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

Outline

- Background
- Methodology
- Findings
- Key messages

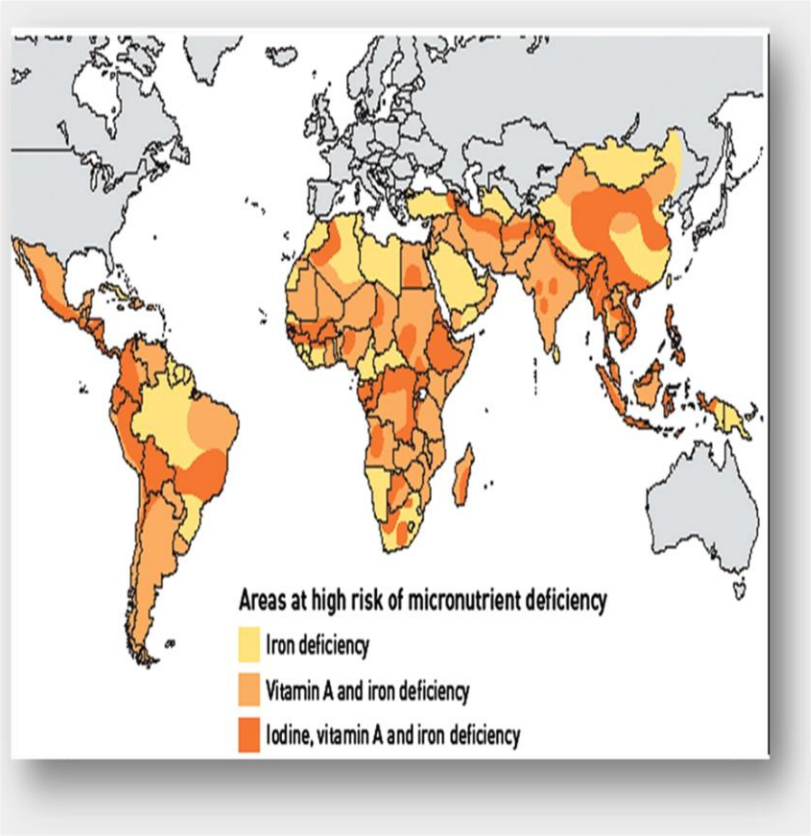
Technical Advisory Group meeting, 2021
Chaired by Kazi Zebunnessa Begum, Additional Secretary

Background

-**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)



Source: WHO, 2016

1st National Micronutrient Survey in Bangladesh was conducted in 2011-12

Objective:

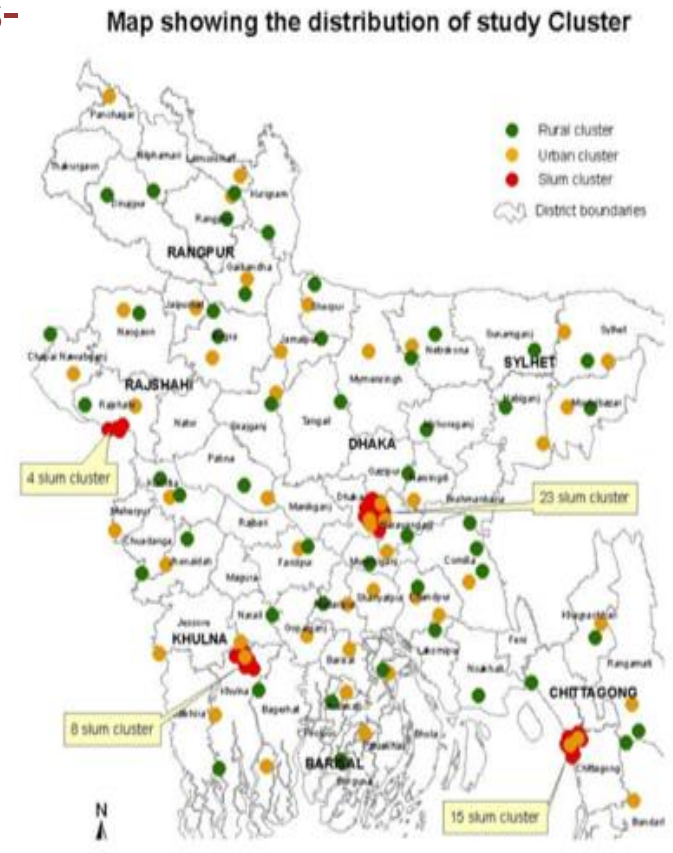
To estimate prevalence of key micronutrients-

