Natural Resources for Human Health
eISSN: 2583-1194

Original Research

Received 03 June 2026
Revised 18 July 2026
Accepted 01 August 2026

Natural Resources for Human Health 2026, Vol. 6 (6): 277–285

KEYWORDS:
Health, stillbirth, risk factors, preventive strategies.

Stillbirth in India: Epidemiology, Risk Factors, and Preventive Strategies – A Narrative Review

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ABSTRACT:

Background: Stillbirth remains a major public health concern globally, particularly in low- and middle-income countries. India contributes substantially to the global burden of stillbirths despite improvements in maternal and neonatal healthcare services. Multiple maternal, fetal, socioeconomic, and healthcare-related factors continue to influence stillbirth occurrence across the country.

Objectives: This narrative review aimed to identify the major risk factors associated with stillbirth in India and to explore evidence-based preventive strategies within the Indian public health system.

Methods: A narrative review of literature published between 2000 and 2025 was conducted using PubMed, Scopus, Web of Science, and ProQuest databases. Keywords including "stillbirth," "risk factors," "preventive strategies," "maternal health," and "India" were used for the search. A total of 117 articles were initially identified. After applying inclusion and exclusion criteria, 18 relevant studies were included in the final review. The selected studies comprised observational studies, systematic reviews, hospital-based studies, and policy reports related to stillbirth in the Indian context.

Results: The review identified several major risk factors associated with stillbirth in India, including maternal complications such as anemia, hypertensive disorders, gestational diabetes, and infections. Fetal conditions including congenital anomalies and intrauterine growth restriction were also significant contributors.

Health system-related factors such as inadequate antenatal care, delayed referral services, poor emergency obstetric care, and shortage of skilled healthcare professionals further increased stillbirth risk. Socioeconomic determinants including poverty, low maternal education, rural residence, and limited healthcare accessibility were strongly associated with adverse pregnancy outcomes.

Preventive strategies identified in the review included strengthening antenatal care services, improving skilled birth attendance, enhancing community-based interventions through ASHA workers, promoting institutional deliveries, and improving perinatal surveillance and health system capacity.

Conclusion: Multiple preventable maternal, fetal, socioeconomic, and healthcare-related factors influence Stillbirth in India. Strengthening maternal healthcare services, improving quality antenatal and obstetric care, enhancing community awareness, and implementing evidence-based public health interventions are essential for reducing stillbirth rates in India. Further research focusing on regional disparities and

implementation challenges is recommended to support targeted policy and program development.

INTRODUCTION

Stillbirth, defined by the World Health Organization (WHO) as fetal death occurring at or after 28 weeks of gestation, remains a major global public health concern. Approximately 1.9 million stillbirths occur annually worldwide, with more than 75% reported from low- and middle-income countries.[1] India contributes substantially to this burden despite improvements in maternal and child health indicators.

Data from NFHS-5 and other national surveys indicate persistent regional and socioeconomic disparities in stillbirth rates across India.[2] Limited access to quality antenatal care, maternal complications, inadequate emergency obstetric services, and social determinants such as poverty and low maternal education contribute significantly to stillbirth occurrence.[3–5]

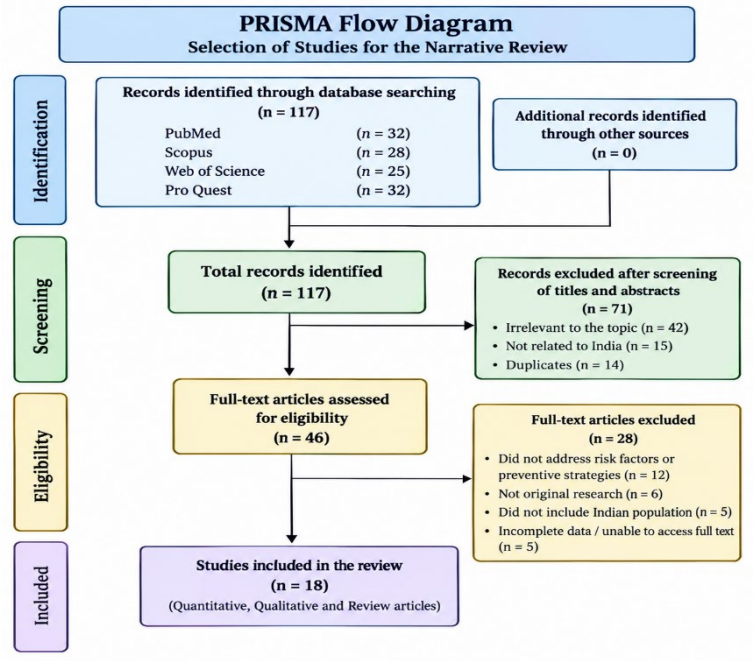
The first objective is to identify the broad and nuanced **risk factors** contributing to stillbirths in the Indian context—ranging from clinical and obstetric conditions to socio-cultural barriers and gaps in the healthcare system. The second goal is just as critical: to explore **evidence-based preventive strategies** that are not only effective but feasible within the complex landscape of India's public health structure. This includes scaling up quality antenatal care, strengthening emergency obstetric services, promoting health education at the grassroots, and ensuring that data systems track stillbirths reliably so we're not planning blind.

