National dissemination program

National Micronutrient Survey, Bangladesh 2019-2020

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Initiative for Non Communicable Diseases
HSPSD, icddr,b

Date: 30th October, 2022
Venue: Hotel Lakeshore, Gulshan
Micronutrient deficiencies (MD) are one of the greatest public health concerns that affect more than 2 billion people worldwide. (WHO, 2016)

Globally, one in three children suffers from a micronutrient deficiency. (WHO, 2018)

At least 50% of the under 5 children suffer from more than one micronutrient deficiency (WHO, 2018)
1st National Micronutrient Survey in Bangladesh was conducted in 2011-12

Objective:
To estimate prevalence of key micronutrients-
- Vitamin A
- Iron
- Zinc
- Vitamin D
- Folate
- Vitamin B12
- Iodine and Anemia

For selected population
- Under-5 children,
- School age children
- Non-pregnant and Non-lactating women

Total cluster: 150
Why do we need to conduct another micronutrient survey in Bangladesh?

**Rationale**

- Assessment of progress of current nutrition program
- Identify differences across demographic characteristics and types of community
- Evidence-based policy decision for strengthening future program planning of NNS and IPHN
- Target needs of additional supplementation programs
Primary objectives of National micronutrient Survey, Bangladesh 2019-2020

To generate national-level prevalence of micronutrient deficiency among NPNL women and under-5 children

1. Children (6-59 months)
   - Micronutrient indicators:
     - Vitamin A
     - Vitamin D
     - Vitamin E
     - Zinc
     - Iron
     - Iodine

2. NPNL Women (15-49 years)
   - Micronutrient indicators:
     - Vitamin A
     - Vitamin D
     - Vitamin B$_{12}$
     - Folate
     - Zinc
     - Iron
     - Iodine

3. Assessment of anemia: Hemoglobin% (among children and NPNL women)

Funded by: National Nutrition Service; PI: Dr. Aliya Naheed
Methodology

**Study design:** Cross-sectional study (Complex survey design)

**Sampling method:** Multi-stage cluster sampling technique. Primary sampling unit from MICS 2019 (Prepared by Bangladesh Bureau of Statistics and NOC obtained)

**Study population and sample size:**
- **Children recruitments:** 1000 (4 children/1 PSU)
- **NPNL women recruitment:** 1000 (4 NPNLW/1 PSU)

**Study sites:**
- 64 districts
- 250 clusters (Rural: 166 and Urban: 84)

**Inclusion Criteria**
- Permanent residence of selected Household
- Voluntary written informed consent
  - Household head
  - NPNL women (15-49 years)
  - Caregiver/children of children (6-59 month)
Field survey and biological sample collection

**Household survey**
- Socio demography characteristics
- Information of household members
- Dietary diversity
- Hygiene practices
- Food insecurity
- FACT survey
  - Salt, oil, rice fortification coverage

**Selected biomarkers**
- Blood Sample:
  - Vitamin A
  - Vitamin D
  - Vitamin B12 (only NPNLW)
  - Vitamin E
  - Zinc
  - Iron
  - Folate (only NPNLW)
- Urine Sample
  - Hemoglobin%
  - Urinary Iodine

Taking blood samples from a child
Site: Dighinala Upazila, Kaghrachari district.
Sampling Strategy (Total clusters: 250)
1 PSU~8 households

By Bangladesh Bureau of Statistics

Sample frame: MICS survey (UNICEF)

Total cluster selected
Barisal PSU: 24
Chattogram PSU: 52
Dhaka PSU: 52
Khulna PSU: 36
Mymensingh PSU: 18
Rajshahi PSU: 30
Rangpur PSU: 30
Sylhet PSU: 18

Total HH listed
Barisal 9755
Chattogram 4785
Dhaka 2860
Khulna 4320
Mymensingh 1943
Rajshahi 4640
Rangpur 5340
Sylhet 2120

Total eligible
Barisal 1063
Chattogram 1547
Dhaka 1860
Khulna 1364
Mymensingh 714
Rajshahi 1140
Rangpur 1201
Sylhet 646

Total recruited
Barisal 194
Chattogram 339
Dhaka 460
Khulna 294
Mymensingh 144
Rajshahi 240
Rangpur 240
Sylhet 144

Total children HH: 1041
Total NPNLW HH: 1041
Total HH: 2055
Findings

Children (6-59 months)

A trained phlebotomist taking blood sample from a child, Alikodom Upazila, Bandarban
Age and sex of children

Sex of children (N=1041)

- Boys: 42.1%
- Girls: 57.9%

Age (in months), Mean (SD)= 33 (13) months

- 6-11 Months: 5.2%
- 12-23 Months: 22.6%
- 24-35 Months: 29.1%
- 36-47 Months: 27.5%
- 48-59 Months: 15.7%
Status of Vitamin A deficiency

