



Ministry of Health and Family Welfare  
Government of India

# Nutrition in India



National Family Health  
Survey (NFHS-3)  
India  
2005-06



International Institute for Population Sciences  
Deonar, Mumbai – 400 088

**NATIONAL FAMILY HEALTH SURVEY (NFHS-3)  
INDIA  
2005-06**

**NUTRITION IN INDIA**

**Fred Arnold  
Sulabha Parasuraman  
P. Arokiasamy  
Monica Kothari**

**August 2009**

Suggested citation: Fred Arnold, Sulabha Parasuraman, P. Arokiasamy, and Monica Kothari. 2009. *Nutrition in India*. National Family Health Survey (NFHS-3), India, 2005-06. Mumbai: International Institute for Population Sciences; Calverton, Maryland, USA: ICF Macro.

For additional information about the 2005-06 National Family Health Survey (NFHS-3), please contact:

International Institute for Population Sciences (IIPS), Govandi Station Road, Deonar, Mumbai - 400 088

Telephone: 022-2556-4883, 022-2558-3778

Fax: 022-2558-3778

E-mail: [iipsnfhs@gmail.com](mailto:iipsnfhs@gmail.com)

Website: <http://www.nfhsindia.org>

For related information, visit <http://www.iipsindia.org> or <http://www.mohfw.nic.in>

# CONTENTS

---

Page

**Abstract** ..... 1

**Introduction** ..... 3

**Nutritional Status of Children** ..... 5

Malnutrition Among Children Under Five Years ..... 6

Undernutrition Among Children Under Five Years in Selected Countries ..... 7

Malnutrition Among Children Under Five Years Based on the WHO Child Growth Standards and the NCHS/WHO International Growth Reference ..... 8

Cumulative Distribution of Weight-for-Age Z-scores..... 9

Cumulative Distribution of Height-for-Age Z-scores of Elite Children..... 10

Percentage of Children Under Five Years Who Are Underweight ..... 11

Nutritional Status of Children Under Five Years by City and Slum/Non-slum Area ..... 12

Trends in Malnutrition Among Children Under Three Years ..... 13

Poor Nutrition as a Contributing Factor to Under-Five Mortality ..... 14

Anaemia Among Children Age 6-59 Months ..... 15

Percentage of Children Age 6-59 Months Who Are Anaemic..... 16

Trends in Anaemia Among Children Age 6-35 Months ..... 17

**Nutritional Status of Children by Background Characteristics**..... 19

Stunting, Wasting, and Underweight Among Children Under Five Years by Age..... 20

Stunting, Wasting, and Underweight Among Children Under Five Years by Residence ... 21

Stunting, Wasting, and Underweight Among Children Under Five Years by Mother’s Education..... 22

Stunting, Wasting, and Underweight Among Children Under Five Years by Household Wealth ..... 23

Stunting, Wasting, and Underweight Among Children Under Five Years by Caste/Tribe..... 24

Percentage of Children Under Five Years Who Are Underweight by Demographic Characteristics ..... 25

Stunting, Wasting, and Underweight Among Children Under Five Years by Source of Drinking Water..... 26

Stunting, Wasting, and Underweight Among Children Under Five Years by Type of Toilet Facility..... 27

Stunting, Wasting, and Underweight Among Children Under Five Years by the Method of Disposal of Children’s Stools..... 28

Stunting, Wasting, and Underweight Among Children Under Five Years by the Child's Weight at the Time of Birth .....	29
Anaemia Status of Children Age 6-59 Months by Whether or Not They Are Malnourished .....	30
Stunting, Wasting, and Underweight Among Children Under Five Years by Mother's Nutritional Status.....	31
Timing of Initiation of Breastfeeding .....	32
Feeding Practices of Infants Under Six Months.....	33
Infant and Young Child Feeding (IYCF) Practices of Children Age 6-23 Months .....	34
Infant and Young Child Feeding Practices by Age.....	35
Children Age 6-59 Months Living in Households with Adequately Iodized Salt by Residence and Household Wealth.....	36
Households Using Adequately Iodized Salt by State.....	37
Anaemia Among Children Age 6-59 Months by Residence .....	38
Anaemia Among Children Age 6-59 Months by Mother's Education and Household Wealth .....	39
Anaemia Status of Children Age 6-59 Months by Mother's Anaemia Status.....	40
Vitamin A Supplementation for Children Age 12-35 Months .....	41
Supplementary Food Received from an <i>Anganwadi</i> Centre (AWC) by Children Under Six Years .....	42
<b>Nutritional Status of Women and Men .....</b>	<b>43</b>
Nutritional Status of Women and Men 15-49 Years .....	44
Percentage of Women 15-49 Years Who Are Too Thin .....	45
Percentage of Women 15-49 Years Who Are Overweight or Obese.....	46
Nutritional Status of Women and Men 15-49 Years by City and Slum/Non-slum Area.....	47
Trends in Malnutrition Among Ever-married Women 15-49 Years.....	48
Anaemia Among Women and Men 15-49 Years .....	49
Percentage of Women 15-49 Years Who Are Anaemic.....	50
Anaemia Among Women and Men 15-49 Years by City and Slum/Non-slum Area.....	51
Trends in Anaemia Among Ever-Married Women 15-49 .....	52
Weekly Consumption of Milk/Curd and Fruit for Women 15-49 Years by Household Wealth.....	53
Frequency of Women's and Men's Consumption of Meat, Chicken, or Fish .....	54
Vegetarianism Among Women 15-49 Years .....	55
Percentage of Women and Men 15-49 Years Who Are Vegetarians by City and Slum/Non-slum Area .....	56
Utilization of ICDS Food Supplementation During Pregnancy and Lactation Among Mothers of Children Under 6 Years by Caste/Tribe.....	57
Malnutrition of Women 15-49 Years by Residence and Education .....	58
Malnutrition of Women 15-49 Years by Caste/Tribe and Household Wealth .....	59

## **ABSTRACT**

This report provides clear evidence of the poor state of nutrition among young children, women, and men in India and the lack of progress over time, based on measurements of height and weight, anaemia testing, testing for the iodization of household cooking salt, utilization of nutrition programmes, and information on child feeding practices and vitamin A supplementation. Young children in India suffer from some of the highest levels of stunting, underweight, and wasting observed in any country in the world, and 7 out of every 10 young children are anaemic. The percentage of children under age five years who are underweight is almost 20 times as high in India as would be expected in a healthy, well-nourished population and is almost twice as high as the average percentage of underweight children in sub-Saharan African countries. Although poverty is an important factor in the poor nutrition situation, nutritional deficiencies are widespread even in households that are economically well off. Inadequate feeding practices for children make it difficult to achieve the needed improvements in children's nutritional status, and nutrition programmes have been unable to make much headway in dealing with these serious nutritional problems.

Adults in India suffer from a dual burden of malnutrition (abnormal thinness and overweight or obesity). Almost half of Indian women age 15-49 (48 percent) and 43 percent of Indian men age 15-49 have one of these two nutritional problems. Although the percentage of women and men who are overweight or obese is not nearly as high as it is in many developed countries, this is an emerging problem in India that especially affects women and men in urban areas, those with higher educational attainment, and those living in households in the highest wealth quintile.



## INTRODUCTION

The 2005-06 National Family Health Survey (NFHS-3) is the third in the NFHS series of surveys. The first NFHS was conducted in 1992-93 and the second (NFHS-2) was conducted in 1998-99. All three NFHS surveys were conducted under the stewardship of the Ministry of Health and Family Welfare (MOHFW), Government of India. The MOHFW designated the International Institute for Population Sciences (IIPS), Mumbai, as the nodal agency for the surveys. Funding for NFHS-3 was provided by the United States Agency for International Development (USAID), the United Kingdom Department for International Development (DFID), the Bill and Melinda Gates Foundation, UNICEF, UNFPA, and the Government of India. Technical assistance for NFHS-3 was provided by ICF Macro, Calverton, Maryland, USA. Assistance for the HIV component of the survey was provided by the National AIDS Control Organization (NACO) and the National AIDS Research Institute (NARI), Pune.

The survey provides trend data on key indicators of family welfare, maternal and child health, and nutrition, and includes information on several new topics such as use of the Integrated Child Development Services (ICDS) programme, HIV prevalence, attitudes toward family life education for girls and boys, men's involvement in maternal care, high-risk sexual behaviour, and health insurance coverage. NFHS-3 collected information from a nationally representative sample of 124,385 women age 15-49 and 74,369 men age 15-54 in 109,041 households. NFHS-3 included biomarker tests for HIV and anaemia, based on blood collected from eligible respondents. Blood samples were collected in every state except Nagaland (where local opposition prevented the collection of blood samples).

This report presents key findings on the nutrition of children, women, and men in India. It supplements information published in the NFHS-3 national and state reports and provides important new information and in-depth analyses. The new features include a cross-country comparison of the nutritional status of children, a comparison of nutritional status calculated with the new WHO Child Growth Standards and the previous NCHS/WHO International Reference Population, a multivariate analysis of the nutritional status of "elite" children, an analysis of nutrition as a contributing factor to under-five mortality, examination of the environmental links to malnutrition, the provision of a complete picture of infant and young child feeding practices by age, and an examination of geographic patterns of vegetarianism.

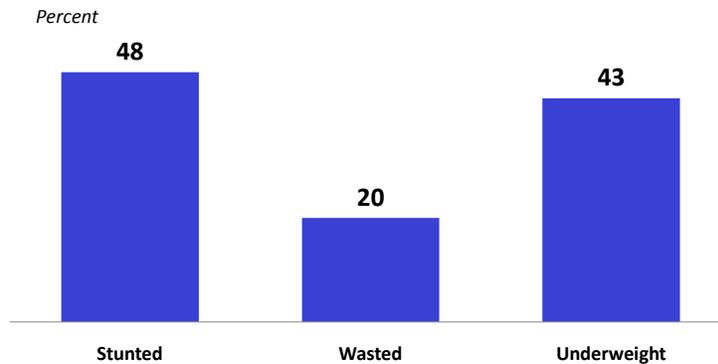
More information about the definitions of indicators included in this report is contained in Volume I of the NFHS-3 National Report, and the questionnaires and details of the sampling procedure for NFHS-3 are contained in Volume II of the NFHS-3 National Report (available at [www.nfhsindia.org](http://www.nfhsindia.org)).





## **NUTRITIONAL STATUS OF CHILDREN**

## Malnutrition Among Children Under Five Years



- Almost half of children under age five years (48 percent) are chronically malnourished. In other words, they are too short for their age or stunted<sup>1</sup>. Stunting is a good long-term indicator of the nutritional status of a population because it does not vary appreciably by the season of data collection or other short-term factors, such as epidemic illnesses, acute food shortages, or shifts in economic conditions.
- Acute malnutrition, as evidenced by wasting<sup>2</sup>, results in a child being too thin for his or her height. One out of every five children in India under age five years is wasted.
- Forty-three percent of children under age five years are underweight for their age<sup>3</sup>. Underweight status is a composite index of chronic or acute malnutrition. Underweight is often used as a basic indicator of the status of a population's health.

---

### Footnotes:

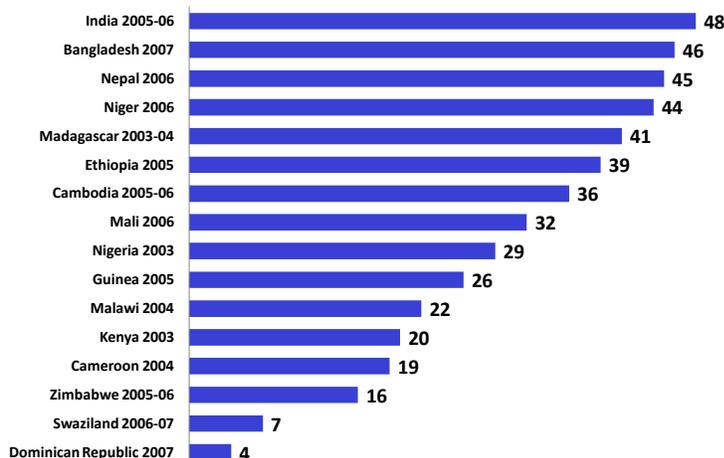
<sup>1</sup> A stunted child has a height-for-age z-score that is at least 2 standard deviations (SD) below the median for the WHO Child Growth Standards. Chronic malnutrition is an indicator of linear growth retardation that results from failure to receive adequate nutrition over a long period and may be exacerbated by recurrent and chronic illness.

<sup>2</sup> A wasted child has a weight-for-height z-score that is at least 2 SD below the median for the WHO Child Growth Standards. Wasting represents a recent failure to receive adequate nutrition and may be affected by recent episodes of diarrhoea and other acute illnesses.

<sup>3</sup> An underweight child has a weight-for-age z-score that is at least 2 SD below the median for the WHO Child Growth Standards. This condition can result from either chronic or acute malnutrition, or both.

# Undernutrition Among Children Under Five Years in Selected Countries

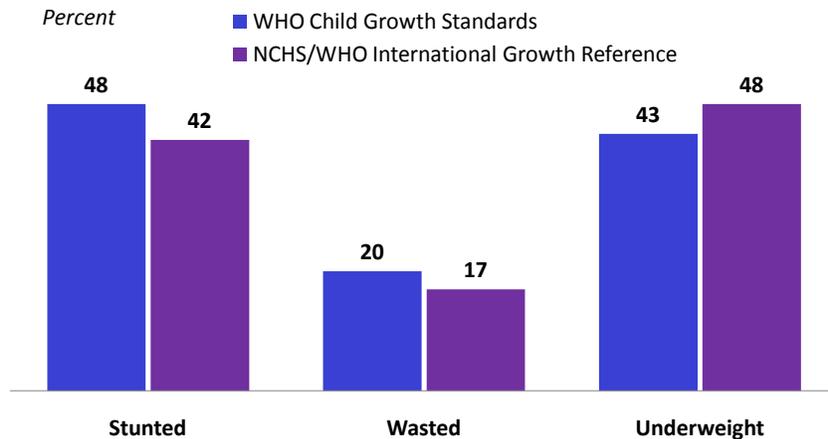
*Percent underweight, based on the NCHS/WHO Growth Reference*



Between 2003 and 2007, the nutritional status of children under five years of age was measured in Demographic and Health Surveys in the same way in 41 developing countries.

- The prevalence of underweight in children was higher in India than in any of the other 40 countries, but was only slightly higher than the prevalence in Bangladesh and Nepal.
- The prevalence of underweight in children in India (48 percent) is almost twice as high as the average prevalence for the 26 sub-Saharan African countries that have similar data (25 percent).

