



ANEMIA AMONG CHILDREN AND ADOLESCENTS

State Fact Sheet

Madhya Pradesh

March 2022

About this factsheet and the Comprehensive National Nutrition Survey (CNNS, 2016-18)

About this factsheet:

This factsheet was created to assist state-level decision-making on anemia reduction strategies and policies.

As you read this factsheet, we encourage you to ask the following questions:

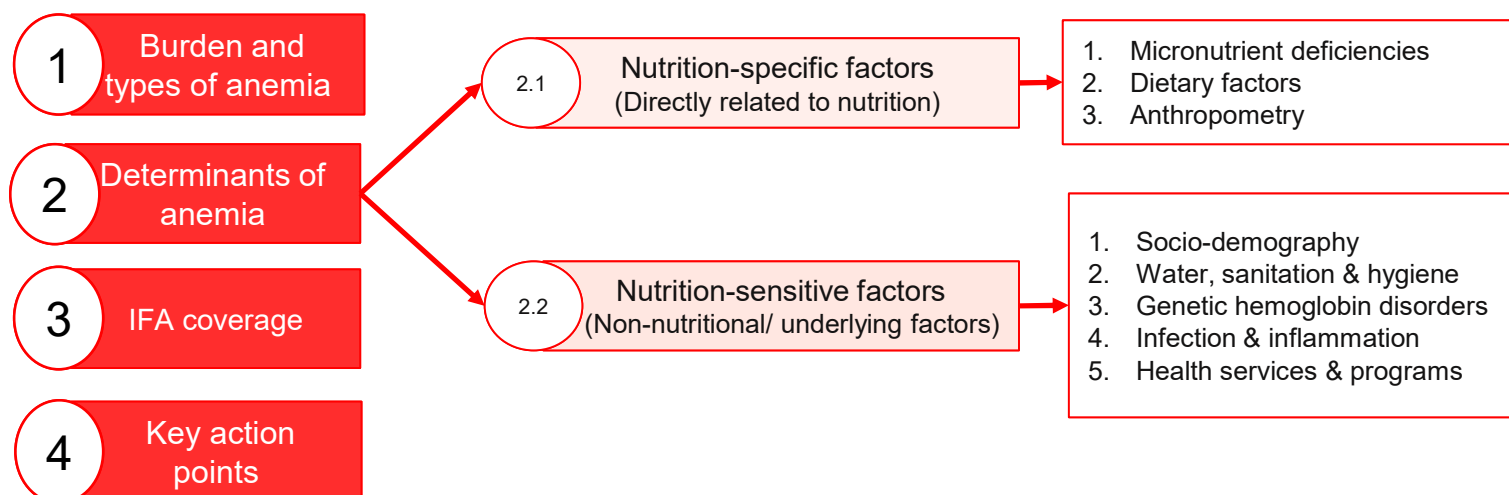
1. What is the status of anemia in our state and who is affected the most?
2. What are the key risk factors for anemia in our state?
3. How well is Anemia Mukta Bharat working in our state?
4. Which areas need attention to combat anemia?
5. Are we doing enough to address non-nutritional/ underlying risk factors of anemia?
6. What are the top 3-5 key actions for anemia reduction in the next 6 months?

About Comprehensive National Nutrition Survey (CNNS, 2016-18):

- All data included in this factsheet are from the Comprehensive National Nutrition Survey (CNNS, 2016-2018), conducted by the Ministry of Health and Family Welfare, UNICEF, and Population Council.
- CNNS is the first nationally representative nutrition survey of children and adolescents aged 0-19 years in India, and the largest micronutrient survey ever implemented globally.
- CNNS covered all the states of India, using a multi-stage survey design in both rural and urban households.
- Three target population groups were covered: preschoolers (1–4 years), school-age children (5–9 years) and adolescents (10–19 years). Data in this factsheet are disaggregated by these three groups.
- To assess anemia, hemoglobin was measured in venous blood using the cyanmethemoglobin method. This is considered the gold standard laboratory method for hemoglobin measurement.