- Vitamin A
- Iron
- Zinc
- Vitamin D
- Folate
- Vitamin B12
- Iodine and Anemia

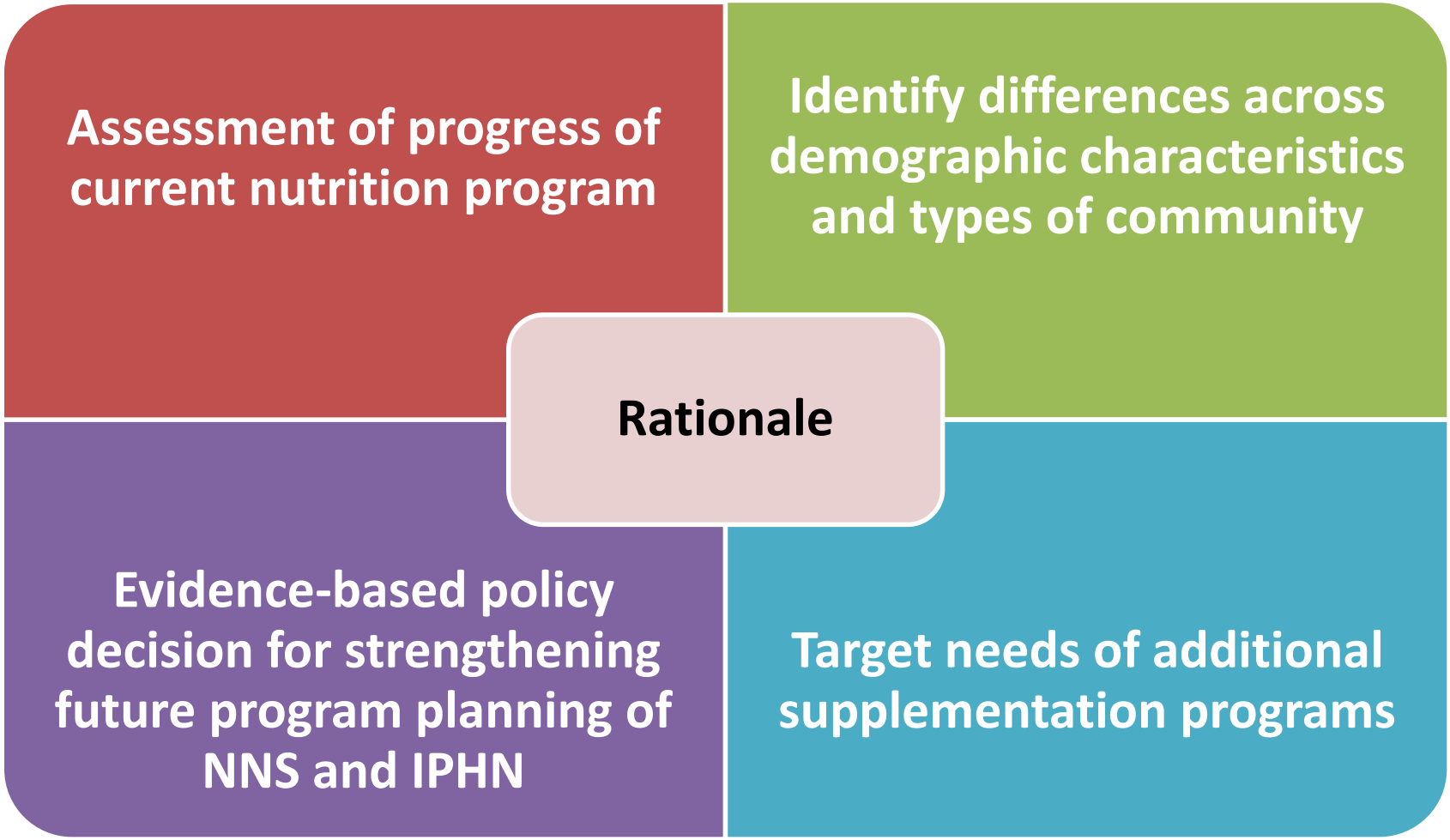
For selected population

- 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?



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)

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:

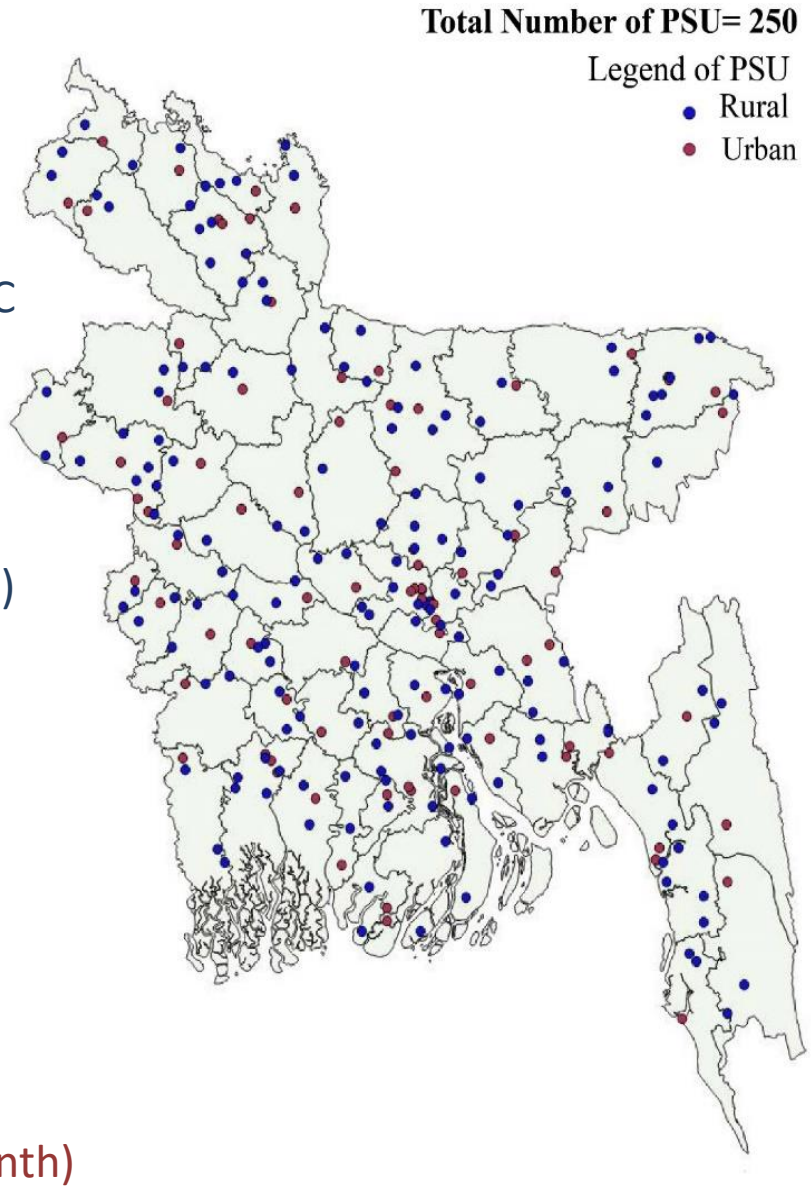
- **Children recruitments :** 1000 (4 children/1 PSU)
- **NPNL women recruitment:** 1000 (4 NPNLW/1 PSU)

