Vol 5 | Issue 3 | July - September | 2025

ORIGINAL ARTICLE

PREVALENCE OF HIGH-RISK PREGNANCIES IN POONAMALLEE HUD, TAMIL NADU, 2024-2025

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ABSTRACT

INTRODUCTION : Maternal mortality remains a major public health challenge globally and in India. Although India's maternal mortality ratio (MMR) has declined, high-risk pregnancies (HRP) continue to contribute significantly to adverse maternal and perinatal outcomes. Tamil Nadu has achieved a low MMR through robust maternal death audits; however, systematic assessment of HRP patterns is needed. This study aimed to estimate the prevalence, patterns, and outcomes of HRP in Poonamallee Health Unit District (HUD), Tamil Nadu.

METHODS : A descriptive cross-sectional study was conducted using secondary data from the Pregnancy and Infant Cohort Monitoring and Evaluation (PICME) system. All registered HRPs in Poonamallee HUD from April 2024 to March 2025 were included (n = 3,593). Maternal sociodemographic details, antenatal risk factors, and pregnancy outcomes were analyzed using descriptive statistics

RESULTS: Among 9,426 registered pregnancies, 3,593 (38.1%) were high-risk, with higher prevalence in Avadi (urban) (53.0%). Most women were aged 25–29 years (42.6%) and gravida 2 (43.3%). Caesarean section was the predominant mode of delivery (64.5%). Live births accounted for 99.7%, while stillbirths were 0.3%. Low birth weight was observed in 15.6% of neonates. Common risk factors included hypothyroidism (26.1%), previous LSCS (18.4%), gestational diabetes mellitus (10.2%), and pregnancy-induced hypertension (6.7%). Nearly one-third (32.2%) had multiple coexisting risk factors.

CONCLUSION: Over one-third of pregnancies were high-risk, with hypothyroidism, previous LSCS, and gestational diabetes as major contributors. The high caesarean rate and burden of low birth weight underscore the need for strengthened antenatal risk stratification, timely referral, and comprehensive perinatal care to further reduce maternal and neonatal morbidity and mortality.

INTRODUCTION

Maternal mortality remains a significant public health challenge globally and in India despite improvements in maternal health indicators. Globally, maternal deaths due to complications from pregnancy or childbirth were estimated at 211 deaths per 100 000 live births in 2017.[1] About 1.3 million maternal deaths were estimated among Indian women in the last two decades, accounting for 12% of global maternal deaths. The majority of maternal deaths were due to direct medical causes. According to the Sample Registration System, the maternal mortality ratio (MMR) has declined from 113 deaths per 100 000 live births between 2016 - 2018 to 103 deaths per 100 000 live births between 2017- 2019, and the majority of maternal deaths occurred in the age range of 20-29 years.[2] Poor maternal health indicators are directly associated with pregnancy-related morbidities and mortality. High-risk pregnancies (HRP) contribute substantially to adverse maternal and perinatal outcomes. Tamil Nadu, with a robust maternal death audit system since 2004, has achieved a marked decline in maternal mortality ratio (MMR) to 35 per 100,000 live births in 2021–20233. However, the burden and patterns of HRP require systematic assessment to guide targeted interventions. Hence we aim to estimate the prevalence of high-risk pregnancies and describe their patterns and outcomes in Poonamallee HUD of Tamil Nadu.

METHODS

Poonamallee Health Unit District (HUD) is one of the Health Unit Districts in Tiruvallur District, Tamil Nadu. The Poonamallee HUD covers both Poonamallee and Avadi Corporation, catering to a large urban and peri-urban population. The HUD comprises a total of 13 Primary Health Centres (PHCs), which serve as the primary point of contact for maternal, child health, and other public health services. During the period from April 2024 to March 2025, a total of 9,426 pregnancies were registered in Poonamallee HUD. A descriptive cross-sectional study was conducted in

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Poonamallee HUD using secondary data from the Pregnancy and Infant Cohort Monitoring and Evaluation (PICME) system, which captures maternal and child health indicators across Tamil Nadu. All registered high risk pregnancies between April 2024 and March 2025 in Poonamallee HUD were included (n = 3,593 high-risk pregnancies). Variables analyzed included maternal sociodemographic characteristics (age, parity, gravida), antenatal high-risk conditions (e.g., hypothyroidism, gestational diabetes, pregnancy-induced hypertension, previous LSCS), and pregnancy outcomes (type of delivery, birth outcome, neonatal characteristics such as sex and birth weight). Descriptive analysis was done using standard statistical software and results were presented as frequencies and percentages.

RESULTS

A total of 9,426 pregnancies were registered between April 2024 to March 2025. Of which 3,593 (38.1%) were classified as high-risk. The prevalence was higher in Avadi (Urban) (53.0%) compared to Poonamallee (47.0%).