The study team conducting field survey among Marma community in Manikchari Upazila, Khagrachari District
Vitamin A deficiency in children

N=1014

- Overall Vitamin A deficiency (mild to severe): 50.9% (95% CI: 46.3-55.5%);
- No severe cases observed
Vitamin A deficiency in children by sex and age

8.6% higher in boys than girls

26.4% higher in younger than older children

P = 0.006

P < 0.001
Proportion of Vitamin A deficiency varies across division (P<0.001)

- Sylhet (n=68): 66.2%
- Rajshahi (n=120): 64.2%
- Rangpur (n=118): 55.9%
- Barisal (n=96): 52.1%
- Chittagong (n=161): 49.7%
- Dhaka (n=234): 47.4%
- Mymensingh (n=72): 47.2%
- Khulna (n=144): 36.8%

No difference across rural and urban

- Rural: 48.1% Normal Status, 51.9% Vitamin A Deficiency
- Urban: 51.0% Normal Status, 49.0% Vitamin A Deficiency

P = 0.382
Comparison of Vitamin A deficiency between NMS 2011-12 and NMS 2019-20

- Mild Vitamin A deficiency reduced 12.6%;
- Moderate Vitamin A deficiency reduced 12.8%;
- No severe case found in NMS 2019-20
Status of Vitamin D deficiency

Dr. Aliya Naheed (PI) is conducting a community feedback meeting in Bandarban district
Vitamin D deficiency in children

N=1027

Overall Vitamin D deficiency: 21.9%
(95% CI: 18.8-25.5%);
Vitamin D deficiency in children by sex and age

No variation across sex

No variation across age

Boys
- Normal Status: 79.1%
- Vitamin D Deficiency: 21.0%

Girls
- Normal Status: 77.0%
- Vitamin D Deficiency: 23.0%

Age: 06-23 Month
- Normal Status: 77.9%
- Vitamin D Deficiency: 22.1%

Age: 24-59 Month
- Normal Status: 78.3%
- Vitamin D Deficiency: 21.7%

P = 0.425
P = 0.895
Vitamin D deficiency in children by division and place of residence

Proportion of vitamin D deficiency varies across division (P=0.001)

8.3% higher in urban than rural areas

P=0.002
Comparison of Vitamin D deficiency between NMS 2011-12 and NMS 2019-20

18% lower in NMS 2019-20

NMS 2011-12
N=461
39.6%

NMS 2019-20
N=1027
21.9%
Status of
Zinc
Deficiency

A phlebotomist allocating blood sample during field survey in Cox Bazar sadar Upazila, Cox Bazar district
Zinc deficiency in children

N=1023

Overall Zinc deficiency: 31.0%
(95% CI: 28.1-33.8%);
Zinc deficiency in children by sex and age

No variation across sex

P = 0.913

No variation across age groups

P = 0.886
Zinc deficiency in children by division and place of residence

No variation across divisions

- Chittagong (n=161): 34.3%
- Dhaka (n=234): 32.9%
- Rangpur (n=118): 32.5%
- Rajshahi (n=120): 32.5%
- Barisal (n=96): 30.2%
- Khulna (n=144): 29.3%
- Sylhet (n=68): 23.9%
- Mymensingh (n=72): 23.6%

7.3% higher in rural than urban children

- Rural: 66.5% (33.5% Zinc Deficiency)
- Urban: 73.8% (26.2% Zinc Deficiency)

P = 0.017
Comparison of Zinc deficiency between NMS 2011-12 and NMS 2019-20

14% lower in NMS 2019-20
Status of Iron deficiency

The photo was taken during filed survey in Naikhongchari upazila, Rangamati
Iron deficiency in children

Overall Iron deficiency: 15.1% (95% CI: 12.9-17.5%);

N=920

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Iron deficiency in children by sex and age

No variations across sex

- Boys: 82.7% Normal Status, 17.3% Iron Deficiency
  - $P = 0.051$

- Girls: 87.3% Normal Status, 12.7% Iron Deficiency

22.2% higher in younger children than older

- Age: 06-23 Month: 68.8% Normal Status, 31.3% Iron Deficiency
  - $P < 0.001$

- Age: 24-59 Month: 90.9% Normal Status, 9.1% Iron Deficiency
Iron deficiency in children by division and place of residence

No variation across divisions ($P=0.561$)