Although several studies have examined stillbirth in India, evidence remains fragmented. Therefore, this narrative review aims to synthesize available literature on the epidemiological profile, risk factors, and preventive strategies related to stillbirth in India.

METHODOLOGY OF NARRATIVE REVIEW

A narrative review of literature published between 2000 and 2025 was conducted using PubMed, Scopus, Web of Science, and ProQuest databases. Keywords included "stillbirth," "risk factors," "preventive strategies," "India," "maternal health," and "perinatal mortality." Articles published in English focused on India or including India in South Asian analyses were included.

Eligible studies comprised systematic reviews, observational studies, hospital-based studies, government reports, and policy documents. Studies exclusively conducted in high-income countries or focusing solely on rare genetic causes were excluded.



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EPIDEMIOLOGICAL PROFILE OF STILLBIRTH IN INDIA

India has shown a gradual decline in stillbirth rates over the past two decades. National estimates indicate a reduction from approximately 33 stillbirths per 1,000 births in the early 2000s to nearly 9.7 per 1,000 births according to NFHS-5.[2] Despite this improvement, substantial regional disparities continue to exist.

Higher stillbirth rates are consistently reported in socioeconomically disadvantaged states such as Bihar, Madhya Pradesh, Odisha, and Uttar Pradesh. Rural populations are disproportionately affected due to limited healthcare accessibility, inadequate transportation facilities, delayed referrals, and shortage of skilled healthcare professionals.[3,4]

Socioeconomic determinants also play a critical role in stillbirth occurrence. Women from marginalized communities, including Scheduled Castes and Scheduled Tribes, experience higher stillbirth rates due to poverty, low literacy levels, nutritional deficiencies, and poor utilization of antenatal services.[5]

Accurate estimation of stillbirth burden remains challenging because of underreporting, inconsistent documentation, and variations in data collection systems such as HMIS and SRS. Strengthening surveillance and perinatal death reporting systems is therefore essential for effective planning and intervention.

Author Name	Objectives	Intervention	Eligibility C &Research Design	Key Result
Manju Puri et al. (2025)	To formulate context-specific interventions that can be adapted and integrated with existing WHO recommendations on antenatal care. These interventions are designed to improve pregnancy outcomes and reduce stillbirths in India, particularly in low-resource setting	The interventions are designed to complement WHO recommendations, focusing on risk assessment, maternal and fetal monitoring, and management of fetal growth restriction, particularly in low-resource settings	Studies investigating maternal, fetal, or environmental factors contributing to stillbirth.	Intended to be adopted by all the practitioners to provide standard care to every pregnant woman for optimal outcomes. Each section of this bundle has undergone extensive discussion followed by consensus
Sutapa Bandyopadhyay Neogi et al. (2018)	To explore the risk factors for stillbirths, particularly those related to a health system.		case-control study was conducted in two districts of Bihar, India. Information on cases (stillbirths) were obtained from facilities as reported by Health Management Information System; controls were consecutive live births from the same population as cases.	22 risk factors were independently associated with stillbirths. Health system-related factors were: administration of two or more doses of oxytocics to augment labour before reaching the facilities (OR 1.6; 95% CI 1.2–2.1), any complications during labour, >10 min to attend to the pregnant woman

				after reaching the facility (OR 2.8;1.7–4.5)
Pradnya Changedeet al. (2021)	To review the causes of stillbirth and classify the causes into maternal, foetal and placental causes and further classify causes by relevant condition at death (ReCoDe) classification.		An observational study of data collected over one year (January 2019–December 2019) from a tertiary care centre in Mumbai, India. The maternal demographic characteristics and causes of stillbirth were studied.	A total of 9074 babies were delivered during this period. There were 275 stillbirths in this year (SBR 30.3 per 1000 total births). Majority of the mothers were in the age group of 26–30 years (32.7%). Almost all the mothers (98.5%) were from urban areas.
Ariarathinam Newtonrajet al. (2017)	To estimate stillbirth rate and to determine the causes and risk factors of stillbirths to facilitate designing of a stillbirth prevention strategy.		This study used following three approaches. Firstly, to estimate stillbirth rate, 'catch and re-catch' method was used. Secondly, to assess probable causes of stillbirth verbal autopsy technique was utilized followed by coding of the causes according to the International Classification of Diseases. Thirdly, to determine the risk factors of stillbirths, a case-control design was adopted.	Stillbirth rate was estimated to be 16/1000 birth. Antepartum causes were more common (68%) than intrapartum causes (32%). Among maternal conditions, hypertension (18.2%) and chorio-amnionitis (13.8%), and Among foetal conditions, growth restriction (19.9%) and congenital anomalies (18.8%) were the leading causes. In about half of the stillbirths foetal (48%) and maternal (44.7%) causes were unidentifiable
Rakhi Dandona (2019)	To understand the risk factors for stillbirths compared with live births that could assist with		Survey the women were selected by a multistage sampling procedure from Bihar	A total of 23,940 births including 338 stillbirths were identified giving the state stillbirth rate

