

Nutrition

The Problem

India is the home of largest number of undernourished children in the world (World Bank 2005). In 2005–2006, nearly half of all children under 5 years of age in India were stunted and 43 per cent were underweight (International Institute for Population Sciences 2007). Although recently released NFHS-4 reports a decline in under-nutrition (35.7 percent) and stunting (38.4 per cent), the proportion of children who exhibit wasting has increased over time (from 20 per cent to 21 per cent).

The prevalence of malnutrition in Rajasthan is extremely high and it performs very badly as compared to other Indian states. With half of the pregnant women being anaemic and 23 percent of children being born with low birth weight (NFHS-4), the provision of essential health and nutrition inputs becomes a topmost priority. Around 40 percent of children are stunted in Rajasthan.

The Government of India has in place nutrition and health programmes Integrated Child Development Scheme (ICDS) implemented by the Ministry of Women and Child Development & National Health Mission (NHM) implemented by the Ministry of Health and Family Welfare which include nutrition based interventions. However, the problem in Rajasthan is the low coverage of these interventions over the last 10 years (Kohli et. al., 2017). Essential health and nutrition inputs reach only less than 55 percent of mothers and children and the consequences of poor nutrition manifest in terms of growth failure of child, reduced learning capacity, increased rate of morbidity and mortality. This study is an attempt to estimate the costs and benefits accruing from increasing the coverage of the national interventions in Rajasthan.

Estimated benefits for Rajasthan from the overall package at 3 times the value of per capita SDP and discounted at 5% are Rs. 91,577 and estimated costs are Rs. 14,144 per beneficiary, resulting in a benefit/cost ratio of approximately 6. The overall intervention is expected to reduce the prevalence of both severe and moderate stunting by 20 per cent to 13.8 percent and 17.4 percent respectively in Rajasthan.

Solutions

Interventions	BCR	Benefit per Beneficiary (INR)	Cost per Beneficiary (INR)
Direct nutrition based interventions	6	91,577	14,144
Interpersonal counseling for behaviour change	43	54,134	1,245
Supplementary food for mother and child	7	81,202	11,532
Micronutrient supplementation for pregnant women during ANC visits	37	23,453	637
Community based treatment of SAM using RUTF (median)	5	46,951	9,395

All costs and benefits are discounted at 5%

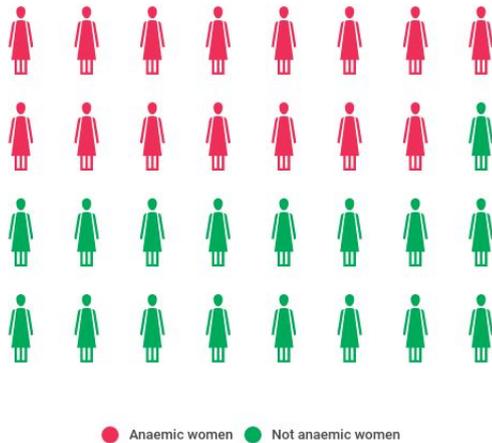
The full paper by **William Joe**, Assistant Professor, Institute of Economic Growth, **Abhishek Kumar**, Research Scholar, Central University of Gujarat, and **S.V. Subramanian**, H Professor of Population Health and Geography, Harvard TH Chan School of Public Health is available on www.rajasthanpriorities.com/nutrition.

Direct nutrition based interventions

The Problem

In Rajasthan, 39 percent of children below five years are stunted and 23 percent are wasted. 46.8 percent of women in reproductive age group are anaemic (NFHS-4). Such nutritional deficiencies adversely affect the health of mother and children.

Reproductive-age women anaemia



The Solution

Direct nutrition-based interventions include counselling for behaviour change, supplementary food and micronutrient supplements.

Costs

It will be a six-year intervention (2016-2021). Cost will be incurred for provision of supplementary food and micronutrients which are distributed through government programmes. Cost per beneficiary is Rs. 14,144 and for a 10 percentage point increase in coverage the total cost is Rs. 233 crore. 57 per cent of the cost is the value of caregiver time and the rest are financial outlays by the state.

