Data, policies and programs to improve preconception nutrition in South Asia

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ABSTRACT

The months before a woman conceives are crucial for improving the health of future mothers and babies. Preconception care has received increased attention particularly after the 2018 Lancet series. Despite this, there is limited research and measurable indicators to track the impact of policies and programs targeting preconception nutrition interventions. This paper examines the status of preconception nutrition in eight South Asian countries, reviews relevant public policies and programs delivering preconception nutrition interventions; and analyzes the systems bottlenecks in program implementation. The study followed a mixed-methods approach and was conducted during August 2023-July 2024, focusing on 15-49 years married pre-pregnant women across the countries. Analysis of large-scale survey data reveals that 25% pre-pregnant women in the region are underweight, one-third are anemic, and younger women are more vulnerable. One in ten pre-pregnant women in most of these countries suffer from diabetes or hypertension. Except Sri Lanka, most countries lack universal programs for health and nutrition screening and essential micronutrients. Despite a positive policy environment in many of these countries, the implementation of comprehensive nutrition services for pre-pregnant women faces significant bottlenecks. These barriers, coupled with limitations in program data, hinder decision-making and the ability to determine which interventions are most effective.

INTRODUCTION

Preconception is a critical period that offers a unique opportunity to improve the health of future mothers and their developing fetuses before conception occurs. Preconception care has received increased attention in recent years, particularly after the 2018 Lancet series (1–3), which emphasized the significance of good health and nutrition for both men and women before conception. The World Health Organization (WHO) defines preconception care as the provision of biomedical, behavioral and social health interventions to women and couples before conception, aiming to improve maternal and child health in both the short and long term (4,5). Traditionally, the preconception period is considered to be the three months before conception among women of reproductive age. However, the 2018 Lancet series expanded this definition to include the days and weeks before embryo development, the time when a woman or couple decides to conceive, and any time a woman is of childbearing age.

In 2013, the WHO outlined recommendations for preconception care, including a focus on nutrition (4). Following this, the WHO South-East Asia Regional Office recommended two key intervention packages—one targeting adolescents' healthy transitions and the other focusing on pre-pregnancy care for both married and unmarried adults—to be delivered through school, health facilities and community (6). Some other recommended interventions included family planning, nutrition, micronutrient supplementation, weight management, immunization, tobacco and alcohol use control, and screening and management of chronic diseases.

Nutrition is a critical aspect of preconception care, as the nutritional status of women before pregnancy significantly impacts the growth, development, and long-term health of their babies (7–9). However, many women in South Asia enter pregnancy nutritional risks, such as underweight, short stature, anemia, and micronutrient deficiencies. For example, 22% of women in reproductive age are underweight (with a body mass index (BMI) less than 18.5 kg/m^2), 11% are too short (height less than 145 cms) and 49% are anemic. Further, 14% of pregnant women (~4.5 million) are adolescents (10). Women who are underweight before pregnancy face a higher risk of preterm birth (32%) than women with a healthy weight (8,9,12). Women who are overweight and obese before and during pregnancy are at increased risk of preeclampsia, hypertension, gestational diabetes, poor pregnancy outcomes. (8,9,12). Short stature in women is associated with poor pregnancy outcomes, such as small-for-gestational-age and preterm births and is strongly correlated with stunting in children (9,13,14). In 2022, Partap et al conducted a systematic review and metanalysis on pre- and peri-conception interventions to prevent low birth weight, small for gestational age and preterm birth and 28 out of 58 studies examined nutritional interventions such as micronutrient supplementation such as iron folic acid, calcium, vitamin A, mushroom in diet) (17). However, 10 studies were from South Asian countries.

Despite the importance of preconception nutrition, there is lack of research and measurable indicators to track progress in this area, status of policies and programs that include preconception nutrition interventions. Also, not much is known about the bottlenecks in implementation of programs and what could be the pathways to improve preconception nutrition in the South Asian region. This paper answers three questions – (a) what is the prevalence of malnutrition in women 15-49 years during preconception phase of life in South Asia?; (b) are the maternal health and nutrition public policies and programs in South Asia delivering proven preconception nutrition interventions? and (c) what are the systems bottlenecks in program for delivering proven preconception nutrition interventions in the region?

METHOD

The study followed a mixed-method approach with five key steps. *First*, to arrive at the prevalence estimates and inequities on health and nutrition status and access to services, we listed the globally recommended indicators related to preconception health and nutritional status (underweight, overweight, obesity, short stature, anaemia, micronutrient deficiencies, and non-communicable diseases such as diabetes and hypertension and risk of metabolic complications), in line with the conceptual framework adapted from Partap et al (17). Then, we mapped their availability in nationally representative cross-sectional surveys, country-wise. The analysis population included married, non-pregnant women of age 15-49 years. We did the analysis separately for women with zero parity and one or more parity; and separately for pre-pregnant women of age 15-24 years. The status of preconception nutrition related indicators was calculated for each of these eight South Asian countries, and pooled estimate was calculated for the region. Table 1 provides a snapshot of the methodology adopted for this study.

Second, 22 evidence based recommended nutrition interventions during preconception was categorized under five domains of health and nutrition screening; access to essential micronutrients; dietary and lifestyle counseling; infection prevention; and special care for women at risk (Figure 1). This categorization was done based on WHO recommendations on preconception care (2013) and UNICEF Programming Guidance on maternal nutrition (2022).

Third, desk review was conducted to explore the availability of national policies, legislations, program and implementation reports on preconception nutrition through online searches. Subsequently, virtual consultations with UNICEF offices in the eight countries were done for their support in obtaining relevant published and grey literature. These documents were thoroughly reviewed and analysis of all relevant documents with policy content was done manually, extracting information using a standardized template.

Fourth, a systems bottleneck analysis was performed for preconception nutrition interventions that were delivered through any program. The constraints in the effective implementation were assessed according to six parameters adapted from the WHO health system building blocks - (i) leadership, governance, and coordination; (ii) budget and financing; (iii) workforce; (iv) essential commodities and supplies; (v) service delivery; and (vi) data and information systems. A mixed-methods approach was used to determine the level of bottlenecks in the health system to implement the interventions. Data was collected on identified key quantitative indicators and qualitative parameters for each bottleneck. Data for quantitative indicators was collected from demographic and health surveys and for qualitative parameters, data was collected through qualitative discussions with country-level stakeholders to gather their insights. Severity of bottlenecks was assessed using a system bottleneck classification tool and categorized into: no; mild; moderate; and significant.

