

NUTRITIONAL STATUS OF CHILDREN 0-18 YEARS

Back ground information

Children have been considered a nutritionally vulnerable segment of the population because in addition to meeting the requirement for basal metabolism and normal physical activity, their dietary intake has to meet the nutrient requirements for growth. Surveys carried out by the National Nutrition Monitoring Bureau in the seventies had shown that dietary intake of Indian children were lower as compared to the requirements and prevalence of under-nutrition in children especially 0-4 year children was high. Therefore, the country initiated national supplementary feeding programmes for children (ICDS and MDM) to bridge the gap in energy intake and thereby reduce the prevalence of under-nutrition. Over time there has been a slow but steady decline in the under-nutrition rates in pre-school children. In the last two decades some small-scale studies reported high prevalence of over-nutrition in school age children from urban upper income families. However, NNMB surveys, AHS-CAB, DLHS 4 and CNNS which surveyed all children between 0-18 year age group in the surveyed families; showed that prevalence of under-nutrition continues to be high and over-nutrition rates are relatively low in the 0-18 year age group. NNMB and CNNS data are not available in public domain but the large data sets in AHS CAB and DLHS4 are available in public domain to assess the trends in nutritional status of 0-18 year children across age groups. NFI had undertaken analysis of the raw data from AHS third round and DLHS 4 to assess nutritional status of children in the 0-18 year age group in AHS and DLHS states to assess:

- Differences if any in nutritional status of children of different age groups,
- Differences in nutritional status of boys and girls,
- Differences between AHS states and DLHS 4 states, and
- Interstate differences in prevalence of under- and over nutrition-in different age groups.

Material and methods

The raw data from these two surveys were cleaned using excel and SPSS. Only those children in whom data on age and sex were available and were correct were included for data analysis. The number of children in the 0-18 year age groups who were surveyed in DLSH4 and AHS - CAB are given in Table1.

Table 1. Total number of children surveyed (0-18 year)					
	Age (yrs)				
DLHS 4	0-4	5-9	10-14	15-18	Total
Boys	37959	40800	32894	37953	149606
Girls	34811	37273	31377	39798	143259
AHS CAB	0-4	5-9	10-14	15-18	Total
Boys	77954	87524	101548	79658	346684
Girls	70353	80030	91106	72867	314356

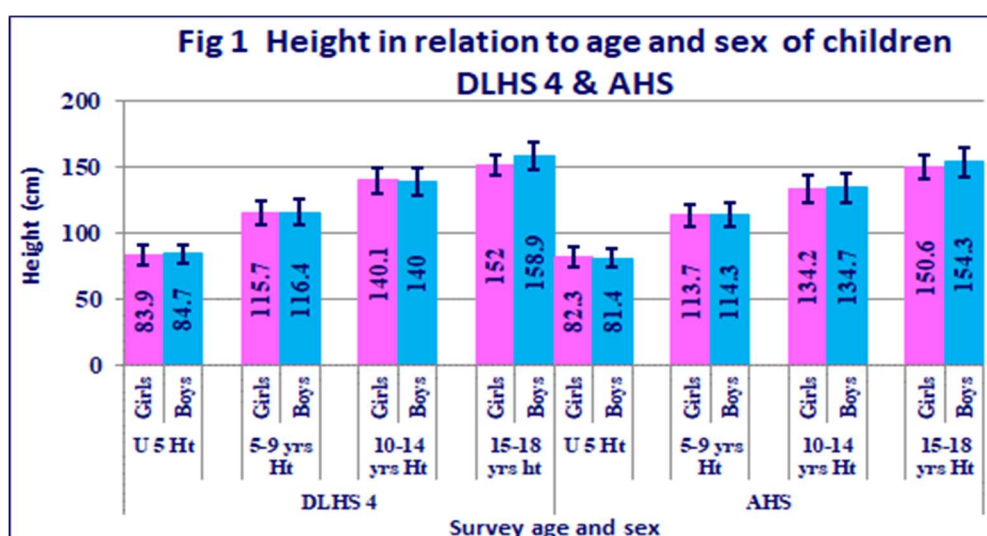
The number of children surveyed in AHS CAB were more than double the number of children in DLHS4. Part of the difference was because AHS states are home of nearly 60% of India's

population. Part of the difference is also because the AHS states and DLHS 4 states are in different stage of demographic transition and % of children for the total population is higher in the AHS states.

