

# **ESTIMATING DISTRICT LEVEL COSTS FOR NUTRITION SPECIFIC INTERVENTIONS IN KARNATAKA**

## **A Policy Brief**

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**MYSURU**

**BENGALURU**

**BELGAVI**

**KALBURAGI**

Districts labeled on the map include: Bidar, Gulbarga, Yadgir, Raichur, Koppal, Bellary, Gadag, Dharwad, Belgaum, Bijapur, Bagalkot, Uttara Kannada, Flaveri, Chiturga, Chikmagalur, Hassan, Mandya, Mysore, Chamrajnagar, Kodagu, D.Kannada, Tumkur, Chikballapura, Ranga, Kolar, Bangalore, and Davanagere.

Similar improvement, however, is not seen in the nutrition indicators in the state (Table 1). The NFHS-3 (2005-06), NFHS-4 (2015-16) and NFHS-5 (2019-20) surveys showed that most nutrition indicators in Karnataka had improved, for example, the percentage of children under five years of age who are stunted had decreased from 43.7% in 2005 to 36.2% 2015-16 and finally to 35.4% in 2019-20. However, the percentage of children under five years of age who are wasted increased from 17.6% to 26.1% in the same period. This situation is reversing itself with improvements in wasting numbers seen at 19.5% in 2019-20. However,

Indicators	Karnataka	Karnataka	Karnataka	Kerala	Tamil Nadu	Maharashtra	India
	NFHS-3, 2005-06	NFHS-4, 2015-16	NFHS-5, 2019-20	NFHS-4 – 2015-16			
<b>Under 5 Stunted (%)</b>	43.7	36.2	35.4	19.7	27.1	34.4	38.4
<b>Under 5 Wasted (%)</b>	17.6	26.1	19.5	15.7	19.7	25.6	21.0
<b>Under 5 Severely Wasted (%)</b>	5.9	10.5	8.4	6.5	7.9	9.4	7.5
<b>Under 5 Underweight (%)</b>	37.6	35.2	32.9	16.1	23.8	36.0	35.8
<b>Infant Mortality Rate</b>	43	26.9	25.4	6	20	24	41
<b>Under 5 Mortality Rate</b>	55	31	29.5	7	27	29	50
<b>Maternal Mortality Ratio (MMR)*</b>	213	108	97	46	66	61	130
<b>Children under 3 years of age breastfed within one hour of birth (%)</b>	35.6	56.3	49.1	64.3	54.7	57.5	41.6
<b>Children under 6 months of age exclusively breastfed (%)</b>	58.6	54.2	61	53.3	48.3	56.6	54.9
<b>Women - Low BMI (%)</b>	35.4	20.7	17.2	9.7	14.6	23.5	22.9
<b>Under 5 Anaemia (%)</b>	70.3	60.9	65.5	35.7	50.7	53.8	58.6
<b>Pregnant Women - Anaemia (%)</b>	60.4	45.4	45.7	22.6	44.4	49.3	50.4

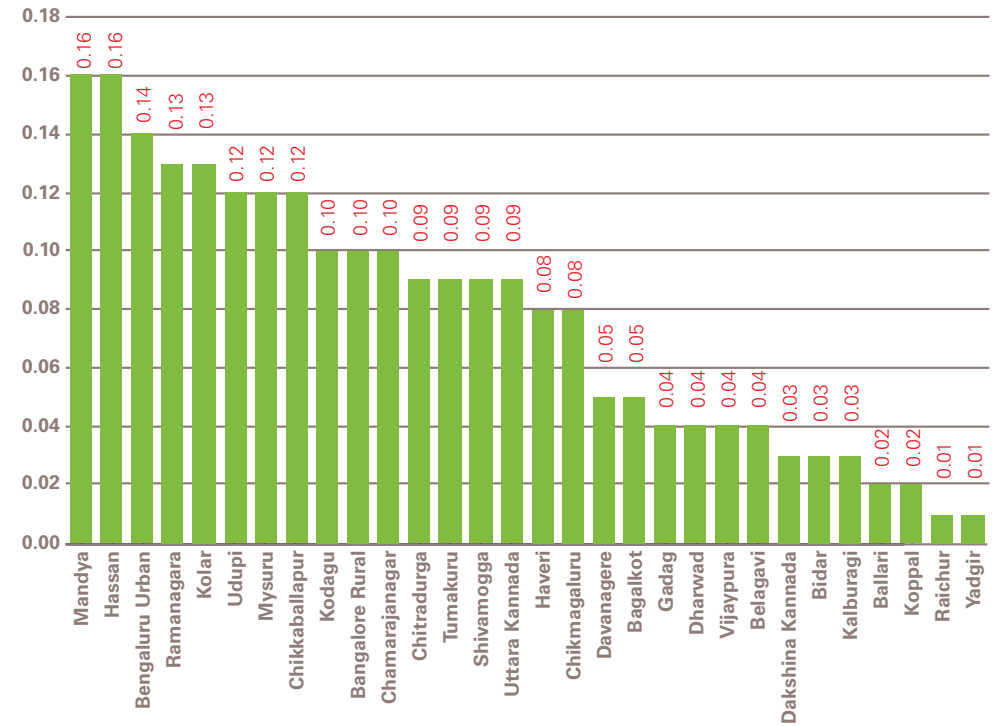
In order to compare the districts according to nutritional status, a composite index comprising of three indicators has been constructed to show the nutrition status of the different districts of Karnataka based on the NFHS-5 district factsheets. The indicators included are as follows: children under 5 years who are stunted (height-for-age), children under 5 years who are wasted (weight-for-height), and all women aged 15-49 years who are anaemic; all women were included due to lack of district level data on pregnant women with anaemia. The index value is constructed to rank all these districts (Figure 2).