Benefits

The primary beneficiaries are pregnant women and lactating mothers and children up to 5 years of age. Benefits have been estimated in terms of reduction in terms of Years of Life Lost (YLLS) and Years lost

due to disability (YLDs) as well as stunting. A 10 percent increase in coverage would avoid 365 deaths, and reduce stunting by 20% in the population receiving the intervention. Benefits realized per beneficiary are Rs. 91,577, 85 percent of which represent improved lifetime productivity from avoided stunting. Total benefits for a 10 percent increase in coverage are Rs. 1509 crore.

Interpersonal counselling for behaviour change

The Problem

Diarrhoea is a major contributor of deaths among children under 5 years of age in Rajasthan (6 percent of all deaths, (GBD, 2016)). Low socioeconomic status, poor maternal literacy, inadequate breastfeeding, malnutrition, poor sanitation and hygiene practices of the mother or the caretaker are the major determinants of diarrheal diseases

The Solution

The intervention focuses on interpersonal counselling for behaviour change. A six-year intervention (2016-2021) which include counselling for breastfeeding, complementary feeding and hand washing will help in avoiding 328 deaths in Rajasthan which are related to diarrhoea.

Costs

Major proportion of cost (Rs. 486) will be incurred on providing complementary feeding and hand washing education (6– 12 months of age). Cost per beneficiary is Rs. 1245 and cost for increasing coverage by 10 per cent is Rs. 21 crore. 35 percent of the cost is the value of caregiver time and the rest are for financial outlays by the state.

Benefits

A total of 216 YLLS and 161 YLDs will be avoided for a 10 per cent increase in coverage, major beneficiaries are the children under 5 years of age who will benefit from reduction in diarrhoea. Stunting will be reduced by 12% in the beneficiary population. Benefits realized per beneficiary are Rs. 54,134, 85 per cent of which represent improved lifetime productivity from avoided stunting. Total benefits for a 10 percent increase in coverage are Rs. 892 crore.

Supplementary food for mother and child

The Problem

The health status of a child is determined by the health status of the mother. Women who are anaemic are likely to deliver low birth weight babies, who are likely to remain anaemic and suffer from cumulative growth and development deficit. Women need to go in pregnancy with adequate body stores. Otherwise the intergenerational cycle of undernutrition will go on perpetually. In India, the maternal and child undernutrition rates are very high.

The Solution

All children below 6 years of age, pregnant women and lactating mothers are eligible for availing of supplementary food services under the Integrated Child Development Scheme (ICDS) which is funded by both Central and State government.

Supplementary nutrition need to be better targeted towards those sections that actually require the appropriate nutrition.

Costs

Costs include provision of complementary food supplements to children aged 6-12 (Rs. 985) and 12-36 months (Rs.1970) and pregnant and lactating women (Rs.1149). Marginal cost of mother's time for these activities is Rs. 8212. Cost per beneficiary is Rs. 11,532 and a ten per cent increase in coverage would cost Rs. 190 crore

Benefits

The primary beneficiaries are children aged 6-12 and 12-36 months and pregnant and lactating women. The benefits will accrue through reduction in deaths and morbidity from specific diseases due to provision of improved nutrition. It is estimated that 324 lives will be saved for a ten percent increase in coverage. Stunting will be reduce by 18% in the population receiving the intervention. Benefits realized per beneficiary are Rs. 81,202, 85 percent of which represent improved lifetime productivity from avoided stunting Total benefits for a 10 percent increase in coverage are Rs. 1,338 crore

Micronutrient supplementation for pregnant women during ANC visits

The Problem

Although micronutrients are required in small amounts for optimal health and development, their absence in diet could lead to susceptibility to infections. Their interacting effects on health, growth and immunocompetence cannot be ignored. The micronutrient deficiencies of vitamin A, iron, iodine, calcium, zinc and folic acid are common among women and children (MWCD, 2012).