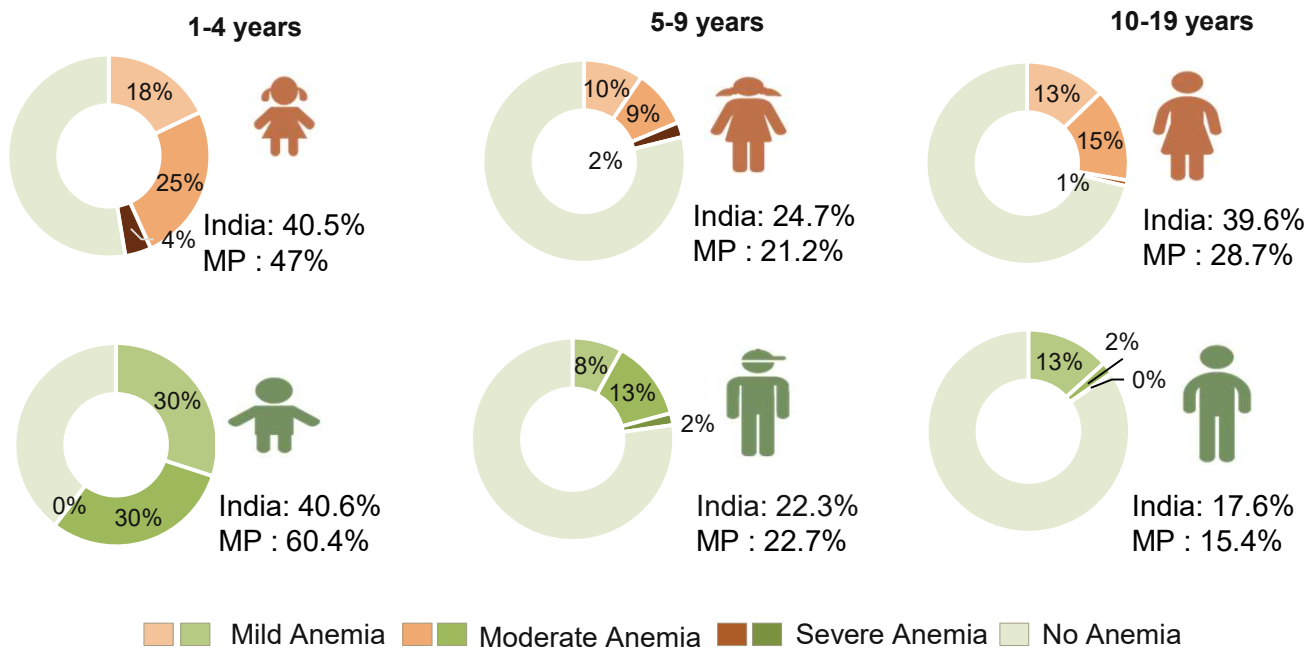
Information available in this factsheet

Anemia is caused by many factors, which is why it is so hard to tackle. Addressing a single factor will not fully address the problem of anemia. In this factsheet we provide information about the burden and types of anemia, nutrition-specific and nutrition-sensitive determinants of anemia, IFA coverage and suggested key action points to aid decision-making. The following figure illustrates the information in this factsheet.



1. Burden and types of anemia - based on age and gender

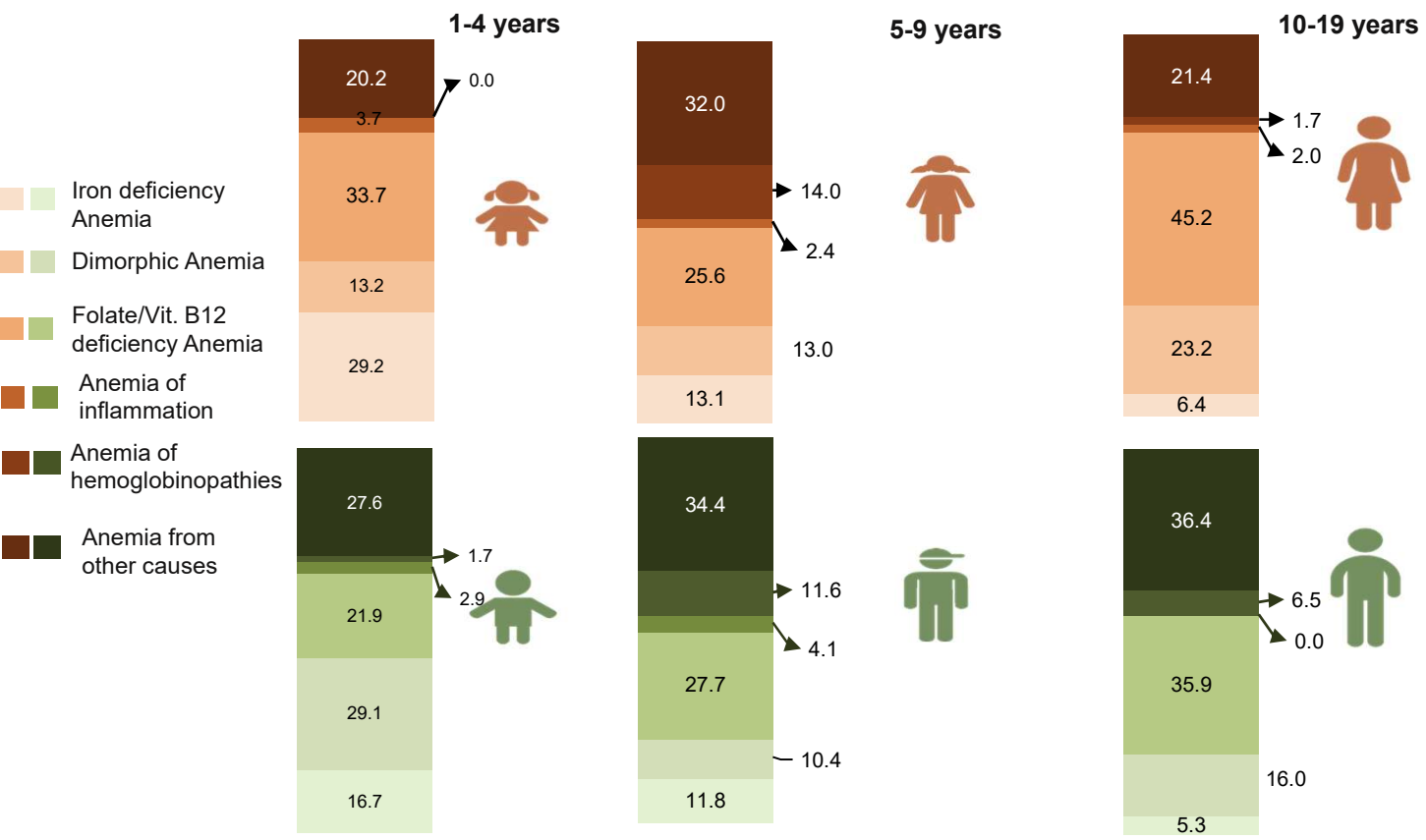
FIGURE 1.1 Prevalence of anemia by age, gender and severity



RESULTS SUMMARY

- Compared to the national average of India, anemia prevalence in Madhya Pradesh is very high for children aged 1-4 years with higher percentage among boys as compared to girls
- Anemia prevalence is more among adolescent girls aged 10-19 years as compared to boys of same age group