Table 2 Total number of children in whom height and weight were measured					
DLHS 4					
Age	Measured	Not present	Refused	Other reasons	Total
0-4 yrs	74398	98	91	130	74717
5-9 yrs	80909	110	49	102	81170
10-14 yrs	65225	84	27	90	65426
15-18 yrs	75131	144	44	117	75436
Total	295663	436	211	439	296749
AHS CAB					
0-4 yrs	130606	7535	858	158	139157
5-9 yrs	144084	12536	730	247	157597
10-14 yrs	163230	15793	820	300	180143
15-18 yrs	119096	13964	729	243	134032
Total	557016	49828	3137	948	610929

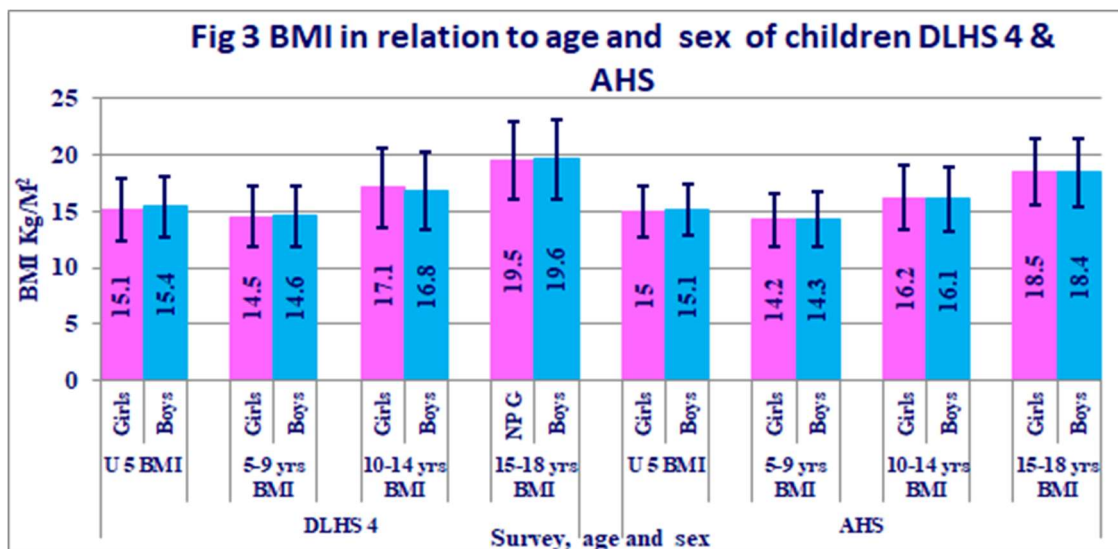
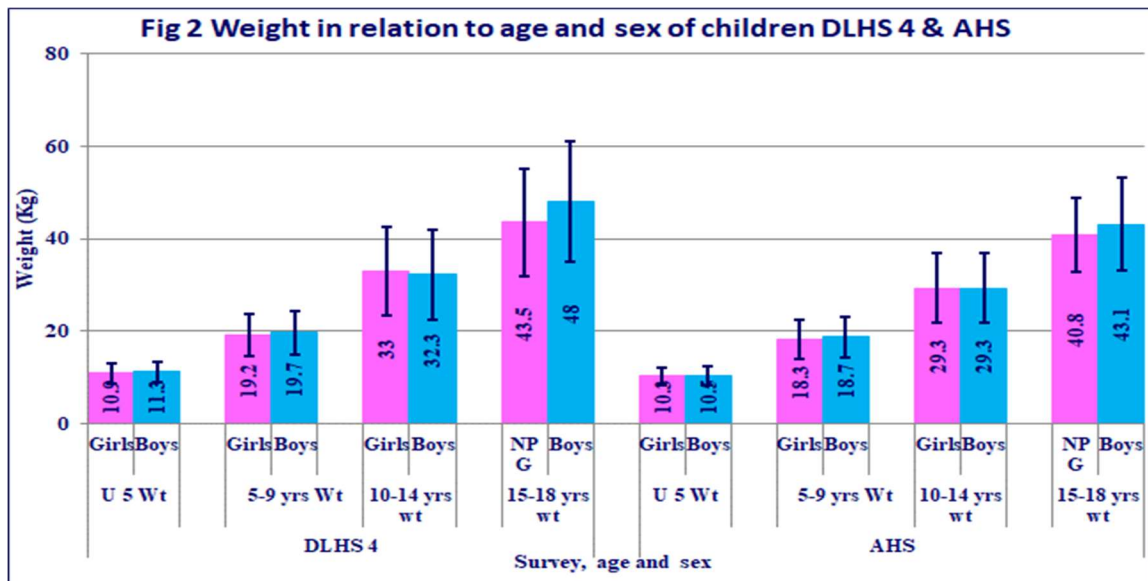
The total number of children in the 0-18 year age group in whom height and weight measurements were carried out is given in Table 2. In both the surveys almost all under-five children were measured. This most probably is because they are at home; relatively higher number of older children were not at home during survey and hence anthropometric measurements could not be taken in them. Refusal for getting the measurements done was very low.