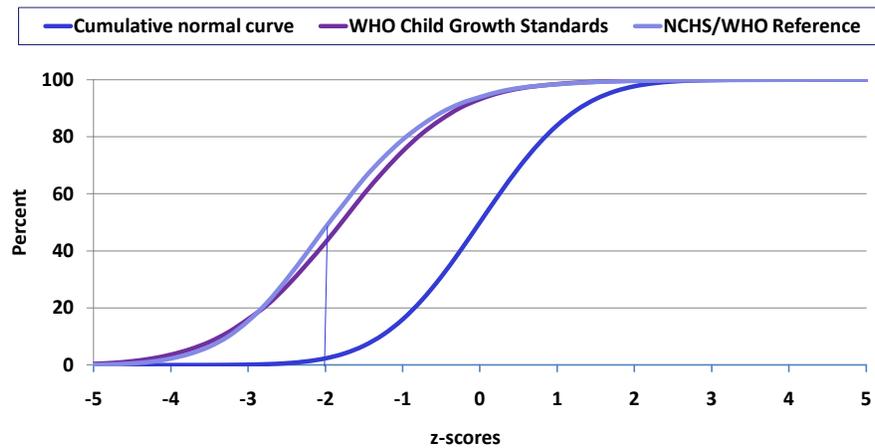
## Malnutrition Among Children Under Five Years Based on the WHO Child Growth Standards and the NCHS/WHO International Growth Reference



Prior to 2006, the nutritional status of preschool children was most often assessed in relation to an International Growth Reference Population established by the U.S. National Center for Health Statistics (NCHS) and endorsed by the World Health Organization (WHO). In 2006, WHO came out with new child growth standards, which have been adopted by the Government of India. The new standards are based on properly fed children with no significant morbidity in Brazil, Ghana, India, Norway, Oman, and the United States. The new standards use the breastfed child as the normative model for growth and development.

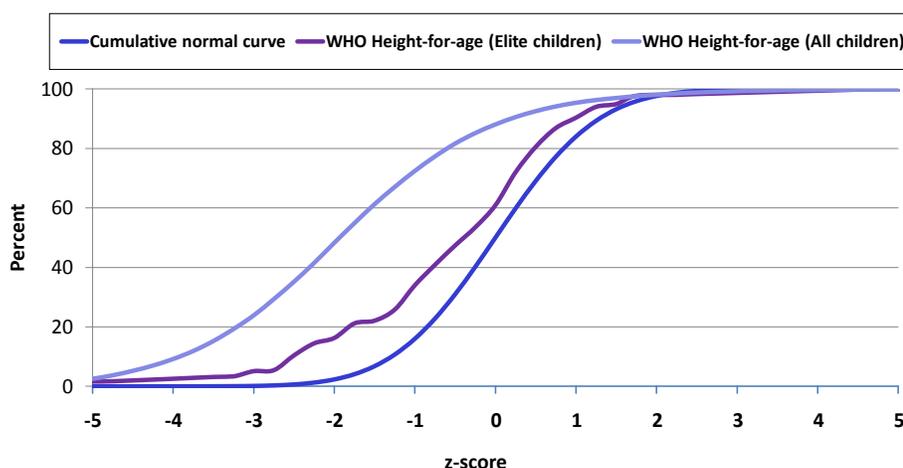
- Compared to the old NCHS/WHO growth reference, the new WHO growth standards estimate that a higher proportion of children are stunted and wasted and a lower proportion are underweight. However, under both standards, the level of malnutrition in India is remarkably high.

## Cumulative Distribution of Weight-for-Age Z-scores



- In a population with normal growth patterns for children (the blue line in the graph), about 2.3 percent of children under five years of age would be underweight (that is, more than two standard deviations below the median level that would be expected in a healthy, well-nourished population). In contrast, in India the percentage of children who are underweight is 19 times the expected level if measured by the WHO Child Growth Standards and 21 times the expected level if measured by the NCHS/WHO International Reference Population. At almost every level of the z-scores, the nutritional status of children in India is much worse than the expected level.
- The percentage of children who are stunted is also 19-21 times as high as would be expected in a healthy, well-nourished population (according to the international child growth standards) and the percentage of children who are wasted is 8-9 times the expected level, depending on which growth standard is used.

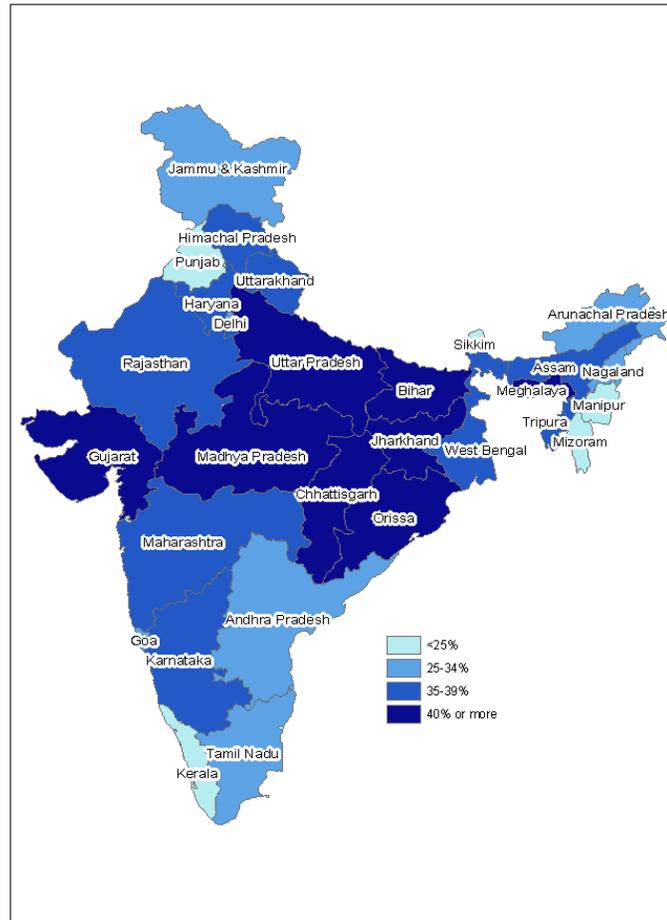
## Cumulative Distribution of Height-for-Age Z-scores of Elite Children



NFHS-3 data can be used to examine the extent to which children in India grow according to the WHO Child Growth Standards by selecting only children with elite characteristics and comparing them with children worldwide with normal growth patterns. Elite children are defined as children whose mothers and fathers have secondary or higher education, who live in households with electricity, a refrigerator, a TV, and an automobile or truck, who did not have diarrhoea or a cough or fever in the two weeks preceding the survey, who were exclusively breastfed if they were less than five months old, and who received complementary foods if they were at least five months old.

- When only elite children are selected, the line for the cumulative distribution of stunting moves most of the way over to the cumulative normal curve. Although the elite cumulative distribution is still to the left of the normal curve (indicating that even elite children are more likely to be stunted than are children in the WHO standard), the analysis suggests that when Indian children are allowed to reach their full genetic potential in a favourable environment when proper feeding practices are followed, they grow and develop at a much more normal rate than the average child growing up in India today. If the analysis had included additional variables that would permit elite children to be better defined, it is likely that the cumulative distribution would have moved even closer to the cumulative normal distribution.
- Arguments that have previously been put forward that Indian children are naturally much smaller than children elsewhere and that they are not necessarily undernourished cannot be sustained in light of this analysis and similar research.

## Percentage of Children Under Five Years Who Are Underweight



Nutritional problems are substantial in every state in India.

- The proportion of children under age five years who are underweight ranges from 20 percent in Sikkim and Mizoram to 60 percent in Madhya Pradesh. In addition to Madhya Pradesh, more than half of young children are underweight in Jharkhand and Bihar. Other states where more than 40 percent of children are underweight are Meghalaya, Chhattisgarh, Gujarat, Uttar Pradesh, and Orissa.
- In Meghalaya, Madhya Pradesh, and Jharkhand, more than one in every four children is severely underweight.
- Although the prevalence of underweight is relatively low in Mizoram, Sikkim, and Manipur, even in those states more than one-third of children are stunted.
- Wasting is most common in Madhya Pradesh (35 percent), Jharkhand (32 percent), and Meghalaya (31 percent).

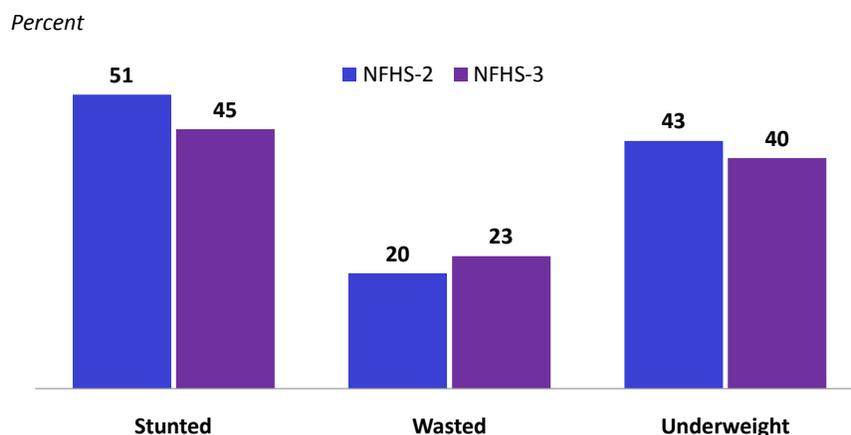
## Nutritional Status of Children Under Five Years by City and Slum/Non-slum Area

City/area	Percent stunted	Percent wasted	Percent underweight	City/area	Percent stunted	Percent wasted	Percent underweight
<b>Delhi</b>	41	15	27	<b>Kolkata</b>	28	15	21
Slum	51	15	35	Slum	33	17	27
Non-slum	38	16	24	Non-slum	23	14	16
<b>Chennai</b>	25	19	23	<b>Meerut</b>	44	10	28
Slum	28	23	32	Slum	46	9	26
Non-slum	25	18	21	Non-slum	42	10	30
<b>Hyderabad</b>	32	9	20	<b>Mumbai</b>	45	16	33
Slum	32	11	26	Slum	47	16	36
Non-slum	32	9	18	Non-slum	42	16	26
<b>Indore</b>	33	29	39	<b>Nagpur</b>	35	17	34
Slum	40	34	50	Slum	48	18	42
Non-slum	31	28	37	Non-slum	27	16	28

The NFHS-3 survey design permits an examination of the nutritional status of children for each of eight cities and for slum and non-slum areas in those cities (Delhi, Chennai, Hyderabad, Indore, Kolkata, Meerut, Mumbai, and Nagpur).

- Among the eight cities, the prevalence of underweight is highest in Indore (39 percent) and lowest in Hyderabad and Kolkata (20-21 percent). In every city except Meerut, underweight is much more prevalent in slum areas than non-slum areas. However, even in non-slum areas of the eight cities, the prevalence of underweight is substantial (16-37 percent). In Indore, half of the children in slum areas are underweight and 19 percent are severely underweight.
- More than 4 out of every 10 children in Mumbai, Meerut, and Delhi are stunted. Stunting is generally higher in slum areas than non-slum areas, but there is almost no difference in Hyderabad, and the differences are relatively small in Chennai, Meerut, and Mumbai.
- The prevalence of wasting is extremely high in both slum and non-slum areas of Indore. The slum/non-slum differentials in wasting are small in most cities.

## Trends in Malnutrition Among Children Under Three Years



Despite efforts to improve the nutritional status of young children, especially through the Integrated Child Development Services (ICDS) programme, there has not been much improvement in the nutritional status of children under three years of age in recent years.

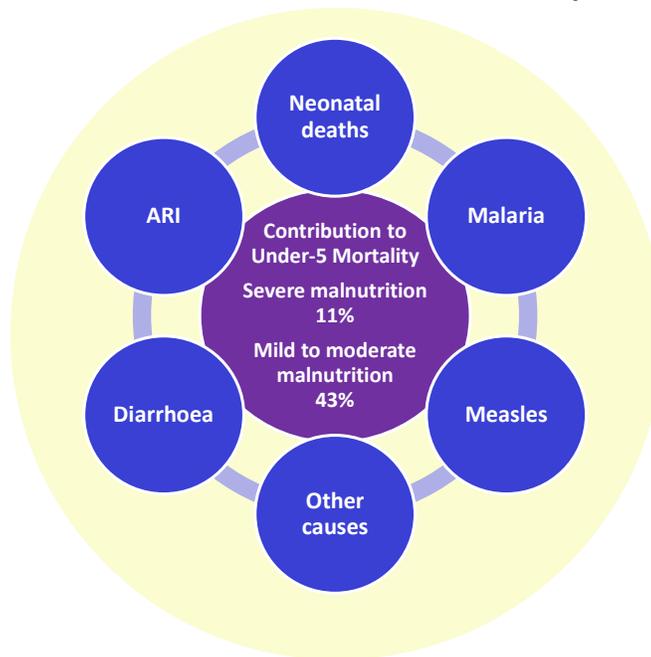
- The percentage of children who are too short for their age (stunted) decreased by less than one percentage point per year over the seven years between the two surveys, from 51 percent in NFHS-2 to 45 percent in NFHS-3.
- The percentage of children who are underweight also decreased, but only by three percentage points. Over this period, the percentage of underweight children decreased by 4 percentage points in urban areas, but by less than 2 percentage points in rural areas.
- Wasting (low weight-for-height) among young children has actually become somewhat worse over time, increasing from 20 percent in NFHS-2 to 23 percent in NFHS-3. The increase in wasting is a consequence of the fact that there was a somewhat greater improvement in stunting than in underweight during this period.

---

Note: The estimates of malnutrition for each of the three indicators are based on children under three years of age born to ever-married women because that is the only group of children weighed and measured in NFHS-2.

---

## Poor Nutrition as a Contributing Factor to Under-Five Mortality



In developing countries, under-five mortality is largely a result of infectious diseases and neonatal deaths. Undernutrition is an important factor contributing to the death of young children. If a child is malnourished, the mortality risk associated with respiratory infections, diarrhoea, malaria, measles, and other infectious diseases is increased.

Formulas developed by Pelletier et al.<sup>1</sup> are used to quantify the contributions of malnutrition to under-five mortality.

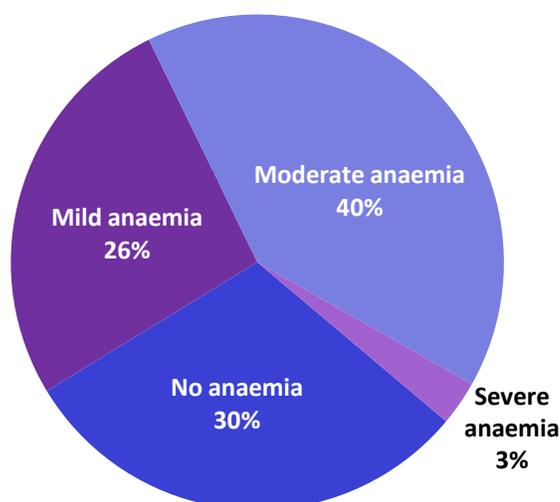
- More than half (54 percent) of all deaths before age five years in India are related to malnutrition.
- Because of its extensive prevalence in India, mild to moderate malnutrition contributes to more deaths (43 percent) than severe malnutrition (11 percent).

---

Footnote:

<sup>1</sup> Pelletier, D.L., E.A. Frongillo, Jr., D.G. Schroeder, and J.P. Habicht. 1994. A methodology for estimating the contribution of malnutrition to child mortality in developing countries. *Journal of Nutrition* 124 (10 Suppl.): 2106S-2122S.