Fifth, validation of the findings on the program and policy landscape around preconception nutrition interventions and severity of bottlenecks in implementation of relevant programs was done through country level virtual and in-person consultations with multiple stakeholders.

FINDINGS

Prevalence of malnutrition among women 15-49 years during the preconception phase of life

Our pooled analysis of nationally representative data from eight South Asian countries shows that 28% pre-pregnant women in South Asia are overweight and 14% are underweight. In five out of six countries

with available data—Bangladesh, Maldives, Nepal, Pakistan, and Sri Lanka—the prevalence of overweight women exceeds 30%. Anaemia remains a critical concern, affecting 55% of women across the region, with the high rates observed in Maldives (63%), India (58%), and Bangladesh (42%). Data gaps exist for Bhutan, Sri Lanka, and Pakistan. Approximately 31% women in Nepal and 23% pre-pregnant women in Afghanistan has anaemia (31%).

Micronutrient deficiencies are also widespread, with 52% of pre-pregnant women lacking zinc, 38% iodine, and 10% folate. Other deficiencies include iron (8%), Vitamin B12 (7%), and Vitamin A (5%). Additionally, 8% of women have diabetes, and 14% suffer from hypertension. Data on mental health concerns are not available for most of the South Asian countries, except Nepal, where 27% of young women of age 15-24 years report anxiety, and 7% report depression in the past two weeks preceding the survey. Data on access to healthy diets and health & nutrition services are not available for most of the countries. More than 50% of pre-pregnant adolescent women have inter-pregnancy interval of less than 2 years. Only one in three use any modern family planning methods.

The study highlights a significant gap in data on preconception nutrition-related interventions for women of reproductive age (WRA) from national surveys and routine program monitoring systems in the region. Only Nepal has survey data on diabetes screening, while Sri Lanka is the only country with both survey and program monitoring data on folic acid supplementation. India and Pakistan have program data, and Nepal has survey data on IFA supplementation. Food fortification survey data is available in six countries, excluding Bhutan and Maldives. For psychosocial counseling, only Pakistan has program data. All eight countries have data on family planning, but data on infection prevention is limited, with India having program data and Nepal survey data on deworming. Five countries have data on bed nets for malaria prevention, excluding Bangladesh, Maldives, and Sri Lanka. Notably, only India has program data on anemia treatment, with both India and Nepal having survey data on diabetes treatment. Nepal also has data on mental health treatment, and India is the only country with both survey and program data on STI/RTI treatment.

Country specific preconception nutrition policies and programmes and associated system bottlenecks

A summary of the policies and programmes that include at least one component of preconception nutrition across the eight countries is presented in Table 2. Below we present the preconception nutrition interventions included in policies and programmes in the South Asian countries (Table 3) and associated system bottlenecks in implementing relevant programmes in each country, in alphabetical order.

Afghanistan

In Afghanistan, 20 out of the 22 recommended preconception nutrition interventions are incorporated into 9 national policies. Of these 20 interventions, 9 are delivered through 5 programmes (Table 2). Despite these policies, only 6 interventions have universal programmes that serve all WRA. Some interventions currently have room for further development. To enhance the healthcare landscape, comprehensive programmes need to be expanded to include anthropometric assessments for women of childbearing age, and screening for anaemia, diabetes mellitus, sexually transmitted infections (STIs) or other reproductive tract infections (RTIs) (e.g. candidiasis, bacterial vaginosis), as well as iron folic acid (IFA) and folic acid supplementation, deworming prophylaxis, counselling on healthy eating and physical activity and reducing caffeine, alcohol, smoke, toxin exposure, balanced energy and protein (BEP) supplements and contextualised dietary modification. Additionally, policies and programmes in critical areas such as social protection interventions and medical nutrition therapy need strengthening.

We identified bottlenecks across six interventions included in the national programmes. For screening and treating psychosocial issues, we found moderate bottlenecks in budget and financing, data and information systems, workforce, supplies, and service delivery. Psychosocial counselling faced moderate bottlenecks, similar to screening and treating psychological issues. For food fortification, we found moderate bottlenecks across all areas. Family planning interventions encountered moderate challenges in budget and financing. For malaria prevention, moderate bottlenecks were found in leadership and governance, budget and financing and supplies. Afghanistan's programme information system only captures data on 3 of the 6 universally implemented interventions: psychosocial

counselling, family planning, and malaria prevention in endemic areas. Stakeholders highlighted that the ongoing humanitarian crisis critically hampers effective programme implementation.

Bangladesh

Bangladesh has 19 policies covering 17 of the 22 interventions and seven interventions are delivered through seven programmes (Table 2). Seven of these 17 interventions are implemented through nationwide government-funded programmes. The weekly IFA supplementation programme is only for adolescent girls aged 10-19 years through the National Nutrition Services Program, but the remaining six interventions have universal programmes catering to all WRA. Despite this strong foundation, opportunities to further develop Bangladesh's policies and programmes include anthropometric assessment, social protection, BEP supplements, contextualized dietary counselling, and medical nutrition therapy. The availability of family planning services programme monitoring data highlights existing strengths and provides a solid basis for expanding and enhancing data for other areas of healthcare (Table 4).

The bottleneck analysis for these six interventions revealed that five interventions (folic acid and IFA supplementation, large-scale food fortification, and counselling on healthy eating and reducing caffeine/alcohol/smoke/toxins exposure) faced moderate to significant bottlenecks in at least five components, including budget, data, workforce, supplies, and service delivery. Family planning services encountered bottlenecks primarily in workforce, supplies, and service delivery.

Bhutan

Bhutan has six policies for WRA, covering 19 out of the 22 interventions and are delivered through six programmes (Table 2). Twelve of these 19 interventions are delivered to all WRA nationwide through government-funded programmes. These interventions include screening and treatment for anaemia, STIs/RTIs, and psychosocial issues, and counselling on healthy eating and physical activity, delivered through district-level health facilities and youth-friendly health centres. Other universal interventions include food fortification, family planning services, contextualised dietary counselling and medical nutrition therapy through all health facilities at district level, and bed net distribution.