FIGURE 1.2 Types of anemia by age and gender



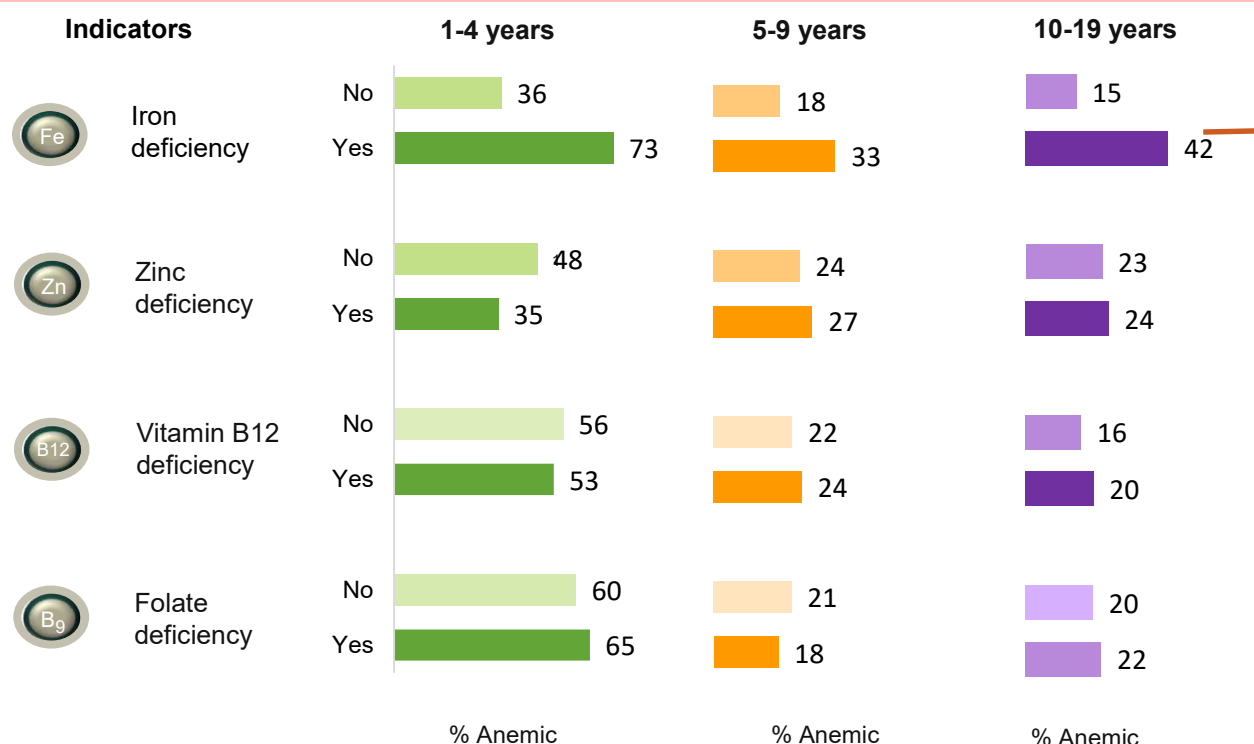
RESULTS SUMMARY

- Vitamin B12 and folate deficiency is the primary nutritional deficiency associated with anemia for both girls and boys of all the age groups.
- A high percentage of boys and girls in the age groups of 5-9 and 10-19 years have dimorphic anemia (iron deficiency and B12 or folate deficiency).
- Multiple types of anemia exists for all age and sex groups.

2. Determinants of anemia

2.1 Nutrition specific factors (directly related to nutrition)

FIGURE 2.1a Prevalence of anemia by micronutrient deficiencies

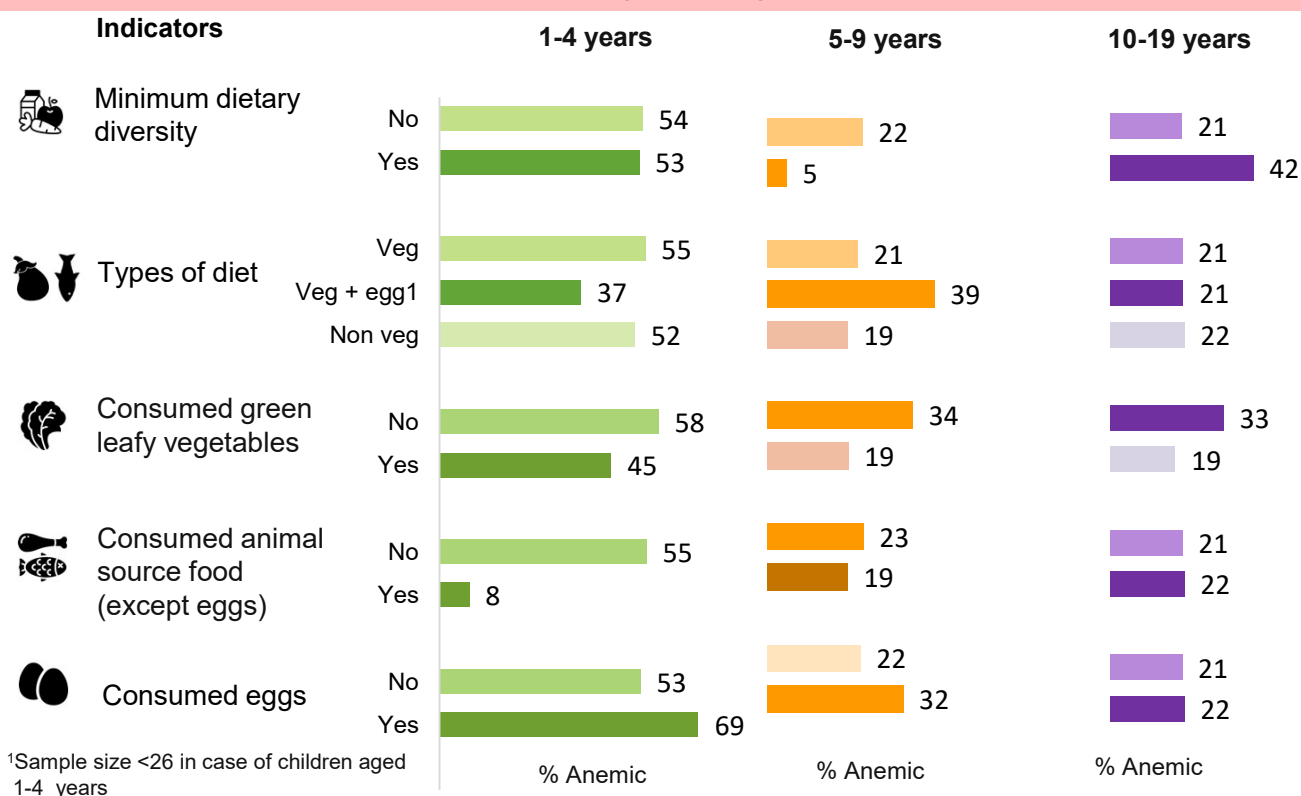


Example interpretation: Among adolescents 10-19 years old in Madhya Pradesh, 15% of those without iron deficiency are anemic and 42% of those with iron deficiency are anemic.