<sup>1</sup> Economic Survey Karnataka, <http://nammakpsc.com/wp/wp-content/uploads/2020/03/Economic-Survey-2019-2020-NammaKPSC.pdf>. Accessed on 20 November 2020.



Figure 2: Nutrition Index for Children aged 0-5 years based on National Family Health Survey-5 (NFHS-5)



The index shows that northern parts of Karnataka do poorly as compared to the southern parts. The exception here is Dakshina Kannada district, where the percentage of children with wasting increased by 12 percent points between 2015-16 and 2019-20. Within Southern Karnataka, the coastal districts are better placed than the eastern districts. Taking the above nutrition indicators into consideration, Mandya district ranks first with the highest number on the index, while Yadgir and Raichur rank last. The percentages of stunted and wasted children in Yadgir were 57.6% and 17.70%, respectively, and 57.6% of women suffer from anaemia in 2019-20. Dakshina Kannada had the highest percentage of wasted children at 30%. Raichur showed the highest percentage of women with anaemia at 60.4%, along with 39.8% of children being stunted and 23% being wasted, thus holding the second last rank in this index.

Study Rationale

Previous studies by Centre for Budget and Policy Studies (CBPS) on the state of nutrition expenditure in Karnataka show that nutrition forms 20% of the total expenditure on children in Karnataka in 2017-18 (Rao, Madhusudan, B.V; Nagaraj, Nakul ; Maithreyi, R; Jha, 2017). The study pooled in expenditures for nutrition-specific, nutrition-sensitive and nutrition-enabling schemes at the state level. It showed that 70% of Karnataka’s share of total nutritional expend is mainly through the supplementary nutrition of the Integrated Child Development Services (ICDS) programme.

However, expenditures at the district level are not well-segregated into various heads, and the sources of the different nutrition components vary. This has made the tracking of expenditures at district levels a futile exercise for identifying any gaps that may be present below the state level. This raises questions on whether expenditures at the district level are adequate. This is especially important as districts vary geographically and population-wise and so do their nutrition requirements. For e.g., districts in coastal Karnataka may have higher access to protein due to access to fish in diet.

In continuation of our study on nutritional expenditure in Karnataka, we propose to estimate the district level cost of direct nutrition interventions in Karnataka. Therefore, the objectives of the study were as follows:

- 1. To estimate district level costs for direct nutrition interventions for children aged 0 to 18 years for Karnataka for 2018, and
- 2. To compare these estimates to known child indicators in the districts, where possible.



Methodology

The study consists of the following main parts: (1) literature review, (2) construction of nutrition index, and (3) estimation of unit costs at the district level.

Estimations of unit costs at district level included the following steps:

**1. Identifying direct nutrition interventions.** Using the paper by (Menon et al., 2016) as reference, a list of direct nutrition interventions were drawn. Karnataka-specific direct nutrition schemes like Ksheera Bhagya, Mathrupoorna, etc., and new schemes like Pradhan Mantri Matru Vandana Yojana (PMMVY) were added to the list. In addition, we added food costs associated with children staying in government and aided hostels and residential schools. The Prime Minister’s Overarching Scheme for Holistic Nutrition (or POSHAN) Abhiyaan is a scheme that combines nutrition-specific as well as nutrition-sensitive interventions. It was rolled out in three phases across the country from 2017-18 to 2019-20. Although central allocations towards the scheme were high, nearly Rs 7,411 crore, the average expenditure was only 34% until November 2019 (Paul & Kapur, 2018). Karnataka was yet to take any concrete steps towards implementing POSHAN Abhiyan until November 2019. Only Rs 132 crore had been released to the state from the centre till November 2019, of which only 2% was utilized. However, all direct nutrition interventions included within POSHAN Abhiyaan have been included in the list. The final list of interventions in given in Table 2.

Table 2: India Plus Interventions Revised for Karnataka\*

1	Counselling optimal breastfeeding to pregnant and lactating women and caregivers of children aged 0–6 months.
2	Counselling for complementary feeding and handwashing to caregivers of children aged 0–6 months.
3	Vitamin A supplementation for children aged 6–59 months.
4	Oral Rehydration Therapy (ORS) and therapeutic zinc supplements for treatment of diarrhoea for children aged 2–59 months.
5	Deworming for children aged 12–59 months.
6	Deworming for adolescents aged 11–15 years.
7	Iron supplements for children aged 6–59 months.
8	Iron-folic acid supplements for adolescents aged 11–15 years.
9	Complementary food supplements for children aged 6–36 months.
10	Hot cooked meals for children aged 3–6 years in Anganwadi centres (includes Srusti egg scheme).
11	Additional food rations for severely malnourished (WAZ**<-3) children 6–59 months.
12	Facility-based treatment for children aged 6–59 months with WHZ** <-3.
13	Mid-day Meal (Akshara Dasoha) for all children aged 6–15 years in government schools (classes 1 to 10).
14	Cash transfers to women for the first six months after delivery as part of Pradhan Mantri Mathru Vandana Yojana (PMMVY).
15	Mathrupoorna Scheme (one hot cooked meal for pregnant and lactating women).
16	Ksheera Bhagya Scheme (milk to anganwadi and school children for five days a week).
17	Food expenses in pre-matric and post-matric government and government aided hostels.
18	Food expenses in residential schools.

\*Table based on the India Plus Interventions (Menon et al., 2016) revised with addition of interventions specific to Karnataka. \*\*WAZ-Weight for Age Z-score, WHZ- Weight for Height Z-score

- 2. Estimating Unit costs:** Unit costs for each intervention were identified based on the latest policy documents or National Health Mission (NHM) Programme Implementation Plan (PIP). The unit cost for each intervention is given in Table 3. The costs estimations only include cost for food and not for costs associated with transport, personnel, procurement, storage, etc.
- 3. Population Estimation:** As the study is a continuation of previous expenditure review of nutrition in Karnataka, we decided to use departmental estimates for populations to be covered to number of beneficiaries enrolled to give us estimates close to what the government has been spending on said intervention. Accordingly, population estimations for micronutrient supply were taken from PIP calculations. For schemes under ICDS, the number of children aged 0–6 years and pregnant and lactating mothers, number of adolescent girls under the ICDS were used. For the MDM scheme number of enrolees for each grade were taken from the education website. For number of children living in hostels and residential schools, departmental data was sought.