<table>
<thead>
<tr>
<th>Division</th>
<th>Sample Size</th>
<th>Iron Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barisal (n=96)</td>
<td></td>
<td>20.8%</td>
</tr>
<tr>
<td>Khulna (n=144)</td>
<td></td>
<td>18.8%</td>
</tr>
<tr>
<td>Mymensingh (n=72)</td>
<td></td>
<td>18.1%</td>
</tr>
<tr>
<td>Dhaka (n=234)</td>
<td></td>
<td>14.1%</td>
</tr>
<tr>
<td>Rangpur (n=118)</td>
<td></td>
<td>13.3%</td>
</tr>
<tr>
<td>Rajshahi (n=120)</td>
<td></td>
<td>13.3%</td>
</tr>
<tr>
<td>Chittagong (n=161)</td>
<td></td>
<td>13.0%</td>
</tr>
<tr>
<td>Sylhet (n=68)</td>
<td></td>
<td>9.9%</td>
</tr>
</tbody>
</table>

10.6% higher in urban children than rural children

![Bar Chart]

<table>
<thead>
<tr>
<th>Division</th>
<th>Sample Size</th>
<th>Iron Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td></td>
<td>11.5%</td>
</tr>
<tr>
<td>Urban</td>
<td></td>
<td>22.1%</td>
</tr>
</tbody>
</table>

Legend: Normal Status, Iron Deficiency
Comparison of Iron deficiency between NMS 2011-12 and NMS 2019-20

4.4 % higher in NMS 2019-20

NMS 2011-12
N=468
10.70%

NMS 2019-20
N=920
15.10%
Status of Iodine deficiency

A phlebotomist taking blood sample during field survey in Dhalar char, Bera Upazila, Pabna
Iodine deficiency in children

N=1019

Overall Iodine deficiency: 19.7%;  
(95% CI: 17.2-22.1);

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe</td>
<td>1.2%</td>
</tr>
<tr>
<td>Moderate</td>
<td>6.8%</td>
</tr>
<tr>
<td>Mild</td>
<td>11.7%</td>
</tr>
<tr>
<td>Optimum</td>
<td>23.8%</td>
</tr>
<tr>
<td>More than adequate</td>
<td>19.3%</td>
</tr>
<tr>
<td>Excessive</td>
<td>37.2%</td>
</tr>
</tbody>
</table>

National prevalence of iodine deficiency was not reported previously

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Iodine deficiency in children by sex and age

6.1% higher in girls than boys

9.5% higher in the older children than the youngers
### Iodine deficiency in children by division and place of residence

Proportion of Iodine deficiency varies across divisions (P<0.001)

<table>
<thead>
<tr>
<th>Division</th>
<th>Proportion of Iodine Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rangpur (n=120)</td>
<td>28.3%</td>
</tr>
<tr>
<td>Rajshahi (n=120)</td>
<td>23.3%</td>
</tr>
<tr>
<td>Dhaka (n=227)</td>
<td>22.9%</td>
</tr>
<tr>
<td>Mymensingh (n=72)</td>
<td>20.8%</td>
</tr>
<tr>
<td>Chittagong (n=169)</td>
<td>17.8%</td>
</tr>
<tr>
<td>Khulna (n=144)</td>
<td>17.4%</td>
</tr>
<tr>
<td>Sylhet (n=71)</td>
<td>11.3%</td>
</tr>
<tr>
<td>Barisal (n=120)</td>
<td>8.3%</td>
</tr>
</tbody>
</table>

18.4% higher in rural children than urban children

Rural
- Normal Status: 74.1%
- Iodine Deficiency: 25.9%

Urban
- Normal Status: 92.5%
- Iodine Deficiency: 7.5%

P < 0.001
Status of Vitamin E deficiency

The study team is crossing the Tista river for field survey in a hard to reach area of Gangachara Upazila, Rangpur
Vitamin E deficiency in children

Total sample: 107

Vitamin E was assessed in 107 cases in 15 cluster of three district, however no deficiency was observed.
The study team taking preparation for field survey in a hard to reach areas of *Rangpur district*
Anemia in children

Overall prevalence of anemia: **21.1%** (95% CI: 18.6-23.9%);
Comparison of mild to severe anemia between NMS 2011-12 and NMS 2019-20

12% lower in NMS 2019-2020

NMS 2011-12
N=607

NMS 2019-20
N=1027
Anemia in children by sex and age

No variations across sex

18.2% higher in younger than older children

Boys
- Normal Status: 77.2%
- Anemia: 22.8%
- $P = 0.158$

Girls
- Normal Status: 80.8%
- Anemia: 19.2%

Age: 06-23 Month
- Normal Status: 66.0%
- Anemia: 34.0%
- $P < 0.001$

Age: 24-59 Month
- Normal Status: 84.2%
- Anemia: 15.8%
Anemia in children by division and place of residence