Anthropometric profile of the children in 0-18 year age group



Anthropometric profile of the children (boys and girls) in 0-18 year age groups surveyed in DLHS 4 and AHS CAB is given in Figs 1-3. There was a progressive increase in mean height and weight with increasing age (Figs 1 and 2). The trends in height and weight in relation to age were similar both in AHS CAB and DLHS 4 but the mean values for all the three parameters

were lower in AHS CAB states as compared to the corresponding age and sex group in DLHS 4 states.

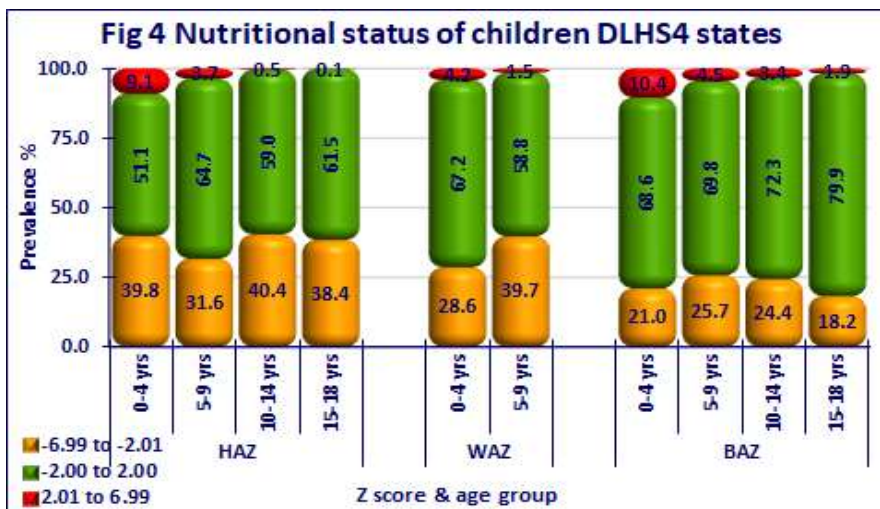


Mean height and weight showed a progressive increase with increase in age. The mean height and weight in boys and girls were essentially similar both in AHS and DLHS 4 states in the 0-14 year age groups. However, the adolescent growth spurt continues in boys beyond 14 years so that in the 15-18 year age groups the boys are significantly taller and heavier as compared to the girls (Figs 1 and 2).

Mean BMI in relation to age and sex of children in the AHS and DLHS 4 states is shown in Fig 3. The mean BMI was lowest in the 5-9 year old children in both DLHS4 and AHS states. The mean BMI in the 0-4 year age group was higher as compared to the 5-9 year old children. There was a progressive increase in the mean BMI in the 10-14 and 15-18 year old children in both boys and girls. The difference in the mean BMI between AHS and DLHS states was marginal and not significant in the 0-4 and 5-9 year age groups but mean BMI in the 10-14 and 15-18 year age groups were significantly higher in the DLHS 4 states as compared to AHS.