Direct Nutrition Interventions and their Expenditure estimates in Karnataka, 2018

We estimate that Karnataka spent Rs 5,596.16 crore on direct nutrition interventions for children aged 0–18 years based on the 2017-18 data. Table 3 gives details on of direct nutrition interventions operating in Karnataka.

Table 3: Details of expenditure on nutrition-specific interventions in Karnataka in 2018.

Sr no.	Intervention	Intervention	Unit per year	Unit Cost (Rs)	Target Population	Total cost (Rs in Crore)
1	Counselling for mothers during pregnancy	Accredited Social Health Activist (ASHA)/ Anganwadi Worker (AWW)	1 visit at Rs 30.1 per visit, at 2 visits per month	722	Pregnant and Lactating women under Integrated Child Development Services (ICDS) project area	46.02
2	Counselling for complementary feeding and hand washing to caregivers of children aged 6 months to 3 years	ASHA/AWW	1 visit at Rs 39.1 per visit, at 2 visits per month	940.8	0 to 3 years population under ICDS project area	204.60
3	Vitamin A supplementation for children aged 6–59 months	Vitamin A Syrup	1 bottle = 5 children	60	Under 5 population, based on state Programme Implementation Plan (PIP) documents 2017-18	7.44
4	Therapeutic zinc supplements for treatment of diarrhoea for children aged 2–59 months	Zinc tablets	1strip (14 tablets) at 2.5 strips per child	10.625	Under 5 population, based on state PIP documents 2017-18	6.59

5	Oral Rehydration Therapy (ORS) for treatment of diarrhoea for children aged 2–59 months	ORS sachet	1 sachet at 5 sachets for 2.5 diarrhoea episodes per child	11.25	Under 5 population based on state PIP documents 2017-18	6.98
6	Deworming of all children aged 1-15 years	Albendazole 400mg	1 tablet at 2 tablets per child	3	School enrolment and children under ICDS project areas	3.40
7	Iron supplements for under six and those aged 11-15 years	Iron and Folic Acid (IFA) syrup self-dispensing (under 6 years)/ IFA tablets for adults	1 ml per child under 5 years of age, and 1 tablet per child aged 11–15 years	9.79 under 5 years 14.6 for 11- 15 years	School enrolment and children under ICDS project areas	10.30
8	Iron supplements for Pregnant and Lactating women (P&L)	IFA for anaemic and non- anaemic P & L women	2 per day for anaemic and 1 per day for non-anaemic	215.712 for anaemic and 107856 for non-anaemic women	45% of P&L are Anaemic of ICDS P&L coverage area	14.36
9	Supplementary Nutrition for children aged 0–6 years	Take Home ration for children aged 0–3 years, hot cooked meal to those aged 3–6 years, and additional ration for severely malnourished	Once a day for 300 days	8 per day per child (aged 0-6 years)	Children aged 0–3 years and 3–6 years under Women & Child Development (WCD) coverage area	844.45
10	Additional food rations for severely malnourished (Weight for Age Z-score WAZ<-3) children aged 6–59 months		Once a day for 300 days	12 per day per child for severely mal-nour-ished	Children aged 0–3 years and 3– 6 years and severely malnourished under WCD coverage area	5.49
11	Facility-based treatment for severely malnourished children under five years of age	Food and medicine cost for child and food and wages cost for caregiver	125 per day for drugs, 125 per day for food, 236 per day, and 125/day for mothers for 14 days	8,554 per child	As per Karnataka PIP 2018-19, number of children targeted 3,860.	3.30

Sr no.	Intervention	Intervention	Unit per year	Unit Cost (Rs)	Target Population	Total cost (Rs in Crore)
12	Supplementary Nutrition for adolescents	One meal per day	Once a day for 300 days	9.50 per child per day for 300 days	As per WCD data (2016-17)	128.50
13	Ksheera Bhagya scheme for children aged 6 months to 6 years	150 ml of milk per day	Once a day for 300 days	5.01 per child per day	Children aged 0–3 years and 3– 6 years under WCD coverage area	528.84
14	Mathrupoorna scheme for P&L women	One hot cooked meal	25 days per month for 15 months	21 per woman per day	Number of P&L women under WCD coverage area	723.14
15	Pradhan Mantri Mathru Vandana Yojana (Cash Transfer)	Rs 5,000 in three instalments		5,000 per woman	Number of P&L under WCD coverage area	459.14
16	Mid-Day Meal for children aged 6–15 years	Hot cooked meal	One meal per day for 300	4.13 for children in classes 1 to 5, and 6.18 for children in classes 6 to 10	Total number of children enrolled as per education department	899.73
17	Ksheera Bhagya scheme for children aged 6–15 years	150 ml of milk per day	Once a day for 300 days	5.18 per child per day	Total number of children enrolled as per education department	904.34
18	Hostels under Karnataka Residential Educational Institutions Society (KREIS)	All meals	1,000 per month for 10 months	10,000 per child	KREIS Department	163.07
19	Pre-matric Hostels for Schedule Caste (SC), Schedule Tribe (ST), Other Backward Classes (OBC), and minorities students	All meals for classes 6 to 10	1,500 per month in government hostels and 1,000 per month in govt-aided hostels for 10 months	15,000 per child in govt- and 10,000 per child in govt-aided	Departments of SC, ST, OBC, and minorities	281.73