Proportion of anemia varies across divisions

<table>
<thead>
<tr>
<th>Division</th>
<th>Normal Status (%)</th>
<th>Anemia (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rajshahi (n=120)</td>
<td>27.5%</td>
<td>12.7%</td>
</tr>
<tr>
<td>Rangpur (n=118)</td>
<td>26.7%</td>
<td>14.6%</td>
</tr>
<tr>
<td>Chittagong (n=161)</td>
<td>24.3%</td>
<td>15.3%</td>
</tr>
<tr>
<td>Barisal (n=96)</td>
<td>24.0%</td>
<td>20.1%</td>
</tr>
<tr>
<td>Dhaka (n=234)</td>
<td>20.1%</td>
<td>18.0%</td>
</tr>
<tr>
<td>Mymensingh (n=72)</td>
<td>15.3%</td>
<td>27.0%</td>
</tr>
<tr>
<td>Khulna (n=144)</td>
<td>14.6%</td>
<td>27.5%</td>
</tr>
<tr>
<td>Sylhet (n=68)</td>
<td>12.7%</td>
<td>24.3%</td>
</tr>
</tbody>
</table>

11% Higher in urban than rural children

P = 0.001
Snapshot of micronutrient deficiency and anemia among children

- Zinc: 31%
- Vitamin D: 21.9%
- Iodine: 19.7%
- Iron: 15.1%
- Vitamin A: 7.2%
- Anemia: 21.1%

Moderate to severe deficiency.
Findings:
Non-pregnant and Non- lactating (NPNL) women (15-49 years)
Characteristics of NPNL women

Distribution of age in NPNL women

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-49 Years</td>
<td>3.7%</td>
</tr>
<tr>
<td>40-44 Years</td>
<td>11.7%</td>
</tr>
<tr>
<td>35-39 Years</td>
<td>22.2%</td>
</tr>
<tr>
<td>30-34 Years</td>
<td>19.2%</td>
</tr>
<tr>
<td>25-29 Years</td>
<td>13.9%</td>
</tr>
<tr>
<td>20-24 Years</td>
<td>13.2%</td>
</tr>
<tr>
<td>15-19 Years</td>
<td>16.1%</td>
</tr>
</tbody>
</table>

Mean (SD) = 30 (SD: 8) years

Education status

Majority completed at least primary education

- Completed 10 year schooling: 28.46%
- Completed 5 year schooling: 50.15%
- Below primary (1-4 grade): 13.52%
- Never went to school: 7.87%
Status of Vitamin A Deficiency

Dr. Munirruzaman, Program Manager, NNS visited the urban field sites of Patiya Upazila of Chittagong district on 21st December, 2020
Vitamin A deficiency in NPNL women

N: 1004

Overall Vitamin A deficiency: 7.5%; (95% CI: 5.6-9.6%);

- Normal Status: 92.5%
- Mild Deficiency: 6.9%
- Moderate Deficiency: 0.6%
- Severe Deficiency: 0%
Comparison of Vitamin A deficiency in NPNL Women between NMS 2011-12 and NMS 2019-20

Mild to severe Vitamin A deficiency reduced 32%

NMS 2011-12
N=933

NMS 2019-2020
N=1004
## Vitamin A Deficiency in NPNL Women by division and place of residence

### Proportion of Vitamin A deficiency varies across divisions

<table>
<thead>
<tr>
<th>Division</th>
<th>Rural (n)</th>
<th>Vitamin A Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rajshahi</td>
<td>119</td>
<td>15.1%</td>
</tr>
<tr>
<td>Sylhet</td>
<td>66</td>
<td>13.6%</td>
</tr>
<tr>
<td>Barisal</td>
<td>96</td>
<td>7.3%</td>
</tr>
<tr>
<td>Rangpur</td>
<td>119</td>
<td>6.7%</td>
</tr>
<tr>
<td>Chittagong</td>
<td>169</td>
<td>6.5%</td>
</tr>
<tr>
<td>Dhaka</td>
<td>219</td>
<td>5.9%</td>
</tr>
<tr>
<td>Khulna</td>
<td>144</td>
<td>5.6%</td>
</tr>
<tr>
<td>Mymensingh</td>
<td>72</td>
<td>1.4%</td>
</tr>
</tbody>
</table>

### No difference across place of residence

- Rural: 92.4% (P=0.816)
- Urban: 92.8%

**Note:** The proportion of Vitamin A deficiency varies across divisions. There is no significant difference across place of residence.
Vitamin A Deficiency in NPNL women by wealth index and education