CAB states. Both in AHS CAB states and DLHS 4 states the differences in the mean BMI

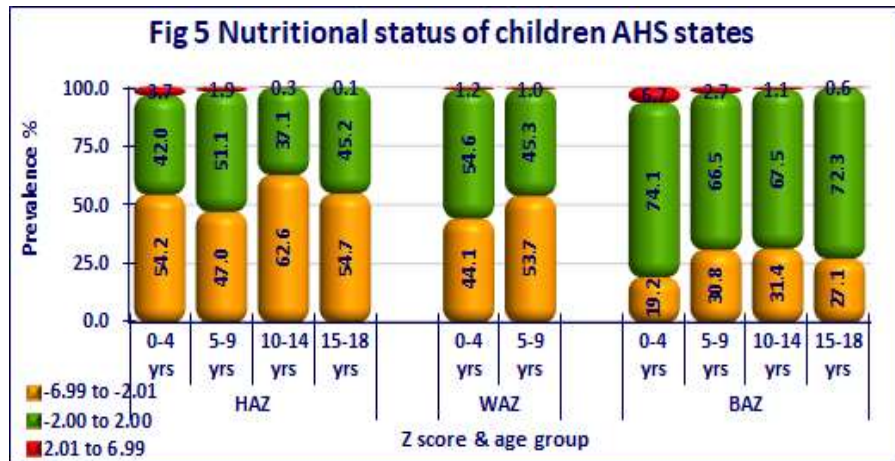
between girls and boys were small in any age group and not significant.



Nutritional status of children of different age groups as assessed by HAZ (tall, normal and stunted), WAZ (underweight, normal and overweight) and BAZ

(wasted, normal and over-nourished) were computed in DLHS 4 states and AHS CAB states and the results are shown in Figs 4 and 5. Data from both surveys showed that the stunting

rates were lowest in the 5-9 year old children as compared to the other three age groups. Underweight rates were higher in the 5-9 year children as compared to 0-4 year old children. Wasting rates were highest in 5-9 year age groups and marginally lower in the 10-14 year age group.



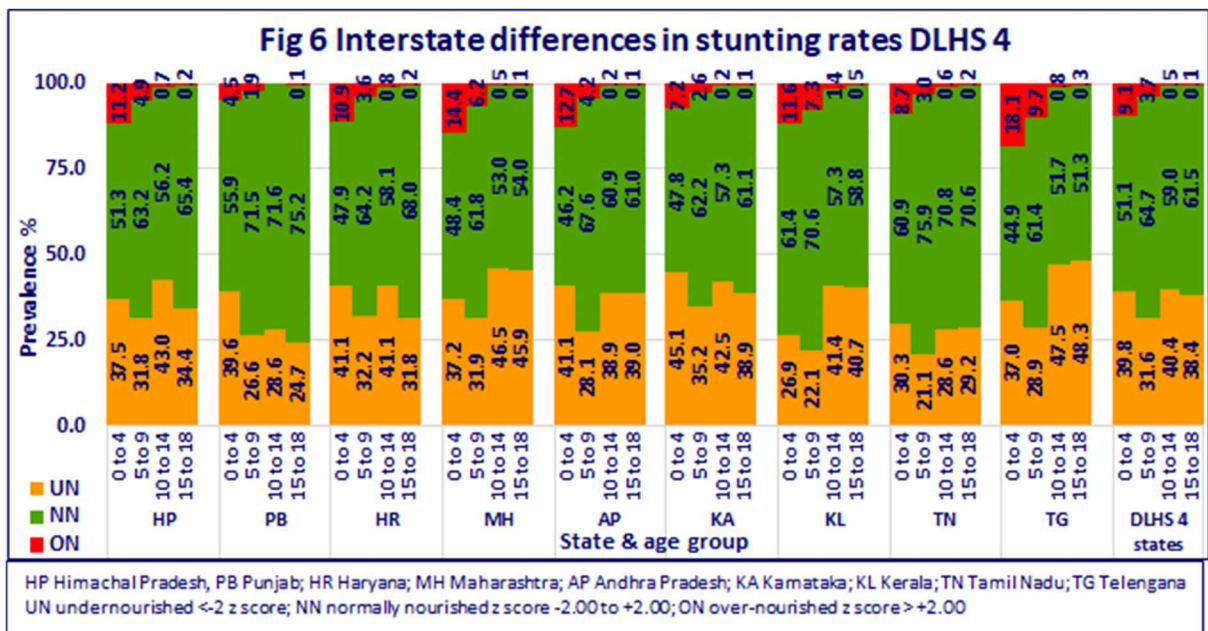
Wasting rates in 0-4 and 15-18 year children were higher compared to the 5-14 year age groups. The trends in nutritional status in relation to age was similar in DLHS 4 and AHS states but stunting, underweight and wasting rates across all age groups were higher in the AHS states.