RESULTS SUMMARY

- Anemia prevalence is higher among children and adolescents with iron deficiency vs those without iron deficiency.
- Anemia prevalence is higher among children aged 1- 4 with folate deficiencies vs. those without this deficiency.
- Anemia prevalence is higher among children aged 5-9 years with zinc, vitamin B12 deficiencies vs. those without these deficiencies.
- Anemia prevalence is slightly higher among adolescents with B12 and folate deficiency vs. those without these deficiencies.

FIGURE 2.1b Prevalence of anemia by dietary factors

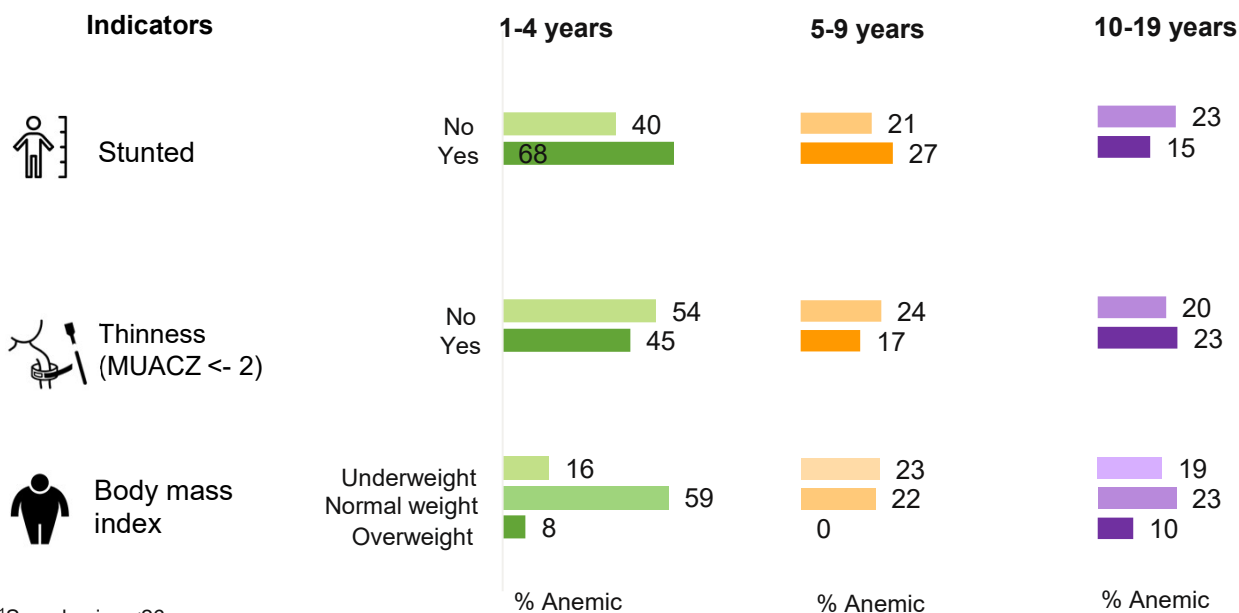


¹Sample size <26 in case of children aged 1-4 years

RESULTS SUMMARY

- Anemia is slightly more prevalent among children aged 1-4 years who do not consume green leafy vegetables, animal source food and consumed eggs.
- Anemia is more prevalent among children aged 5-9 years with poor diet diversity, consuming vegetarian food, eggs, and non-consumption of green leafy vegetables, and animal source food.

FIGURE 2.1c Prevalence of anemia by anthropometry indicators



¹Sample size <26.

²MUAC:Mid-Upper Arm Circumference z-score less than 2 standard deviations from the age- and sex-specific mean in a healthy population

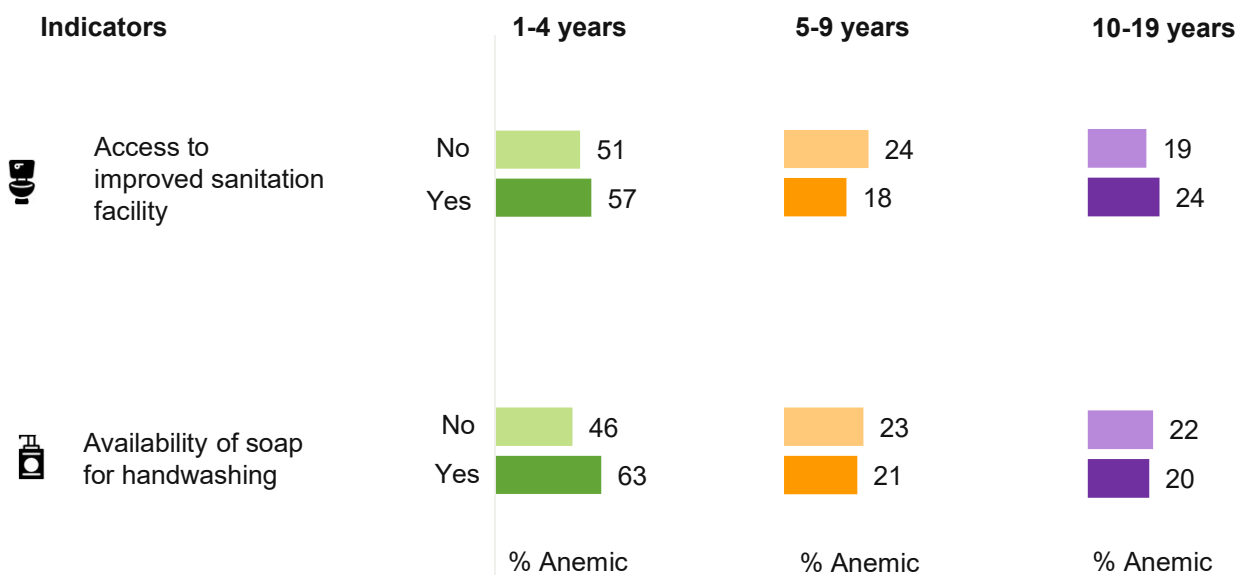
RESULTS SUMMARY

- Anemia prevalence is higher in children and adolescents who are stunted vs those who are not.