However, five interventions, such as folic acid and IFA supplementation, deworming, counselling to reduce caffeine/alcohol/smoke/toxin exposure, and psychosocial counselling, target married adolescent girls only and do not cover the entire WRA age range of 15-49 years. Additionally, screening and treatment for diabetes mellitus are provided only in select districts. Bhutan has made significant strides in health policy, though there are opportunities to further expand policies and programmes in key areas such as anthropometric assessment, social protection, and BEP supplementation. Additionally, enhancing programme monitoring systems beyond family planning and malaria prevention, currently tracked through DHIS 2, could further strengthen Bhutan's healthcare delivery (Table 4).

We identified various bottlenecks across different nutrition interventions targeting pre-pregnant women. Data and information system challenges were found in screening and treatment for anaemia, diabetes mellitus, STIs/RTIs, psychosocial issues, and folic acid supplementation. Screening for psychosocial concerns, psychosocial counselling, deworming and counselling to reduce caffeine, alcohol, smoking, and toxin exposure faced moderate bottlenecks across all areas. Additionally, moderate bottlenecks were noted in data systems for food fortification, and in most areas except governance for counselling on healthy eating and physical activity.

India

India has 16 policies that include 20 of the 22 interventions, with 18 interventions delivered through 10 programmes (Table 2). Of these, 9 interventions have universal coverage, including screening, treatment and counselling for STIs/RTIs, counselling on healthy eating and physical activity, and counselling to reduce caffeine/alcohol/smoking exposure, delivered through Village Health, Sanitation, and Nutrition Days (VHSNDs) and the Rashtriya Kishore Swasthya Karyakram (RKSK or National Adolescent Health Programme). Other interventions include screening for psychosocial problems and treatment and counselling of depression and other psychosocial issues through the RKSK and Ayushman Bharat-Health and Wellness Centres. Large-scale food fortification is implemented through the Universal Salt

Iodization Program and Rice Fortification Initiative, as part of Pradhan Mantri Garib Kalyan Anna Yojana (Prime Minister Food Welfare Scheme for Poor). Family planning services are provided under the National Health Mission (NHM) nationally and Mission Parivar Vikas (Family Development) Program in 7 states, RKSK, VHSND, and incentives to Accredited Social Health Activist (ASHA, female community-based health worker) through the NHM. Nine out of 18 interventions have policies and/or programmes tailored to specific sub-target groups.

While India has established robust policies, opportunities to further enhance programme implementation exist. Folic acid supplementation and BEP supplementation for women in preconception age groups are areas for potential development. Additionally, expanding policies and programmes in social protection and medical nutrition therapy could strengthen the healthcare system. It is encouraging that programme service delivery/coverage data is available for IFA supplementation, family planning, deworming prophylaxis, anaemia and STI/RTI treatment through the Health Management Information System (HMIS) (Table 4), providing a solid foundation for future improvements.

We identified bottlenecks in all intervention areas for pre-pregnant women in India. Challenges include legislation and policies, leadership, governance, and coordination, budget and financing, data systems, workforce, essential supplies, and service delivery. Bottlenecks were prominent for anthropometric assessments, screening for diabetes mellitus, psychosocial problems, counselling on healthy eating and physical activity, reducing caffeine, alcohol, smoking/toxin exposure, dietary modification, and treatment of anaemia, diabetes, depression, and STIs/RTIs. Screening for anaemia faced bottlenecks in all areas except legislation and policies. Moderate bottlenecks were also noted in budget and financing, information systems, workforce, essential supplies, and service delivery, for IFA supplementation. Food fortification programmes encountered bottlenecks in leadership, management, governance, budget and financing, workforce, supplies, service delivery, and information systems. Family planning interventions faced challenges in leadership, governance, and coordination, and workforce, while deworming interventions had bottlenecks in legislation and policies, leadership, management and governance, budget and financing, data systems, and service delivery.

Maldives

The Maldives has 8 national policies or guidelines for 15 out of 22 interventions, of which 13 interventions delivered through 3 programmes. Four interventions have programmes that cater to all WRA and nine targeted to specific subgroups (Table 2), such as adolescent girls and young women aged 10-24 years. Four interventions have universal coverage, including STI/RTI screening, counselling, and treatment through adolescent and youth-friendly health services and routine family planning visits, counselling on healthy eating and physical activity during premarital sessions, and family planning services through the National Family Planning Program. Two programmes target either a specific subgroup i.e., adolescent girls and young women aged 10-24 years or piloted in select atolls, offering services like anthropometric assessments; diabetes screening and treatment; IFA supplementation; and contextualized dietary counselling. These two programmes also include screening, counselling and treatment for depression and other psychosocial problems and counselling aimed at reducing alcohol, caffeine, smoke, and toxin exposure.

Despite policies being established, challenges in programme implementation persist, particularly in food fortification and anaemia screening. Additionally, the Maldives lacks both policies and programmes in critical areas such as folic acid supplementation, deworming prophylaxis, social protection interventions, BEP supplements, medical nutrition therapy, and anaemia treatment. Program monitoring is currently available only for family planning through the HMIS (Table 4).

We identified bottlenecks across multiple components for various interventions, particularly for all five interventions under health and nutrition screening, IFA supplementation, counselling to reduce caffeine/alcohol/smoking, psychosocial counselling, contextualized dietary modification linked counselling, and treatment for diabetes, STI/RTI, and psychosocial problems. Family planning interventions faced challenges in budget and financing.

Nepal

Nepal has 19 national policies or guidelines for 18 out of the 22 interventions, with these policies translating into 11 programmes for 15 interventions (Table 2). Of these, 12 interventions have universal programmes that serve all WRA. Three interventions have programmes tailored to specific subgroups or piloted in some provinces. These include provision of IFA supplements through the Weekly Iron and Folic Acid Supplementation Programme for out of school adolescent girls through facilities. Deworming for school-going adolescent girls aged 10-19 years and WRA are delivered through the School Health and Nutrition Programme and Female Community Health Volunteer Programme, respectively. Counselling to reduce caffeine, alcohol, smoking, and toxin exposure is through the National Tobacco Control Programme.

Despite these established policies, gaps remain in programme implementation, particularly in anthropometric assessment, anaemia screening and BEP supplementation. Nepal also lacks both policies and programmes in several critical areas, such as anaemia treatment, social protection, contextualized dietary counselling, and medical nutrition therapy. Programme monitoring data is available only for family planning and bed net provision through the HMIS (Table 4).