Inter-state differences in nutritional status of children

Inter-state differences in stunting rates in selected DLHS 4 states and AHS states are shown in Figs 6 and 7. The trends in stunting rates relation to age in children is similar in all the states in both the surveys; stunting rates are lowest in the 5-9 year age group. Stunting rates in AHS states were higher in all age groups as compared to the DLHS 4 states. Among the DLHS 4 states stunting rates were higher in Maharashtra and Karnataka. Stunting rates in UP, Bihar and MP were higher as compared to the other AHS states.

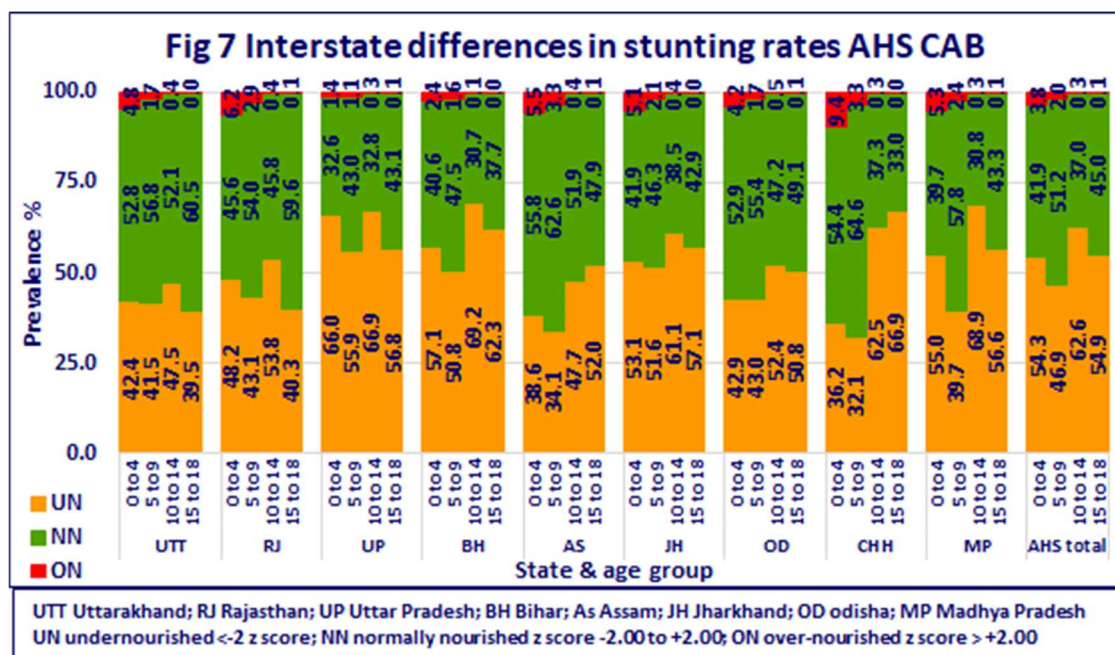
Interstate differences in underweight rates in selected DLHS 4 states and AHS states are shown in Figs 8 and 9. The trends in underweight rates relation to age in children is similar in all the states in both the surveys; underweight rates were lower in the 0-4 year as compared to 5-9 year age group. Underweight rates in DLHS 4 states were lower as compared to AHS

states. Among the DLHS 4 states underweight rates were lower in Kerala and Himachal