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

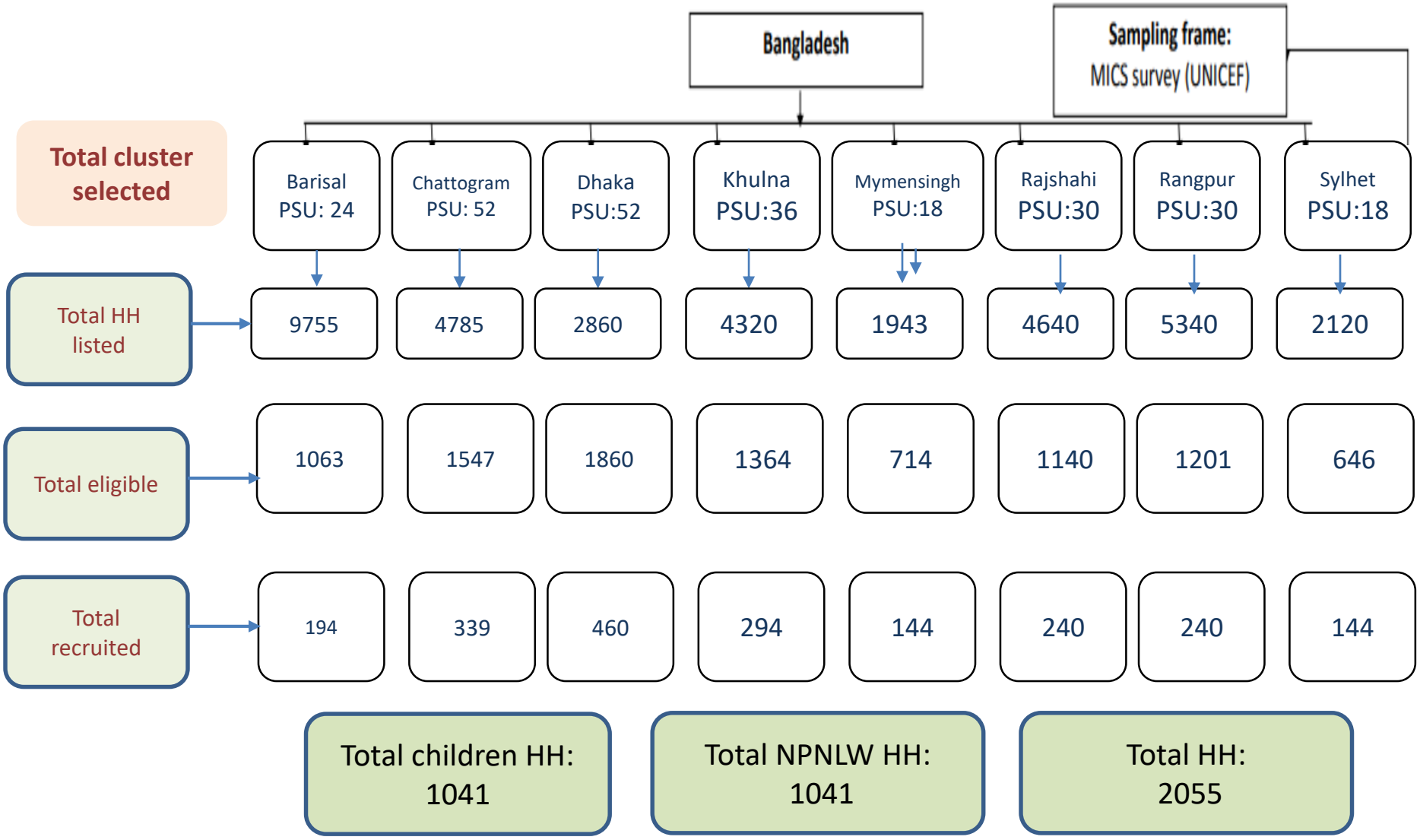
- Blood Sample:
  - Vitamin A
  - Vitamin D
  - Vitamin B12 (only NPNLW)
  - Vitamin E
  - Zinc
  - Iron
  - Folate (only NPNLW)
  - Hemoglobin%
- Urine Sample
  - Urinary Iodine

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



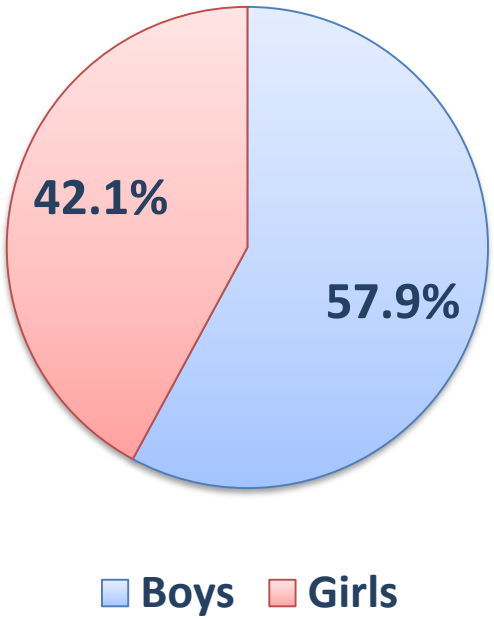
Findings

Children (6-59 months)