Bottlenecks were identified across the 15 interventions in Nepal. While most interventions face challenges across the six building blocks, family planning, food fortification, and malaria prevention interventions had fewer bottlenecks. Family planning, however, encountered challenges with data and information systems; food fortification faced challenges in leadership and governance, budgeting, and data systems; and malaria prevention struggled mainly with budget and financing.

Pakistan

Pakistan has 8 policies that address 18 out of 22 interventions with 6 programmes delivering 7 interventions (Table 1). Four interventions are delivered through nationwide programmes for all WRA, while three are targeted to adolescents aged 15-19 years. The nationwide programmes include weekly IFA supplementation for women planning pregnancy and food fortification; family planning services; and mass distribution of long-lasting insecticide nets (LLINs). The three targeted programmes focus on STI/RTI screening and treatment, as well as the treatment of psychosocial issues, all delivered through the Essential Package of Health Services (EPHS).

Programme implementation is lacking in key areas including anthropometric assessment, screening for anaemia, diabetes mellitus, and psychosocial issues, provision of folic acid, deworming prophylaxis, counselling on healthy eating and physical activity, counselling linked to contextualized dietary modification, BEP supplements, and treatment for anaemia and diabetes mellitus. Pakistan lacks both policies and programmes in counselling to reduce caffeine, alcohol, smoke and toxin exposure, psychosocial counselling, social protection, and medical nutrition therapy. Program monitoring data is available for IFA supplementation, provision of bed nets in malaria endemic areas, and family planning through the HMIS (Table 4).

We identified bottlenecks across the building blocks for the seven implemented interventions. Screening and treatment for STIs/RTIs and psychosocial problems face bottlenecks in all aspects. Food fortification intervention had moderate bottlenecks in data and information systems. Family planning had moderate challenges in leadership and governance, budget and financing, workforce, and service delivery.

Sri Lanka

Sri Lanka has 10 policies and 4 programmes that deliver 17 out of 22 interventions (Table 2) for all WRA. Malaria prevention and deworming prophylaxis are not relevant for Sri Lanka, as the country was certified malaria-free by WHO in 2016, and the burden of worm infestation is low. The Service Package for Newly Married Couples, 2018, along with other policies, guidelines and programmes address anthropometric assessment, screening and treatment for anaemia, diabetes mellitus, STIs/RTIs, and psychosocial issues, folic acid supplementation, food fortification, and counselling on healthy eating, physical activity, counselling to reduce caffeine/alcohol/smoke/toxin exposure, psychosocial

counselling, family planning, counselling linked to contextualized dietary modification and medical nutrition therapy.

However, preconception IFA supplementation, social protection, and BEP supplements, are neither mentioned in policies nor implemented through programmes. Program monitoring data is available only for folic acid supplementation and family planning services (Table 4).

We found implementation bottlenecks in a few interventions, but the rest had no challenges. Screening for anaemia and diabetes faced challenges with essential commodities and supplies, while screening for psychosocial concerns had bottlenecks in workforce, essential commodities and supplies, and service delivery. Furthermore, psychosocial counselling faced bottlenecks in almost all domains. Food fortification had data and information bottlenecks.

Recommended actions against five specific strategies

Together with each country team, we reviewed the programme and policy landscape and implementation bottlenecks and formulated action points against the five specific strategies to be taken up by governments and their development partners.

1. **Science-based advocacy for strengthened policies, financing and accountability**

Sensitise stakeholders on the importance of preconception interventions through technical, academic and policy consultations, especially in countries where preconception nutrition pilots are lacking. Integrate preconception nutrition within the existing policies/programmes/platforms.

2. **Strengthening guidelines with costed plans and institutional architecture to improve delivery of preconception nutrition services through food, health, social protection systems**

Collaboratively develop and implement guidelines for preconception nutrition services, address system bottlenecks through design, planning, and domestic financing, and support institutional capacity building via research and training institutions.

3. **Increase the capacity and support to service providers at facility and community levels to deliver preconception nutrition services through and community partnerships**

Enhance frontline health workers' capacities through training, supervision, and social and behaviour change tools, and develop and integrate training modules for preconception care.

4. **Increase supplies of essential commodities and prevent stockouts and enhance local production**

Integrate IFA/Multiple Micronutrient Supplements (MMS) into preconception care and enhance supply systems through demand forecasting and adequate funding for supplements and equipment.

5. **Harness data and generate evidence through implementation research to inform policy and programme decisions**

Enhance routine preconception care programme reporting and monitoring and generate evidence on preconception interventions through periodic population-based studies, surveys, and real-time demonstrations.

Proposed algorithm for women's nutritional care and support before, between and beyond pregnancy

Based on a previously drafted algorithm by UNICEF India and Department of Health and Family Welfare India for preconception services delivered through village health sanitation and nutrition day, and reviewed program pathways from the various pilot interventions and programmes in different countries of South Asia, we propose an updated algorithm for women's nutritional care and support before, between and beyond pregnancies. This suggested algorithm illustrates 5 actions for all eligible women aged 15-49 years, married, non-pregnant and non-protected couple/women (Figure 2). The five actions include (i) health and nutrition **assessment** (ask, measure, look for and test), (ii) **give** weekly IFA/ MMS (depending on the prevalence and country-specific policy), daily folic acid supplements (if planning pregnancy), biannual deworming, and rubella and Tetanus-Diphtheria (Td) vaccination (if not received), and link to social protection schemes, (iii) **counsel** on healthy eating and physical activity; caffeine intake, alcohol, tobacco, and drug use; consumption of IFA/MMS; menstrual hygiene and hand

washing; positive thinking and problem-solving skills; family planning; and birth preparedness; (iv) **risk classification** based on the health and nutritional assessment, and (v) **specific actions** for those women who are at health and nutritional risk. The possible platforms could be field camps, community outreach sessions, health centers, community meetings and home visit; while the actors could include frontline health workers and medical officers.