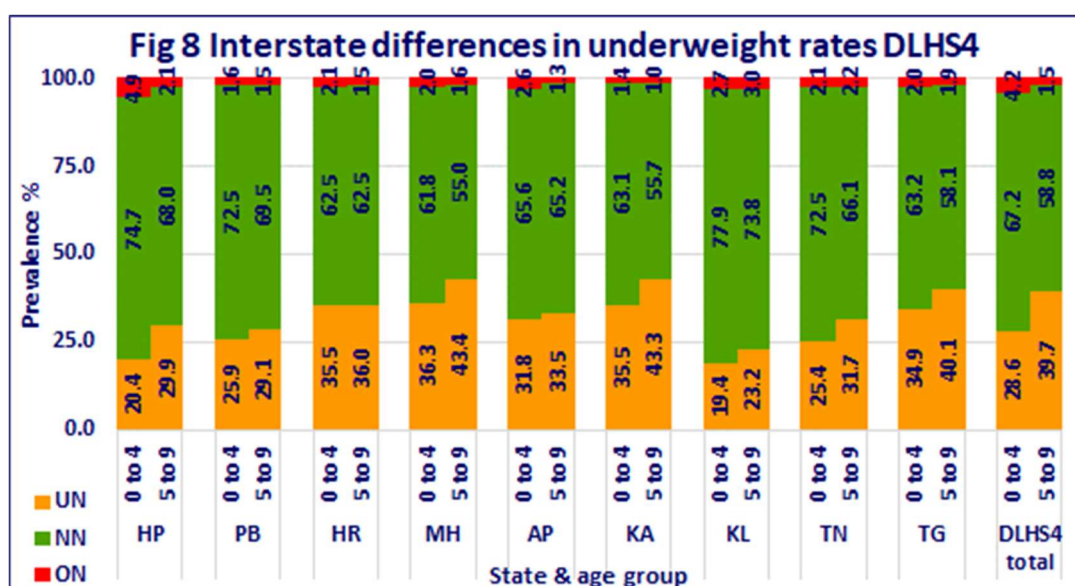
Pradesh and higher in higher Maharashtra and Karnataka.

Inter-state differences in wasting rates in relation to age of children in DLHS4 and AHS states is given in Figs 10 and 11. Wasting rates were higher in the 5-9 and 10-14 year age groups as compared to the 0-4 and 15-18 year age groups in almost all the states. Wasting rates in AHS states were higher as compared to wasting rates in DLHS 4 states. Among the DLHS 4 states, wasting rates were lowest in Himachal Pradesh and Punjab; wasting rates in Maharashtra, Telangana and Karnataka were higher as compared to other DLHS 4 states. Among the AHS states wasting rates were lowest in Uttarakhand and higher in Rajasthan, Bihar, Chhattisgarh



and MP.