Table 1: High risk Pregnancies , Poonamallee HUD, 2024-2025

	n	Percentage (%)
Avadi (Urban)	1,906	53.0
Poonamallee (Semi urban/Rural)	1,687	47.0

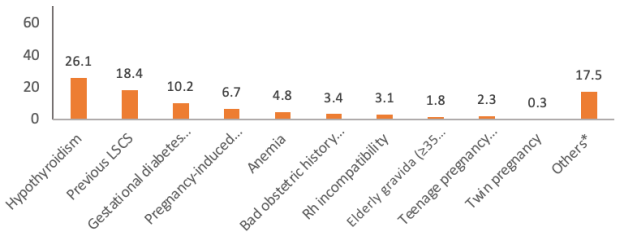

Figure1: High risk conditions, Poonamallee HUD, 2024-2025

The leading high-risk conditions were hypothyroidism (26.1%), previous LSCS (18.4%), gestational diabetes mellitus (10.2%), and pregnancy-induced hypertension (6.7%). Other risk factors included anemia (4.8%), bad obstetric history (3.4%), Rh incompatibility (3.1%), twin pregnancy (1.3%), elderly gravida (1.8%), and teenage pregnancy (2.3%), while the remaining (29.2%) were attributed to medical and surgical diseases complicating pregnancy. Notably, nearly (32.2%) of the high-risk mothers had two or more coexisting risk factors. The majority of high-risk mothers belonged to the 25–29years age group (42.6%), followed by the 20–24 years group (27.4%), ≥35 years (5.4%) and <20 years (4.1%). Almost 43.3% of the high risk mothers were gravida 2 women and (39.8%) primi gravida while higher-order pregnancies (gravida ≥4) accounted for 4.2%.

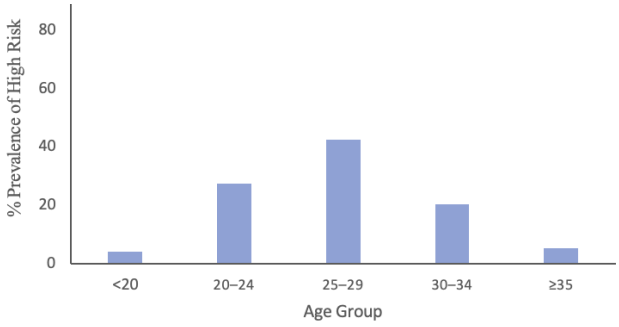

Figure 2: Age distribution of high risk pregnancies in Poonamallee HUD(N=3593), 2024–2025

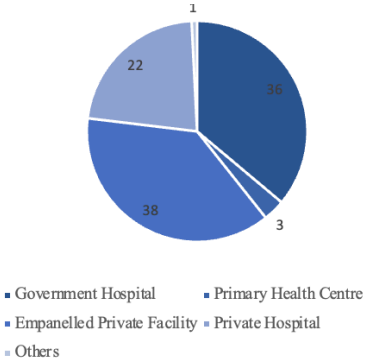

Figure3: Facilities deliveries occurred for High risk pregnancies in Poonamallee HUD, 2024-2025.

Among the high-risk pregnancies, the largest proportion of deliveries occurred in empanelled facilities (38%), followed by government hospitals (36%). Deliveries in private hospitals accounted for 22%, while only a small proportion took place in primary health centres (3%).

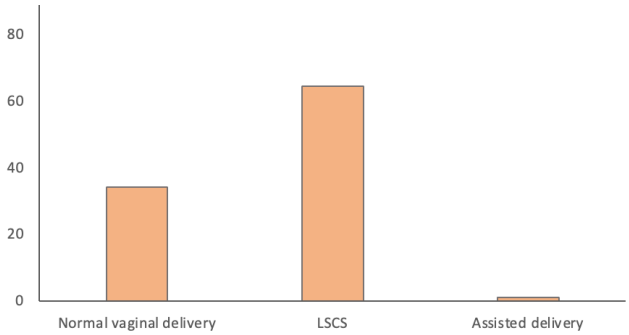

Figure4: Mode of delivery for High risk Pregnancies, Poonamallee HUD, 2024-2025.

Among deliveries, caesarean section was the most common mode (64.5%), followed by normal vaginal delivery (34.3%). Live births constituted 99.7% of outcomes, while stillbirths accounted for 0.3%. Neonatal low birth weight was observed in 15.6% of cases.

