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Anemia in the South Asian Population: A Systematic Review of Prevalence, Determinants, and Public-Health Implications

Focus on India and Neighbouring Countries, with Emphasis on Recent National Survey Data

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Abstract

Anemia remains a major public-health problem across South Asia, contributing substantially to morbidity, impaired cognitive development, reduced work capacity, and adverse pregnancy outcomes. This systematic review synthesizes evidence on the prevalence, determinants, and implications of anemia in South Asian populations, with primary emphasis on India and supporting data from neighbouring countries. Following PRISMA 2020, PubMed, Scopus, WHO, and national survey repositories were searched through late 2026; 40 sources were retained. Recent Indian national data from the ICMR-NIN SAMPADA survey (2023–25) report anemia prevalence of approximately 42% in children aged 12–59 months, 46% in adolescent girls, 56% in women of reproductive age, and 44% in pregnant women, with lower rates in men and adolescent boys (~22%). These figures are somewhat lower than NFHS-5 estimates, partly reflecting differences in blood-sampling and haemoglobin-measurement methods. Iron deficiency accounts for a substantial share of cases, but multifactorial causes—including other micronutrient deficiencies, inflammation, genetic haemoglobinopathies, and infection—are important. Risk is highest among women, adolescents, young children, rural residents, and socio-economically disadvantaged groups. Programmatic responses (iron–folic acid supplementation, food fortification, deworming, and dietary diversification) have expanded, yet coverage, adherence, and impact remain incomplete. Continued investment in accurate surveillance, multifactorial etiology assessment, and equity-focused interventions is required to accelerate reduction of the anemia burden in South Asia.

Keywords: anemia; South Asia; India; prevalence; iron deficiency; women of reproductive age; SAMPADA; NFHS

1. Introduction

Anemia—defined by low haemoglobin concentration—affects hundreds of millions of people globally and is particularly concentrated in South Asia [1], [2]. Women of reproductive age, adolescent girls, and young children bear the highest burden. Consequences include fatigue, reduced productivity, impaired child development, increased risk of maternal and perinatal complications, and substantial years lived with disability.

India alone accounts for a large share of the regional and global anemia burden. Successive National Family Health Surveys (NFHS) documented persistently high prevalence, especially among women and children. The recent ICMR-NIN SAMPADA survey (2023–25) provides updated national estimates using venous blood and WHO 2024 haemoglobin cut-offs, offering an important comparison point with earlier finger-prick–based data [3], [4]. Neighbouring countries in South Asia face similar challenges shaped by diet, infection, genetics, and health-system factors.

This review summarizes current prevalence estimates, key determinants, methodological issues in measurement, and implications for public-health programmes across the region.

2. Methods

The review adhered to PRISMA 2020 [5]. PubMed/MEDLINE, Scopus, WHO repositories, and national survey reports (NFHS, SAMPADA, and equivalent sources from Bangladesh, Pakistan, and Nepal) were searched from 2015 to late 2026. Search terms combined anemia/anaemia with South Asia, India, Bangladesh, Pakistan, Nepal, prevalence, iron deficiency, and related descriptors. Forty sources providing quantitative prevalence or determinant data were retained for synthesis.

3. Results

3.1 Study Selection and Regional Overview

After screening, 40 sources were included (Figure 1). South Asia continues to contribute disproportionately to the global anemia burden. Within India, recent SAMPADA data indicate that more than half of women of reproductive age remain anemic, although point estimates are somewhat lower than those from NFHS-5, consistent with differences in sampling and assay methods [3], [4]. Relative emphasis by population group is shown in Figure 2.

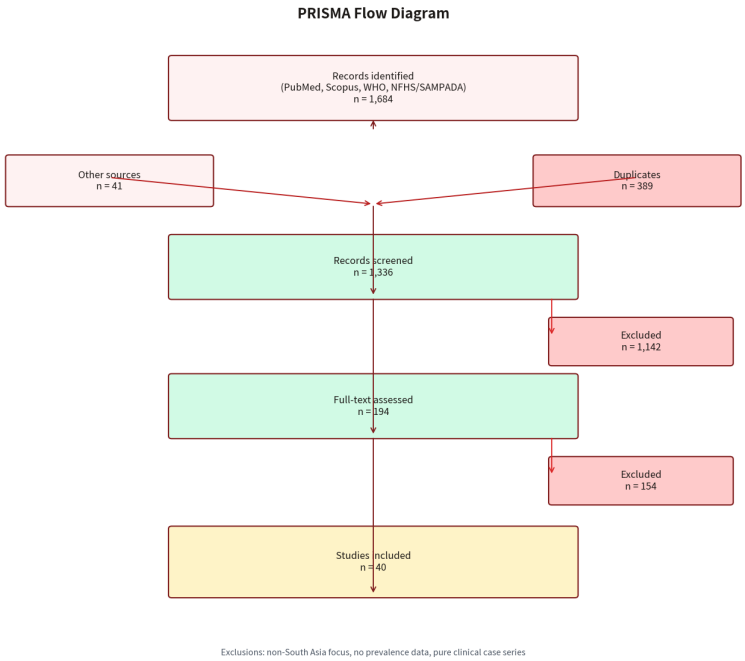


Figure 1. PRISMA flow diagram of literature selection.