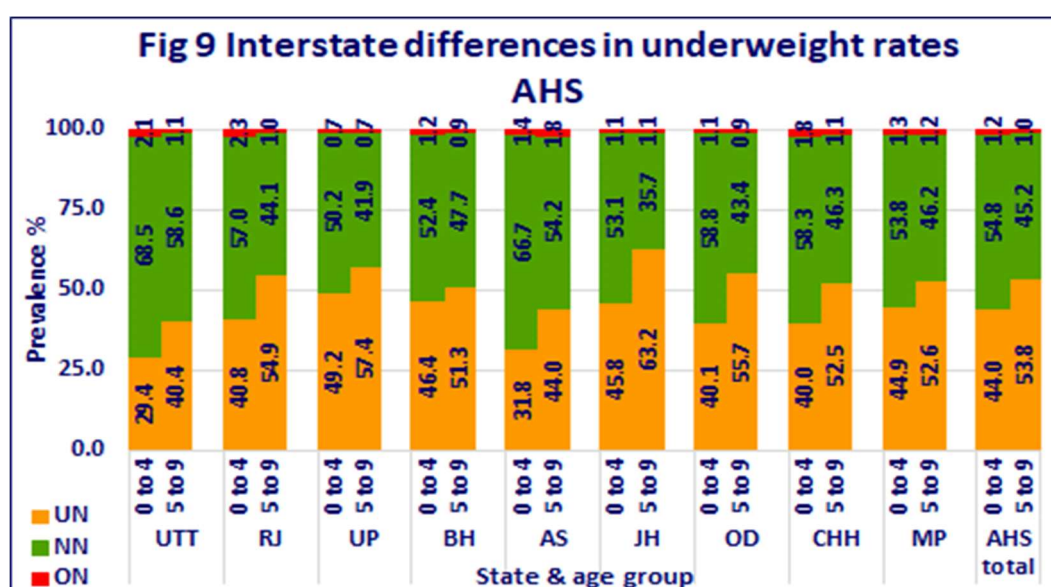
Policy and programme implications



There is a progressive increase in the mean height and weight with increasing age. Mean BMI for age is similar in the 0- 4 and 5-9 year age groups; there is a progressive increase in the mean BMI between 10-14 and 15-18 year age groups

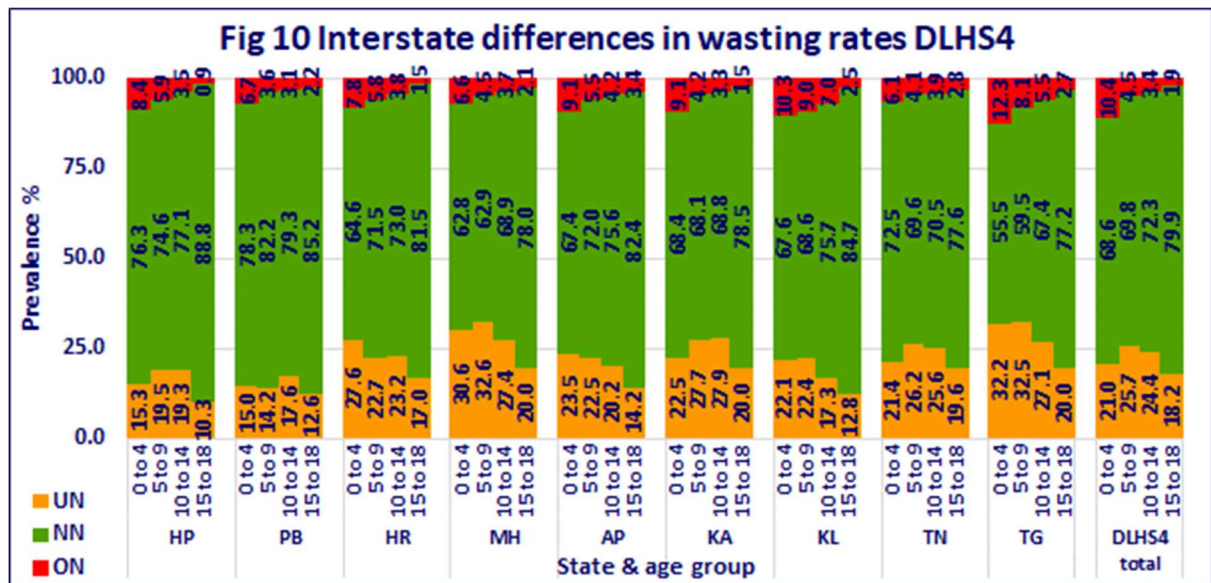
Data on mean height and weight in 0-18 year old children indicate that there is not any substantial difference in the mean height and weight of the girls and boys in the age group 0-14 years. However, in the 15-18 year age groups boys were taller and heavier as compared to girls. There was no difference in the mean BMI between girls and boys across 0 to 18 years of age.

Stunting rates were lowest in the 5-9 year age group; underweight rates are lowest in the 0-4 year age group; wasting rates are higher in 5-9 and 10-14 years as compared to 0 to 4 or 15-18 year age groups.