20	Post-matric Hostels for ST, SC, OBC and minorities students	All meals	1,600 per month in govt hostels and 1,100 per month in govt-aided hostels for 10 months	16,000 per child in govt and 11,000 per child in govt-aided	Departments of SC, ST, OBC, and minorities	333.94
21	Ashram Schools for SC, ST, OBC, and minorities students	All meals for classes 1 to 4.	1,200 per month for 10 months	12,000 per child	Departments of SC, ST, OBC, and minorities	20.79
	Total	Rs 5,596.16 Crore				

Source: Based on estimates by Centre for Budget and Policy Studies (CBPS)

Expenditure by Type of Nutrition Interventions:

- The interventions for nutrition can be divided into six major groups as below (see Table 4).
- Cash Transfers:** This intervention consisted mainly of the PMMVY given by the department of Women and Child Development (WCD). It made up of 8.2% of the total nutritional expenditure.
  - Clinical intervention:** This expenditure consisted mainly of facility-based management of children with severe, acute malnutrition and comes under the department of health and makes up of only 0.06% of the nutritional expenditure. This expenditure also included daily loss of pay and food expenses paid to the parent of the child. Treatment of severely anaemic mothers with Iron Sucrose was not included in analysis.
  - Micronutrient supplementation and deworming:** These consist of six different schemes which formed 0.8% of the nutritional expenditure. These included, Weekly Iron and Folic Acid Supplementation (WIFS) in schools, Iron and Folic Acid (IFA) for children under five years of age, IFA for pregnant and lactating women, deworming of all children in the state during National Deworming Days, Vitamin A immunisation, distribution of zinc supplements and Oral Rehydration Therapy (ORS) packets for diarrhoea prevention. Although all these schemes are undertaken with the co-ordination between the departments of health and WCD, the expenditures for the provision of these supplements are undertaken by department of health under NHM.
  - Nutritional counselling:** This involved counselling by Accredited Social Health Activist (ASHA) workers (health department) and Anganwadi workers (AWW) (WCD department) to mothers of children under five years of age and pregnant women, and this formed about 4.5% of the nutrition expenditure.
  - Supplementary Nutrition:** Supplementary nutrition formed 72% of the nutritional expenditure. The Supplementary Nutrition Programme (SNP) for children under six years of age, and severely malnourished children, mid-day meal scheme for school children, Ksheera Bhagya scheme for all children aged 6 months to 15 years, SNP under Scheme for Adolescent Girls (SAG) and Mathrupoorna for pregnant and lactating mothers.
  - Food Expenses:** Expenditure on food for children residing in public and aided residential schools and hostels made up of 14% of nutrition costs.

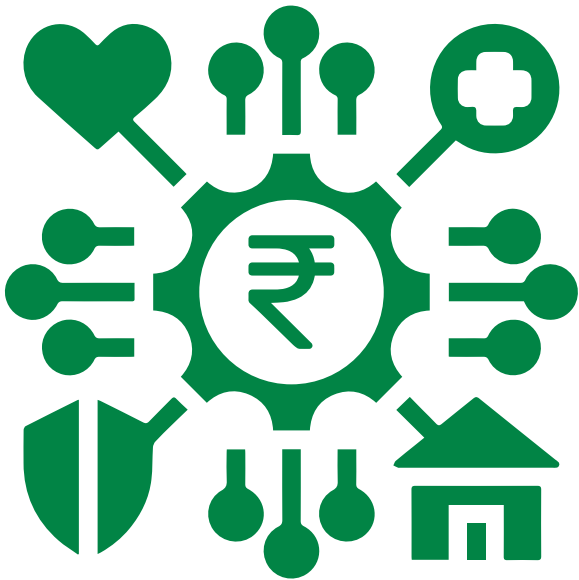




Table 4: Nutritional Expenditure by type of intervention in Karnataka, 2018

Nutritional intervention	Estimated expenditure (Rs in Crore)	Proportion of total nutrition expenditure
Counselling	250.62	4.5
Micronutrients and Deworming	49.09	0.9
Clinical Intervention	3.30	0.1
Hot cooked Meal, Take home rations, Milk	4034.48	72.1
Cash Transfer	459.14	8.2
Hostel/Residential schools	799.54	14.3
Total Nutrition Expenditure	5596.16	100

Source: Based on analysis by Centre of Budget and Policy Studies (CBPS)

Distribution of Nutritional Expenditure by Department:

The departments of education, and of WCD spend almost equally on nutrition interventions, i.e., 40.5% and 39.9%, respectively. Both expenditures are driven by supplementary nutrition components, with education leading simply due to the sheer number of children aged 6–15 years in schools. The department of health and family welfare has the lowest share of expenditure on nutrition interventions at less than 1%. However, health and WCD departments share about 4.5% of expenditure. Social welfare expenditures come from Schedule Caste (SC), Schedule Tribe (ST), Other Backward Classes (OBC), and minorities’ department’s residential schools, ashrama schools and pre- and post-matric hostels, which is at 14.3% of the total nutrition expenditure.

Table 5: Expenditure on direct nutrition interventions on children in Karnataka (2018), by age.