2. Determinants of anemia

2.2 Nutrition sensitive factors (non-nutritional/ underlying factors)

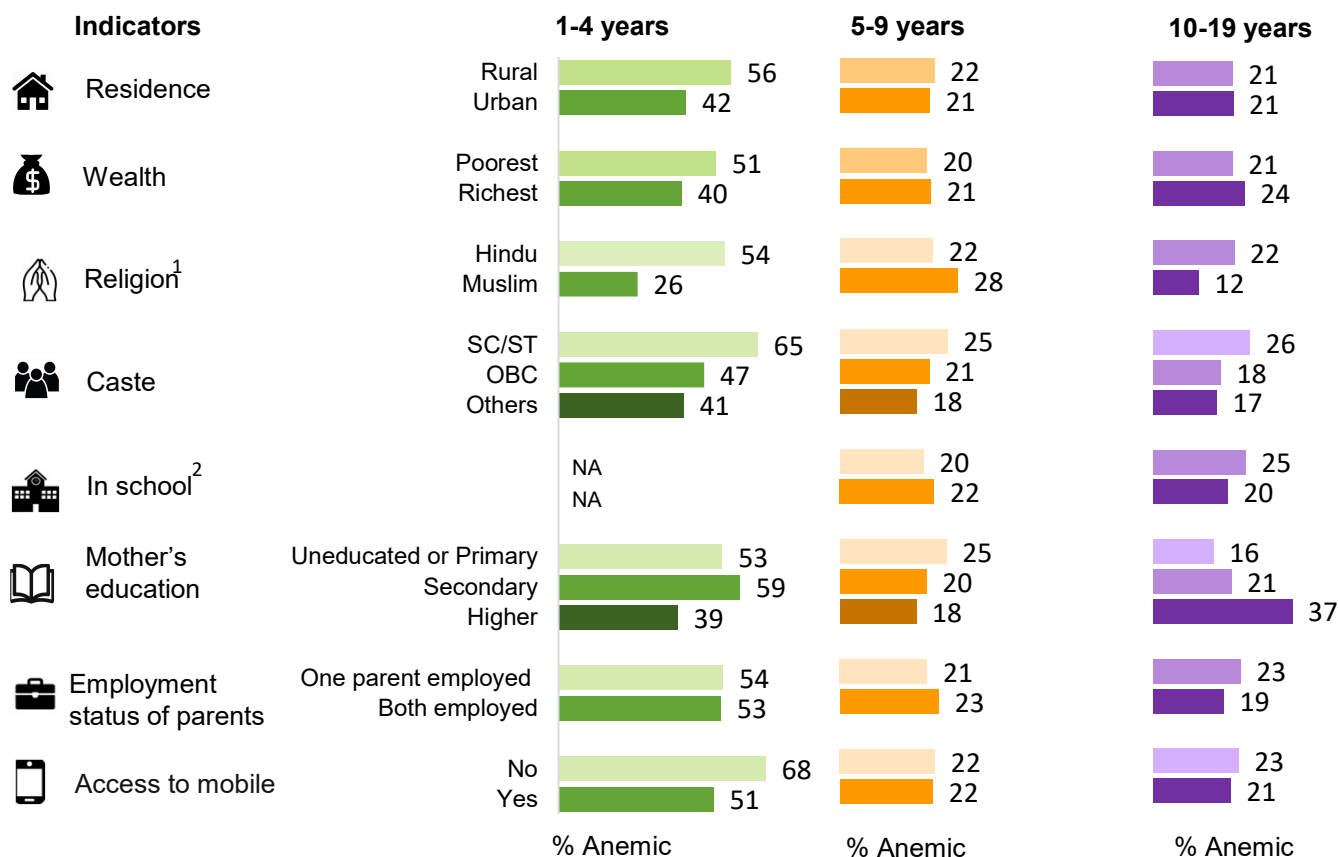
FIGURE 2.2a Prevalence of anemia by water, sanitation and hygiene



RESULTS SUMMARY

- Anemia prevalence is higher among children having access to improved sanitation facilities but no availability of soap for handwashing vs those who have access to these.
- Among older children, anemia prevalence is higher among those who do not have access to improved sanitation facility
- Among adolescents, anemia prevalence is higher when they have access to improved sanitation facility and no availability to soap for handwashing

FIGURE 2.2b Prevalence of anemia by socio demographic factors



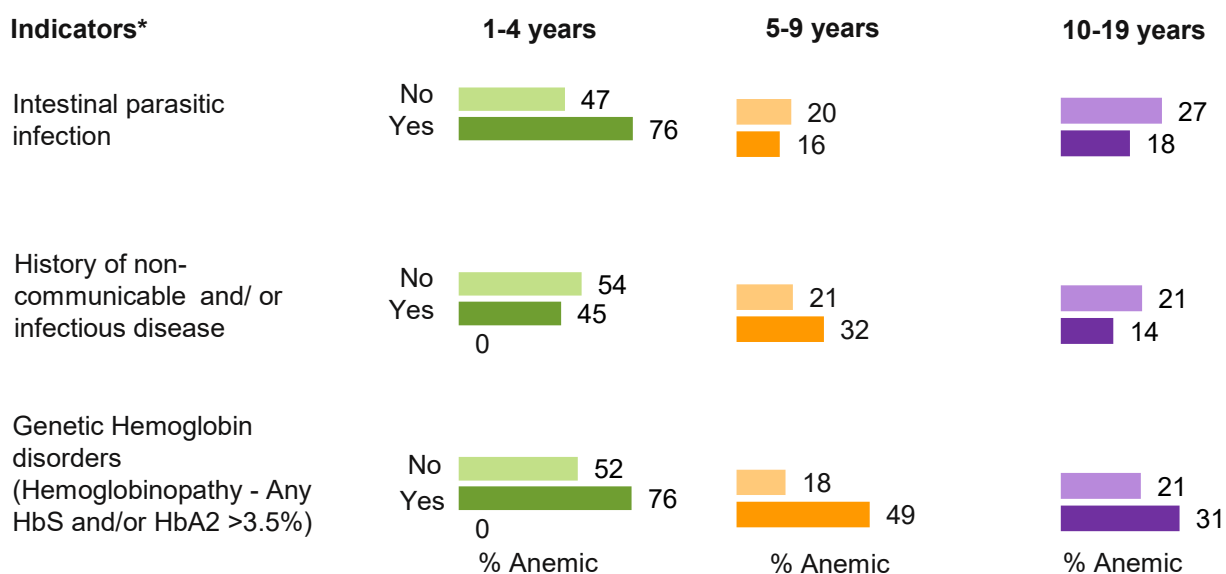
¹Sample size <26 in all the age groups

²Question on child's enrolment in school was not captured for girls and boys aged 1-4 years