## Anaemia Among Children Age 6-59 Months



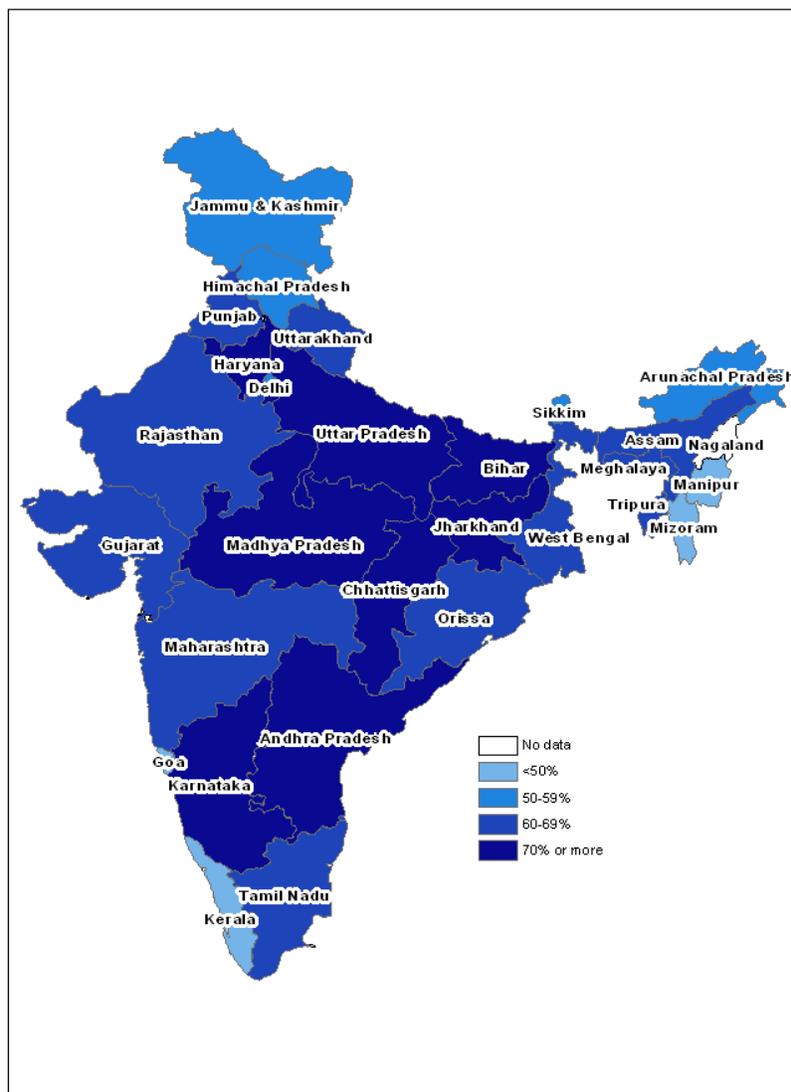
Note: Prevalence of anaemia is adjusted for altitude.

In NFHS-3, anaemia in children was measured in the field with a drop of blood from a finger stick using the HemoCue HB201+ analyzer. Three levels of anaemia were distinguished based on the level of haemoglobin: mild anaemia (10.0-10.9 grams/decilitre), moderate anaemia (7.0-9.9 g/dl), and severe anaemia (less than 7.0 g/dl).

Anaemia is characterized by the lack of an adequate amount of haemoglobin in the blood. A low level of haemoglobin interferes with the ability of the blood to carry oxygen from the lungs to other organs and tissues. Anaemia in young children results in increased morbidity from infectious diseases, and it can result in impairments in coordination, cognitive performance, behavioural development, language development, and scholastic achievement. Anaemia can be caused by a nutritional deficiency of iron and other essential minerals and vitamins, as well as infections such as malaria and sickle cell disease.

- Seven out of every 10 children age 6-59 months in India are anaemic.
- Three percent of children age 6-59 months are severely anaemic, 40 percent are moderately anaemic, and 26 percent are mildly anaemic.
- Anaemia testing was not conducted in Nagaland due to local opposition to blood collection.

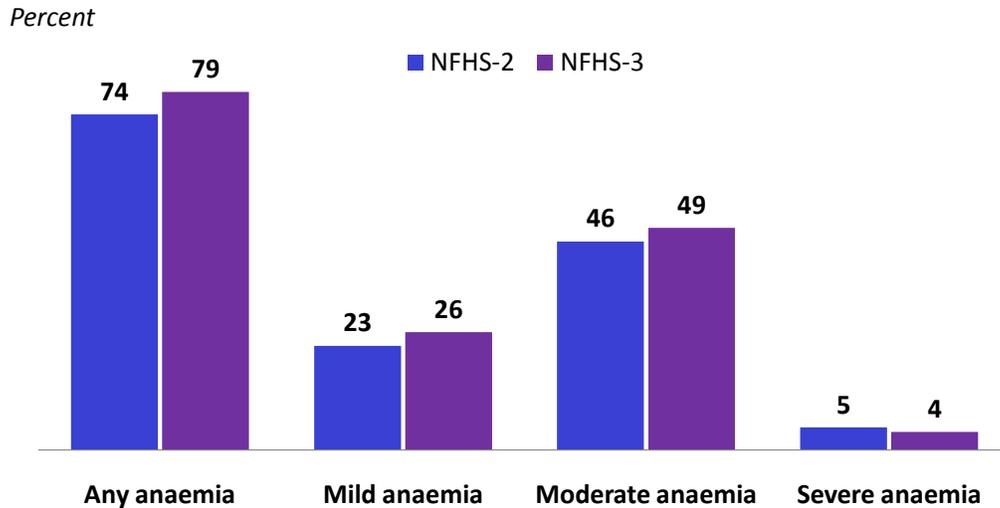
## Percentage of Children Age 6-59 Months Who Are Anaemic



Anaemia among children is widespread throughout India.

- The prevalence of anaemia varies from 38 percent in Goa to 78 percent in Bihar. More than half of young children in 24 states have anaemia, including 11 states where more than two-thirds of children are anaemic.
- Seven percent of children in Rajasthan and Punjab are severely anaemic, more than twice the level in India as a whole.
- Almost half of children in Uttar Pradesh, Bihar, Chhattisgarh, Andhra Pradesh, Madhya Pradesh, Rajasthan, and Haryana are moderately or severely anaemic.

## Trends in Anaemia Among Children Age 6-35 Months

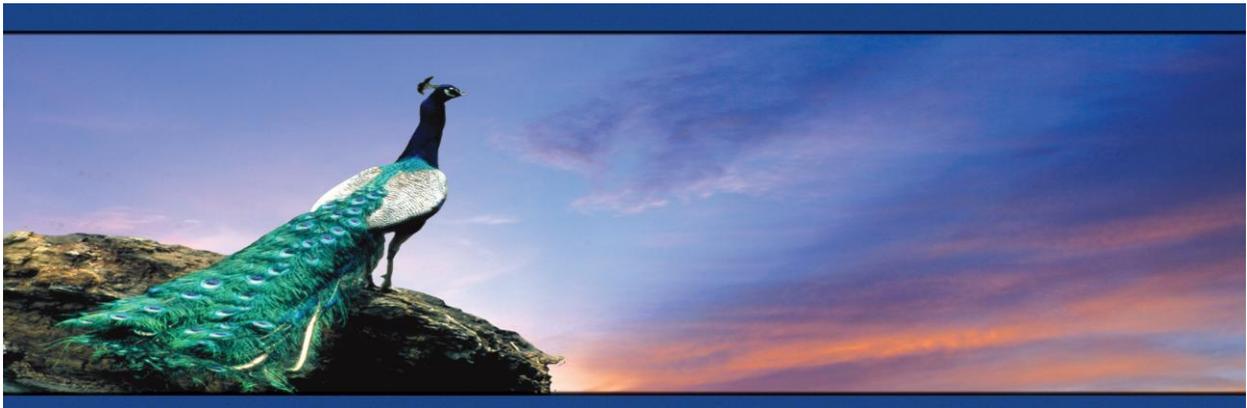


Note: Prevalence of anaemia is adjusted for altitude. Estimates of anaemia trends are based on children under three years of age born to ever-married women.

Anaemia among children under three years old was found to be extremely widespread at the time of NFHS-2, and the prevalence of anaemia actually increased further between NFHS-2 and NFHS-3.

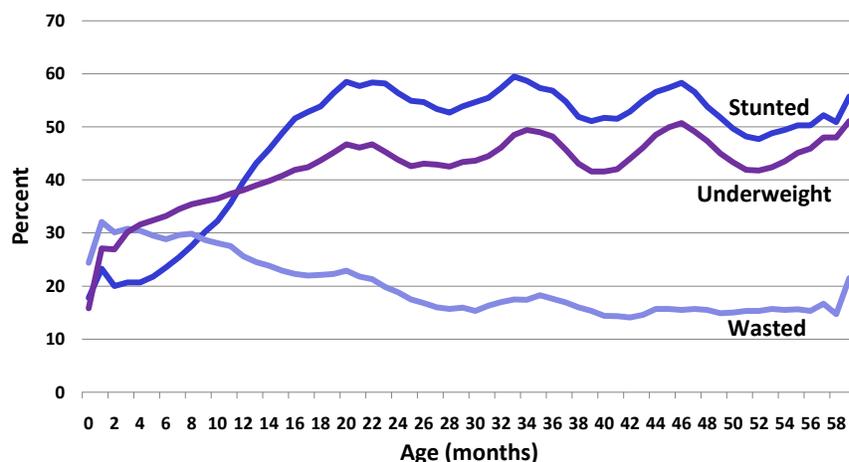
- The percentage of children with any anaemia increased from 74 percent in NFHS-2 to 79 percent in NFHS-3.
- In the period between the two surveys, there was an increase in the prevalence of mild anaemia (from 23 percent to 26 percent) and moderate anaemia (from 46 percent to 49 percent).
- Severe anaemia, which is of particular concern because of its close relationship to children's health, decreased from 5 percent to 4 percent during this period.





# **NUTRITIONAL STATUS OF CHILDREN BY BACKGROUND CHARACTERISTICS**

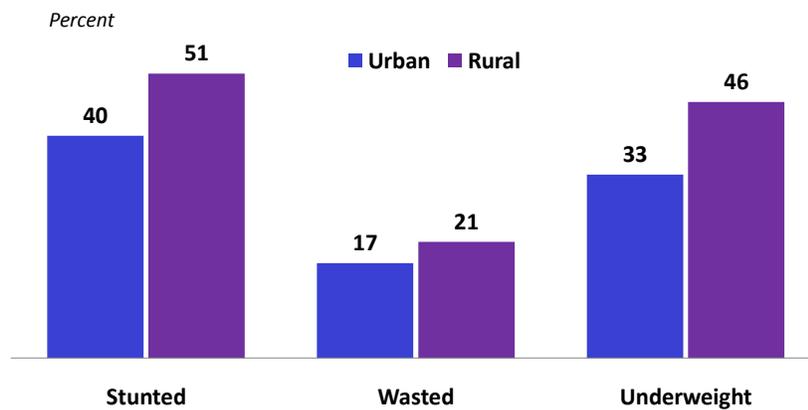
## Stunting, Wasting, and Underweight Among Children Under Five Years by Age



Nutritional deficiencies in India are evident right from the time of birth, and stunting and underweight rise rapidly in the first two years of life.

- The proportion of children stunted rises sharply from 0 to 20 months of age, peaking at 59 percent. Thereafter, the proportion of children fluctuates between 48 percent and 60 percent.
- The proportion of children who are underweight also rises rapidly for the first 20 months of life to 47 percent. At older ages, the proportion underweight has a similar pattern of fluctuation as observed for stunting, but at a lower level.
- The proportion of children wasted rises from 24 percent in the first month of life to 32 percent at one month of age, and generally declines thereafter. About one out of every six children age 38-57 months is wasted. The decline in wasting with age is a result of the more rapid increase in stunting than in underweight with increasing age.
- The first two years of life is a critical period in the growth and development of children, but it is clear that nutritional deficiencies generally worsen during that period. In response to this age pattern found in earlier NFHS surveys as well, the Government of India reoriented its Integrated Child Development Services (ICDS) programme, expanding the programme from its almost exclusive focus on children age 3-6 years to include younger children. However, children in India continue to suffer from serious nutritional problems during the early childhood years.

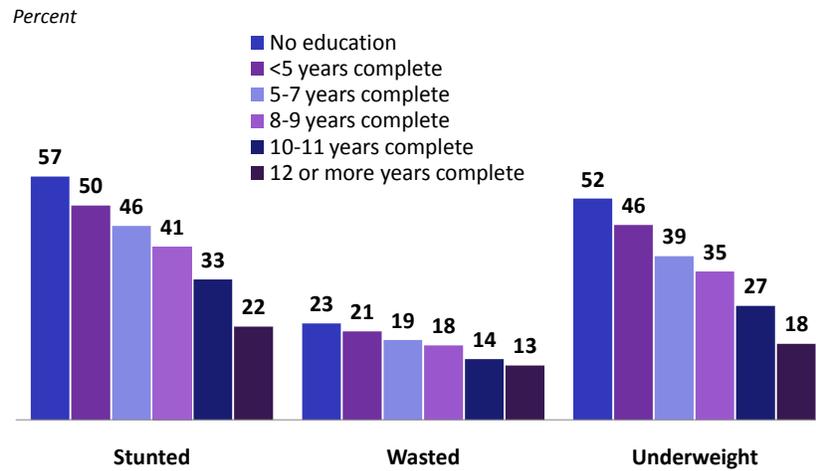
## Stunting, Wasting, and Underweight Among Children Under Five Years by Residence



According to all three measures of nutritional status, the lack of proper nutrition in India is a particularly serious problem in rural areas.

- In rural areas, half of young children are stunted, almost half are underweight, and one out of every five is wasted.
- Although nutritional deficiencies are lower in urban areas than in rural areas, even in urban areas undernutrition is very widespread. In urban areas, 40 percent of young children are stunted, one-third are underweight, and 17 percent are wasted.
- Among the three measures of nutritional status, the differential in prevalence between urban and rural areas is most prominent for the prevalence of underweight children. Children in rural areas are almost 40 percent more likely to be underweight than children in urban areas. The prevalence of stunting is 28 percent higher in rural areas than in urban areas.