Age at Intervention	Expenditure in Rs	Percentage expenditure	Proportion in child population*
0–5 years	2,858.07	51.1	29.67%
6–10 years	835.45	14.9	25.81%
11–18 years	1,902.63	34.0	44.51%
Total	5,593.87	100.0	

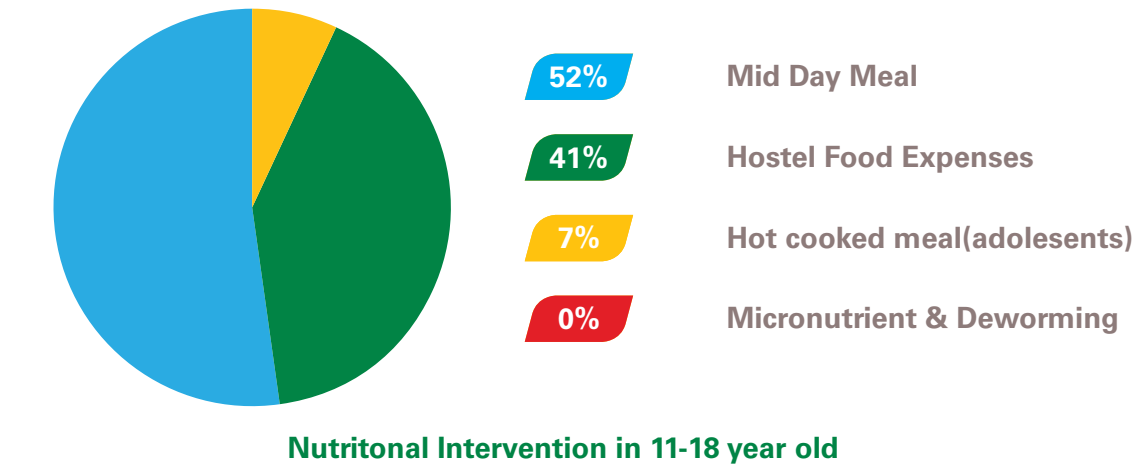
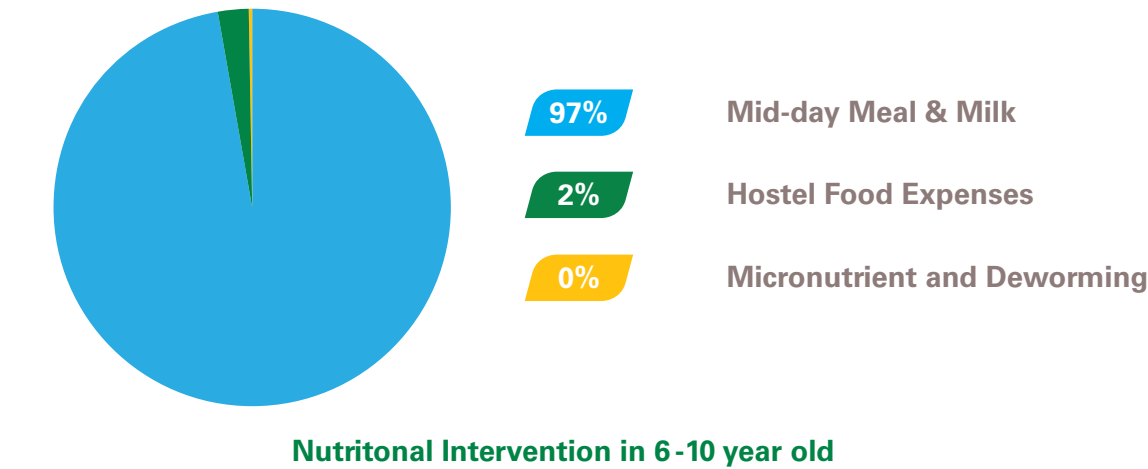
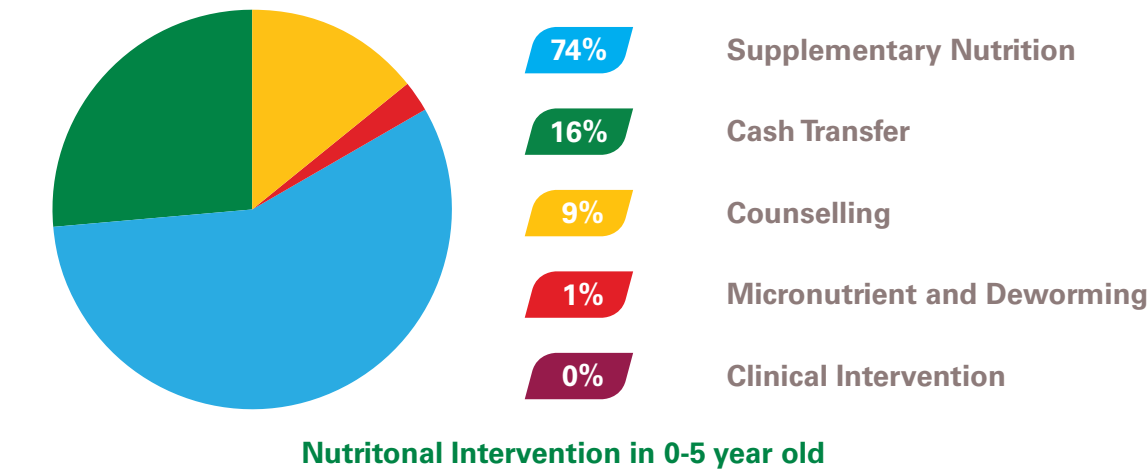
Source: Based on Direct Nutrition Intervention (DNI) estimations calculated from Census 2011 data.



Distribution of Expenditure by Age group:

About 51% or Rs 2,858 crore is estimated to be spent towards nutrition interventions for children under six years of age (Table 5). Expenditure on pregnant and lactating (P&L) women directly affects health of the newborn; hence, it is included with expenditure on 0-5-year-olds. Of this expenditure, 74% was on supplementary food that consisted of take-home rations for children under three years of age and hot cooked meals for 3-6-year-olds and pregnant & lactating women. This also included milk scheme for anganwadi children. Cash transfers are estimated to be 16% of expenditure in this age group (Figure 3A).