<table>
<thead>
<tr>
<th>Wealth Index</th>
<th>No difference across wealth index classes</th>
<th>No difference across education group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper</td>
<td>6.4%</td>
<td>7.5%</td>
</tr>
<tr>
<td>Upper Middle</td>
<td>6.5% P=0.318</td>
<td>7.3% P=0.503</td>
</tr>
<tr>
<td>Middle</td>
<td>5.6%</td>
<td>6.1%</td>
</tr>
<tr>
<td>Lower Middle</td>
<td>9.2%</td>
<td>11.7%</td>
</tr>
<tr>
<td>Lower</td>
<td>10.4%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Status of Vitamin D deficiency

The study team visiting hard to reach area for field survey, Jamuna Char, Sariakandi Upazila, Bogra
Vitamin D deficiency in NPNL women

Overall vitamin D deficiency: 69.9%; (95% CI: 67.0-72.7%); N=1009
Comparison of Vitamin D deficiency in NPNL Women between NMS 2011-12 and NMS 2019-20

1.6% lower in NMS 2019-20 than NMS 2011-12

NMS 2011-12
N=631

NMS 2019-20
N=1009
### Vitamin D Deficiency in NPNL women by division and place of residence

**Proportion of Vitamin D deficiency varies across divisions**

<table>
<thead>
<tr>
<th>Division</th>
<th>Sample Size (n)</th>
<th>Vitamin D Deficiency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rajshahi</td>
<td>119</td>
<td>79.8%</td>
</tr>
<tr>
<td>Sylhet</td>
<td>68</td>
<td>79.4%</td>
</tr>
<tr>
<td>Mymensingh</td>
<td>72</td>
<td>77.8%</td>
</tr>
<tr>
<td>Chittagong</td>
<td>170</td>
<td>71.8%</td>
</tr>
<tr>
<td>Rangpur</td>
<td>120</td>
<td>70.8%</td>
</tr>
<tr>
<td>Barisal</td>
<td>96</td>
<td>67.7%</td>
</tr>
<tr>
<td>Khulna</td>
<td>144</td>
<td>66.0%</td>
</tr>
<tr>
<td>Dhaka</td>
<td>127</td>
<td>60.5%</td>
</tr>
</tbody>
</table>

**15.3 % higher in urban than rural areas**

- Urban: 79.9%
- Rural: 64.6%

- P<0.001

### Proportion of Normal Status and Vitamin D Deficiency

- **Normal Status**
  - Rural: 35.4%
  - Urban: 20.1%

- **Vitamin D Deficiency**
  - Rural: 64.6%
  - Urban: 79.9%
Vitamin D Deficiency in NPNL women by wealth index and education

Vitamin D deficiency varies across wealth index

- Upper: 78.9%
- Upper Middle: 72.1%
- Middle: 62.3%
- Lower Middle: 67.8%
- Lower: 68.1%

P=0.006

Vitamin D deficiency varies across education status

- Completed 10 year schooling: 78.4%
- Completed 5 year schooling: 65.8%
- Below Primary (1-4 Class): 65.4%
- Never Went to School: 76.6%

P=0.001
Status of Vitamin B12 deficiency

Eng. Nazmul Haque (left) and Dr. M. Islam Bulbul, DPM visited a field site of Begumganj, Noakhali district.
Vitamin B$_{12}$ deficiency in NPNL women

Overall vitamin B$_{12}$ deficiency: 20.2% (95% CI: 16.7-23.9%);
# Vitamin B12 Deficiency in NPNL women by division and place of residence

## Proportion of Vitamin B12 varies across divisions

<table>
<thead>
<tr>
<th>Division</th>
<th>n</th>
<th>Vitamin B12 Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mymensingh</td>
<td>72</td>
<td>29.2%</td>
</tr>
<tr>
<td>Rajshahi</td>
<td>119</td>
<td>28.6%</td>
</tr>
<tr>
<td>Barisal</td>
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<td>Rangpur</td>
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<td>Sylhet</td>
<td>68</td>
<td>19.4%</td>
</tr>
<tr>
<td>Dhaka</td>
<td>127</td>
<td>17.7%</td>
</tr>
<tr>
<td>Chittagong</td>
<td>170</td>
<td>17.5%</td>
</tr>
<tr>
<td>Khulna</td>
<td>144</td>
<td>15.3%</td>
</tr>
</tbody>
</table>

## No variation across place of residence

- Rural: 79.6% (P = 0.822)
- Urban: 80.2%

Proportion of Vitamin B12 varies across divisions.
Vitamin B12 Deficiency in NPNL women by wealth index and education

No variation across the socioeconomic status

- Upper: 18.8%
- Upper Middle: 18.1%
- Middle: 17.1%
- Lower Middle: 22.6%
- Lower: 26.1%

P = 0.160

No variation across the education groups

- Completed 10 year schooling: 17.1%
- Completed 5 year schooling: 20.7%
- Below Primary (1-4 Class): 22.1%
- Never Went to School: 25.0%