RESULTS SUMMARY

- Anemia is most prevalent among children and adolescents living in rural areas, from poor households and belonging to hindu religion, SC/ST caste, and having educated mother.
- Anemia prevalence is high among children and adolescents with no access to mobile
- Anemia prevalence is high among out of school children and adolescents compared to those who are in school.

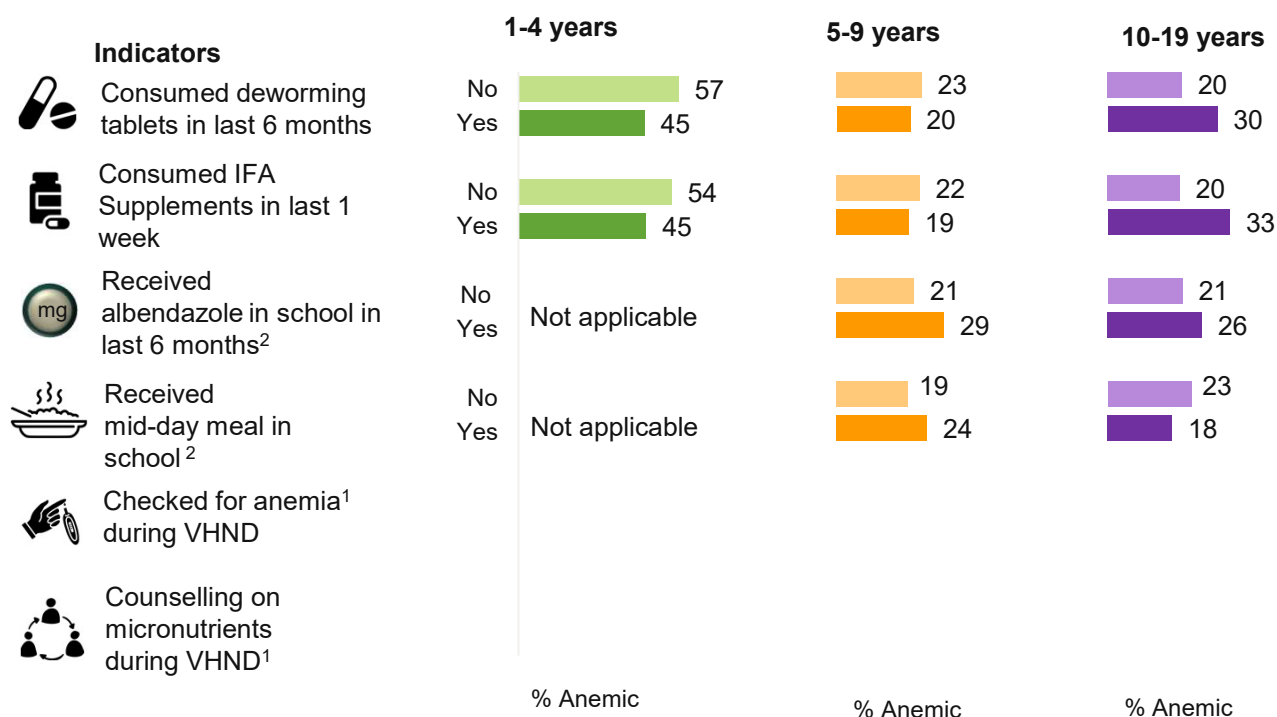
FIGURE 2.2c Prevalence of anemia by infections, chronic diseases and genetic hemoglobin disorders



RESULTS SUMMARY

- Anemia prevalence is higher in children with intestinal parasitic infection compared to those who do not have intestinal parasitic infection.
- Among adolescents, anemia prevalence is higher among those without any intestinal parasitic infection.
- Anemia prevalence is higher in children and adolescents with no history of chronic infectious disease compared to those with no such history.
- Anemia prevalence is higher among children and adolescents with genetic hemoglobin disorders (hemoglobinopathy) vs those who do not have hemoglobinopathies.