DISCUSSION

We present a comprehensive picture of the malnutrition burden among women in the preconception phase and the availability of relevant policies, programmes, and data system around preconception nutrition, while identifying systemic bottlenecks in implementing preconception nutrition interventions across eight South Asian countries. Policy/programme documents do not explicitly define the preconception period; however, they mention WRA, specific sub-groups or newly married couples as the target population. Almost all countries are integrating preconception nutrition into their maternal nutrition policies, implementing evidence-based interventions aimed at improving maternal and child health, in alignment with WHO and UNICEF recommendations. Among the eight South Asian countries, only Sri Lanka has fully implemented preconception care as a national programme. Others have initiatives that only partially address preconception nutrition for women of reproductive age (15-49 years) or adolescent girls aged 10-19 years.

Health and nutrition screening are essential for early detection of malnutrition and health issues in women before and during pregnancy, which is crucial for preventing adverse pregnancy outcomes such as low birth weight, preterm births, and stunting (18,19). WHO and UNICEF recommend screening women aged 15-49 for malnutrition, anaemia, diabetes, mental health issues, and STIs/RTIs. While most South Asian countries have national screening policies, few have fully implemented them apart from Sri Lanka. Bhutan and Nepal have comprehensive screening programmes for three out of five recommended interventions.

Essential micronutrients: Periconceptional folic acid supplementation prevents neural tube defects, and enhanced pre-conceptional vitamin and mineral intake may reduce the risk of low birth weight, small for gestational age, and preterm births (18). While all eight countries have policies for folic acid and IFA supplementation, and large-scale food fortification, few have fully implemented them. Bangladesh, Nepal and Sri Lanka offer universal preconception folic acid to all women planning pregnancy, and Pakistan provides IFA to all women. Bangladesh, Bhutan, Maldives and Nepal provide IFA to married, non-pregnant adolescent girls of age 15-19 years. Six countries practice large-scale food fortification, mainly salt iodization, but routine monitoring is limited to Nepal.

Most South Asian countries have *dietary and lifestyle counselling* policies promoting healthy eating, physical activity, and reducing caffeine, alcohol, smoking, and toxin exposure. However, only five provide universal nutrition counselling for all WRA, and only Sri Lanka, Bangladesh, and India offer comprehensive programmes to reduce harmful exposures. All countries have family planning policies and universal programmes aimed at delaying first pregnancies and extending inter-birth intervals.

Infection prevention: Malaria and worm infestations contribute to anaemia (20), which is linked to maternal and perinatal mortality, low birth weight, small for gestational age, preterm births, stillbirths, and miscarriage (20,21). All six countries, except for the Maldives and Sri Lanka, have universal policies for the provision of bed nets in malaria endemic areas. For deworming prophylaxis, three countries, including Pakistan, Nepal and Afghanistan have policies that target only adolescent girls, whereas Bangladesh, Bhutan and India target all WRA. Three countries—Bhutan, India, and Nepal—have active programmes that target a sub-target group.

Special care for women who are at risk is essential as many pregnancies in South Asia are unplanned (ranging from 8% in India to 24% in the Maldives) which makes improving maternal nutrition early in pregnancy challenging. WHO and UNICEF recommend comprehensive pre-pregnancy care, including social protection, dietary counselling, BEP supplementation, and treatment for anaemia, diabetes, mental health, and STIs/RTIs. However, no country in the region has fully implemented comprehensive policies or programmes for nutritional management and social protection for undernourished women

before pregnancy. Only Sri Lanka has national policies and universal programmes addressing anaemia, diabetes, STIs/RTIs, and mental health issues; screening for all pre-pregnant women and management for at-risk women.

Data is lacking on preconception nutrition-related interventions for WRA from national surveys and routine programme monitoring systems in the region and the quality of survey and programme data could not be assessed. Only Nepal has survey data on diabetes screening, and only Sri Lanka has both survey and programme monitoring data on folic acid supplementation. India and Pakistan have programme data, and Nepal has survey data on IFA supplementation. Food fortification survey data is available in five countries, excluding Bangladesh, Bhutan and Maldives. Only Afghanistan has psychosocial counselling programme data. All eight countries have family planning data, but infection prevention (deworming) data is limited to programme data in India and survey data in Nepal. Five countries have data on bed nets for malaria prevention, excluding Bangladesh, Maldives, and Sri Lanka. Only India has programme data on anaemia treatment, and India and Nepal have survey data on diabetes treatment. Nepal has mental health treatment data. Only India has both survey and programme data on STI/RTI treatment.

Several systemic bottlenecks affect existing programmes, hindering the effective delivery of preconception nutrition interventions. Six South Asian countries have established legislation for preconception nutrition and Afghanistan and Bangladesh have limited frameworks. Maldives, Pakistan, and India face significant legislative and policy bottlenecks. India, Maldives, and Nepal face major challenges in leadership, governance, budget allocation, financing, and service delivery for more than half of the recommended preconception nutrition interventions. Half of the interventions Bhutan, India, Maldives, and Nepal face data and information systems challenges. Additionally, over half of the preconception nutrition interventions in India and Maldives face health workforce and essential supplies constraints.

Our study's strength is that it combines a comprehensive review of policies and programmes, bottleneck analysis of programme implementation, with insights from experts and decision-makers. This provided robust and validated findings to inform recommended actions. However, the bottleneck analysis was conducted at the national level, which may limit the applicability of findings at sub-national levels. Additionally, country-level stakeholder discussions varied in format, which may have led to differences in how priorities were addressed across countries.

CONCLUSION

The study highlights the need for greater focus for preconception nutrition. Policy makers and programme implementers must implement targeted interventions for preconception women to achieve the short- and long-term benefits of preconception nutrition. Despite a positive policy environment in many South Asian countries, programmes delivering a package of nutrition services for pre-pregnant women are constrained. Moderate to significant programme implementation bottlenecks were found for multiple interventions. Lack of programme data impedes decision-making and limits understanding of intervention effectiveness. Country level stakeholder consultations validated the findings and identified prioritized actions including scaling a complete package of interventions, addressing data deficiencies, and strengthening legal frameworks and enforcement, and monitoring of the food environment. Multilaterals, national and sub-national Government, academia, health sector, and civil society need to work together to make progress toward improving women's nutritional care and support before, between and beyond pregnancy.

REFERENCES

1. Stephenson J, Heslehurst N, Hall J, Schoenaker DAJM, Hutchinson J, Cade JE, et al. Before the beginning: nutrition and lifestyle in the preconception period and its importance for future health. Vol. 391, The Lancet. Lancet Publishing Group; 2018. p. 1830–41.