P = 0.380
Comparison of B12 deficiency in NPNL Women between NMS 2011-12 and NMS 2019-20

~1.8% lower in NMS 2019-20 than NMS 2011-12

NMS 2011-12: 22.00% (N=872)
NMS 2019-20: 20.20% (N=1004)
Dr. Mahfuza Haque, DPM from the National Nutrition Service visited filed site of Rangamati Sadar Upazila, Rangamati on 28th December, 2020
Folate deficiency in NPNL women

N=1001

Overall folate deficiency: 29.0% (95% CI: 26.0-31.8%);
Comparison of Folate deficiency in NPNL Women between NMS 2011-12 and NMS 2019-20

Increased ~ 20% in NMS 2019-20 compared to NMS 2011-12

NMS 11-12
N=849
9.10%

NMS 19-20
N=1001
29.00%
Folate deficiency in NPNL women by division and place of residence

Proportion of folate deficiency varies across divisions

- Sylhet (n=65): 58.5%
- Chittagong (n=166): 34.3%
- Mymensingh (n=72): 30.6%
- Rangpur (n=120): 28.3%
- Dhaka (n=220): 27.7%
- Rajshahi (n=119): 26.9%
- Barisal (n=96): 24.0%
- Khulna (n=143): 16.1%

11% higher in urban than rural areas

- Rural: 25.7% (P = 0.002)
- Urban: 35.1%

Proportion of folate deficiency varies across divisions.

P = 0.002
Folate deficiency in NPNL women by wealth index and education

No difference across the socioeconomic status

<table>
<thead>
<tr>
<th>Socioeconomic Status</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper</td>
<td>29.4%</td>
</tr>
<tr>
<td>Upper Middle</td>
<td>32.2%</td>
</tr>
<tr>
<td>Middle</td>
<td>24.2%</td>
</tr>
<tr>
<td>Lower Middle</td>
<td>29.5%</td>
</tr>
<tr>
<td>Lower</td>
<td>30.4%</td>
</tr>
</tbody>
</table>

No variation across the education group

<table>
<thead>
<tr>
<th>Education Group</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed 10 year schooling</td>
<td>28.7%</td>
</tr>
<tr>
<td>Completed 5 year schooling</td>
<td>27.85%</td>
</tr>
<tr>
<td>Below Primary (1-4 Class)</td>
<td>31.3%</td>
</tr>
<tr>
<td>Never Went to School</td>
<td>32.89%</td>
</tr>
</tbody>
</table>

P = 0.502

P = 0.746
Status of Zinc deficiency

Dr. S M Mustafizur Rahman, LD, NNS has visited field site of Cox Bazar sadar, NAZIRAR TEK on 23rd December, 2020.
Zinc deficiency in NPNL women

N=1009

Overall Zinc deficiency: 43.4% (95% CI: 40.4-46.6%);

56.6% Normal Status

43.4% Zinc Deficiency

Funded by: National Nutrition Service; PI: Dr. Aliya Naheed
Comparison of Zinc deficiency in NPNL Women between NMS 2011-12 and NMS 2019-20

~14% lower in NMS 2019-2020 than NMS 2011-12

NMS 2011-12
N=1073
57.3%

NMS 2019-20
N=1009
43.4%

13.9%
Zinc deficiency in NPNL women by division and place of residence

Proportion of Zinc deficiency varies across divisions

- Barisal (n=96) 63.5%
- Rajshahi (n=119) 62.2%
- Khulna (n=144) 52.1%
- Mymensingh (n=72) 48.6%
- Sylhet (n=68) 42.6%
- Rangpur (n=120) 37.5%
- Dhaka (n=220) 32.3%
- Chittagong (n=170) 28.2%

No variation between Rural and urban

- Rural: 54.9% Normal Status, 45.1% Zinc Deficiency
- Urban: 59.8% Normal Status, 40.2% Zinc Deficiency

P = 0.139
Zinc deficiency in NPNL women by wealth index and education

Zinc deficiency varies across wealth index

- **Upper**: 28.9%
- **Upper Middle**: 39.3%
  - *P < 0.001*
- **Middle**: 49.3%
- **Lower Middle**: 52.4%
- **Lower**: 48.1%

No variation across the education group

- **Completed 10 year schooling**: 39.01%
- **Completed 5 year schooling**: 46.36%
  - *P = 0.125*
- **Below Primary(1-4 Class)**: 35.85%
- **Never Went to School**: 49.35%
Status of Iodine deficiency

Rapot building with the community before conducting field survey, Bandarban district
Iodine deficiency in NPNL women

N= 1000

Overall iodine deficiency: 29.6% (95% CI: 26.8-32.6%);

