

# Anemia in Pregnancy in South Sudan: Challenges, Interventions, and Pathways to Improved Maternal Health Outcomes

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## Abstract

In resource-constrained environments like South Sudan, where fragile healthcare systems, widespread poverty, and a high disease burden contribute to its prevalence, anemia in pregnancy is a major public health concern. An estimated 61% of pregnant women in the country suffer from anemia, with severe anemia being linked to maternal deaths and poor neonatal outcomes. Malnutrition, malaria, inadequate antenatal care (ANC), and a lack of regional blood banks for transfusion services worsen the situation. Despite evidence-based interventions like iron supplementation and malaria control programs, systemic barriers impede progress. To address anemia in pregnancy in South Sudan, a comprehensive strategy that combines nutritional interventions, infectious disease control, blood transfusion capacity building, and Healthcare system strengthening. This review analyzes recent data from 2014-2024 to identify gaps and suggest context-specific interventions by examining the prevalence of anemia in pregnancy in South Sudan, including its causes, difficulties, and potential solutions.

**Keywords:** Anemia in Pregnancy; Maternal Health; Nutritional Deficiencies; Antenatal Care; Resource-Limited Settings; Blood Transfusion; South Sudan

## Abbreviations

ANC: Antenatal Care; WHO: World Health Organization Hb: Hemoglobin; IPT: Intermittent Preventive Treatment.

## Introduction

Women in low-resource countries, such as South Sudan, are disproportionately affected by anemia during pregnancy, which is defined as hemoglobin levels below 11 g/dL. Twenty percent of maternal deaths worldwide are thought

to be caused by anemia, according to WHO estimates. In South Sudan, the burden is even higher because of the country's pervasive poverty, food insecurity, and restricted access to healthcare [1]. Numerous expectant mothers lack access to necessary medical care due to the ongoing conflicts and insufficient health financing that strain South Sudan's already precarious health system. In addition to providing context-specific suggestions for enhancing maternal health outcomes, this review examines the prevalence, etiology, and treatment of anemia during pregnancy in South Sudan.

## Burden of Anemia in South Sudan

South Sudan's maternal mortality rate of 1,150 deaths per 100,000 live births is among the highest in the world. Over 60% of pregnant women suffer from anemia, which is a significant contributing factor. The lack of regional blood banks for transfusion services, high illness prevalence, and inadequate healthcare services all disproportionately impact rural areas. The cycle of poverty in South Sudan is made worse by anemia during pregnancy. It raises the possibility of low birth weight and premature delivery, which can result in neonatal problems that put more strain on families and the healthcare system [2].

## Risk Factors for Anemia in South Sudan

More than 7.8 million people in South Sudan suffer from food insecurity, which causes iron and folate deficiency in pregnant women to be common. These inadequacies are exacerbated by the lack of diversity in traditional meals [3]. Pregnancy-related anemia is largely caused by malaria, which is widespread in South Sudan and causes serious morbidity in both the mother and the fetus. Because of inadequate sanitation, intestinal parasites, such as hookworms, are common and exacerbate blood loss. Anemia risk is increased by early marriage and adolescent pregnancies, which are prevalent in South Sudan. Women's access to ANC services and health education is restricted by gender inequalities and low literacy levels. Furthermore, women with severe anemia sometimes lack timely access to life-saving blood transfusions due to the absence of regional blood banks [1].

## Classification of Anemia based on severity

Pregnancy-related anemia is categorized according to hemoglobin (Hb) levels. Hemoglobin levels between 10 and 10.9 g/dL are considered mild anemia, those between 7 and 9.9 g/dL are considered moderate anemia, and those below 7 g/dL are considered severe anemia. Many women in South Sudan arrive with moderate to severe anemia, frequently necessitating urgent interventions like blood transfusions with limited availability of regional blood banks [1].

## Pathophysiology of Anemia in Pregnancy

Pregnancy-related hemodilution, combined with persistent blood loss from infections and nutritional deficits, results in a significant reduction in oxygen carrying capacity [2,3]. In South Sudan, untreated anemia frequently escalates to severe cases that result in maternal heart failure, intrauterine growth restriction, and poor neonatal outcomes [4].

## Screening and Diagnosis of Anemia in South Sudan

Anemia is characterized as mild, moderate, or severe based on hemoglobin concentrations. Diagnostic tools are

frequently unavailable in rural South Sudan, thus anemia goes undetected until complications emerge. Due to a shortage of laboratory facilities, point-of-care hemoglobin testing and clinical symptom assessments are widely employed in South Sudan. However, these methods are limited in terms of accuracy and accessibility.

## Interventions for Prevention and Management

There are iron and folic acid supplementation programs in place in South Sudan, but poor ANC participation and supply chain challenges limit their accessibility. Pregnancy-related anemia prevalence has been demonstrated to be reduced by malaria prevention using insecticide-treated bed nets and intermittent preventative treatment (IPT) which are provided during ANC, however due to low ANC uptake, their utilization is questionable in South Sudan especially in rural settings [5]. To help women with severe anemia receive blood transfusions services, regional blood banks should be established, this can reduce mortality from severe anemia in pregnancy. Community health worker initiatives have proven successful in providing ANC services and increasing awareness of anemia in rural South Sudan by training traditional birth attendants to perform basic health services.

## Challenges and Barriers

South Sudan's healthcare sector is facing serious shortages of skilled health workers, drugs, and diagnostic tools. Only 40% of pregnant women have at least one ANC visit, and even less complete the required eight contacts [2]. The lack of regional blood banks is a big challenge, as women with severe anemia frequently cannot receive life-saving transfusions. Traditional beliefs frequently hinder pregnant women from obtaining medical attention, resulting in delayed identification and treatment of anemia. Furthermore, high traveling expenses, poor road infrastructure and insecurity impede access to healthcare facilities. The South Sudan Ministry of Health has published recommendations for addressing anemia in pregnancy, but their implementation is limited.

## Recommendations

To address the challenges of anemia during pregnancy in South Sudan, the following measures are proposed:

### Policy Recommendations

- Establish and equip regional blood banks to provide prompt blood transfusions.
- Integrate anemia prevention and treatment into comprehensive maternal health policy.
- Improve supply chains to ensure consistent availability of supplements and pharmaceuticals.

### Community Empowerment

- Provide community health workers with the necessary training and tools to provide ANC awareness and services.
- Encourage public awareness initiatives to dispel cultural myths and boost ANC participation.

### Healthcare Infrastructure

- Provide standard laboratories and diagnostic services to rural areas.
- Invest more in the education and retention of healthcare professionals.
- To finance and carry out maternal health initiatives, strengthen collaboration with international organizations.

### Conclusion

Anemia in pregnancy remains a major health challenge in South Sudan, exacerbated by dietary inadequacies, infectious illnesses, systemic barriers, and a lack of regional blood banks. Addressing this issue requires a multifaceted approach that includes better healthcare infrastructure, community-based

interventions, and targeted policy. Investing in maternal health has the potential to break the cycle of poverty and enhance outcomes for both mothers and children.

### Competing Interest

The Author declares no competing interest

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