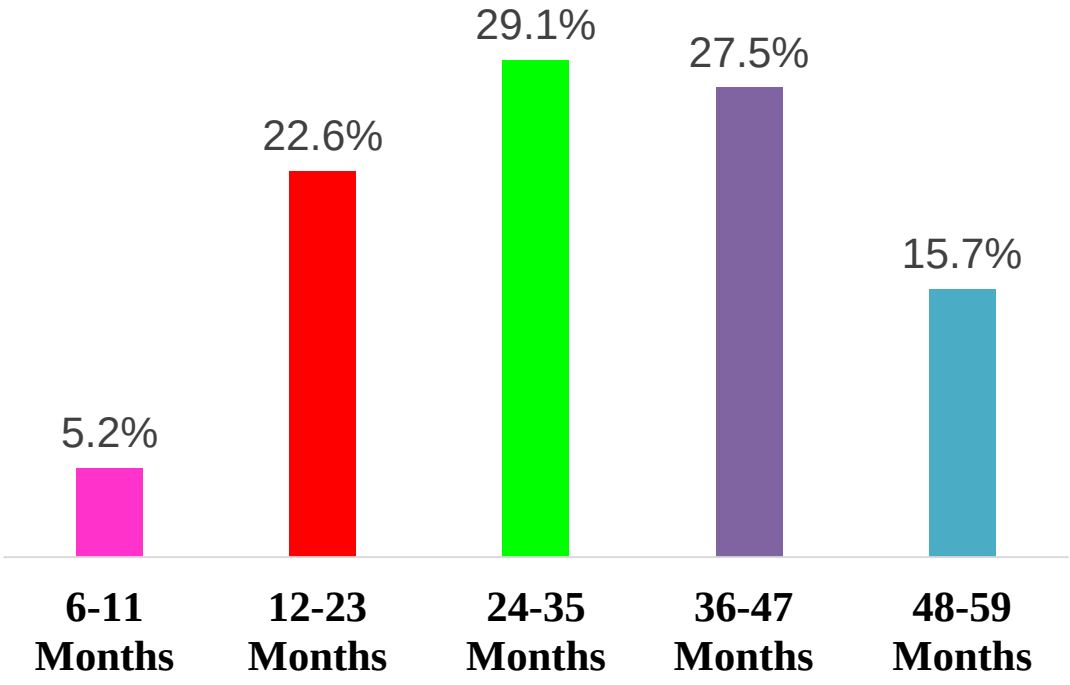
A trained phlebotomist taking blood sample from a children, *Alikodom Upazila, Bandarban*

Age and sex of children

Sex of children (N=1041)



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



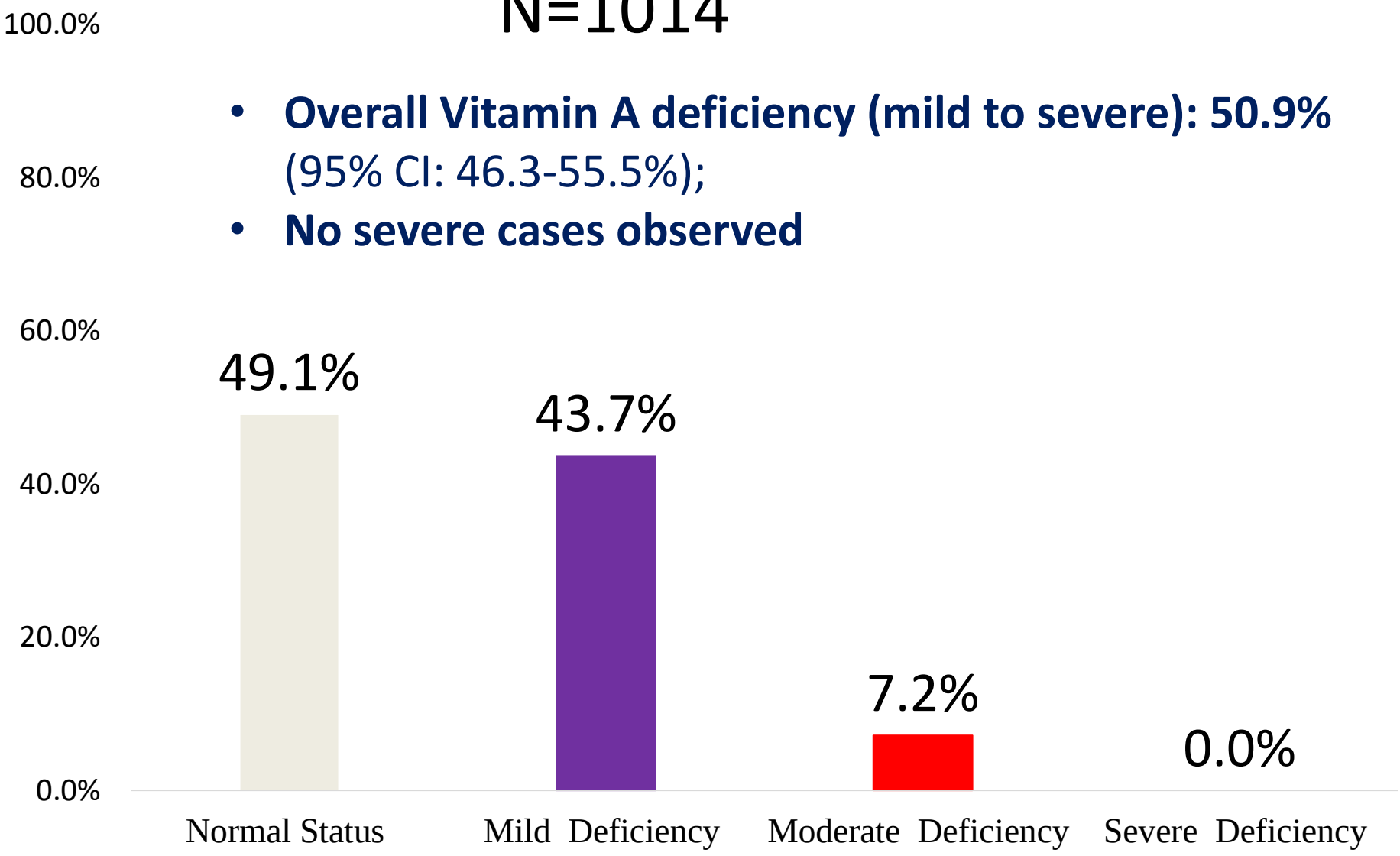
Status of Vitamin A deficiency

The study team conducting field survey among Marma community in *Manikchari Upazila, Khagrachari District*