2. Fleming TP, Watkins AJ, Velazquez MA, Mathers JC, Prentice AM, Stephenson J, et al. Origins of lifetime health around the time of conception: causes and consequences. Lancet. 2018 May 5;391(10132):1842–52.
3. Barker M, Dombrowski SU, Colbourn T, Fall CHD, Kriznik NM, Lawrence WT, et al. Intervention strategies to improve nutrition and health behaviours before conception. Vol. 391, The Lancet. Lancet Publishing Group; 2018. p. 1853–64.
4. WHO. Preconception care: Maximizing the gains for maternal and child health. A policy brief. Geneva; 2013.
5. WHO. Meeting to Develop a Global Consensus on Preconception Care to Reduce Maternal and Childhood Mortality and Morbidity. Geneva; 2012.
6. World Health Organization Regional Office for South-East Asia. Preconception care Report of a regional expert group consultation. New Delhi, India ; 2014.
7. World Health Organization (WHO). Preconception care: Maximizing the gains for maternal and child health. A policy brief. WHO: Geneva; 2013.
8. Ramakrishnan U, Grant F, Goldenberg T, Zongrone A, Martorell R. Effect of Women's Nutrition before and during Early Pregnancy on Maternal and Infant Outcomes: A Systematic Review. Paediatr Perinat Epidemiol. 2012 Jul 28;26(s1):285–301.
9. Dalmiya N, Kupka R, Tyler V, Aguayo V, Arts M, Blankenship J, et al. NUTRITION GUIDANCE SERIES UNICEF PROGRAMMING GUIDANCE Maternal Nutrition Acknowledgements. 2021.
10. UNICEF. Undernourished and overlooked A GLOBAL NUTRITION CRISIS IN ADOLESCENT GIRLS AND WOMEN [Internet]. 2023. Available from: www.unicef.org/nutrition
11. Stevens GA, Beal T, Mbuya MNN, Luo H, Neufeld LM, Addo OY, et al. Micronutrient deficiencies among preschool-aged children and women of reproductive age worldwide: a pooled analysis of individual-level data from population-representative surveys. Lancet Glob Health. 2022 Nov 1;10(11):e1590–9.
12. Dean S V., Lassi ZS, Imam AM, Bhutta ZA. Preconception care: Nutritional risks and interventions. Vol. 11, Reproductive Health. BioMed Central Ltd.; 2014.
13. Kozuki N, Katz J, Lee ACC, Vogel JP, Silveira MF, Sania A, et al. Short maternal stature increases risk of small for-gestational-age and preterm births in lowand middle-income countries: Individual participant data meta-analysis and population attributable fraction. Journal of Nutrition. 2015;145(11):2542–50.
14. Kim R, Mejía-Guevara I, Corsi DJ, Aguayo VM, Subramanian S V. Relative importance of 13 correlates of child stunting in South Asia: Insights from nationally representative data from Afghanistan, Bangladesh, India, Nepal, and Pakistan. Soc Sci Med. 2017 Aug 1;187:144–54.
15. International Institute for Population Sciences (IIPS), ICF. National Family Health Survey (NFHS-5), 2019-21. Mumbai, India; 2021.
16. Ministry of Health (MOH), ICF. Maldives Demographic and Health Survey 2016-17. Malé, Maldives, and Rockville, Maryland, USA; 2018.
17. Partap U, Chowdhury R, Taneja S, Bhandari N, De Costa A, Bahl R, et al. Preconception and periconception interventions to prevent low birth weight, small for gestational age and preterm birth: a systematic review and meta-analysis. Vol. 7, BMJ Global Health. BMJ Publishing Group; 2022.
18. Ramakrishnan U, Grant F, Goldenberg T, Zongrone A, Martorell R. Effect of Women's Nutrition before and during Early Pregnancy on Maternal and Infant Outcomes: A Systematic Review. Paediatr Perinat Epidemiol. 2012 Jul 28;26(s1):285–301.
19. Young MF, Ramakrishnan U. Maternal Undernutrition before and during Pregnancy and Offspring Health and Development. Ann Nutr Metab. 2020;76(Suppl. 3):41–53.
20. Savera S, Ali SA. Prevalence and determinants of anemia among women of reproductive age in developing countries of Asia and Africa: A systematic review protocol. 2020; Available from: https://doi.org/10.21203/rs.3.rs-24100/v1.

21. Rahman S, Ahmed T, Rahman AS, Alam N, Ahmed AS, Ireen S, et al. Determinants of iron status and Hb in the Bangladesh population: the role of groundwater iron. Public Health Nutr. 2016 Jul;19(10):1862–74.

Tables and figures

Table 1: Snapshot of study methodology on preconception nutrition

STUDY COMPONENTS	METHODS	SOURCES
Prevalence on preconception nutrition indicators	• Secondary data analysis	• Demographic and Health Surveys • Other National Surveys
Policy, programs and data availability	• Desk review • Consultation with country stakeholders	• Program/ policy documents (Operational guidelines/ strategic plan/action plans) • Published literatures
Systems bottlenecks in program implementation	• Development of bottleneck analysis framework to categorize severity of bottlenecks • Desk review • Consultation with country stakeholders	• Program/policy documents (Operational guidelines/ strategic plan/ action plans) • Published literatures

Table 2: Summary listing of policies and programmes that include at least one component of preconception nutrition across the eight countries

Countries	Number of policies that include at least one preconception nutrition interventions	Number of preconception interventions these policies cover	Programmes that include at least one preconception nutrition interventions	Number of preconception interventions these programmes cover	Number of interventions and programmes that cover WRA
Afghanistan	9 policies	20 interventions	5 programmes	9 interventions	6 interventions delivered through the 5 programmes
Bangladesh	19 policies	17 interventions	7 programmes	7 interventions	6 interventions delivered through 5 programmes
Bhutan	6 policies	19 interventions	6 programmes	19 interventions	12 interventions through 5 programmes
India	16 policies	20 interventions	10 programmes	18 interventions	9 interventions delivered through 6 programmes
Maldives	8 policies	15 interventions	3 programmes	13 interventions	4 interventions delivered through family planning programme and premarital session.
Nepal	19 policies	18 interventions	11 programmes	15 interventions	12 interventions delivered through 8 programmes
Pakistan	8 policies	18 interventions	6 programmes	7 interventions	4 interventions delivered through 6 programmes
Sri Lanka	10 policies	17 interventions	4 programmes	17 interventions	17 interventions through 4 programmes

