demonstrate that term deliveries remain the predominant outcome of pregnancies, reflecting a generally stable obstetric situation and the effectiveness of antenatal monitoring and pregnancy management systems. At the same time, the substantial proportion of preterm births, particularly within the late preterm period, indicates that premature delivery continues to represent a significant clinical and public health challenge. Although late preterm births are often considered relatively less severe, their high frequency contributes considerably to neonatal morbidity and imposes an additional burden on healthcare resources.

The presence of very and extremely preterm births, albeit in smaller proportions, is of particular clinical importance due to their strong association with adverse neonatal outcomes, including increased mortality, long-term neurological impairment, and the need for intensive care support. These findings emphasize the necessity of further strengthening neonatal intensive care services and improving early identification of high-risk pregnancies.

Another critical observation of the study is the persistence of maternal mortality, which remains a key indicator of healthcare system performance. Despite improvements in perinatal care organization, maternal mortality reflects ongoing challenges related to the timely diagnosis of complications, access to specialized care, and the effectiveness of

emergency obstetric interventions. This underscores the need for a comprehensive approach that integrates clinical excellence with organizational efficiency.

The high proportion of cases managed at higher-level perinatal care facilities suggests that the referral system is functioning effectively and that high-risk pregnancies are being appropriately centralized. However, the coexistence of positive outcomes with unresolved challenges indicates that further optimization of perinatal care strategies is required.

In this context, improving early diagnosis, enhancing risk stratification, and implementing evidence-based preventive measures are essential steps toward reducing preterm birth rates and improving maternal and neonatal outcomes. Additionally, strengthening antenatal care, optimizing referral pathways, and ensuring the availability of specialized medical resources will play a crucial role in further advancing the quality of perinatal healthcare.

Overall, the results of this study not only reflect current trends in perinatal care but also highlight priority areas for intervention, aligning with global healthcare objectives aimed at reducing maternal and neonatal morbidity and mortality.

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