Vitamin A deficiency in children

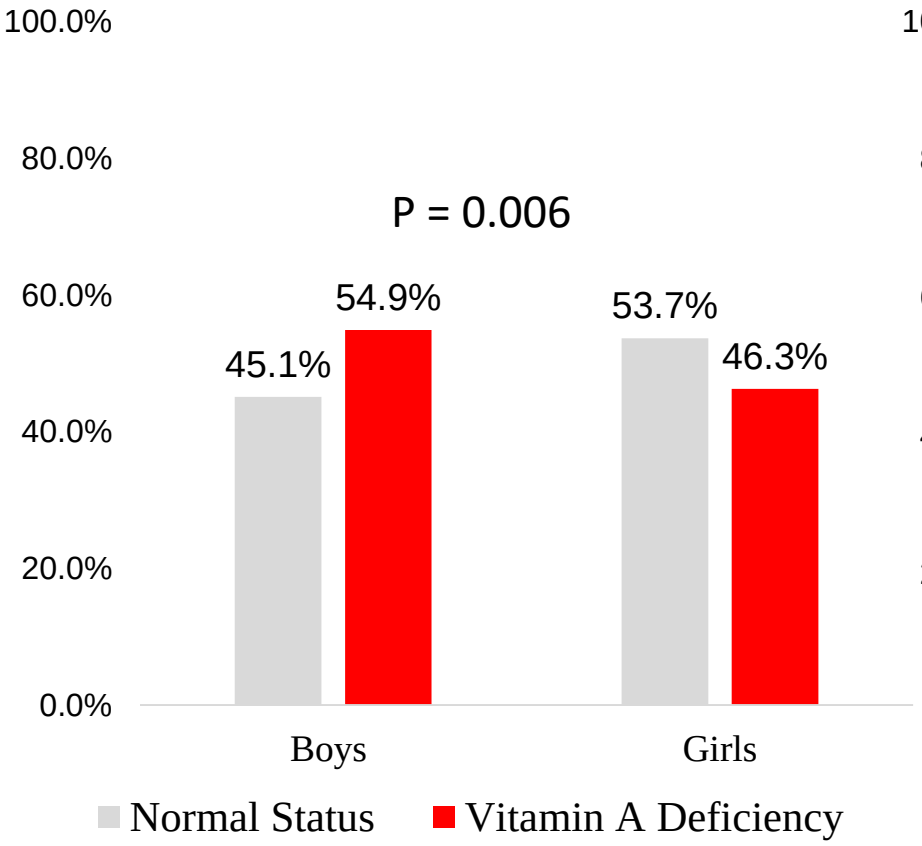
N=1014

- **Overall Vitamin A deficiency (mild to severe): 50.9%** (95% CI: 46.3-55.5%);
- **No severe cases observed**