Stunting, underweight or wasting rates were higher in AHS as compared to DLHS 4 states in all the age groups both in boys and girls. Prevalence of under-nutrition was higher among

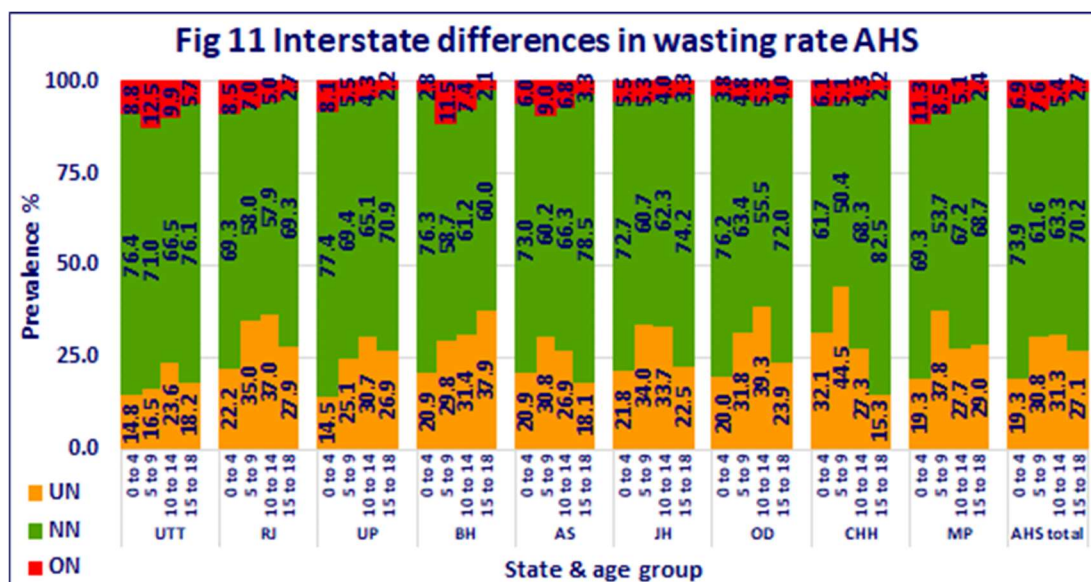
children in AHS states as compared to children in DLHS states. There was considerable variation in prevalence of under-nutrition in between states (both in AHS and DLHS 4 states).



Policy and programme implications.

In view of the fact that Indian children are short statured it is important to use BMI for age in children for detection of both under- and over-nutrition in the dual nutrition burden era.

Universal screening of all children in the 0-4 year age group envisaged in the POSHAN Abhiyaan should be effectively implemented in all states. This would result in early detection of under-nutrition. Focussed interventions (nutrition education, food supplementation and care during morbidity) and monitoring for improvement in nutritional status can accelerate



the pace of reduction in under-nutrition.

Focusing on the 0-4 year age group is easier because both ICDS and health system have the infrastructure and manpower to universally screen the children and provide the needed

interventions effectively. Such a focus will yield greater dividends because when under-nutrition is prevented further growth during childhood will not be hampered by the earlier under-nutrition. The demonstration that under-nutrition in early childhood predisposes to over-nutrition and non-communicable diseases in adult life is yet another reason for focussing on early detection and effective management of under-nutrition in the 0-4 year age group.

Data from the surveys indicate that there is an increase in wasting rates in the 5-9 and 10-14 year age groups. Early detection of wasting in these school age children and providing them with additional food from the MDM and monitoring improvement in their nutritional status may help in accelerating the reduction in wasting in these children and preventing stunting in the period of adolescent growth spurt (10-18 year).

In India over-nutrition rates in children is still low. This is an opportunity and any rise in overnutrition in children should be prevented by ensuring adequate physical activity and nutrition education to ensure that habitual consumption of fried high calories, high salt, sugar snacks.

When BMI for age is used for assessment of nutritional status in children, over 3/4th of Indian children is normally nourished. Every effort is to be made to ensure that they have healthy eating habits and life style. Ensuring adequate physical activity will go a long way in keeping them normally nourished and preventing any escalation in non-communicable disease risk.