- Severe: 1.9%
- Moderate: 10.4%
- Mild: 17.3%
- Optimum: 25.5%
- More than adequate: 17.0%
- Excessive: 27.9%

Funded by: National Nutrition Service; PI: Dr. Aliya Naheed
Comparison of Iodine deficiency in NPNL Women between NMS 2011-12 and NMS 2019-20

12.5% lower in NMS 2019-20

NMS 2011-12: 42.10% (N=1273)
NMS 2019-20: 29.60% (N=1000)
Iodine deficiency in NPNL women by division and place of residence

Proportion of Iodine deficiency varies across division

- Rangpur: 53.8%
- Rajshahi: 31.9%
- Mymensingh: 30.6%
- Dhaka: 30.0%
- Chittagong: 28.4%
- Khulna: 23.6%
- Sylhet: 22.1%
- Barisal: 11.5%

~11% higher in rural areas than urban areas

- Rural: 66.6%
- Urban: 77.9%

P < 0.001

Proportion of Iodine deficiency varies across division.
Iodine Deficiency in NPNL women by wealth index and education

No difference across the socio-economic classes

<table>
<thead>
<tr>
<th>Wealth Class</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper</td>
<td>26.5%</td>
</tr>
<tr>
<td>Upper Middle</td>
<td>24.6%</td>
</tr>
<tr>
<td>Middle</td>
<td>29.6%</td>
</tr>
<tr>
<td>Lower Middle</td>
<td>29.8%</td>
</tr>
<tr>
<td>Lower</td>
<td>37.8%</td>
</tr>
</tbody>
</table>

No variation across the level of education

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed 10 year schooling</td>
<td>28.42%</td>
</tr>
<tr>
<td>Completed 5 year schooling</td>
<td>27.55%</td>
</tr>
<tr>
<td>Below Primary (1-4 Class)</td>
<td>32.33%</td>
</tr>
<tr>
<td>Never Went to School</td>
<td>37.66%</td>
</tr>
</tbody>
</table>

P = 0.053

P = 0.259
Status of Iron deficiency

A field research assistant collecting data from a NPNL women of Marma community, Manikchari, Khagrachari
Iron deficiency in NPNL women

Overall Iron deficiency: 14.1%;
(95% CI: 11.8-16.4%);

N=916

- Normal Status: 85.9%
- Iron Deficiency: 14.1%
Comparison of Iron deficiency in NPNL Women between NMS 2011-12 and NMS 2019-20

Almost 7% higher in NMS 2019-20

- NMS 2011-12: 7.1% (N=882)
- NMS 2019-20: 14.1% (N=916)
Iron deficiency in NPNL women by division and place of residence

Proportion of Iron deficiency varies across divisions

<table>
<thead>
<tr>
<th>Division</th>
<th>N</th>
<th>Iron Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barisal (n=96)</td>
<td></td>
<td>26.0%</td>
</tr>
<tr>
<td>Chittagong (n=170)</td>
<td></td>
<td>16.5%</td>
</tr>
<tr>
<td>Dhaka (n=127)</td>
<td></td>
<td>15.7%</td>
</tr>
<tr>
<td>Mymensingh (n=72)</td>
<td></td>
<td>15.3%</td>
</tr>
<tr>
<td>Sylhet (n=68)</td>
<td></td>
<td>14.7%</td>
</tr>
<tr>
<td>Khulna (n=144)</td>
<td></td>
<td>13.9%</td>
</tr>
<tr>
<td>Rajshahi (n=119)</td>
<td></td>
<td>6.7%</td>
</tr>
<tr>
<td>Rangpur (n=120)</td>
<td></td>
<td>5.8%</td>
</tr>
</tbody>
</table>

7.6% higher in urban areas than rural areas

- Rural: 11.6% (Normal Status) vs. 26.0% (Iron Deficiency)
- Urban: 19.0% (Iron Deficiency) vs. 81.0% (Iron Deficiency)

P = 0.002

Proportion of Iron deficiency varies across divisions.
Iron deficiency in NPNL women by wealth index and education

Iodine deficiency varies across wealth index

- Upper: 21.7%
- Upper Middle: 14.9%
- Middle: 12.7%
- Lower Middle: 14.4%
- Lower: 7.7%

P = 0.006

No variation across the level of education

- Completed 10 year schooling: 16.5%
- Completed 5 year schooling: 13.7%
- Below Primary (1-4 Class): 10.1%
- Never Went to School: 14.7%

P = 0.410
Status of Anemia

Field site: Shutki palli, Cox Bazar
Anemia in NPNL women

Funded by: National Nutrition Service; PI: Dr. Aliya Naheed

N=1007

Prevalence of anemia: 28.9%; 95% CI: (25.8-31.7%);