Figure 3 A, B, and C: Distribution of expenditures by intervention in children aged 0–6 years, 6–10 years, and 11–18 years in Karnataka (in percent)



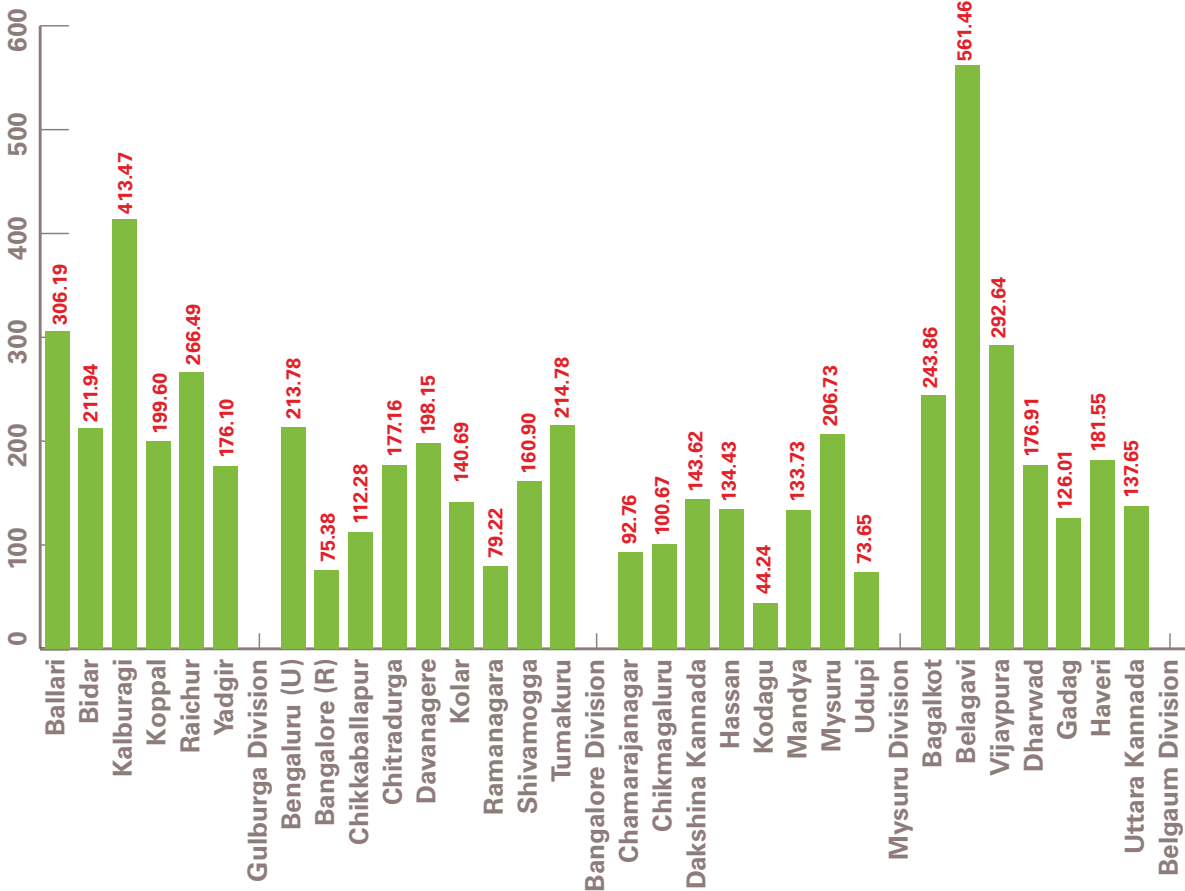
Children aged 6–10 years have the lowest number of interventions and therefore the lowest nutrition expenditure, i.e., 14.9% of the total as compared to other age groups (Figure 3B). The main expense on this group is through the mid-day meal scheme and Ksheera Bhagya scheme, which makes up for 97% of expenditures in this age group. This is followed by expenditure on the adolescent age group of children aged 11–18 years at 34%. Closer inspection of the adolescent age group shows that interventions are skewed towards those aged 11–15 years as these are easily identified in schools than those who leave schools, after class 10. Hence, interventions for those aged 11–18 years have been shown together. (Figure 3C)

District-Wise distribution of Expenditures:

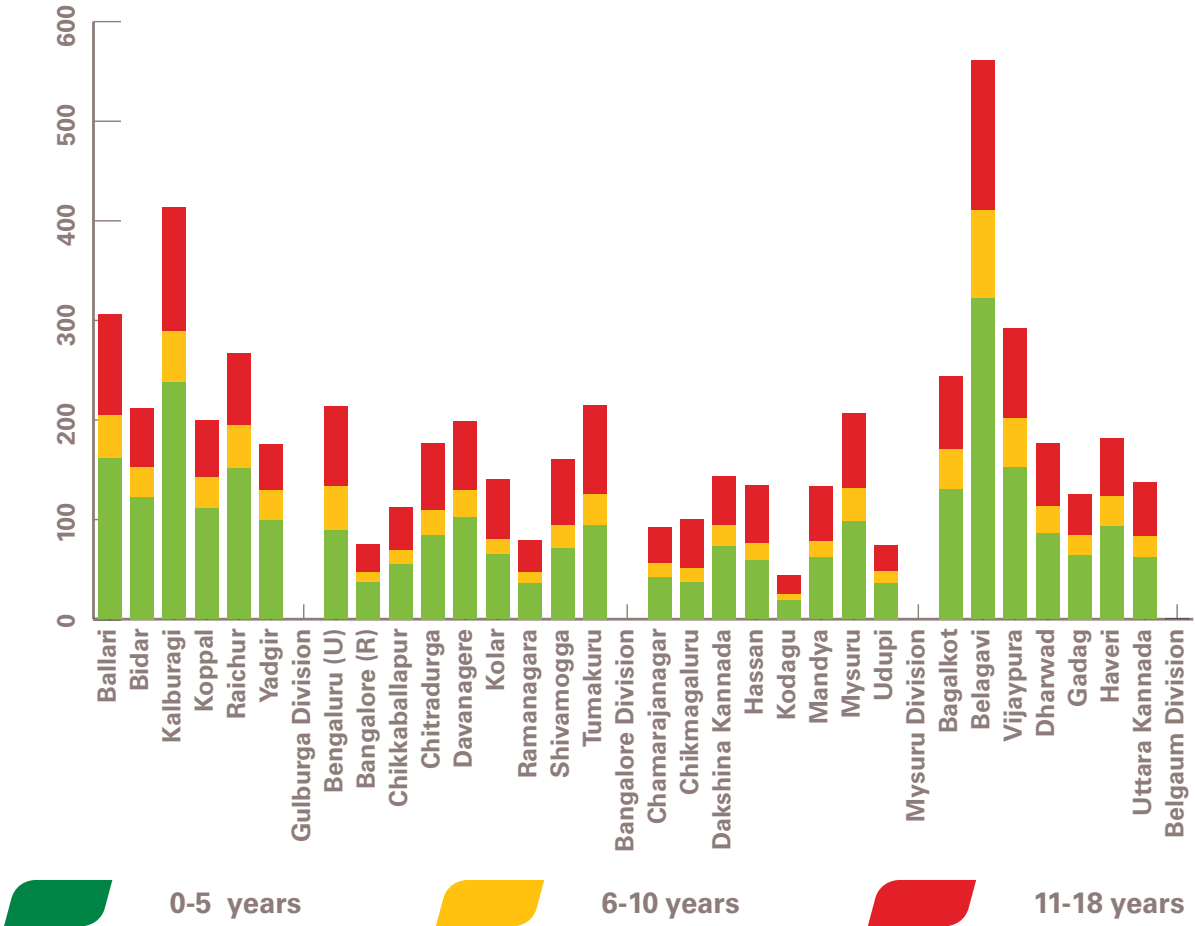
Looking at expenditures by district (Figure 4A), we see that Belagavi’s estimations are the highest at Rs 530 crore, i.e., 10% of the state’s total Direct Nutrition Intervention (DNI) expenditure, while Kodagu district’s expenditure is the lowest at Rs 44.20 crore, only 0.8% of total nutrition expenditure in the state. This is to be expected as the estimations are based on population proportions. Belagavi, Kalburagi, and Ballari have the highest expenditures but are ranked poorly in the in the nutrition index. However, our estimates also depend on the usage of ICDS services by the population in the district, which may be the reason why Yadgir and Raichur though ranked poorly still get a sizable allocation. In addition, aspirational districts under NITI Aayog receive additional funding under NHM and state budgets for administration of programmes. Additional monitoring and review support might also be a reason for better expenditure of funding at district level.



Figures 4A: District-wise estimated nutrition expenditure in Rs In Crore



Figures 4B: District-wise expenditure by age



Looking at the expenditure estimates by division, the Belagavi district has the highest expenditures, nearly double of the other districts in its division. The estimates are also high for Kalburagi division as compared to the southern divisions. Hence districts with poor health indicators appear to be having higher nutritional spending. Looking at proportion of distribution of nutritional expenditure by age followed the state pattern of distribution, we can see that 51% of state level nutrition expenditure was for children aged 0–5 years; however, within districts, the expenditure on children aged 0–5 years ranged from 57.9% in Bidar to 37.1% in Chikkamagaluru (Figure 3A).

Bidar, Kalburagi, Koppal, Belagavi and Yadgir all show more than 55% of estimated expenditure of the total nutrition expenditure on the age group 0–5 years. However, nutrition index computed shows Kalburagi, Koppal, Raichur, and Yadgir having the poorest nutrition indicators in 2015-16 (Figure 2), pointing towards gaps between allocations and expenditures. Bengaluru Urban shows one of the lowest proportions of expenditure on 0-5-year-olds in the state. In contrast, Bengaluru Urban’s proportional expenditure on 6-10-year-olds is the highest in the state, while Kolar district is estimated to spend only 11% of its total nutrition expenditure on 6–10-year-olds. Here too, supplementary nutrition drives expenditures through mid-day meals in schools. Poorer districts like Yadgir and Raichur show higher proportion of expenditure as compared to better off districts like Mandya and Kolar (Figure 4A, 4B).

Estimates of proportional expenditures on children aged 11–18 years showed poorer districts showing the lowest expenditure estimates. Yadgir, Raichur, and Koppal show the lowest estimated expenditures on adolescents. In this age group, 41% of the total expenditure goes towards food expenses in hostels and residential schools. This means that on exclusion of these food expenses, the spending on this group will further decrease. Hot cooked meals to two adolescent girls from each anganwadi centre was the only expenditure that could be traced to children aged 15–18 years. It is interesting to note that while state level expenditure on this age group averaged at 34%, the highest proportion spent by the districts was 49.5% in Chikkamagaluru, and the lowest was by Yadgir at 26.6% (see Figure 4A).



In conclusion, disbursement of allocations for nutritional intervention based on population estimates is only one way of financing nutrition at district level. There is a gap in data availability at the district level and this hinders understanding of true nutrition burdens at that level. Hence, estimates are only the first level in nutritional financing; gaps in data needed to be filled to generate a wholesome nutritional financing environment.



## Discussion and Recommendations

It is estimated that Karnataka spends more than Rs 5,500 crore on nutrition-specific interventions alone. This is far more than that predicted by earlier studies. Provision of food remains the most popular intervention consisting of 72% of estimated expenditure. Children aged 0–6 years receive the highest allocations within nutrition and rightly so as this age group is most vulnerable to irreversible changes due to malnutrition. Karnataka government has tried to address its poor nutrition indices through nutrition-specific schemes like Mathrupoorna, Ksheera Bhagya and egg scheme. This seems to have paid off with a majority of the districts showing improvement in wasting levels between 2015-16 to 2019-20. Stunting levels have improved only marginally with 16 districts showing an increase in stunting numbers. Anaemia both in women and children is an area that requires prioritisation. Both stunting and anaemia are priorities under the POSHAN Abhiyaan Scheme. However, Karnataka has yet to take concrete steps under this scheme as already seen. It should also be noted that most of the budget is allocated under food supplements for children and women; however, there is a need for the state now to look beyond food insecurity to nutrition insecurity to bring about the required change in nutrition context of the state.