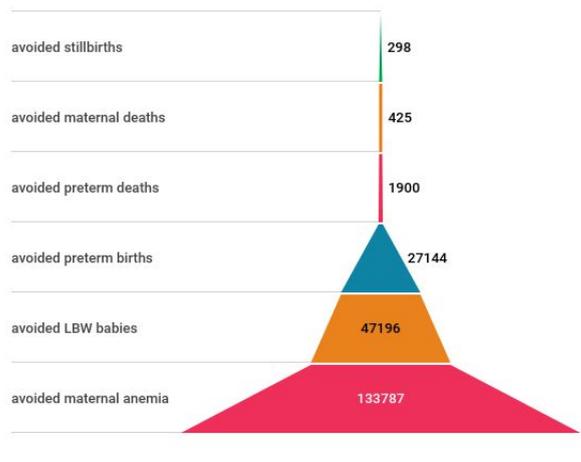
The Solution

Scaling up micronutrient supplementation for pregnant women during ANC visits. The interventions which focus on providing iron, iodine, calcium, zinc and ORS which are included in national programmes.

The intervention aims at reducing maternal anaemia, reduce the risk of preterm births and low birth weights.

Impacts from intervention

Micronutrient supplementation for pregnant women during ANC visits



Costs

The total cost of this intervention in Rajasthan for one year is Rs. 124 crore rupees and includes the cost of health workers, training of the workers and

provision of the supplements. It is assumed that during each visit a two month supply of Calcium and Multi-micronutrients will be provided to the beneficiary. Cost per beneficiary is Rs. 637, all of which are financial outlays.

Benefits

The benefits estimated from this intervention are 4646 crore rupees. There are a multitude of impacts from the intervention: 133,787 cases of maternal anemia avoided, 47,196 avoided LBW babies, 425 avoided maternal deaths, 27,144 avoided preterm births, 1,900 avoided preterm deaths and 298 avoided stillbirths. The total YLDs avoided from all effects is 99,782 at the 5% discount rate with almost all from Low Birth Weight (LBW) averted. Total YLLs avoided from 2623 avoided deaths and stillbirths are 49,823 at the 5% discount rate. Benefits realized per beneficiary is Rs. 23,453.

Community based treatment of children with SAM using Ready-to use Therapeutic foods (RUTF)

The Problem

An immediate concern in Rajasthan is wasting which has reportedly increased to 23 per cent in 2016 from 20.4 per cent in 2006. Children with weak nutritional base are more likely to experience growth failure and probably pass it on to the next generation (MWCD, 2012).

The Solution

Children with Severe Acute Malnutrition (SAM) have nine times higher risk of dying than well-nourished children (GOI). This intervention proposes scale up of SAM screening by ASHA workers and implementation of community based management of SAM using RUTF or local-based nutritionally equivalent therapeutic foods. The intervention assumes a scale up of a community-based program that will actively screen and treat 80% of all children suffering from SAM using RUTF. This is similar in nature to the government of Rajasthan’s POSHAN project. The program screened 230,000 and treated about 9000 children for SAM with high recovery rates (Government of Rajasthan, 2018). In 2017 the program was expanded to cover 20 districts.

Treatment of children with Severe Acute Malnutrition (SAM). The intervention assumes 80% treatment of wasted children throughout the state, following on the success of Phase I of the POSHAN pilot.

Costs

Major components of total cost are cost of provision of RUTF for children suffering from SAM and MAM, total personnel and training cost, incentives for staff and parents and cost incurred by households on treatment visits. Cost per beneficiary ranges from Rs 5853 to Rs. 12,937. For this intervention average cost per beneficiary of Rs. 9,395 is considered.

Benefits

The benefits estimated due to this intervention are 4001 to 6273 avoided deaths each year, mostly from avoided deaths due to diarrhea and respiratory infections. It would also avoid 4165 to 6530 YLDs per year, mostly from avoided diarrhea and other infections. Benefits realized per child treated range from Rs. 27,964 to Rs 65,938.

Rs. costs and benefits per beneficiary