Table 3: Preconception nutrition interventions included in policies and programmes in South Asia

Evidence-based nutrition interventions for non-pregnant women (15-49 years)	AGH	BGH	BHU	IND	MAL	NPL	PAK	SLK	Countries with policy	Countries with universal programme
I. Health and Nutrition Screening										
Anthropometry (height, weight, waist-hip ratio)	2	1	1	3[b]	4	2	2	5	**6**	**1**
Anaemia (Blood test for haemoglobin)	2	2	5	4	2	2	2	5	**8**	**2**
Diabetes mellitus using oral glucose tolerance test	2	2[a]	4	3[f]	4	5	2	5	**7**	**2**
Sexually transmitted infections (STIs) or reproductive tract infections (RTIs)	2	2[a]	5	5	5	5	4	5	**7**	**5**
Psychosocial problems	5	2[a]	5	5	4	5	2[b]	5	**7**	**5**
II. Provision of essential micronutrients										
Folic acid supplements, if planning pregnancy (400 µg or 0.4 mg daily)	2[b]	5	4	2	1	5	2	5	**8**	**3**
Supplementation with iron containing supplements (Iron Folic Acid or IFA)[1]	2[b]	4	4	4	4	4	5	1	**7**	**1**
Large-scale food fortification of staple foods (e.g., cooking oil, rice, salt and wheat flour) with one or more micronutrients (e.g., folic acid, iron, vitamin A and iodine)	5	5	5	5	2	5	5	5	**8**	**7**
III. Counselling on healthy eating and family planning choices and services										
Counselling on healthy eating and physical activity to attain or maintain a healthy weight, weight gain monitoring, dietary diversity and use of micronutrient supplements (IFA/MMS)	2	5[c]	5	5	5	5	2	5	**8**	**5**
Reduce caffeine/ alcohol/ smoke / toxin exposure	2	5[c]	4	5	4	3[d]	1	5	**7**	**2**
Psychosocial counselling	5	2[b]	4	3[f]	4	5	1	5	**7**	**3**

Evidence-based nutrition interventions for non-pregnant women (15-49 years)	AGH	BGH	BHU	IND	MAL	NPL	PAK	SLK	Countries with policy	Countries with universal programme
Family planning choices for delaying age at first pregnancy (>=20 years) / increase inter-birth interval (to at least 24 months)	5	5	5	5	5	5	5	5	**8**	**8**
IV. Infection prevention										
Deworming prophylaxis	2[b]	2	4	4	1	3	2[b]	NA	**6**	**1**
Provision of bed nets in malaria endemic areas	5	5	5	5	NA	5	5	NA	**6**	**5**
V. Treatment and care for women at-risk[2]										
Social protection interventions (cash, food voucher, food ration)	1	1	1	1	1	1	1	1	**0**	**0**
Balanced energy and protein supplements in women of reproductive age in undernourished populations (underweight >= 20%)	2	1	1	2	1	2	2	1	**4**	**0**
Contextualised dietary modification linked counselling tailored to nutrition assessment	2	1	5	3	4	1	2	5	**6**	**2**
Medical Nutrition Therapy, based on nutrition risk classification	1	1	5	1	1	1	1	5	**2**	**2**
Anaemia with daily IFA supplementation for a period of 3 months	3	2[a]	5	3	1	1	2	5	**6**	**2**
Diabetes mellitus	4	2[a]	4	3	4	5	2	5	**8**	**2**
Depression and other psychosocial problems	5	2[a]	5	5	4	5	3	5	**8**	**5**
STI/RTI	4	2[e]	5	5	5	5	4	5	**8**	**5**

Both Policy and universal program in place	5
Policy in place, but Program caters to sub-target group	4
Both Policy and Program cater to sub-target group	3
Policy in place but no Program	2
Neither Policy nor Program in place	1
Intervention not relevant to context	NA

Note: NA- Not applicable due to low burden in the country

[1] >40% or higher prevalence – Daily; 30-60 mg of elemental iron and 400 µg of folic acid; 20-39.9% prevalence – Weekly; 60 mg of elemental iron and 2,800 µg folic acid.

[2] Underweight (BMI <18.5 kg/m^2); Overweight/obese (BMI >=25 kg/m2); Short stature (height <145 cm); Anaemia (Hb <=12 g/dl); Diabetic (blood sugar level >140 mg/dl); Having mental health concerns; Having STI/RTIs.

[a] Universal program delivered through Upazila Health Complexes with no focus on pre-pregnant women.

[b] The policy only caters to adolescent girls 10-19 years.

[c] Intervention delivered through community clinics, with a primary focus on pregnant women; however, married and currently non-pregnant women are also covered.

[d] Policy and program both cater to tobacco and alcohol consumption. There is no mention of reducing caffeine.

[e] Only indicates counselling for STIs/RTIs and not treatment.

[f] The policy and programme cater to 10-19 years and 30 years and above age groups

Table 4: Data systems for preconception interventions in South Asia

Evidence-based nutrition interventions for non-pregnant women (15-49 years)	AGH	BGH	BHU	IND	MAL	NPL	PAK	SLK	Countries with data in surveys	Countries with data in programme MIS
I. Health and Nutrition Screening										
Anthropometry (height, weight, waist-hip ratio)	NA	NA	NA	0	0	NA	NA	0	0/3	0/3
Anaemia (Blood test such as hemoglobin)	NA	NA	0	0	NA	NA	NA	0	0/3	0/3
Diabetes mellitus using oral glucose tolerance test	NA	NA	0	0	0	2	NA	0	1/5	0/5
Sexually transmitted infections (STIs) or reproductive tract infections (RTIs)	NA	NA	0	0	0	0	0	0	0/6	0/6
Psychosocial problems	0	NA	0	0	0	0	NA	0	0/6	0/6
II. Provision of essential micronutrients										
Folic acid supplements, if planning pregnancy (400 µg or 0.4 mg daily)	NA	0	0	0	NA	0	NA	3	1/5	1/5
Supplementation with iron containing supplements (Iron Folic Acid or IFA)[1]	NA	0	0	1	0	2	1	NA	1/6	2/6
Large-scale food fortification of staple foods (e.g., cooking oil, rice, salt and wheat flour) with one or more micronutrients (e.g., folic acid, iron, vitamin A and iodine)	2	2	0	2	NA	2	2	2	6/7	0/7
III. Counselling on healthy eating and family planning choices and services										
Counselling on healthy eating and physical activity to attain or maintain a healthy weight, weight gain monitoring, dietary diversity and use of micronutrient supplements (IFA/MMS)	NA	0	0	0	0	0	NA	0	0/6	0/6
Reduce caffeine/ alcohol/ smoke / toxin exposure	NA	0	0	0	0	0	NA	0	0/6	0/6