	reduction of stillbirths is not readily available for the Indian population		state which is divided into 38 districts, each of which is divided into 5– 27 blocks, giving a total of 534 blocks in the state.	(SBR) of 15.4 (95% CI 13.2–17.9) per 1000 births, with no difference in SBR by sex. Antepartum and intrapartum SBR was 5.6 (95% CI 4.3–7.2) and 4.5 (95% CI 3.3–6.1) per 1000 births, respectively.
Anchal Purbey et al. (2019)	To understand the existing prevalence of stillbirth for three years before the pandemic, (ii) identify the spatial patterns of SBR and high burden clusters (hotspots) and (iii) study the possible risk factors of stillbirth using triangulation of National Family Health Survey		Spatial patterns of SBR at district level was identified using local indicator of spatial association (LISA). Risk factors of stillbirths were Studied by triangulation of HMIS and National Family Health Survey (NFHS-4) data using bivariate LISA.	National average of SBR in 2017–18, 2018–2019 and 2019–2020 are 13.4 [4.2–24.2], 13.1 [4.2–22.2] and 12.4 [3.7–22.5] respectively. Districts of Odisha, Madhya Pradesh, Rajasthan and Chhattisgarh (OMRC) form a contiguous east-west belt of high SBR.

RISK FACTORS ASSOCIATED WITH STILLBIRTH IN INDIA

Stillbirth doesn't just happen in a vacuum. It's not a single moment—it's a series of things, stacking up, silently. One missed diagnosis here, one untreated infection there. And before anyone realizes what's gone wrong, it's too late. In India, this reality plays out in thousands of families every year. Understanding the risk factors behind it isn't just an academic exercise—it's about pinpointing failure points in the system, in care, and sometimes, in society itself. The risk factors aren't isolated; they often overlap. And they tell a story of gaps—medical, structural, cultural.

Maternal-Related Risk Factors

Maternal health conditions are among the most significant contributors to stillbirth in India. Severe anemia, hypertensive disorders of pregnancy, gestational diabetes mellitus, maternal infections, and malnutrition are frequently associated with adverse fetal outcomes.[6,8]

Extremes of maternal age also increase stillbirth risk. Adolescent pregnancies are associated with poor nutritional status, inadequate antenatal care, and increased obstetric complications, whereas advanced maternal age is linked with hypertension, diabetes, and placental insufficiency.[10,11]

Maternal infections, particularly syphilis and TORCH infections, may lead to fetal growth restriction, congenital abnormalities, and intrauterine fetal death if not diagnosed and treated promptly.

Fetal and Obstetric Risk Factors

Fetal complications such as congenital anomalies, intrauterine growth restriction (IUGR), prematurity, and multiple gestations are important determinants of stillbirth.[2,14] Inadequate fetal surveillance and limited access to ultrasonography in rural settings often delay early diagnosis and intervention.

Obstetric complications including obstructed labor, abnormal fetal presentation, placental disorders, and previous adverse obstetric history further increase the risk of stillbirth. Delayed emergency obstetric interventions contribute substantially to preventable fetal deaths.

Health System -Related Risk Factors

Poor quality antenatal and intrapartum care remains a major challenge in India. Many women do not receive the recommended number of antenatal visits, and essential investigations such as blood pressure monitoring, hemoglobin estimation, and ultrasonography are often inadequately performed.[3,15]Weak referral systems, inadequate emergency obstetric services, shortage of trained healthcare professionals, and delayed transportation contribute significantly to adverse pregnancy outcomes. The "three delays" model—delay in recognizing complications, delay in seeking care, and delay in receiving appropriate treatment—continues to influence stillbirth occurrence in many rural areas.

Socio-Economic and Cultural Determinants

Low maternal education, poverty, gender inequality, and poor health awareness are strongly associated with stillbirth in India. Women from economically weaker sections frequently experience barriers in accessing healthcare services due to financial constraints and social discrimination.