FIGURE 2.2d Prevalence of anemia by health service factors



IFA: Iron Folic Acid; VHND: Village Health and Nutrition Day

¹Sample size <26 in case of children aged 1-4 years and 5-9 years

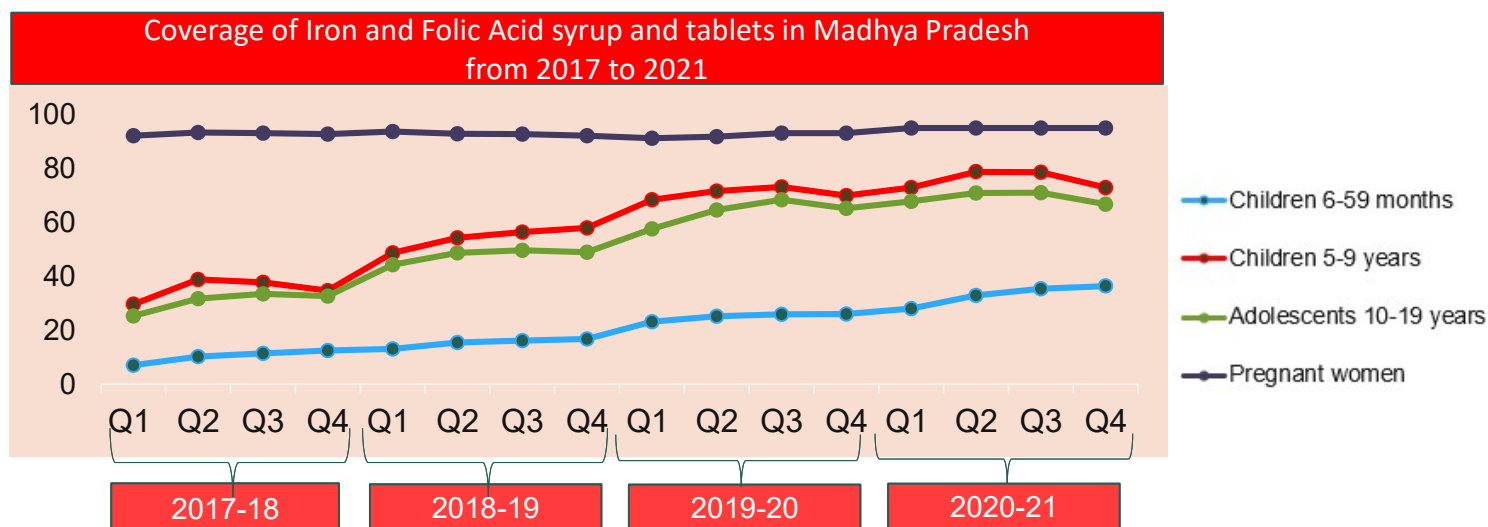
²Questions on receiving albendazole and mid-day meal from school were not applicable for children aged 1-4 years

RESULTS SUMMARY

- Among children aged 1-4 years and 5-9 years, anemia prevalence is higher among those who did not receive albendazole or IFA supplementation in school vs those who received.
- Among adolescents aged 10- 19 years, anemia prevalence was higher among those who consumed albendazole tablet and IFA supplements in school.

3. Anemia Mukht Bharat (AMB) Program and IFA Coverage in MP

The Ministry of Health and Family Welfare (MoHFW), Government of India launched the Anemia Mukht Bharat Program (AMB) with a target of reducing prevalence of anemia by 3 percentage points per year. Coverage for IFA syrup and IFA tablets are generated for each quarter **and now on monthly basis** from Health Management and Information System (HMIS) and displayed in the AMB website to assess the state/ district's performance.



Source: www.anemiamukhtbharat.info

Note:

- Coverage of Iron Folic Acid:
 - 1) Percentage of children 6-59 months provided 8-10 doses (1ml) of Iron and Folic Acid (IFA) syrup (Bi weekly),
 - 2) Percentage of children covered under WIFS JUNIOR (5-9 years) provided 4-5 IFA (Pink) tablets (In schools + out of school)
 - 3) Percentage of (6-12 class) provided 4 IFA (Blue) tablets in schools and
 - 4) Percentage of pregnant women given 180 IFA (red) tablets.
- Q1: April to June; Q2: July to September; Q3: October to December; Q4 January to March of subsequent year.

4. Key Action Points

- Anemia due to vitamin B12 and folate deficiency is the major type of anemia among all the age groups and gender. Prophylactic iron folic supplementation should be ensured for all age groups along with test and treat strategy to achieve the targets of Anemia Mukht Bharat program.
- Anemia is more prevalent among children and adolescents with poor dietary diversity, vegetarians, who do not consume green leafy vegetables or eggs or animal source foods. Social behavior change and communication interventions should aim to improve diets.
- Social protection schemes such as mid-day-meal program and ICDS should ensure dietary diversity and consider iron and vitamin c rich food items along with eggs in the diet plan.
- Anemia is more prevalent among children and adolescents who are stunted compared to those with normal height and weight for their age. Integration of all programs that address nutrition-specific and nutrition-sensitive determinants of anemia along with the Anemia Mukht Bharat program services is essential. Programs need reach all age groups.
- Anemia is more prevalent among children and adolescents with intestinal parasitic infection and genetic hemoglobinopathies compared to those who do not have intestinal parasitic infection. Deworming along with promotion of sanitation and hygiene is essential in all age groups to control anemia. Carrier screening and genetic counselling is vital to screen hemoglobinopathies among adolescents.