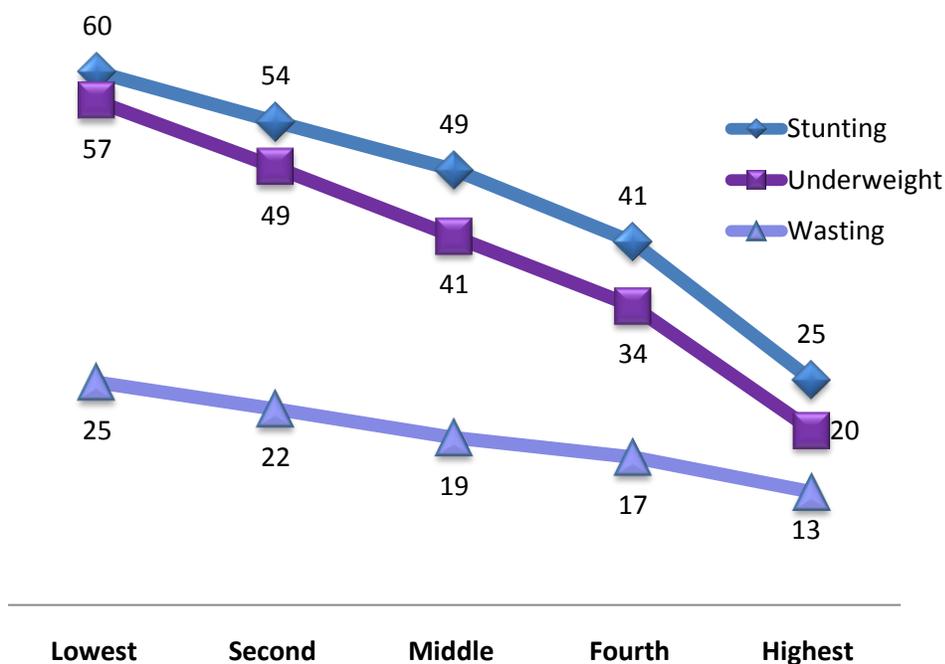
## Stunting, Wasting, and Underweight Among Children Under Five Years by Mother's Education



Good child care practices are influenced by the mother's education. In India, 49 percent of mothers of children under five years of age have never attended school and only 9 percent have completed 12 or more years of schooling.

- Maternal education has a strong inverse relationship with all three measures of nutritional status. For every measure of nutritional status, nutritional deficiencies decrease steadily with rising education of the mother.
- The percentage of children who are underweight is almost three times as high for children whose mothers have no education than for children whose mothers have completed at least 12 years of education. The educational differentials are almost as large for stunting.

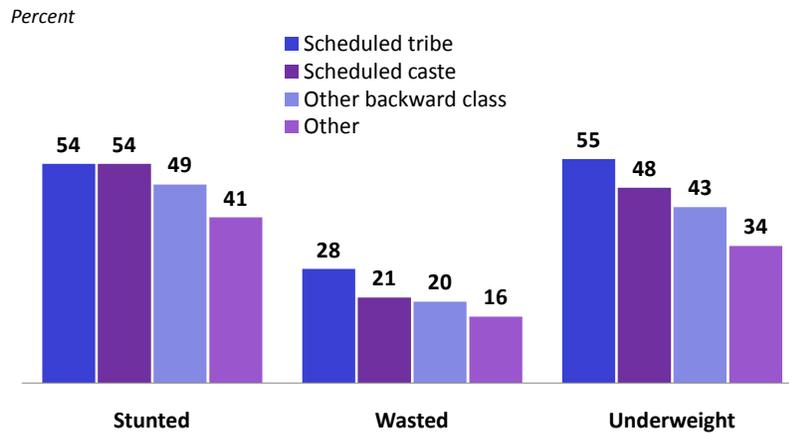
## Stunting, Wasting, and Underweight Among Children Under Five Years by Household Wealth



The economic status of households in NFHS-3 is determined by constructing a wealth index that uses data on different household assets and housing characteristics. Households are ranked on the basis of the wealth index and individuals in the households are divided into quintiles according to the household's wealth. Households in the highest wealth quintile are not necessarily wealthy in monetary terms, but they are better off socioeconomically than four-fifths of the population in India.

- There is a strong inverse relationship between undernutrition in children and the level of wealth of the households that they live in.
- Six out of 10 children living in the poorest households (households in the lowest wealth quintile) are stunted and almost as many are underweight.
- However, even in the wealthiest households (households in the highest wealth quintile), one-quarter of children are stunted and one-fifth are underweight.

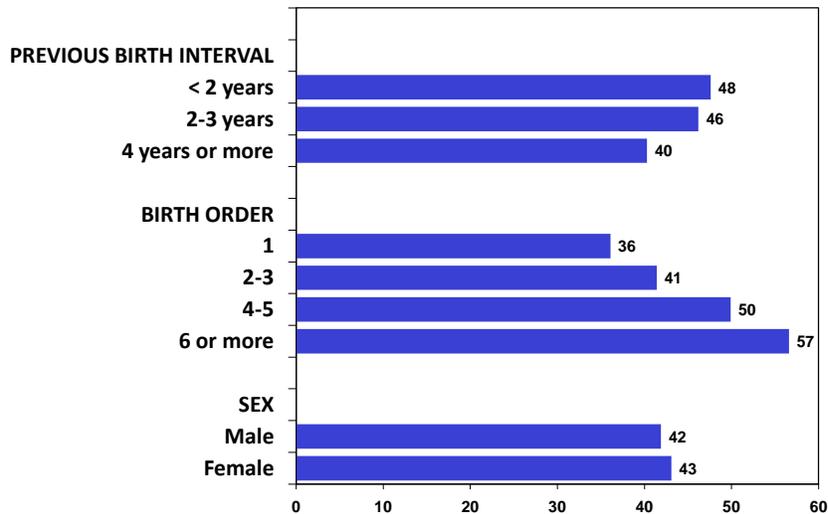
## Stunting, Wasting, and Underweight Among Children Under Five Years by Caste/Tribe



Nutritional deficiencies are more prevalent among disadvantaged groups.

- Young children from scheduled tribes and scheduled castes are more likely to be stunted, wasted, and underweight than children from other castes/tribes.
- Children from other backward classes fall in the middle of the scale on all three measures of nutritional status.
- Children who do not belong to any of the above disadvantaged groups are least likely to be stunted, wasted, and underweight. However, even for this group, the levels of undernutrition are extremely high relative to the levels expected in a normal, healthy population.

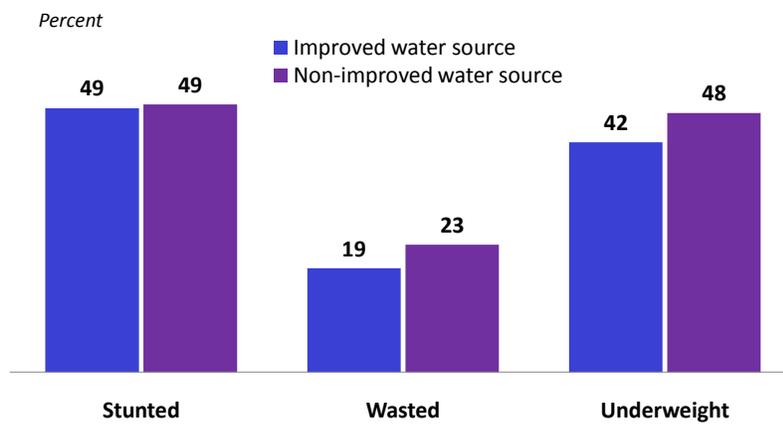
## Percentage of Children Under Five Years Who Are Underweight by Demographic Characteristics



This figure examines the relationship between the prevalence of underweight children and demographic characteristics.

- Children who are born within four years of a previous birth are somewhat more likely to be underweight than are children who are born after an interval of four years or more.
- Children of higher birth orders are much more likely to be underweight than children of lower birth orders. The proportion of children who are underweight ranges from 36 percent for first-order births to 57 percent for sixth and higher order births.
- Despite the strong preference for sons in India, girls and boys are about equally likely to be underweight. The lack of a sex differential in nutritional deficiencies was also found for the measures of stunting and wasting.

## Stunting, Wasting, and Underweight Among Children Under Five Years by Source of Drinking Water



**Note:**

**Improved water source:** piped into dwelling, piped into yard or plot, public tap or standpipe, tube well or borehole, protected dug well, protected spring, rainwater

**Non-improved water source:** unprotected dug well, unprotected spring, tanker truck, surface water

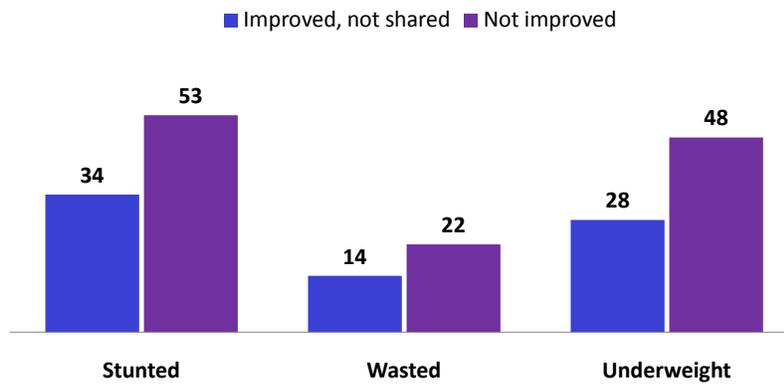
Environmental factors also affect the growth and development of children. A household's source of drinking water is often linked to its socioeconomic status. Poor households are more likely to obtain their drinking water from contaminated water sources such as surface water or unprotected wells. The risks of food contamination, diarrhoeal disease, and malnutrition are higher when a household does not have access to an improved water source. Infants and young children from households that do not have access to an improved water source are at a greater risk of being malnourished than those from households with an improved water source.

- Children whose drinking water is from a non-improved water source are more likely to be underweight and wasted than children with access to an improved water source.
- The level of stunting does not vary by water source. This may be related to the fact that stunting is an indicator of the long-term effects of malnutrition and it does not vary according to recent dietary intake or diarrhoeal disease.

Combining different water sources into improved and unimproved sources masks the distinctions between individual water sources. For all three measures of the nutritional status of children, nutritional deficiencies are most prevalent in households that obtain their drinking water from wells, tube wells, and surface water, much less prevalent in households that use piped water, and least prevalent in households that use bottled water or water from a tanker truck.

## Stunting, Wasting, and Underweight Among Children Under Five Years by Type of Toilet Facility

Percent

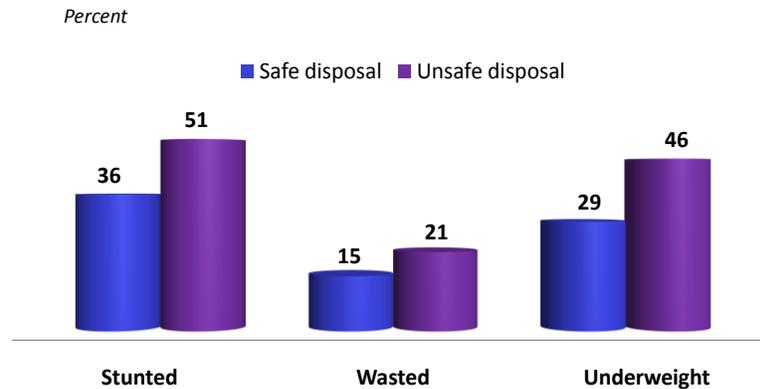


**Improved facility:** Flush or pour flush toilet to sewer system, septic tank, or pit latrine; ventilated improved pit (VIP) latrine; pit latrine with slab; twin pit or composting toilet  
**Not improved:** pour or pour flush not to sewer system, septic tank, or pit latrine; pit latrine without a slab/open pit; dry toilet; no facility/open defecation; any facility that is shared

The type of toilet facility that members of a household use is strongly related to malnutrition among young children. Poor households are more likely not to have any toilet facility or to use unimproved facilities. In addition, the use of improved facilities reduces the risk of contracting diarrhoeal diseases. In India, more than half of households (55 percent) do not have any toilet facility and household members practice open defecation. An additional 15 percent of households use non-improved toilet facilities. Only 3 out of every 10 households use an improved toilet facility that is not shared with other households.

- Young children in households that use improved toilet facilities are much less likely than other children to be stunted, wasted, and underweight.
- For example, almost half of children in households without improved toilet facilities are underweight, compared with only 28 percent of children in households with improved toilet facilities. More than half of children in households without improved toilet facilities are stunted, compared with 34 percent in households with improved toilet facilities.

## Stunting, Wasting, and Underweight Among Children Under Five Years by the Method of Disposal of Children's Stools



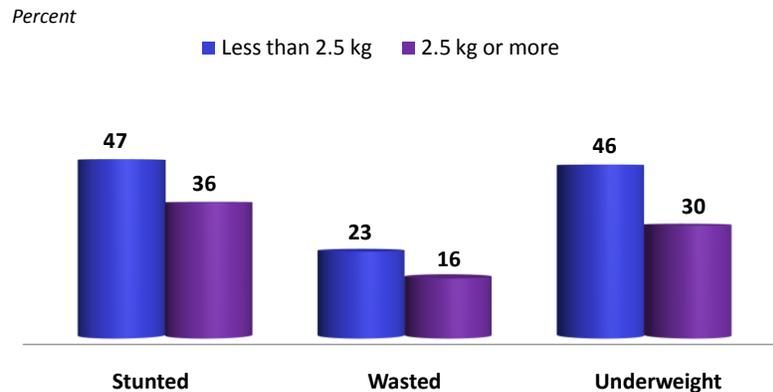
Note: Percentages are based on the youngest child under five years of age living with the mother. Disposal of stools is considered safe if the child used a toilet or latrine, if the stools were put or rinsed into a toilet or latrine, or if the stools were buried.

Unsafe disposal of children's stools can spread disease, including diarrhoeal disease, by direct contact with the stools or animal transmission. In India, the stools of 79 percent of young children are not disposed of safely.

- Children whose stools are disposed of in an unsafe way are much more likely than other children to suffer from nutritional deficiencies according to all three measures of nutritional status.
- Almost half of children whose stools are disposed of unsafely are underweight, compared with only 29 percent of children whose stools are disposed of hygienically.
- More than half of children whose stools are disposed of unsafely are stunted, compared with just over one-third of children whose stools are disposed of hygienically.

The differentials in nutritional deficiency by the method of disposal of the child's stools are almost the same as the differentials by the type of toilet facility the members of the household use.

## Stunting, Wasting, and Underweight Among Children Under Five Years by the Child's Weight at the Time of Birth

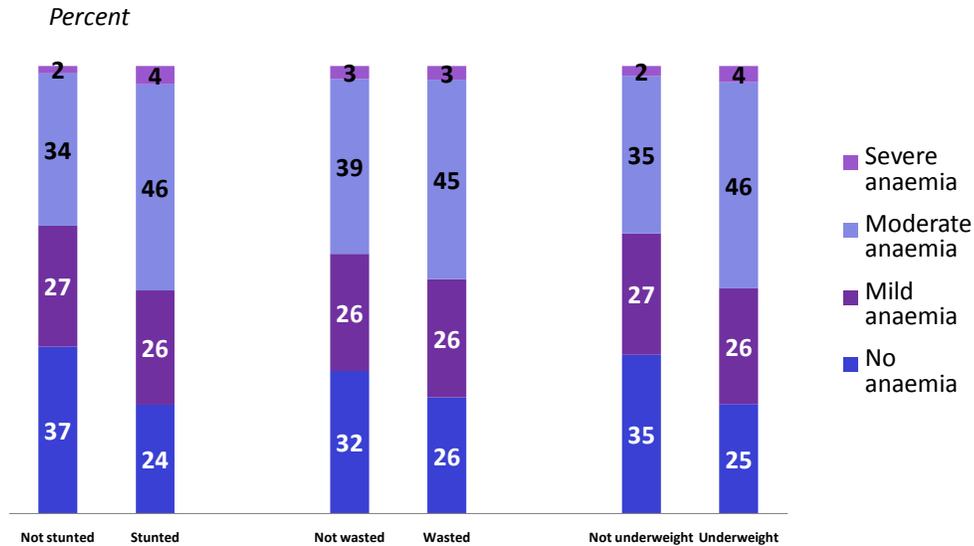


Note: Excludes children whose birth weight is not known.