Traditional beliefs, home deliveries without skilled birth attendants, and limited decision-making autonomy among women further contribute to delayed healthcare utilization and increased stillbirth risk.

PREVENTIVE STRATEGIES FOR STILLBIRTH REDUCTION:

Strengthening Antenatal and Obstetric Care

Improving the quality and coverage of antenatal care is essential for preventing stillbirths. Early identification and management of high-risk pregnancies through routine screening for anemia, hypertension, diabetes, and fetal growth abnormalities can significantly reduce adverse outcomes.[16]

Institutional deliveries attended by skilled birth attendants and timely access to emergency obstetric care are equally important. Availability of essential diagnostic services, referral transport, and comprehensive obstetric management should be strengthened, particularly in rural and underserved areas.

Community-Based Interventions

Community health workers, especially Accredited Social Health Activists (ASHAs), play a crucial role in promoting maternal health awareness, encouraging antenatal registration, and facilitating institutional deliveries.

Government initiatives such as Janani Suraksha Yojana (JSY), Home-Based Newborn Care (HBNC), and Village Health and Nutrition Days have improved healthcare utilization among pregnant women. However, continuous monitoring and quality improvement are necessary to maximize their effectiveness.

Health education programs focusing on nutrition, birth preparedness, danger signs during pregnancy, and early healthcare seeking behavior are important for reducing preventable stillbirths.

Health System Strengthening

Strengthening health systems through improved referral mechanisms, skilled workforce training, and functional emergency obstetric care services is essential for reducing stillbirths. Programs such as Basic Emergency Obstetric and Newborn Care (BEmONC) and Comprehensive Emergency Obstetric and Newborn Care (CEmONC) enhance the capacity of healthcare providers to manage obstetric emergencies effectively.[17,18]

Perinatal death audits and improved Health Management Information Systems (HMIS) are necessary to identify causes of stillbirth and guide evidence-based interventions.

Policy and Program Interventions

National initiatives including the National Health Mission (NHM), LaQshya, SUMAN, and RMNCH+A have contributed to improving maternal and neonatal healthcare services in India. These programs focus on quality antenatal care, institutional delivery, respectful maternity care, and strengthening healthcare infrastructure.

Despite these efforts, implementation gaps persist due to workforce shortages, inadequate infrastructure, and uneven resource distribution. Strengthening policy implementation and ensuring equitable healthcare access remain critical priorities.

DISCUSSION

This review highlights that stillbirth in India is closely associated with preventable maternal, fetal, socioeconomic, and healthcare-related factors. Maternal anemia, hypertensive disorders, poor-quality antenatal care, delayed referrals, and inadequate emergency obstetric services emerged as the most commonly reported determinants across studies.[3,6,8]

Socioeconomic disparities continue to significantly influence stillbirth outcomes. Rural populations and marginalized communities experience higher stillbirth rates due to limited healthcare accessibility, poor nutrition, low literacy, and financial barriers. Although national maternal health programs have improved institutional delivery rates, quality of care remains inconsistent across regions.

Inadequate data reporting and limited implementation of perinatal death audits further hinder accurate assessment of stillbirth burden in India. Strengthening surveillance systems and improving data quality are necessary for effective policy planning and monitoring.

A multisectoral and context-specific approach integrating maternal healthcare, nutrition, education, and community participation is essential to reduce preventable stillbirths in India.

LIMITATIONS:

This review included only English-language publications and may have excluded relevant regional studies. As a narrative review, the findings may also be subject to selection bias.

CONCLUSION:

Stillbirth remains a significant yet under-recognized public health problem in India. Preventable maternal conditions, inadequate antenatal and intrapartum care, delayed referrals, and socioeconomic inequalities contribute substantially to the burden of stillbirths.

Improving quality antenatal care, strengthening emergency obstetric services, enhancing community awareness, and ensuring effective implementation of maternal health programs are essential for reducing stillbirth rates. Strengthening perinatal surveillance systems and promoting evidence-based interventions can further support national efforts toward improving maternal and neonatal health outcomes.

Future research should focus on region-specific determinants, implementation challenges, and evaluation of community-based interventions to support targeted public health strategies.

ETHICS APPROVAL AND CONSENT TO PARTICIPANT:

No ethical approval or consent to participate was required for this narrative review.

CONSENT FOR PUBLICATION:

All authors provide consent for publication.

AVAILABILITY OF DATA AND MATERIALS:

Yes, the data analyzed during the current study are available from the corresponding author on reasonable request.

Funding: Not Applicable

AUTHOR'S CONTRIBUTION:

All authors reviewed the final manuscript. The authors read and approved the final manuscript.

Acknowledgement: Not Applicable

DECLARATION COMPETING INTERESTS:

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper

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