Evidence-based nutrition interventions for non-pregnant women (15-49 years)	AGH	BGH	BHU	IND	MAL	NPL	PAK	SLK	Countries with data in surveys	Countries with data in programme MIS
Psychosocial counselling	1	NA	0	0	0	0	NA	0	0/6	1/6
Family planning choices for delaying age at first pregnancy (>=20 years) / increase inter-birth interval (at least 24 months)	3	3	3	3	3	3	3	3	8/8	8/8
IV. Infection prevention										
Deworming prophylaxis	NA	NA	0	1	NA	2	NA	x	1/3	1/3
Provision of bed nets in malaria endemic areas	3	0	3	3	x	3	3	x	5/6	5/6
V. Treatment and care for women at-risk[2]										
Social protection interventions (cash, food voucher, food ration)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Balanced energy and protein supplements in women of reproductive age in undernourished populations (underweight >= 20%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Contextualised dietary modification linked counselling tailored to nutrition assessment	NA	NA	0	0	0	NA	NA	0	0/4	0/4
Medical Nutrition Therapy, based on nutrition risk classification	NA	NA	0	NA	NA	NA	NA	0	0/2	0/2
Anaemia with daily IFA supplementation for a period of 3 months	0	NA	0	1	NA	NA	NA	0	0/4	2/4
Diabetes mellitus	0	NA	0	2	0	2	NA	0	2/6	1/6
Depression and other psychosocial problems	0	NA	0	0	0	2	0	0	1/7	1/7
STI/RTI	0	NA	0	3	0	0	0	0	1/7	2/7

Yes survey, Yes programme MIS	3
Yes survey, no programme MIS	2
No survey, yes programme MIS	1
Not in surveys, not in programme MIS	0
No programme existing	NA

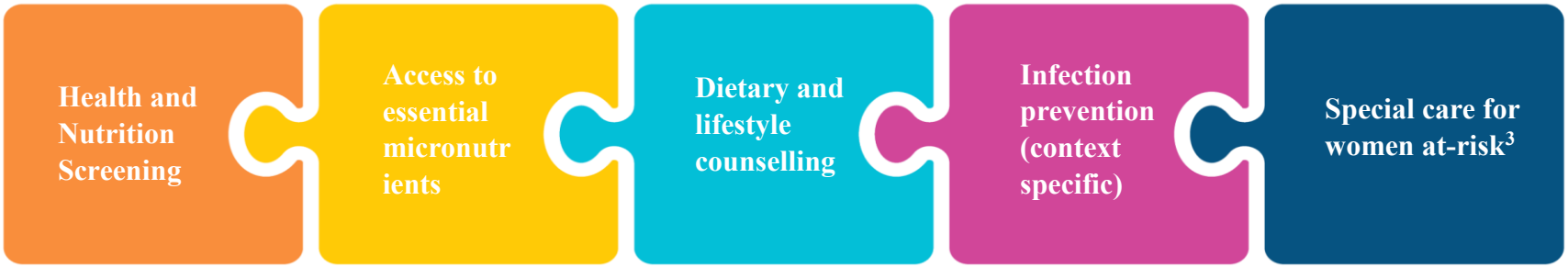
Note: NA- Not applicable due to low burden in the country

[1] >40% or higher prevalence – Daily; 30-60 mg of elemental iron and 400 µg of folic acid; 20-39.9% prevalence – Weekly; 60 mg of elemental iron and 2,800 µg folic acid.

[2] Underweight (BMI <18.5 kg/m^2); Overweight/obese (BMI >=25 kg/m2); Short stature (height <145 cm); Anaemia (Hb <=12 g/dl); Diabetic (blood sugar level >140 mg/dl); Having mental health concerns; Having STI/RTIs.

x: Intervention not needed due to low burden in the country

Figure 1: Evidence-based recommended preconception nutrition interventions



1. Anthropometry – weight, height, waist-hip ration
2. Anemia
3. Diabetes
4. Psychosocial problems
5. STI/RTI/ other
6. Iron and Folic Acid[1] /MMS (context-specific)
7. Folic acid supplements, if planning pregnancy
8. Large-scale staple food fortification
9. Weight gain monitoring and identification of flag signs
10. Healthy eating and physical activity
11. Psychosocial counseling
13. Deworming prophylaxis[2], in areas with worm infestation
14. Provision of bed nets in malaria endemic areas

15-19. Health and Nutrition risk treatment
- 15. Medical Nutrition Therapy, based on nutrition risk classification
- 16. Anaemia with daily IFA supplementation for a period of 3 months or IV iron sucrose/FCM/others
- 17. Diabetes mellitus
- 18. Depression and other psychosocial problems
- 19. STI/RTI

20. Nutrition-risk specific counselling

21-22. Social protection
- 21. Balanced energy and protein
- 22. Cash/voucher/food ration

[1] >40% or higher prevalence – Daily; 30 mg of elemental iron and 400 µg of folic acid; >20% or higher prevalence – Weekly; 60 mg of elemental iron and 2,800 µg folic acid

[2] >50% prevalence – Biannual single-dose albendazole (400 mg) or mebendazole (500 mg); 20% or higher prevalence- Annual single-dose albendazole (400 mg) or mebendazole (500 mg)

[3] Classification of nutrition risks, with or without medical/ psychosocial complications: Short stature (height <145 cm)/ Young (Age <20 years)/ Underweight (BMI<18.5kg/m^2)/ Overweight/obese (BMI >=25 kg/m^2)/ Any anaemia (Hb <=12 g/dl)/ having blood sugar level >140 mg/dl / mental health concerns / symptoms of STIs/RTIs

Figure 2: Five Actions for women's nutritional care and support – before, between and beyond pregnancy