In India, most children are not weighed at the time of birth. Only 34 percent of children born in the five years before the survey had a birth weight reported by the mother. More than one-fifth of children whose weight was reported had a low birth weight (lower than 2.5 kg). Birth weight is an important indicator of a child's risk of childhood illnesses.

- Children with a low birth weight are much more likely than other children to be malnourished as they grow up. Almost half of children with a low birth weight are currently stunted or underweight, compared with about one-third of children with a birth weight of 2.5 kg or more.
- Children who were not weighed at the time of birth, but were reported by the mother to be smaller than average in size at the time of birth, have a very high risk of being malnourished. For example, fifty-eight percent of these children are stunted.
- The lasting adverse effects of low birth weight on children's nutritional status make it imperative that steps be taken to avoid the delivery of low birth weight babies through proper care and nutrition for mothers during pregnancy.

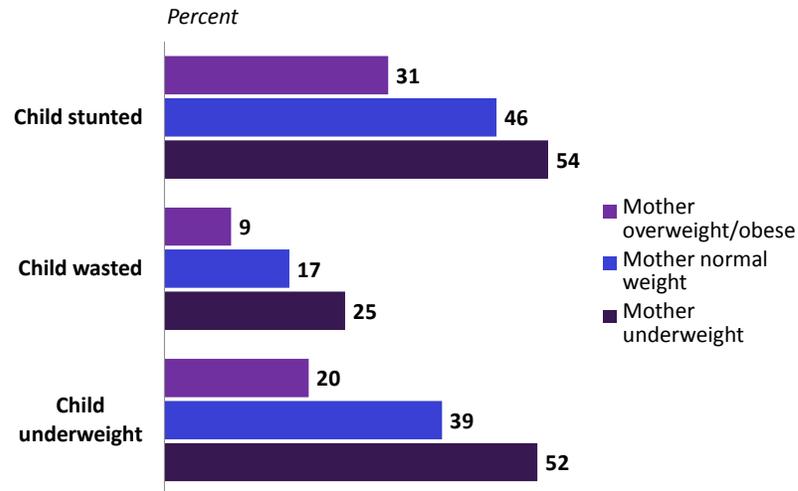
## Anaemia Status of Children Age 6-59 Months by Whether or Not They Are Malnourished



Micronutrient deficiency, particularly an inadequate intake of iron, has a direct impact on the nutritional status of young children and is the most common cause of anaemia.

- Children who are stunted, wasted, or underweight are much more likely than other children to suffer from moderate to severe anaemia.
- Half of young children who are stunted or underweight are moderately or severely anaemic, compared with 36-37 percent of those who are not stunted or underweight.

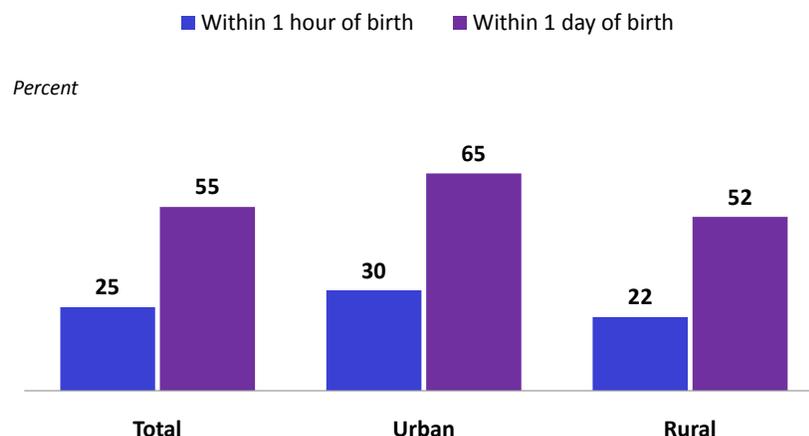
## Stunting, Wasting, and Underweight Among Children Under Five Years by Mother's Nutritional Status



The nutritional status of children is strongly related to the nutritional status of their mothers.

- Children whose mothers are underweight (with a body mass index less than 18.5 kg/m<sup>2</sup>) are much more likely than other children to be stunted, wasted, and underweight.
- On the other hand, children whose mothers are overweight are least likely to be undernourished.

## Timing of Initiation of Breastfeeding

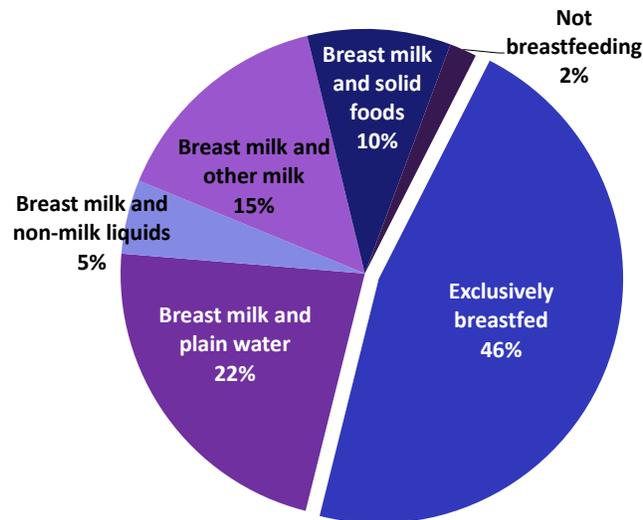


Note: The estimates are based on last-born ever-breastfed children in the last five years whether the children are living or dead at the time of the survey.

The Government of India recommends that breastfeeding should begin immediately after childbirth, preferably within one hour of delivery. It is important to breastfeed the child right after birth because the first breast milk (called colostrum) is highly nutritious and contains antibodies that help protect the newborn child from diseases.

- Although almost all children in India have been breastfed (96 percent), breastfeeding typically begins much later than recommended. Overall, only one-quarter of children are breastfed within the first hour of birth and slightly more than half are breastfed within one day of birth.
- Although the early initiation of breastfeeding is more common in urban areas than in rural areas, even in urban areas, 7 out of every 10 children are not breastfed within the first hour after birth.
- It is also recommended that children should not be given anything to drink or eat before the initiation of breastfeeding, not even plain water. However, most mothers (57 percent) gave their babies something other than breast milk to drink in the first three days after birth. The most common “prelacteal” liquid given to babies is milk other than breast milk, followed by honey, sugar or glucose water, and plain water. Honey is often given to the baby as part of a blessing ceremony.

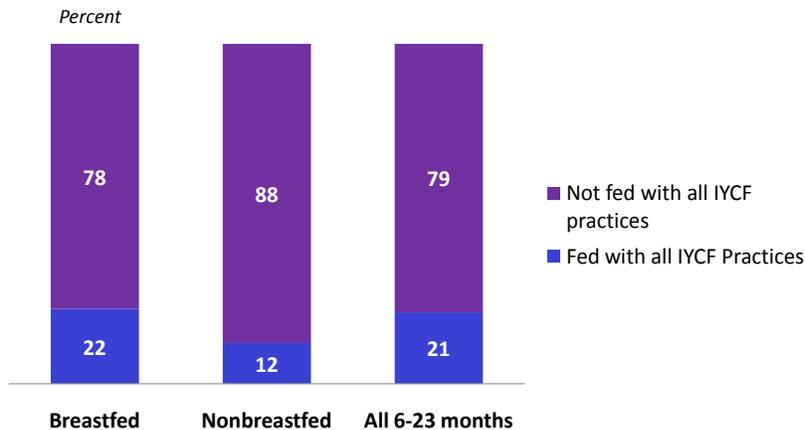
## Feeding Practices of Infants Under Six Months



Improper feeding practices and diarrhoeal disease are important determinants of malnutrition. The Government of India recommends that children should be exclusively breastfed for the first six months of life (that is, they should be given only breast milk with no other liquids or food). There are many reasons for recommending exclusive breastfeeding for the first six months. First, breast milk is nutritionally superior to other liquids and solid foods. Second, when a child consumes other liquids and solid foods, the intake of breast milk is reduced, which in turn decreases the mother's supply of milk. Third, feeding young infants liquids and solid foods increases their exposure to pathogens, putting them at greater risk of contracting diarrhoeal disease.

- In India, the introduction of liquids and solid or semi-solid foods often takes place before the recommended age of six months. Less than half of children under six months of age are exclusively breastfed. Exclusive breastfeeding drops to only 28 percent for children age 4-5 months.
- In addition to breast milk, 22 percent of children under six months of age are given plain water, 15 percent are given milk, 5 percent are given liquids other than water or milk, and 10 percent are given solid or semi-solid food.
- Only 2 percent of infants under six months of age are not being breastfed.

## Infant and Young Child Feeding (IYCF) Practices of Children Age 6-23 Months



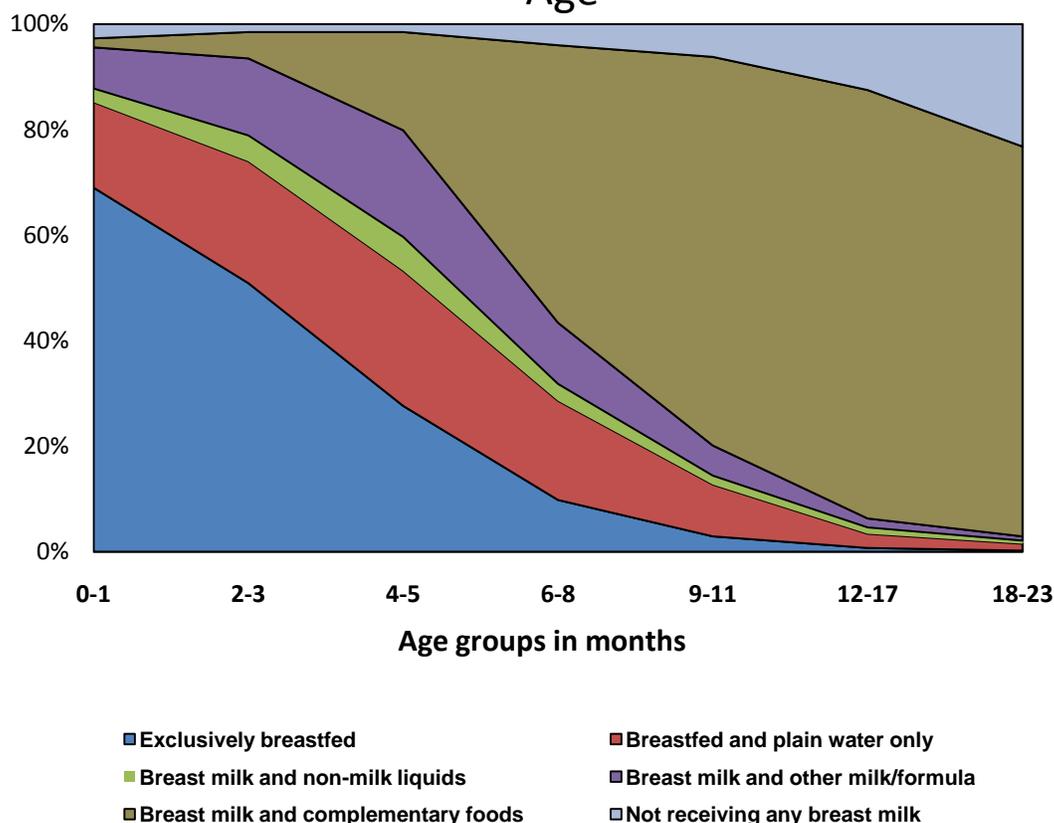
In 2008, the World Health Organization published a standard set of recommended feeding practices for infants and young children, based on the recommendations of the WHO Global Consensus Meeting on Indicators of Infant and Young Child Feeding<sup>1</sup>. For children age 6-23 months, they developed a summary IYCF indicator to measure the minimum acceptable diet for children in that age group. The indicator is based on continued breastfeeding or feeding with appropriate calcium-rich foods if not breastfed; the consumption of solid, semi-solid, or soft food for a minimum number of times per day according to age and breastfeeding status; and the inclusion in the diet of foods from a minimum number of food groups per day according to breastfeeding status.

- Overall, only 21 percent of children age 6-23 months are fed according to all three IYCF recommended practices.
- Twenty-two percent of *breastfed* children age 6-23 months are fed according to all IYCF recommended practices.
- Only 12 percent of *nonbreastfed* children age 6-23 months are fed according to all IYCF recommended practices.

---

<sup>1</sup>World Health Organization. 2008. Indicators for assessing infant and young child feeding practices: Conclusions of a consensus meeting held 6-8 November 2007 in Washington, DC, USA. Geneva: World Health Organization.

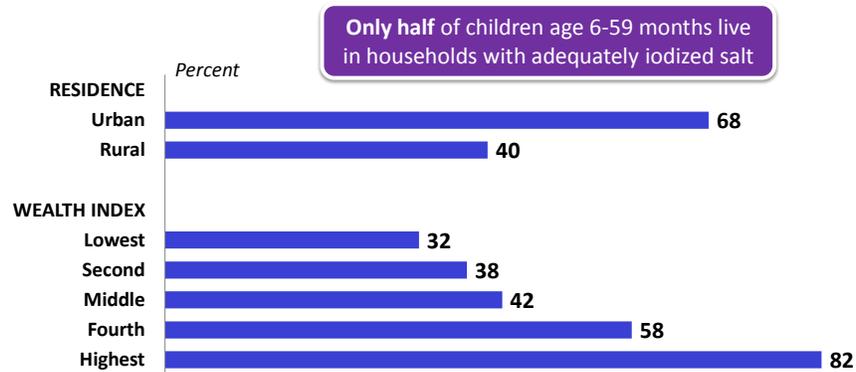
## Infant and Young Child Feeding Practices by Age



More detailed information on feeding practices for children under two years of age is shown in this figure.

- One-third of infants under two months of age are not being exclusively breastfed, primarily because they are given water or other milk in addition to breast milk.
- Some children are weaned before they are one year old and the pace of weaning accelerates beyond 12 months of age. More than one-fifth of children age 18-23 months are not being breastfed at all.
- Complementary foods are added to the diet at too young an age for many children. Almost one-fifth of children age 4-5 months are given complementary food, contrary to nutritional recommendations.

## Children Age 6-59 Months Living in Households with Adequately Iodized Salt by Residence and Household Wealth



Children and adults need an adequate amount of iodine in their diets to avoid getting iodine deficiency disorders (IDD). Iodine deficiency is known to cause goitre and cretinism (a severe form of neurological defect). Children with IDD can grow up stunted, apathetic, mentally retarded, and incapable of normal movement, speech, or hearing. IDD in pregnant women may cause miscarriage, stillbirth, and mental retardation in infants.

The consumption of salt that has been fortified with iodine can help prevent IDD. Proper packaging and storage of iodized salt is essential to ensure that the salt maintains an adequate concentration of iodine.

- In India, only half of children who are 6-59 months old live in households that use cooking salt containing an adequate level of iodine (at least 15 parts per million).
- Use of iodized salt is much higher in urban areas than in rural areas, but even in urban areas one-third of children do not live in households using adequately iodized salt.
- The use of iodized salt rises rapidly with household wealth. Most children in households in the fourth wealth quintile live in households with adequately iodized salt, as do more than 4 out of 5 children living in households in the highest wealth quintile.