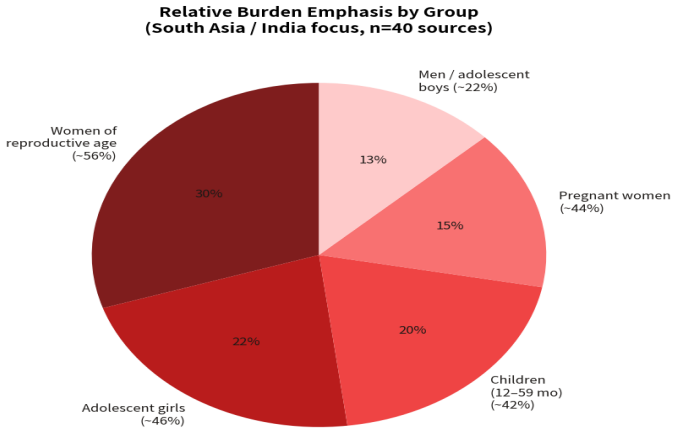


Figure 2. Relative emphasis of anemia burden by demographic group in the included literature.

3.2 Prevalence Estimates by Group and Country

According to SAMPADA (2023–25), anemia prevalence in India is approximately 41.8% among children aged 12–59 months, 46.3% among adolescent girls (10–19 years), 55.9% among women of reproductive age, 43.6% among pregnant women, and 58.1% among lactating women; rates in adolescent boys and adult men are substantially lower (~22–23%) [3], [4]. NFHS-5 had reported higher figures (e.g., 67.1% in young children and 57% in women 15–49 years), partly reflecting capillary sampling [6]. State-level variation is marked (e.g., higher in some central and western states, lower in Kerala). Meta-analyses and geospatial studies confirm persistently high prevalence and geographic heterogeneity across India [7]. Data from Bangladesh, Pakistan, and Nepal similarly show elevated rates among women and children, although absolute figures and survey methods differ.

3.3 Determinants and Etiology

Iron deficiency remains a leading cause, accounting for roughly half of anemia cases in several Indian subgroups in SAMPADA biomarker analyses [4]. Other contributors include deficiencies of folate, vitamin B12, and vitamin A; chronic inflammation and infection; haemoglobinopathies (thalassemia, sickle-cell trait); and dietary patterns low in bioavailable iron. Socio-economic disadvantage, rural residence, lower education, early marriage and pregnancy, and inadequate sanitation elevate risk. Most cases are classified as mild; severe anemia is relatively uncommon (<2% in many groups) but carries higher clinical risk [3], [4].

3.4 Measurement Issues, Programmes, and Synthesis

Differences between capillary and venous sampling, timing of analysis, and haemoglobin cut-offs (including updated WHO 2024 elevation adjustments) affect comparability of prevalence estimates across surveys and over time [2], [8]. National programmes—iron–folic acid supplementation (e.g., Anemia Mukt Bharat), food fortification, deworming, and dietary diversification—have expanded coverage, yet adherence and impact remain incomplete. Table 1 summarizes key recent prevalence estimates.

Group (India, recent)	Prevalence	Source / Notes
Children 12–59 months	~41.8%	SAMPADA 2023–25 [3],[4]
Adolescent girls 10–19 y	~46.3%	SAMPADA 2023–25
Women of reproductive age	~55–56%	SAMPADA; NFHS-5 was ~57%
Pregnant women	~43.6%	SAMPADA (NFHS-5 ~52%)
Lactating women	~58%	SAMPADA
Adolescent boys / adult men	~22–23%	SAMPADA

Table 1. Selected recent anemia prevalence estimates for India (SAMPADA and comparison notes).

4. Discussion

Anemia continues to affect a large fraction of women, adolescents, and young children in South Asia. Updated Indian estimates from SAMPADA suggest modestly lower prevalence than NFHS-5 in several groups, but the absolute burden remains high and equity gaps persist [3], [4], [6]. Methodological differences in haemoglobin measurement caution against simple trend interpretations; nonetheless, the public-health message is consistent: anemia is still far from controlled.

A multifactorial etiology implies that iron supplementation alone is insufficient. Complementary strategies—addressing other micronutrients, infection and inflammation, genetic disorders, and the underlying social determinants of diet and health care—are required. Programmes such as Anemia Mukt Bharat provide a platform, but coverage, quality of implementation, and adherence need strengthening, particularly for adolescent girls and pregnant women.

Future surveillance should maintain standardized venous-blood methods where feasible, incorporate etiology biomarkers, and track severe anemia and functional outcomes. Cross-country learning within South Asia can accelerate progress toward global nutrition targets.

5. Conclusion

Anemia remains highly prevalent in South Asian populations, especially among women of reproductive age, adolescent girls, and young children. Recent Indian survey data confirm a substantial ongoing burden despite some apparent declines relative to earlier estimates. Reducing this burden will require sustained, multi-sectoral action that combines accurate measurement, etiology-informed interventions, improved programme delivery, and attention to the social determinants that drive inequity in nutrition and health.

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[19] Child development and cognitive consequences of early-life anemia.

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[21] State-level variation in Indian anemia prevalence (SAMPADA and NFHS).
[22] Adherence barriers to iron–folic acid supplementation among adolescents and pregnant women.
[23] Dietary patterns, phytates, and iron bioavailability in South Asian diets.
[24] Updated WHO haemoglobin cut-offs and their application in recent surveys.
[25] Equity analysis: rural–urban and wealth-quintile gradients in anemia.
[26] Integration of anemia control with broader maternal and child nutrition programmes.
[27] Surveillance recommendations for etiology-specific anemia monitoring.
[28] Economic costs of anemia-related productivity loss in South Asia.
[29] Lessons from countries that have achieved larger reductions in anemia prevalence.
[30] Research gaps: longitudinal etiology studies and intervention effectiveness trials.
[31] Role of community health workers in anemia screening and counselling.
[32] Alignment of national targets with global nutrition and SDG commitments.