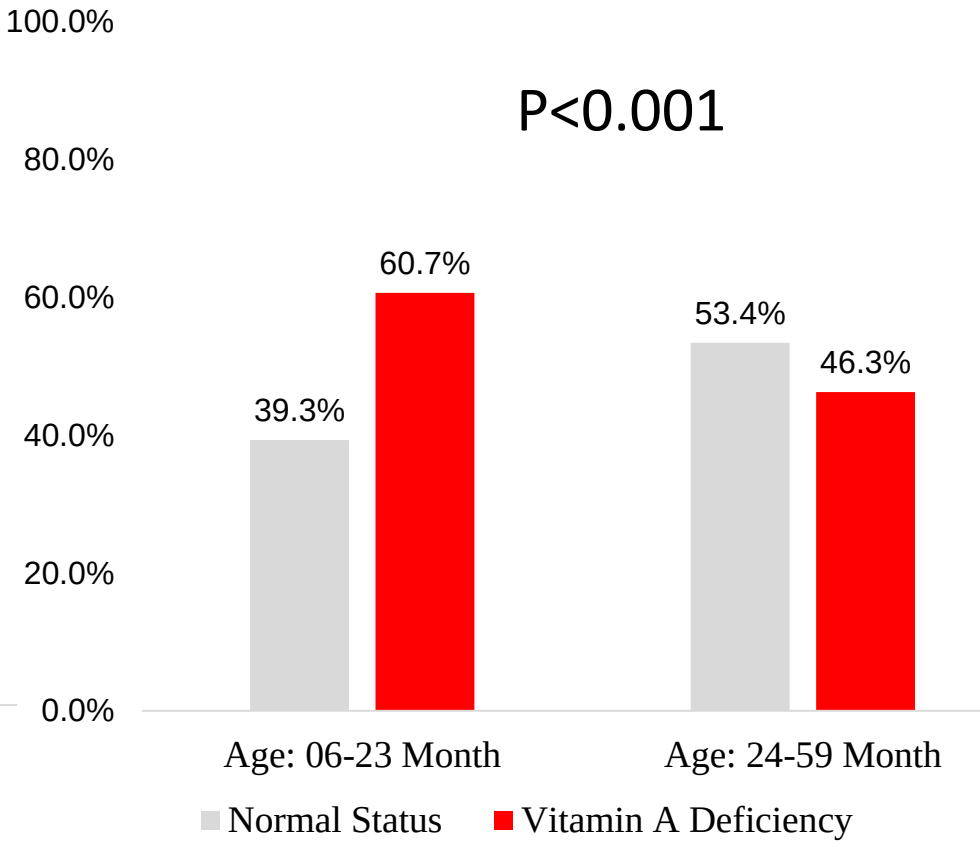


Vitamin A deficiency in children by sex and age

8.6% higher in boys than girls

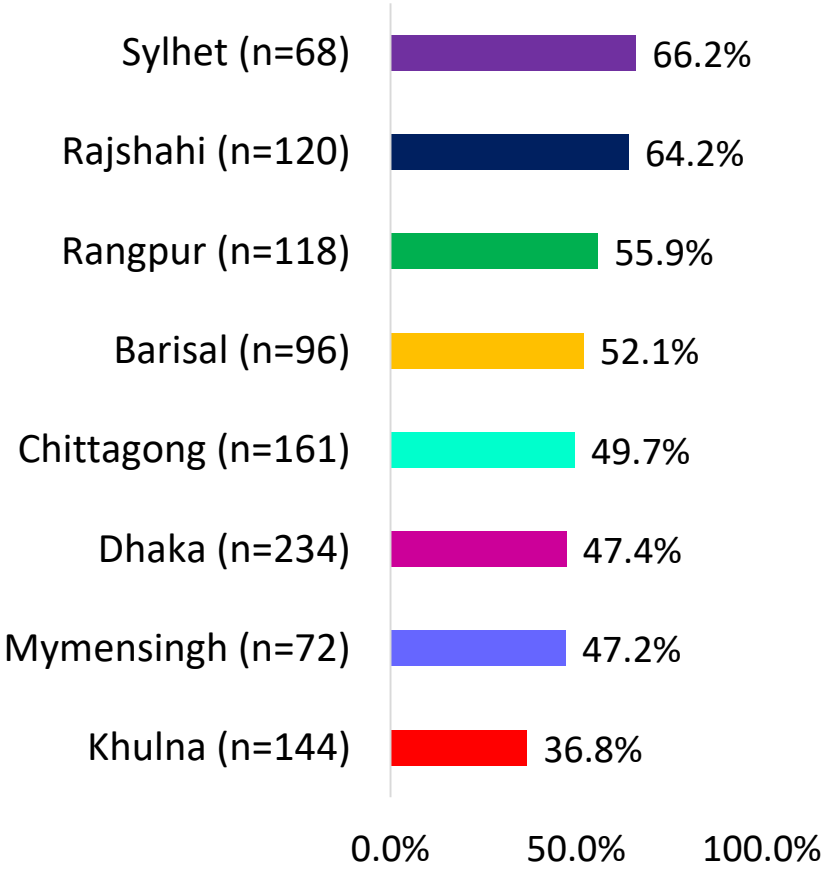


26.4% higher in younger than older children

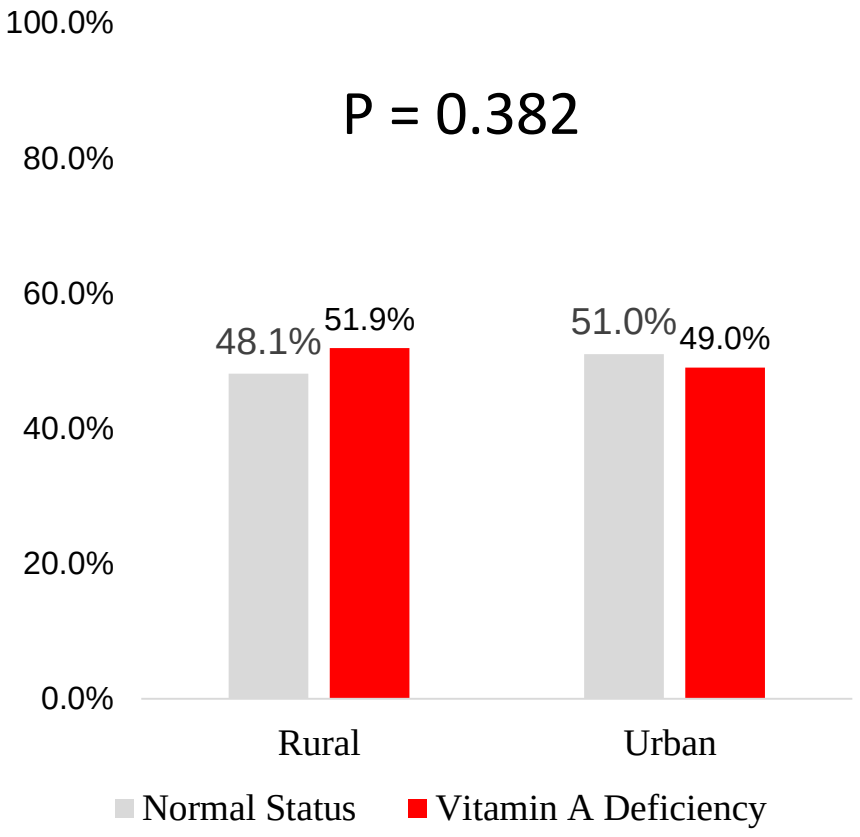


Vitamin A deficiency in children by division and place of residence