## Households Using Adequately Iodized Salt by State

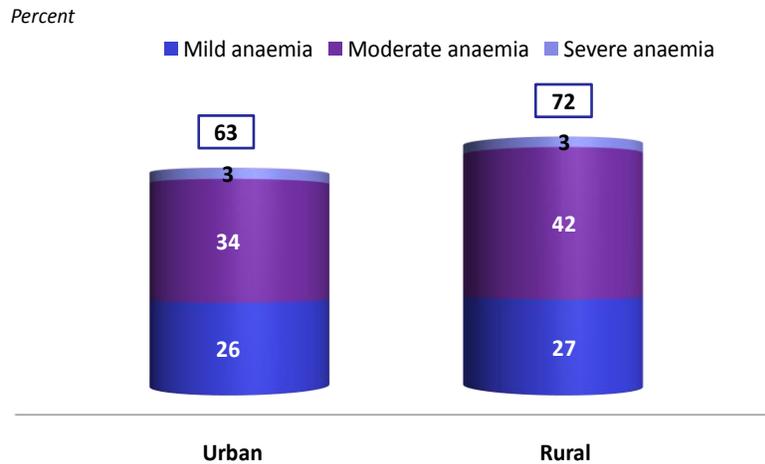
Less than 40 percent		40-59 percent	
Andhra Pradesh Madhya Pradesh	Uttar Pradesh Orissa	Rajasthan Tamil Nadu Karnataka Uttarkhand	Jharkhand Chhattisgarh Haryana Gujarat
60-79 percent		80 percent or higher	
Maharashtra Goa Bihar West Bengal Assam	Punjab Kerala Tripura Jammu & Kashmir Sikkim	Meghalaya Himachal Pradesh Nagaland Arunachal Pradesh	Mizoram Delhi Manipur

In the early 1980s, the Government of India advised every state and union territory to ban the sale of non-iodized salt meant for human consumption. The ban was lifted in 2000, but many states opted to keep their state ban on the sale of non-iodized salt in place. The ban on the sale of non-iodized salt was reimposed in 2005, but the 2005 regulation did not take effect until May, 2006 (after most of the NFHS-3 fieldwork had been completed).

At the time of NFHS-3, there were dramatic differences among the states in the use of adequately iodized salt at the household level. These differences reflect historical patterns, as well as factors such as the level of enforcement of regulations, the scale of salt production, transportation requirements, the pricing structure for iodized salt, and storage arrangements.

- Several states have achieved nearly universal levels of consumption of iodized salt, including Manipur, Delhi, and Mizoram.
- At the other end of the spectrum, less than 40 percent of households in Andhra Pradesh, Madhya Pradesh, Uttar Pradesh, and Orissa use adequately iodized salt. The household use of adequately iodized salt is lowest in Andhra Pradesh, where less than one-third of households use adequately iodized cooking salt.

## Anaemia Among Children Age 6-59 Months by Residence

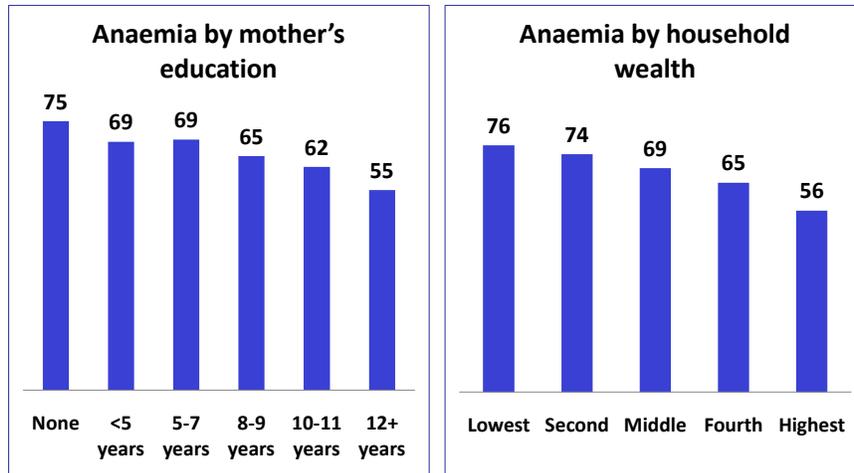


Note: Prevalence of anaemia is adjusted for altitude.

Anaemia is very widespread in both urban and rural areas in India.

- In rural areas, almost three-quarters of children age 6-59 months are anaemic. In urban areas, more than 6 in 10 children are anaemic.
- The difference in anaemia prevalence in urban and rural areas is almost entirely due to the higher prevalence of moderate anaemia in rural areas.
- There is no difference between urban and rural areas in the prevalence of severe anaemia (3 percent).

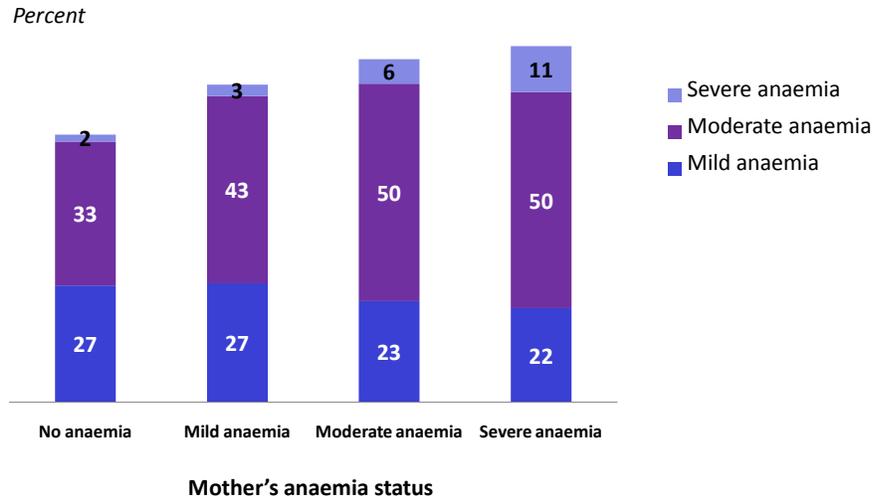
## Anaemia Among Children Age 6-59 Months by Mother's Education and Household Wealth



Both the mother's education and household wealth affect the prevalence of anaemia in children age 6-59 months.

- The prevalence of anaemia decreases from 75 percent among children whose mother has no education to 55 percent among children whose mother has 12 or more years of education.
- Anaemia decreases steadily from 76 percent among children in the poorest households to 56 percent among children in the wealthiest households.
- The decrease is more gradual for anaemia than it was for the indicators of stunting and underweight. Even in the highest education and wealth group, more than half of children are anaemic. This is a clear indication of how pervasive children's anaemia is in the population.

## Anaemia Status of Children Age 6-59 Months by Mother's Anaemia Status



An intergenerational examination of anaemia shows that the likelihood of a child being anaemic is strongly related to the mother's anaemia status.

- The prevalence of anaemia in children age 6-59 months increases steadily with the mother's level of anaemia, reaching 82 percent for children of mothers who are severely anaemic. All of the increase is in the moderate and severe categories of anaemia.
- One-third of children whose mothers are not anaemic are moderately anaemic, compared with half of children whose mothers are severely anaemic.
- Severe anaemia is rare for children whose mothers are not anaemic (2 percent). Children whose mothers are severely anaemic are more than six times as likely to be severely anaemic as children whose mothers are not anaemic.

## Vitamin A Supplementation for Children Age 12-35 Months

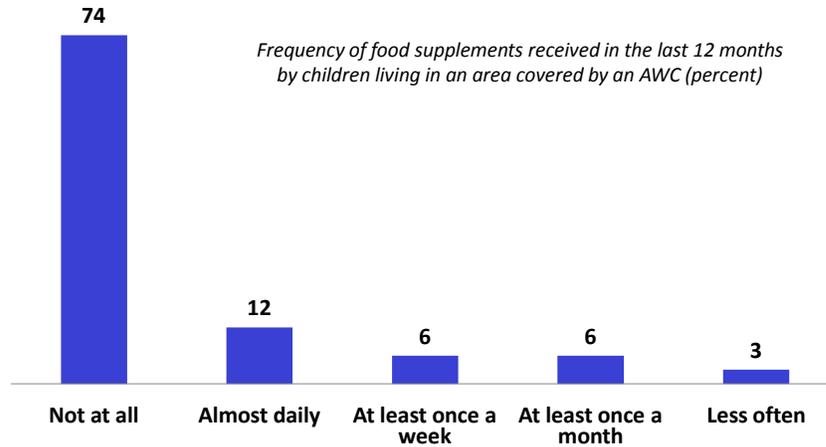
*Percent of youngest children given vitamin A supplements in the last six months*

Less than 20 percent		20-29 percent	
Uttar Pradesh Nagaland Chhattisgarh Manipur Haryana	Rajasthan Jammu & Kashmir Arunachal Pradesh Assam	Madhya Pradesh Delhi Uttarkhand Gujarat Punjab Meghalaya	Karnataka Sikkim Jharkhand Andhra Pradesh Orissa
30-39 percent		More than 40 percent	
Bihar Himachal Pradesh	Maharashtra	Tripura Goa Tamil Nadu	Kerala Mizoram West Bengal

Vitamin A is an essential micronutrient for the immune system and it helps to maintain the body's epithelial tissue. The Government of India recommends that children should be given vitamin A supplements every six months from age nine months to three years to avoid vitamin A deficiency (VAD). VAD can cause eye damage and can increase the severity of infections in children, such as diarrhoeal diseases and measles.

- Overall, only one-quarter of children age 12-35 months were given any vitamin A supplements in the six months preceding the NFHS-3 survey.
- There is no state in which more than half of children were given vitamin A supplements in the last six months. The states with the most successful supplementation programmes are West Bengal, Mizoram, and Kerala.
- In 9 states, less than 20 percent of children were given vitamin A supplements. In Uttar Pradesh and Nagaland, not even 1 out of every 10 children received vitamin A supplementation during the last six months.

## Supplementary Food Received from an *Anganwadi* Centre (AWC) by Children Under Six Years



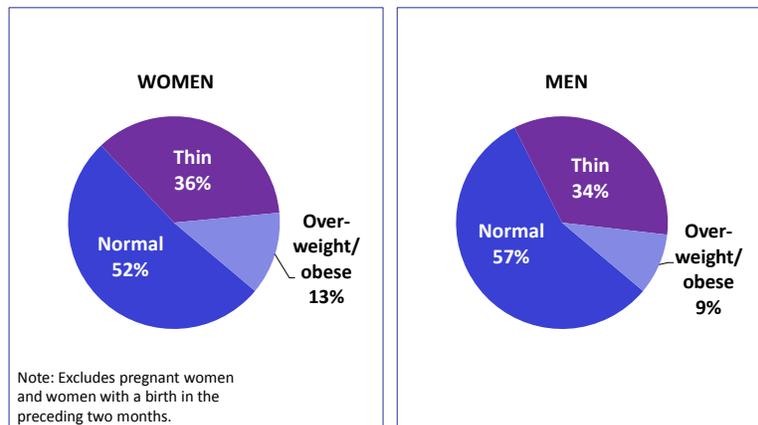
The main programme of the Government of India to provide nutrition services for preschool children is the Integrated Child Development Services (ICDS) programme, established in 1975. The programme is implemented through a network of community-level *anganwadi* centres (AWC). Supplementary feeding and growth monitoring are essential components of the programme. Supplementary food includes both food served at the *anganwadi* centre daily and food given in the form of take home rations. Although more than four-fifths of children under age six years lived in enumeration areas covered by an *anganwadi* centre at the time of NFHS-3, only 28 percent of children received any service from an *anganwadi* centre in the 12 months preceding the survey.

- Among children under six years old who live in areas covered by an *anganwadi* centre, only 26 percent received food supplements from an AWC at any time in the 12 months preceding the survey. Among those who received food supplements, one-third received supplements less than once a week.
- Among children under five years old who live in areas covered by an *anganwadi* centre, only one-fifth were weighed at an AWC at any time in the last 12 months. Among those who were weighed, half of their mothers did not receive counselling from an AWC after the child was weighed.



# **NUTRITIONAL STATUS OF WOMEN AND MEN**

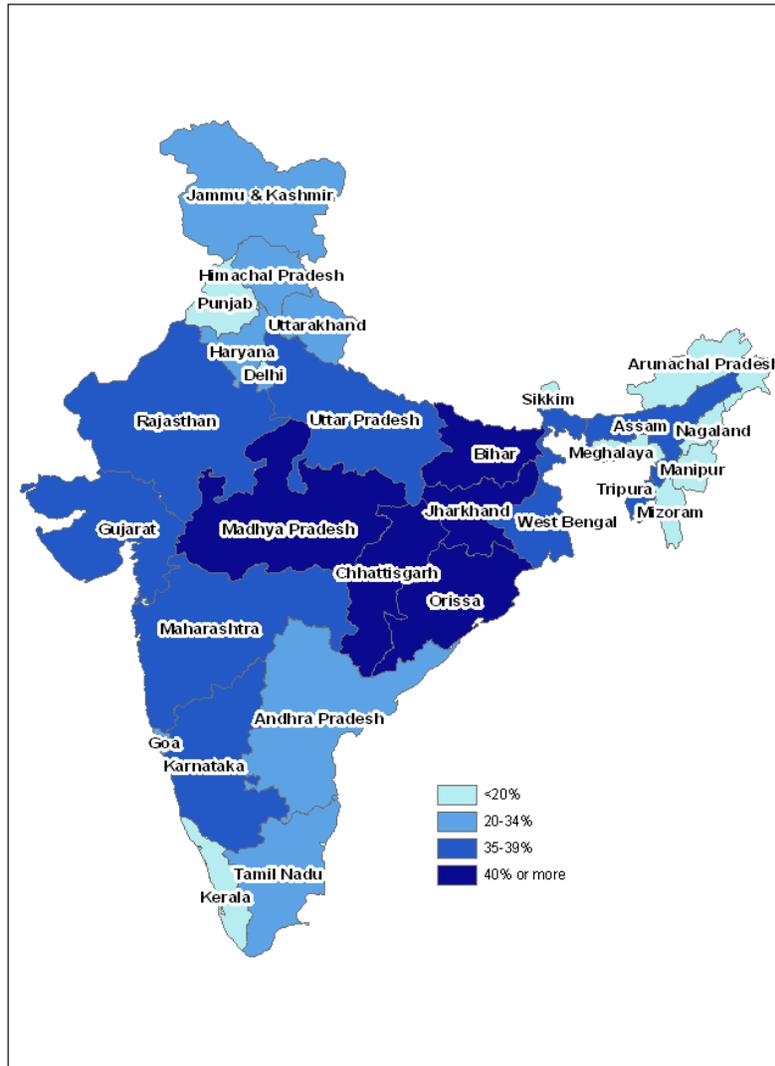
## Nutritional Status of Women and Men 15-49 Years



Malnutrition in adults can be assessed using the body mass index (BMI), which is defined as weight in kilograms divided by height in metres squared ( $\text{kg/m}^2$ ). A BMI below 18.5 indicates chronic energy deficiency or undernutrition. Adults with a BMI below 18.5 are considered to be too thin for their height. Adults with a BMI of 25 or higher are considered to be overweight or obese. A normal weight for height is indicated by a BMI of 18.5-24.9.