- Normal Status: 71.1%
- Mild: 18.6%
- Moderate: 9.7%
- Severe: 0.6%
Comparison of Anemia in NPNL Women between NMS 2011-12 and NMS 2019-20

~3% higher in NMS 2019-2020 compared to NMS 2011-12

N=1031

N=1007
Status of anemia in NPNL women by division and place of residence

No variation across divisions

<table>
<thead>
<tr>
<th>Division</th>
<th>Normal Status</th>
<th>Anemia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sylhet</td>
<td>36.8%</td>
<td></td>
</tr>
<tr>
<td>Chittagong</td>
<td>33.5%</td>
<td></td>
</tr>
<tr>
<td>Barisal</td>
<td>31.3%</td>
<td></td>
</tr>
<tr>
<td>Rangpur</td>
<td>29.2%</td>
<td></td>
</tr>
<tr>
<td>Rajshahi</td>
<td>28.6%</td>
<td></td>
</tr>
<tr>
<td>Khulna</td>
<td>27.5%</td>
<td></td>
</tr>
<tr>
<td>Dhaka</td>
<td>25.0%</td>
<td></td>
</tr>
<tr>
<td>Mymensingh</td>
<td>22.2%</td>
<td></td>
</tr>
</tbody>
</table>

P = 0.386

No difference between urban and rural areas

- Rural: 72.4% Normal Status, 27.6% Anemia (P = 0.217)
- Urban: 68.7% Normal Status, 31.3% Anemia

P = 0.217
Snapshot of micronutrient deficiency and anemia among NPNL women
Dietary Diversity, Food insecurity, Food fortification status
Almost 61% NPNL women does not meet the minimum dietary diversity (MDD-W)

Overall (N=1014) 61.44%
Rural (N=665) 65.11%
Urban (N=349) 54.44%

P=0.001
Overall 28.8% of children (6-23 months) meet the good IYCF practice

No significant variations between urban and rural areas

Good Practice (ICFI score = 6)
Mild to severe food insecurity at the household level: 66%

- Food secure: 34%
- Mildly food insecure: 11%
- Moderately food insecure: 43%
- Severely food insecure: 12%
Household coverage of salt, oil and rice

- Consumption of salt, oil/ghee and rice was found to be universal (100%)
- Consumption in their fortifiable forms almost universal for salt and oil (99.5% and 98.4% for salt and oil respectively).

**Note:** “Consumes fortifiabes” means the food vehicle used by the household was industrially processed (i.e. not made at home).
Fortification labeled of salt and oil: Findings from the GAIN FACT tool survey

Over all **37.1%** of households were observed with salt package containing fortification logo or label of fortification.

Over all **39.8%** of households were observed with oil package containing fortification logo or label of fortification.
### Key findings of micronutrient deficiency

<table>
<thead>
<tr>
<th>Nutrient Deficiency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vitamin A deficiency</strong></td>
<td>One out of two children</td>
</tr>
<tr>
<td><strong>Vitamin D deficiency</strong></td>
<td>One out of five children</td>
</tr>
<tr>
<td><strong>Zinc deficiency</strong></td>
<td>One out of three children</td>
</tr>
<tr>
<td><strong>Iron deficiency</strong></td>
<td>Two out of twelve children</td>
</tr>
<tr>
<td><strong>Vitamin B12 deficiency</strong></td>
<td>One out of five NPNL women</td>
</tr>
<tr>
<td><strong>Folate deficiency</strong></td>
<td>Two out of seven NPNL women</td>
</tr>
<tr>
<td><strong>Iodine deficiency</strong></td>
<td>One out of three NPNL women</td>
</tr>
<tr>
<td><strong>Anemia</strong></td>
<td>One out of five children</td>
</tr>
</tbody>
</table>

**Notes:**
- NPNL: Not pregnant, not lactating
- W: Women
Conclusion

• Micronutrient deficiencies are substantial in both children under five years and NPNL women of reproductive age in Bangladesh.

• The status of deficiency did not significantly improve either in women and children under 5 years over the past decade (2011-2021).

• Vitamin D deficiency is highly prevalent in women and warrants urgent attention of the policymakers and the programme managers for introducing Vit D supplementation in the national program.
Recommendation

• At least one of three children and women have zinc deficiencies in Bangladesh, which warrants further attention to the Zinc supplementation program.

• The nationally representative sampling frame established under the current survey creates a wonderful opportunity to conduct periodic surveys of micronutrient status of children and women as a means of monitoring the progress of micronutrient supplementation programs of National Nutrition Service of DGHS.
Thank you

Funding Support: **National Nutrition Services**