Indicator definitions

Severity and Types of Anemia:	
Any anemia	a) Percentage children (1-4 years) with Hb < 11.0g/dl; b) Percentage children (5-11 years) with Hb < 11.5g/dl; c) Percentage adolescents (12-14 years) with Hb < 12.0g/dl; d) Percentage adolescent girls (15-19 years) with Hb < 12.0g/dl; e) Percentage adolescent boys (15-19 years) with Hb <13.0 g/dl
Mild anemia	a) Percentage children (1-4 years) with Hb 10.0-10.9 g/dl; b) Percentage children (5-11 years) with Hb 11.0-11.4 g/dl; c) Percentage adolescents (12-14 years) with Hb 11.0-11.9 g/dl; d) Percentage adolescent girls (15-19 years) with Hb 11.0-11.9 g/dl; e) Percentage adolescent boys (15-19 years) with Hb 11.0-12.9 g/dl
Moderate anemia	a) Percentage children (1-4 years) with Hb 7.0-9.9 g/dl; b) Percentage children (5-19 years) with Hb 8.0-10.9 g/dl
Severe anemia	a) Percentage children (1-4 years) with Hb < 7.0g/dl; b) Percentage children (5-19 years) with Hb < 8.0 g/dl
Iron deficiency anemia	a) Percentage anemic children (1-4 years) who had serum ferritin <12 µg/l and normal serum RBC folate, and serum vitamin B12 levels ; b) Percentage anemic children (5-19 years) who had serum ferritin <15 µg/ and normal serum RBC folate, and serum vitamin B12 levels adjusted for soluble transferrin receptor (sTfR) sTfR>1.76 mg/l and elevated sTfR-ferritin index (>1.63 in 1-4 year-olds/>1.49 in 5-19 year-olds) among those with inflammation.
Folate/Vit. B12 deficiency anemia	Percentage anemic children aged 1-19 years who had serum vitamin B12 < 203 pg/ml or serum RBC folate < 151 ng/ml with normal serum ferritin
Dimorphic anemia	a) Percentage anemic children aged 1-4 years who had either serum vitamin B12 < 203 pg/ml or serum RBC folate < 151 ng/ml, and serum ferritin <12 µg/l; b) Percentage anemic children aged 5-19 years who had either serum vitamin B12 < 203 pg/ml or serum RBC folate < 151 ng/ml, and serum ferritin <15 µg/l adjusted for sTfR>1.76 mg/l and elevated sTfR-ferritin index (>1.63 in 1-4 year-olds/>1.49 in 5-19 year-olds) among those with inflammation (CRP >5mg/l).
Anemia from other causes	Percentage anemic children aged 1-19 years with normal serum ferritin, serum RBC folate, and serum vitamin B12 levels with no inflammation
Anemia of inflammation	Percentage anemic children aged 1-19 years with inflammation who had non-iron-non-folate/Vitamin B12 deficiency or iron deficiency with sTfR<1.76 or low sTfR-ferritin index or both.
Any hemoglobinopathy	Percentage anemic children aged 1-19 years who had sickle cell anemia (any HbS) and/ or thalassemia trait (HbA2>3.5%) or both.
Nutrition Specific Factors:	
Iron deficiency	a) Percentage of children aged 1-4 years who had serum ferritin <12 µg/l; b) Percentage of children 5-19 aged years who had serum ferritin <15 µg/l
Zinc deficiency	a) Percentage of children aged 1-9 years with serum zinc concentration < 65 µg/dl; b) Percentage of non-pregnant adolescent girls aged 10-19 years with serum zinc concentration on morning fasting < 70 µg/dl or morning non-fasting < 66 µg/dl; c) Percentage of adolescent boys aged 10-19 years with serum zinc concentration on morning fasting < 74 µg/dl or morning non-fasting < 70 µg/dl.
Vitamin B12 deficiency	Percentage of children aged 1- 19 years who had serum vitamin B12 < 203 pg/ml
Folate deficiency	Percentage of children aged 1-19 years who had serum erythrocyte folate < 151 ng/ml
Minimum dietary diversity	a) Percentage children aged 1-4 years who received foods from 4 or more food groups in the last 24 hours; b) Percentage children aged 5-19 years who received foods from 5 or more food groups (out of 10) daily.
Types of diet	During the week preceding the survey: a) Percentage of mothers/caregivers of children 1-4 years who consumed vegetarian, non-vegetarian, or vegetarian diet along with eggs; b) Percentage of children 5-19 years who consumed vegetarian, non-vegetarian, or vegetarian diet along with eggs
Consumed green vegetables	a) Percentage children 1-4 years who consumed any green leafy vegetables during the day before the survey; b) Percentage children 5-19 years who consumed any green leafy vegetables at least once during the week preceding the survey.
Consumed ASF	a) Percentage children 1-4 years who consumed any liver, kidney, heart or other organ meat, chicken, duck, or other birds, fresh or dried fish or shellfish, or any other meat during the day before the survey; b) Percentage children 5-19 years who consumed any fish, chicken or meat at least once during the week preceding the survey.
Consumed eggs	a) Percentage children 1-4 years who consumed eggs during the day before the survey; b) Percentage children 5-19 years who consumed eggs at least once during the week preceding the survey.
Stunted	Percentage children aged 1-19 years whose height for age score was less than -2 SD of the WHO Child Growth Standards median
MUAC < -2 Z score	Percentage children aged 1-19 years whose mid-upper arm circumference was less than -2 SD of the WHO Child Growth Standards median
Body Mass Index	Underweight: Percentage children aged 1-19 years who had BMI for age Z score < - 2; Normal weight: Percentage children aged 1-19 years who had BMI for age Z score in the range [-2, 1]; Overweight: Percentage children aged 1-19 years who had BMI for age Z score > 1

Indicator definitions (Cont.)

Nutrition Sensitive Factors	
Wealth Index	Percentage of children aged 1-19 years belonging to the richest or poorest wealth quintile constructed as per the Demographic Health Survey's (DHS)
Improved water	Percentage of households that have access to improved water source (as defined by the WHO).
Improved sanitation	Percentage of households that have improved sanitation facility (as defined by the DHS).
Handwashing	Percentage of households that had both water and soap available at the place of washing hands (observed).
Mother's education	Percentage of mothers who – a) received no education or completed 5 years of schooling were defined as uneducated or with primary education; b) completed 6-9 years of schooling were defined as those with secondary education; c) completed 10 or more years of schooling were defined as those with higher education.
Employment status of parents	Percentage of children aged 1-19 years were defined to have both parents as working if their mother worked for cash or kind in the last 12 months (aside from own house work) and the father was employed in professional sector, service, sales, production, agriculture or any other job.
Access to mobile	Percentage of adolescents aged 10-19 years or parents of children aged 1-9 years who have access to mobile phone.
Parasitic infection	Presence of Charcot-Leyden crystals/ cysts/ ova/ trophozoites/ adult worm in the stool sample.
History of non-communicable and/ or infectious disease	History of asthma, heart problem, tuberculosis and polio as reported by the respondent
Health Service Factors	<p>Consumed deworming tablets in last 6 months: Percentage of children aged 1-19 years who consumed deworming tablets in the last six months</p> <p>Consumed IFA supplements in last one week: Percentage of children aged 1-19 years who consumed iron and folic supplements in the last one week.</p> <p>Received albendazole in school in last 6 months: Percentage of children aged 5-19 years who were given Albendazole tablets for deworming in the last 6 months by the school.</p> <p>Received mid-day meal: Percentage of children aged 5-19 years who received mid-day meal in school (No time-frame indicated)</p> <p>Checked for anemia during VHND: a) Percentage of caregiver/parents of children aged 1-9 years who were checked for anemia during VHND meetings in three months preceding the survey; b) Percentage of children aged 10-19 years who were checked for anemia during VHND meetings in three months preceding the survey;</p> <p>Counselling on micronutrients during VHND: a) Percentage of caregiver/parents of children aged 1-9 years who received counselling on importance of iron supplements, vitamins, and micronutrients during VHND meetings in three months preceding the survey; b) Percentage of children aged 1-9 years who received counselling on importance of iron supplements, vitamins, and micronutrients during VHND meetings in three months preceding the survey.</p>

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