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

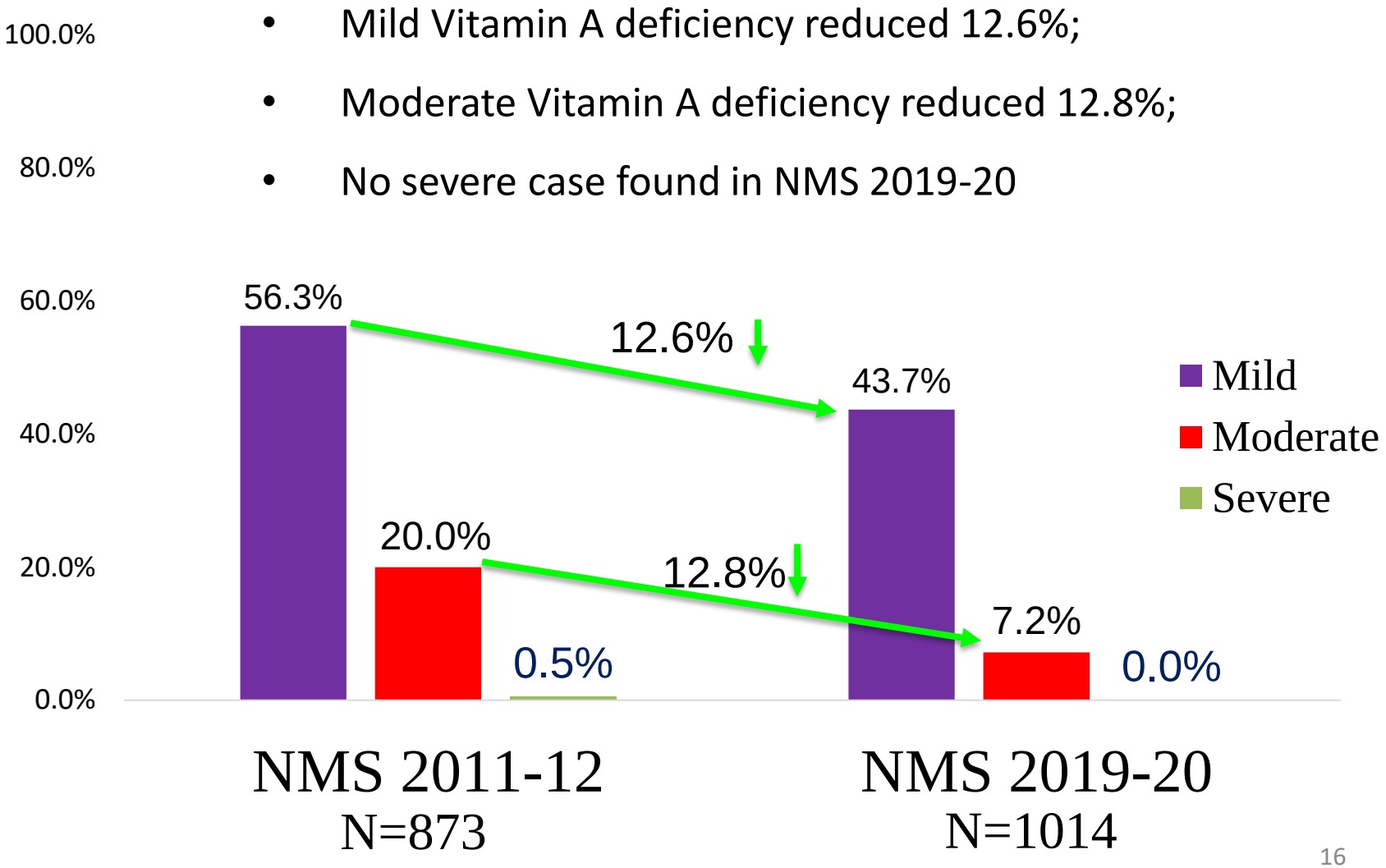


No difference across rural and urban



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

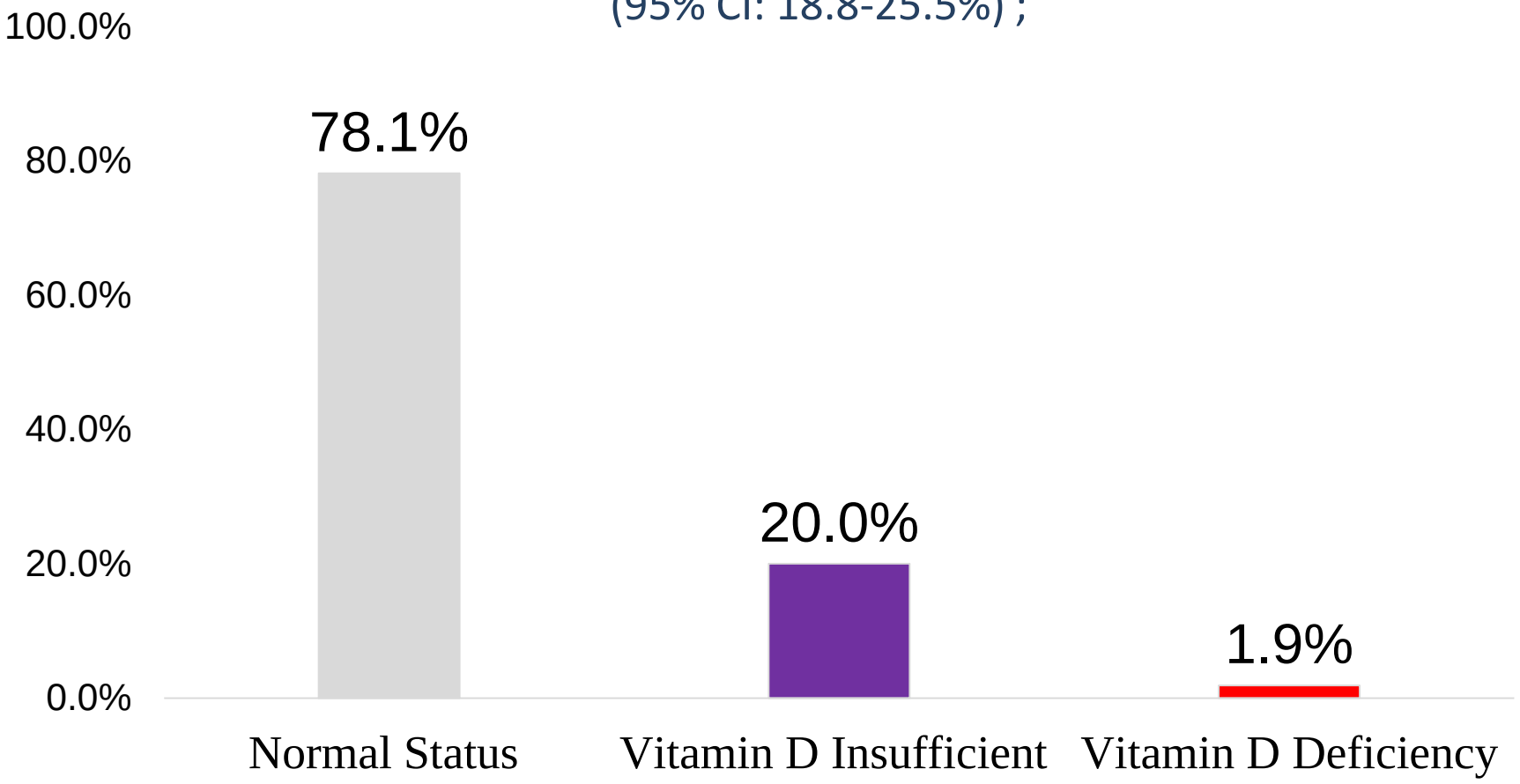
Dr. Aliya Naheed (PI) is conducting a community feedback meeting in Bandarban district