- Thirty-six percent of women and 34 percent of men are undernourished, with a BMI less than 18.5, indicating a high prevalence of nutritional deficiency.
- Overweight and obesity are emerging problems in India. Thirteen percent of women and 9 percent of men are overweight or obese.
- The simultaneous occurrence of overnutrition and undernutrition indicates that adults in India are suffering from a dual burden of malnutrition. Only 52 percent of women and 57 percent of men are at a normal weight for their height.

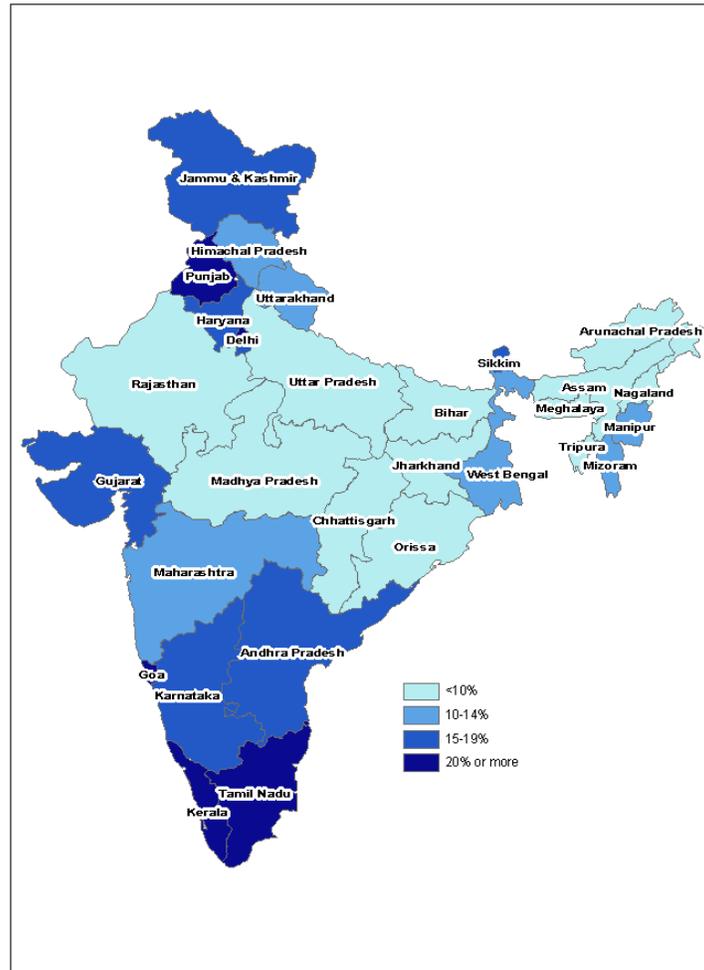
## Percentage of Women 15-49 Years Who Are Too Thin



The proportion of women who are too thin varies substantially by state and region of the country.

- Nutritional problems are substantial in every state in India, but they are particularly widespread in several adjoining states in Central and Eastern India. More than 40 percent of women are too thin in Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, and Orissa. In 13 states, more than 35 percent of women are too thin.
- Delhi, Kerala, Punjab, and six small northeastern states have the lowest proportion of women who are too thin (less than 20 percent).

## Percentage of Women Who Are Overweight or Obese



The proportion of women who are overweight or obese, although much lower overall than the proportion who are too thin, varies substantially by state.

- More than one-quarter of women in Punjab, Kerala, and Delhi are overweight or obese. Tamil Nadu and Goa also have a high prevalence of overweight and obesity (more than 20 percent).
- Less than 10 percent of women in 12 states are overweight or obese, including most states in the Central, East, and Northeast regions of the country.
- The percentage of women who are overweight or obese is lower than the percentage who are too thin in every state except Delhi, Punjab, Sikkim, and Kerala.
- Obesity ( $BMI \geq 30$ ) is highest in Punjab (9 percent) and Delhi (8 percent).

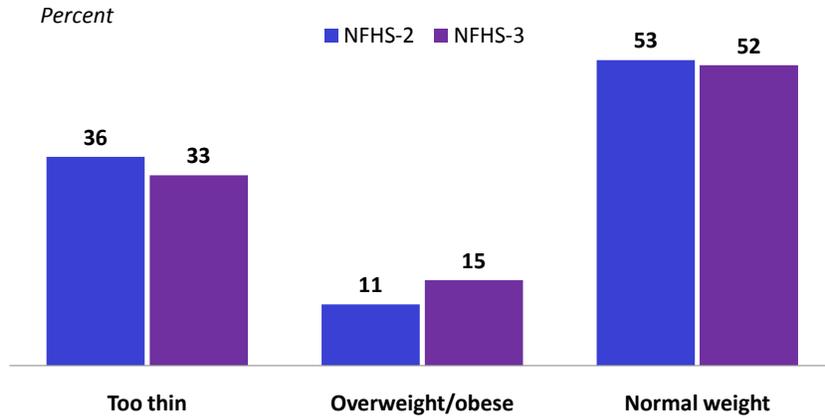
## Nutritional Status of Women and Men 15-49 Years by City and Slum/Non-slum Area

City/area	Percent of women		Percent of men	
	Too thin	Overweight/ obese	Too thin	Overweight/ obese
<b>Delhi</b>	14	27	15	18
Slum	21	20	22	11
Non-slum	13	29	13	20
<b>Chennai</b>	16	39	23	23
Slum	18	34	27	18
Non-slum	15	41	22	25
<b>Hyderabad</b>	21	33	22	25
Slum	21	31	25	22
Non-slum	21	34	21	25
<b>Indore</b>	25	22	21	14
Slum	33	19	26	9
Non-slum	23	23	20	15
<b>Kolkata</b>	16	30	20	18
Slum	21	25	23	15
Non-slum	14	32	19	20
<b>Meerut</b>	20	30	23	19
Slum	22	25	26	16
Non-slum	19	34	21	21
<b>Mumbai</b>	22	27	25	18
Slum	23	25	26	16
Non-slum	21	30	23	21
<b>Nagpur</b>	31	19	35	13
Slum	36	14	41	10
Non-slum	28	23	31	16

In the eight cities for which separate estimates of nutrition are available from NFHS-3 (Chennai, Delhi, Hyderabad, Indore, Kolkata, Meerut, Mumbai, and Nagpur), the prevalence of undernutrition and overnutrition among women and men ranges widely.

- Among the eight cities, the proportion of adults who are too thin ranges from 14 percent of women and 15 percent of men in Delhi to 31 percent of women and 35 percent of men in Nagpur.
- The proportion of men who are overweight or obese is lowest in Nagpur (13 percent) and highest in Hyderabad (25 percent). Overweight or obesity among women ranges from 19 percent in Nagpur to 39 percent in Chennai.
- In general, both women and men are more likely to be too thin in slums than in non-slum areas, but the differences are small in some cities. In every city, women and men are less likely to be overweight or obese if they live in slum areas than in non-slum areas. Even in slum areas, however, overweight and obesity are major problems. In slum areas in Chennai, Hyderabad, Kolkata, Meerut, and Mumbai, at least one-quarter of women are overweight or obese.

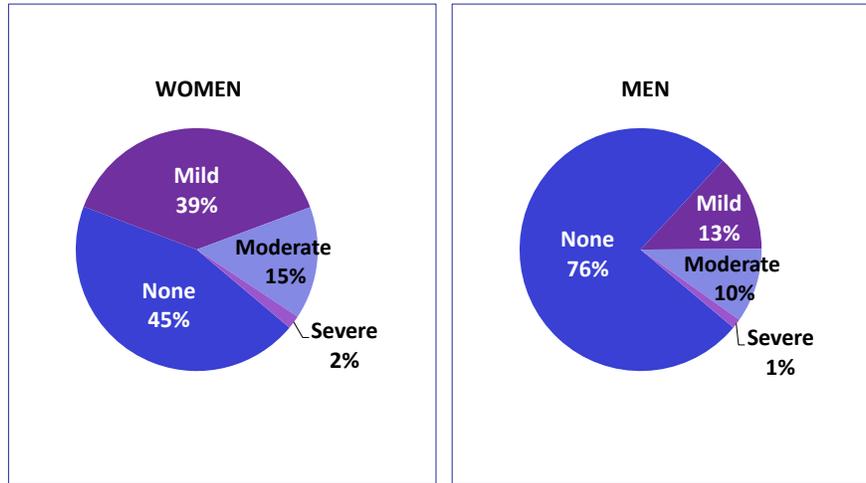
## Trends in Malnutrition Among Ever-married Women 15-49 Years



Trends in the prevalence of malnutrition among ever-married women between NFHS-2 and NFHS-3 can be examined to see how patterns of malnutrition among adults are changing over time.

- There was a slight decrease in the proportion of ever-married women who were too thin in the seven years between the two surveys, from 36 percent to 33 percent.
- In contrast, the percentage of ever-married women who were overweight or obese increased from 11 percent to 15 percent.
- Because of the opposing trends in undernutrition and overnutrition, the percentage of women in the normal weight range did not change appreciably over time.

## Anaemia Among Women and Men 15-49 Years

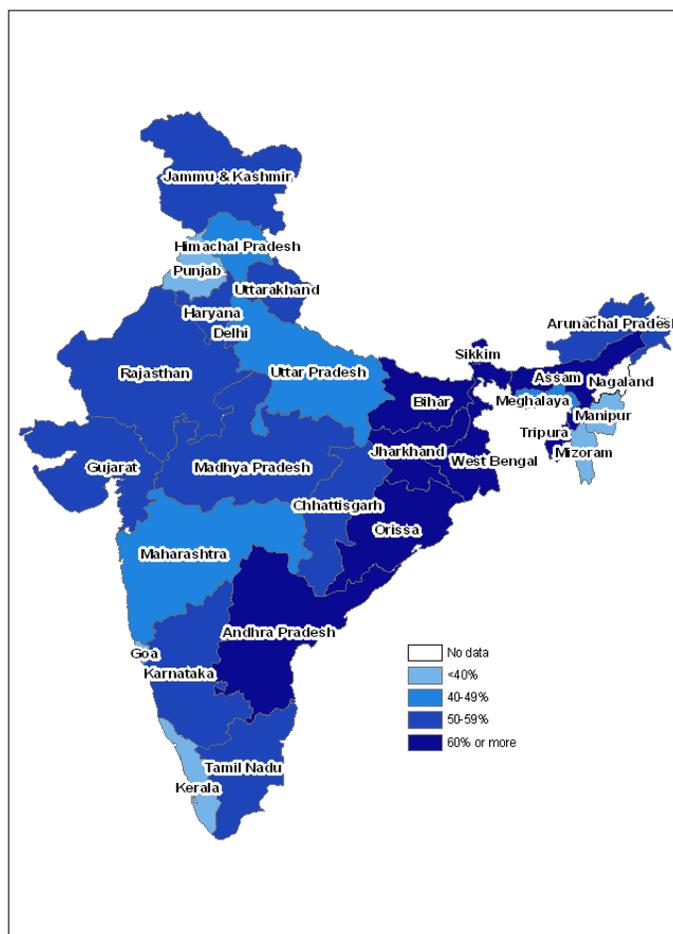


Note: Prevalence of anaemia is adjusted for altitude and smoking.

In NFHS-3, anaemia in adults was measured in the field with a drop of blood from a finger stick using the HemoCue HB201+ analyzer. Three levels of anaemia were distinguished based on the level of haemoglobin: mild anaemia (10.0-10.9 grams/decilitre for pregnant women, 10.0-11.9 g/dl for nonpregnant women, and 12.0-12.9 g/dl for men), moderate anaemia (7.0-9.9 g/dl for women and 9.0-11.9 g/dl for men), and severe anaemia (less than 7.0 g/dl for women and less than 9.0 g/dl for men).

- More than half of women (55 percent) and almost one-quarter of men (24 percent) are anaemic.
- Thirty-nine percent of women have mild anaemia, 15 percent have moderate anaemia, and 2 percent have severe anaemia. Among men, 13 percent have mild anaemia, 10 percent have moderate anaemia, and 1 percent have severe anaemia.
- The level of anaemia exceeds 50 percent for every group of women studied except for Sikhs, Jains, women with 10 or more years of education, and women in the highest wealth quintile. Pregnant women are slightly more likely to be anaemic (59 percent) than non-pregnant women (55 percent).

## Percentage of Women 15-49 Years Who Are Anaemic



Although the prevalence of anaemia among women varies widely among the states, it is widespread in every state.

- The highest prevalence of anaemia in women (more than 60 percent) is found in eight contiguous states along the East Coast of India continuing north through Jharkhand and Bihar into the Northeast. Severe anaemia is highest in Assam and Andhra Pradesh (3 percent).
- The lowest levels of anaemia are in five states that are widely scattered throughout the country (Punjab, Manipur, Mizoram, Goa, and Kerala). Even in these states, however, more than 30 percent of women are anaemic.
- The geographic pattern of anaemia for men is generally similar to the pattern for women. The lowest prevalence of anaemia for both women and men is in Kerala.

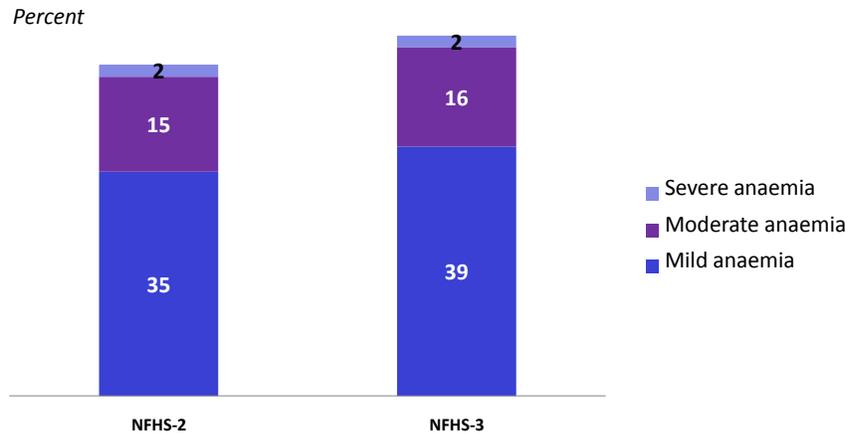
## Anaemia Among Women and Men 15-49 Years by City and Slum/Non-slum Area

City/area	Percent of women anaemic	Percent of men anaemic	City/area	Percent of women anaemic	Percent of men anaemic
<b>Delhi</b>	44	18	<b>Kolkata</b>	55	20
Slum	48	22	Slum	52	17
Non-slum	44	17	Non-slum	57	22
<b>Chennai</b>	51	13	<b>Meerut</b>	45	13
Slum	51	15	Slum	40	12
Non-slum	51	13	Non-slum	48	14
<b>Hyderabad</b>	50	12	<b>Mumbai</b>	47	12
Slum	55	13	Slum	46	11
Non-slum	49	12	Non-slum	48	13
<b>Indore</b>	40	11	<b>Nagpur</b>	51	16
Slum	43	12	Slum	49	17
Non-slum	40	10	Non-slum	52	16

NFHS-3 measured the prevalence of anaemia in women and men in Delhi, Chennai, Hyderabad, Indore, Kolkata, Meerut, Mumbai, and Nagpur by slum/non-slum areas.