DISCUSSION

This study highlights a prevalence of 1/3rd of high-risk pregnancies (38.1%) in Poonamallee HUD during 2024–

2025. The observed prevalence is higher than the expected prevalence from population-level surveys, reflecting the improved screening and reportingin Poonamallee HUD. The findings for Tamil Nadu, NFHS-5 reports that nearly 49% of women aged 15–49 years are anaemic, 26.4% have a BMI ≥25, and 9% have elevated blood sugar or are on medication for diabetes. The relatively lower proportion of anaemia (4.8%) observed in the present study likely reflects improved antenatal detection, treatment, and reporting practices in Tamil Nadu's public health system. In contrast, the increased prevalence of hypothyroidism (26.1%) and gestational diabetes mellitus (10.2%) aligns with NFHS-5 evidence of a rising burden of non-communicable diseases among women of reproductive age in Tamil Nadu, particularly in urban and peri-urban settings.[5]

Also a longitudinal community-based study near Bangalore reported a 61.6% prevalence of HRP, with previous LSCS (16.1%), hypothyroidism (11.6%), and bad obstetric history (5.5%) among common risk factors. Women with HRP had significantly higher odds of adverse maternal outcomes.[6] The age distribution of high-risk pregnancies in this study shows that the majority occurred among women aged 25–29 years, which mirrors NFHS-5 findings that most births in Tamil Nadu occur in the 20–29 year age group. Similar findings have been reported in studies from Kerala and Karnataka, where gestational diabetes and thyroid disorders were common contributors to high-risk status among women aged 20–30 years.

The high proportion of gravida 2 and primi gravida women among cases is consistent with earlier studies from Tamil Nadu and Andhra Pradesh, which report that primigravida and second gravida women often have better service utilization and hence higher detection of risk conditions. The relatively small proportion of higher-order pregnancies (≥4) reflects Tamil Nadu's sustained success in fertility reduction, as also documented in NFHS-5, where the total fertility rate is reported as 1.6, well below replacement level.[5] A community-based study conducted in rural Andhra Pradesh reported that primigravida and second-gravida women constituted more than 65% of identified high-risk pregnancies, attributed to early registration, regular antenatal visits, and better compliance with screening protocols under the public health system.[6]

This study also highlights the high caesarean section rate (64.5%) among high-risk pregnancies. NFHS-5 reports an overall caesarean section rate of 36.3% in Tamil Nadu, one of the highest in the country. The much higher rate observed in the present study is expected given the exclusive focus on high-risk pregnancies, particularly those with previous LSCS (18.4%), gestational diabetes, and hypertensive disorders. A study in rural western India reported an HRP prevalence of 34.3%. Hypothyroidism (43.7% among HRP women) and previous LSCS (19.1%) were primary contributors, closely aligning with the study results.[7]

The low birth weight (LBW) prevalence of 15.6% among HRP cases is comparable to NFHS-5, which reports 15.4% LBW in Tamil Nadu overall. This similarity suggests that despite a high proportion of medically complicated pregnancies, effective antenatal care, timely referral, and institutional deliveries may have mitigated adverse neonatal outcomes. Studies from other districts in Tamil Nadu have also demonstrated that robust antenatal follow-up and early identification of HRP can substantially reduce stillbirths and neonatal mortality, findings supported by the very low stillbirth proportion (0.3%) observed in this study.

A community-based study from southern Tamil Nadu reported an LBW prevalence of 14–16%, similar to state and NFHS estimates. The study highlighted that early risk identification, minimum four ANC visits, and nutrition supplementation were associated with reduced LBW and stillbirths.[8]

Notably, nearly one-third of high-risk mothers had two or more coexisting risk factors, emphasizing the growing complexity of maternal risk profiles. This clustering of risks has been reported in multiple Indian studies and is increasingly linked to urbanization, delayed childbearing, lifestyle changes, and the rising prevalence of non-communicable diseases among women. NFHS-5 similarly points to a convergence of anaemia, overweight/obesity, and diabetes risk in Tamil Nadu, particularly in urban areas, which may explain the higher HRP prevalence observed in Avadi compared to Poonamallee.

Overall, the findings reaffirm Tamil Nadu's epidemiological transition in maternal health from predominantly obstetric causes to a combination of obstetric and medical conditions complicating pregnancy. While the state's strong maternal death surveillance and institutional delivery have contributed to a low MMR, the high prevalence of HRP calls for strengthened antenatal risk stratification, integration of NCD screening into routine ANC, focused counselling for women with previous LSCS, and continuity of care through referral linkages. Aligning programmatic strategies with insights from systems like PICME and population-level evidence from NFHS-5 will be crucial to sustain and further improve maternal and neonatal outcomes in Tamil Nadu.

CONCLUSION

More than one-third of pregnancies were categorized as high-risk, with hypothyroidism, previous LSCS, and gestational diabetes as major contributors. The high caesarean rate and notable burden of low birth weight highlight the need for strengthened antenatal risk stratification, timely referral, and comprehensive perinatal care to further reduce maternal and neonatal morbidity and mortality.

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