### Unit cost? Does one size fit all?

Currently, the state government decides nutritional allocation based on population proportion. Even though districts like Belagavi and Kalburagi have the highest allocations for nutritional interventions, the health indicators of the children are poor. To have a positive impact on nutrition, there might be a need to look beyond population estimations to bring about a cure for under-nutrition. Hanagodimath & Annigeri, 2019 have developed a hunger index for Karnataka, which showed that 'a higher level of hunger is observed among people who have lower literacy rates, human development, and per capita income, face gender discrimination, and are dependent on agriculture more than other citizens. It was also seen that although estimations based on unit costs saw higher estimated expenditures, this did not necessarily bring about an improvement in health indicators. Therefore, there is a need to improve costing estimates factoring nutrition-sensitive indicators of the region as well. Hence, unit costs should be calculated taking into account factors like literacy rates, per capita income of the population availing anganwadi services and public schools, etc.

### Better district-wise data for better impact

As seen above, nutrition deprivation in children cannot be measured merely by a few health indicators, and even if they can be, these are seldom available at sub-district levels. Currently, a large amount of data is amassed in anganwadi centres and government school health check-ups; when collated with data on birth and death registrations, these can be used for effective tracking of each child in a Panchayat. This may also help in capturing data of deprived out-of-school children who are no longer in the school system and hence unable to avail nutrition benefits. In Karnataka, where almost 97.5% of births is registered (NFHS-5), the time is ripe to develop strong child-tracking systems using already available resources that can be a more effective way of tracking nutritional status in children by age group, gender, and area.

### The missing 15-to-18-year-olds

Currently, anganwadi children (aged 0–5 years), school children (aged 6–15 years), and P&L women are all benefitting from one free meal/take home ration. However, little data exists on adolescents aged 15–18 years and only 2 adolescent girls per anganwadi are eligible for a free meal. Expenditures

on adolescent girls, especially those out of school, cannot be traced. Estimates by age group showed that 7% of expenditure in the age group 11–18 years goes through SNP through anganwadis to out-of-school adolescents. Looking at distribution on nutrition expenditure by districts, expenditure on this age group was lowest in the poorest districts of the states, namely Yadgir, Raichur, Kalburagi, etc. However, these districts showed higher expenditures in age group 0–5 years. The Comprehensive National Nutrition Survey (CNNS) survey showed that iron deficiency anaemia is prevalent in 30% of children aged 10–19 years in Karnataka, which is much higher the national average at 21%. The survey also showed that out-of-school girls aged 15–19 years had a higher prevalence of anaemia. Statistics at the level of districts in terms of population of 15-18-year-olds as well as their health and nutrition is still lacking. Public expenditure reviews of health programmes in both Maharashtra and Rajasthan revealed that adolescent health programmes receive one of the lowest priorities in these states, showing decreasing allocations for these programmes (Raghuraman et al., 2019a, 2019b). Girls in this age group are at the start of the reproductive cycle and require micronutrient supplementation and adequate nutrition to prepare them for a safe motherhood ahead. Our study showed a lack of data on how many children aged 15–18 years actually receive benefits of micronutrient programmes under WIFS and deworming.

### Nutritional Counselling for intergenerational change

Our estimates showed that Karnataka spends a dismal 5% of its total nutritional allocation on counselling. This is also concentrated on those in the age group 0–5 years. Previous studies have shown that counselling on nutrition provides one the highest returns on investment. The work profile of ASHA and AWW workers leaves very little room for consistent dialogue on nutrition with care givers of children. Both these women workers are often over-worked and receive very little training on the importance of nutritional counselling. The working group report on nutrition strongly recommended that capacity building for nutrition counselling be done at all levels of the government. It recommended training of Panchayati Raj members as well as other grass roots members on the importance of nutrition to ensure better community support. An additional village nutrition volunteer whose work focuses only on nutritional interventions and counselling can bring about positive change as seen in the Karnataka Multisectoral Nutrition Project. This volunteer can also relieve some of burdens that the AWW face. Introducing nutritional education as part of course curriculum in schools can also help bring about awareness in children and their parents about local foods and their nutrition content, preventing future under- and over-nutrition problems.



The POSHAN Abhiyaan promotes nutritional counselling as one of its pillars. It has also emphasised the need for community ownership of the programme to improve its reach and efficiency. The scheme also promotes the usage of mobile phones by AWW in digitising the records maintained by them to improve efficiency and reduce errors. This may also help the AWW focus on other tasks like counselling. Karnataka has yet to increase its POSHAN Abhiyaan expenditure.



## Conclusion

In conclusion, estimating nutrition expenditures at the sub-district level is not only about calculating costs according to population proportions, but also requires efforts to understand the underlying causes of food deprivation in a particular area; foremost of this is a need for developing sub-district level child nutrition tracking systems. A higher emphasis on low-cost interventions such as nutritional counselling will go a long way in addressing intergenerational nutrition disparities, which cannot be solved by food supplementation alone. The start of the intergenerational nutritional cycle begins at adolescence and there a need to concentrate on children aged 15–18 years. In the time of the Covid-19 pandemic, there is a need for more sustainable nutrition intervention as under-nutrition has become even more relevant with rising unemployment and inability of children to go to schools and anganwadis, thus missing out on midday meal/other meal schemes.





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