- The prevalence of anaemia is widespread and differentials in anaemia are more modest than they were in the case of poor nutritional status. Anaemia in women and men is highest in Kolkata and lowest in Indore.
- The differences in the prevalence of anaemia between slum and non-slum areas are small and inconsistent in direction. Anaemia is actually less prevalent in slum areas than in non-slum areas for women and men in Kolkata, Meerut, and Mumbai, and for women in Nagpur.

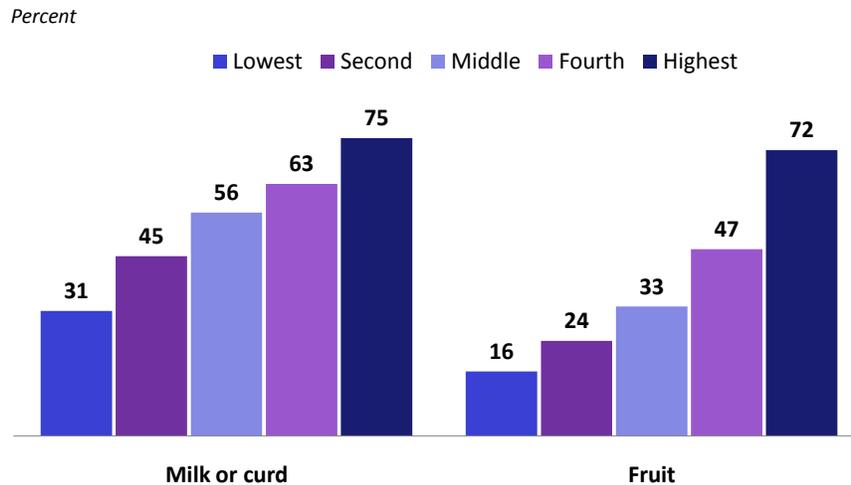
## Trends in Anaemia Among Ever-Married Women 15-49 Years



Anaemia among women continues to be a serious problem in India.

- Anaemia among ever-married women, which was already high in NFHS-2, increased from 52 percent to 56 percent in the seven years between the two surveys.
- Most of the increase between the two surveys was in the category of mild anaemia.

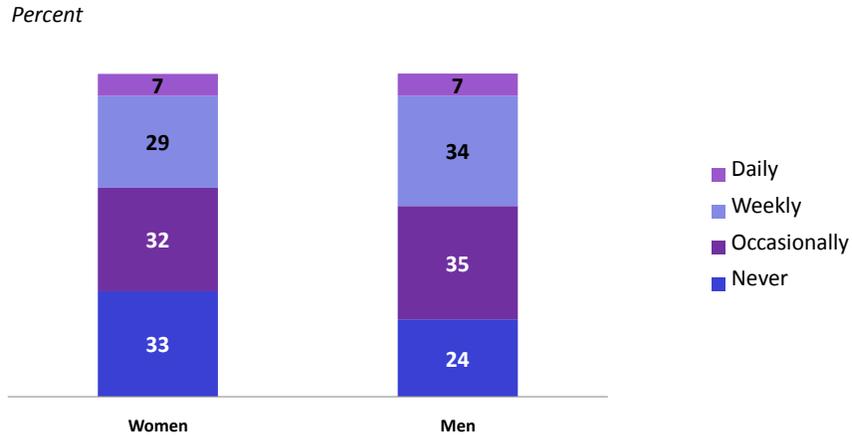
## Weekly Consumption of Milk/Curd and Fruit for Women 15-49 Years by Household Wealth



NFHS-3 collected information on women's and men's consumption of various food items, including milk/curd and fruit. The consumption of a wide variety of nutritious foods is important for the health of adults.

- Women from wealthier families are much more likely than poorer women to have a healthy and well-balanced diet. The consumption of milk/curd and fruit increases steadily with the level of household wealth.
- Less than one-third of women in the lowest wealth quintile consume milk or curd at least once a week, as do less than half of women in the second wealth quintile. More than half of women in the three highest wealth quintiles consume milk or curd at least once a week. In the highest wealth quintile, three-quarters of women consume milk or curd at least once a week.
- The differentials in food consumption are even sharper for the consumption of fruit. Weekly consumption of fruit increases from 16 percent in the lowest wealth quintile to 72 percent in the highest wealth quintile. Various fruits are good sources of vitamin C, carbohydrates, and carotene, which is converted into vitamin A.

## Frequency of Women's and Men's Consumption of Meat, Chicken, or Fish



NFHS-3 collected information on women's and men's consumption of various food items, including meat, chicken, or fish. This information can be used to estimate the proportion of the population that is vegetarian.

- Meat, chicken, and fish are not major elements of the diet of most women and men age 15-49 in India. Only 7 percent of women and men eat meat, chicken, or fish on a daily basis. Twenty-nine percent of women consume any of these items weekly and 32 percent consume them occasionally. Just over one-third of men consume meat, chicken, or fish weekly and a similar proportion consume these items occasionally.
- One-third of women and one-quarter of men are vegetarians (that is, they report that they never consume meat, chicken, or fish).

## Vegetarianism Among Women 15-49 Years

*Percent of women who never eat meat, chicken, or fish*

50 percent or more		20-49 percent	
Haryana (88%) Rajasthan (75%) Punjab (75%) Gujarat (70%)	Madhya Pradesh (57%) Himachal Pradesh (64%) Delhi (52%)	Uttar Pradesh Uttarkhand Maharashtra	Karnataka Jammu & Kashmir Chhattisgarh
10-19 percent	Less than 10 percent		
Bihar Sikkim	Jharkhand Tamil Nadu Andhra Pradesh Orissa Goa	Kerala Assam West Bengal Arunachal Pradesh Tripura	Mizoram Manipur Meghalaya Nagaland

Vegetarianism varies dramatically from one state to another.

- There are seven contiguous states in which more than half of women age 15-49 years are vegetarians. Vegetarianism is most prevalent in Haryana, Rajasthan, and Punjab, where at least three-quarters of women are vegetarians. More than half of women are also vegetarians in Gujarat, Madhya Pradesh, Himachal Pradesh, and Delhi.
- In 14 states, less than 10 percent of women are vegetarians.
- Women are more likely to be vegetarians than men in every state except for three small states in the northeast where almost no women or men are vegetarians.

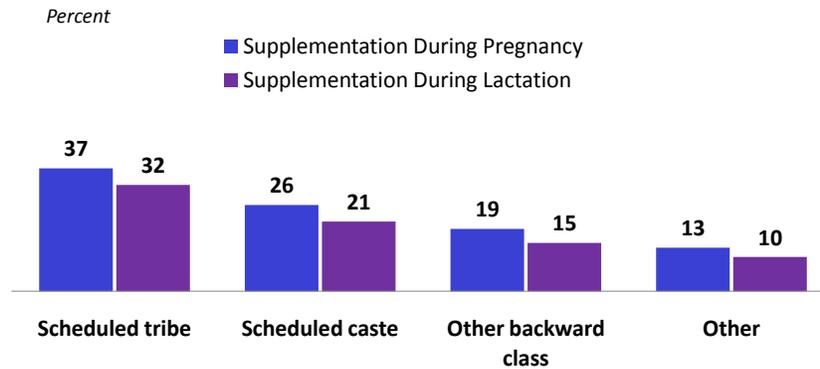
## Percentage of Women and Men 15-49 Years Who Are Vegetarians by City and Slum/Non-slum Area

City/area	Women age 15-49		Men age 15-49	
	No meat, chicken, or fish	No meat, chicken, fish, or eggs	No meat, chicken, or fish	No meat, chicken, fish, or
<b>Delhi</b>	<b>50</b>	<b>40</b>	<b>33</b>	<b>20</b>
Slum	27	21	16	10
Non-slum	56	45	38	23
<b>Chennai</b>	<b>10</b>	<b>8</b>	<b>7</b>	<b>5</b>
Slum	3	2	2	1
Non-slum	12	9	8	6
<b>Hyderabad</b>	<b>17</b>	<b>14</b>	<b>12</b>	<b>8</b>
Slum	10	7	8	5
Non-slum	18	15	12	9
<b>Indore</b>	<b>62</b>	<b>56</b>	<b>51</b>	<b>41</b>
Slum	61	56	47	35
Non-slum	62	56	52	42
<b>Kolkata</b>	<b>6</b>	<b>6</b>	<b>3</b>	<b>3</b>
Slum	4	4	2	2
Non-slum	7	7	4	4
<b>Meerut</b>	<b>54</b>	<b>45</b>	<b>38</b>	<b>26</b>
Slum	46	36	30	18
Non-slum	61	53	45	33
<b>Mumbai</b>	<b>22</b>	<b>20</b>	<b>17</b>	<b>15</b>
Slum	16	13	12	10
Non-slum	30	28	25	22
<b>Nagpur</b>	<b>35</b>	<b>29</b>	<b>20</b>	<b>15</b>
Slum	27	21	15	12
Non-slum	40	34	23	17

In the eight cities for which separate estimates of food consumption are available from NFHS-3, patterns of vegetarianism can be examined for each city and for slum/non-slum areas of those cities.

- Among the eight cities, the percentage of women and men who never eat meat, chicken, or fish is lowest in Kolkata and Chennai and highest in Indore and Meerut. Vegetarianism is also high in Delhi, where half of women and one-third of men never eat meat, chicken, or fish.
- When eggs are also considered, the percentages decrease. For example, 50 percent of women and 33 percent of men in Delhi never eat meat, chicken, or fish, but only 40 percent of women and 20 percent of men never eat meat, chicken, fish, or eggs.
- Except for women in Indore, persons living in slums are always less likely than persons living in non-slum areas to be vegetarian. The differences are greatest in Delhi and Mumbai, where persons in non-slum areas are more than twice as likely to be vegetarians as persons living in slums.

## Utilization of ICDS Food Supplementation During Pregnancy and Lactation Among Mothers of Children Under 6 Years by Caste/Tribe

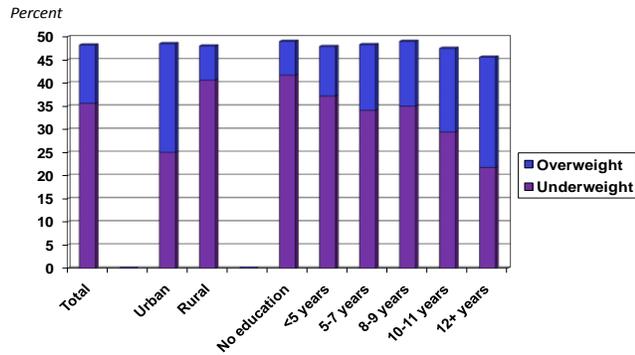


Note: Estimates are based on mothers of children under age six years in areas covered by an *anganwadi* centre.

Pregnant and lactating women are eligible to receive a variety of services through the Integrated Child Development Services (ICDS) programme. In NFHS-3, among children under 6 years of age, mothers were asked about utilization of ICDS services, including food supplementation, during the pregnancy and when they were lactating.

- Overall, only 21 percent of women in areas served by an *anganwadi* centre received food supplementation when they were pregnant and even fewer women (17 percent) received food supplementation when they were lactating.
- Women from scheduled tribes were more likely than any other caste/tribe group to have received food supplementation, followed by women from scheduled castes and other backward classes. Women not belonging to any of these disadvantaged groups were least likely to have received food supplementation.

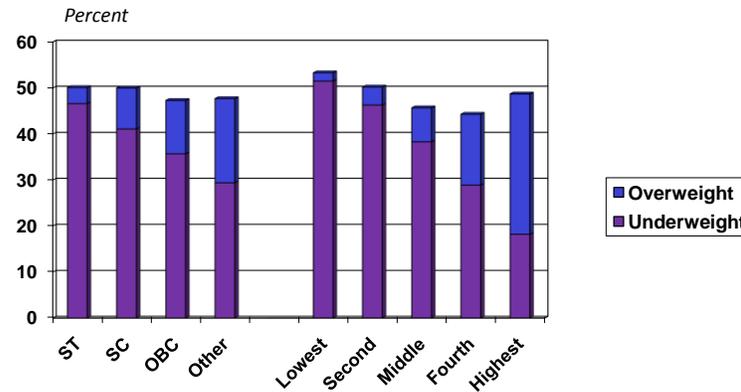
## Malnutrition of Women 15-49 Years by Residence and Education



The prevalence of malnutrition (the percentage who are too thin plus the percentage who are overweight or obese) can be calculated from NFHS-3 measurements of the height and weight of adults.

- For women, there is an amazing consistency across residence and wealth groups in the percentage of women who are either undernourished or overweight/obese. Although the prevalence of total malnutrition is almost the same irrespective of place of residence or educational attainment, the composition of malnutrition varies substantially from one group to another.
- Nearly half of all women (48 percent) are either too thin or overweight/obese. Although the overall percentage malnourished is almost the same in urban areas (49 percent) and rural areas (48 percent), the contribution of each component of malnutrition is very different. Forty-nine percent of malnutrition in urban areas is due to overweight or obesity, compared with only 15 percent in rural areas.
- The overall prevalence of malnutrition is between 46 and 49 percent in every education group, but again the composition of malnutrition differs from one group to another. For women with no education, 85 percent of malnutrition is due to undernutrition. For women with 12 or more years of education, malnutrition is slightly more likely to be due to overweight or obesity (52 percent) than to undernutrition (48 percent).
- The general pattern of changes in the composition of malnutrition by residence and education is similar for men, but the overall level of malnutrition is slightly lower for men than for women.

## Malnutrition of Women 15-49 Years by Caste/Tribe and Household Wealth



The prevalence and composition of malnutrition among disadvantage groups is shown in the figure. The castes/tribes are broken into four groups—scheduled tribes (ST), scheduled castes (SC), other backward classes (OBC), and others. Household wealth is broken into five groups according to wealth quintiles.

- Total malnutrition is higher among women from scheduled castes and scheduled tribes than for women in the OBC group and women from other castes, but the differences are small. In all caste/tribe groups, most malnutrition is due to undernutrition. The proportion of total malnutrition that is due to overweight or obesity varies from only 7 percent for scheduled tribe women to 38 percent for women who do not belong to scheduled tribes, scheduled castes, or other backward classes.
- The percentage of women who are underweight decreases sharply throughout the wealth distribution. Total malnutrition decreases with wealth status in the first four wealth quintile groups but increases in the highest wealth quintile because of a huge increase in the percentage of women who are overweight or obese in that group. In the highest wealth quintile, 22 percent of women are overweight and another 8 percent are obese. Overweight and obesity account for 63 percent of total malnutrition for women in the highest wealth group.



Technical assistance for NFHS-3 was provided by Macro International and assistance for the HIV component was provided by NACO and NARI. Funding assistance was provided by:



The opinions expressed in this publication do not necessarily reflect the views of the funding agencies.

For additional information on NFHS-3, visit [www.nfhsindia.org](http://www.nfhsindia.org).  
For related information, visit [www.ipsindia.org](http://www.ipsindia.org) or [www.mohfw.nic.in](http://www.mohfw.nic.in).