Vitamin D deficiency in children

N=1027

Overall Vitamin D deficiency: 21.9%

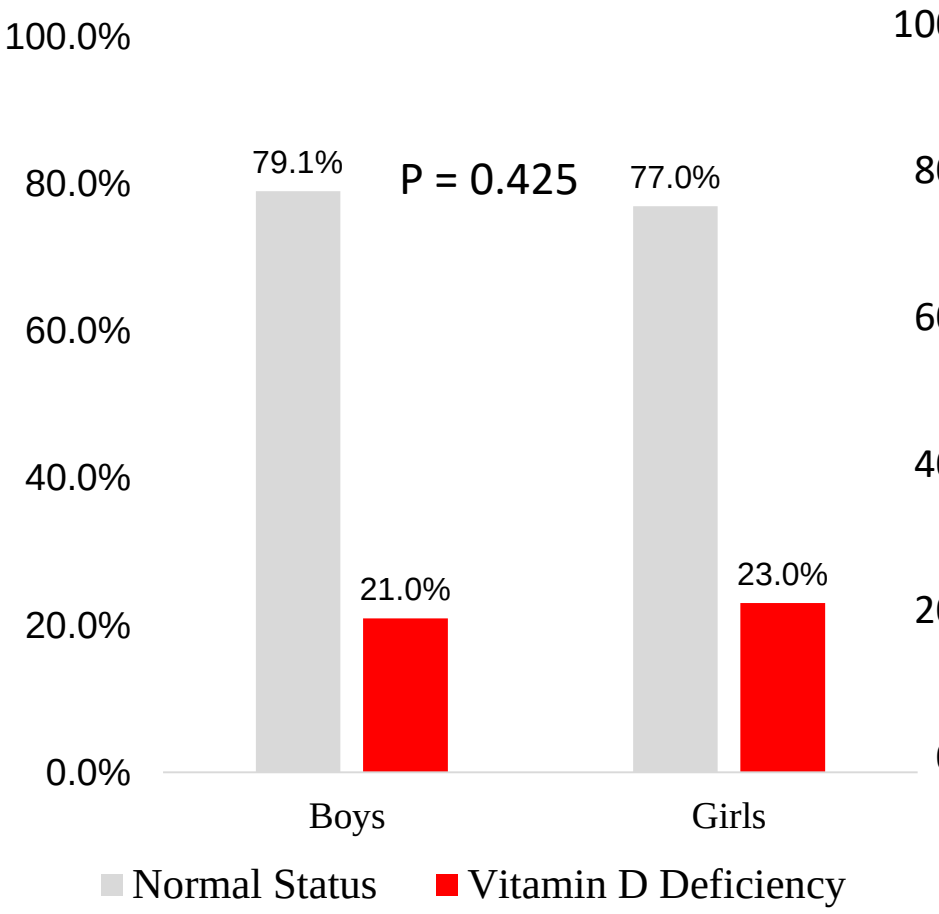
(95% CI: 18.8-25.5%) ;



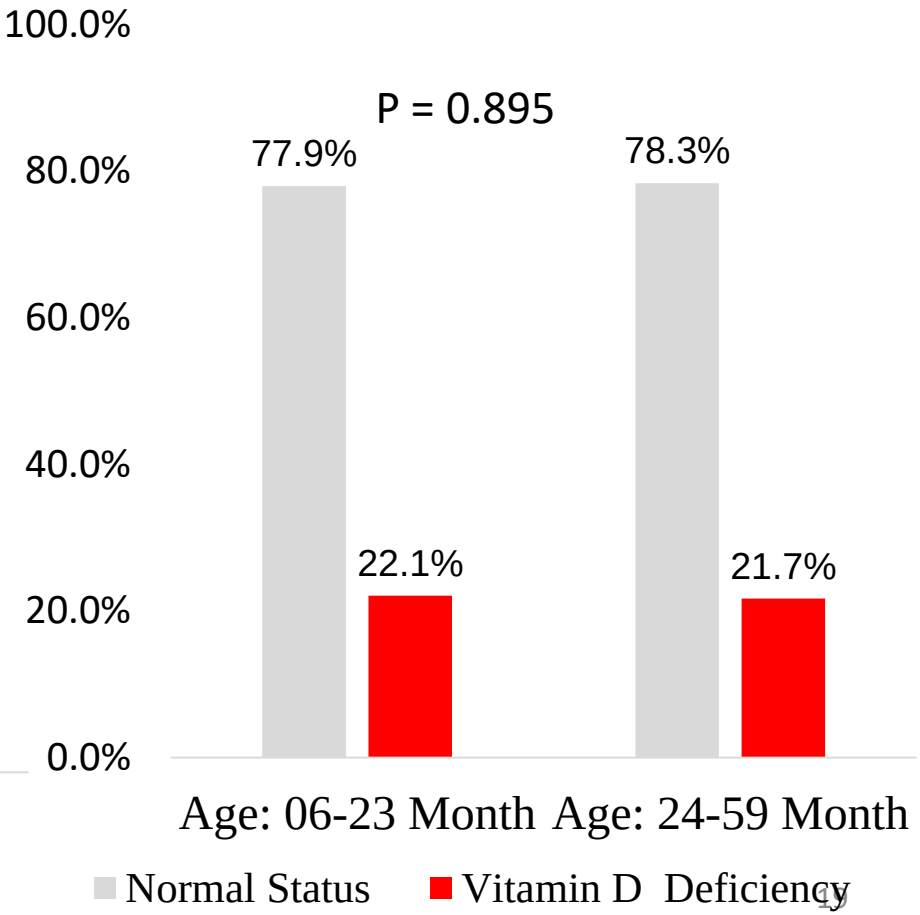
Funded by : National Nutrition Service; PI: Dr. Aliya Naheed

Vitamin D deficiency in children by sex and age

No variation across sex

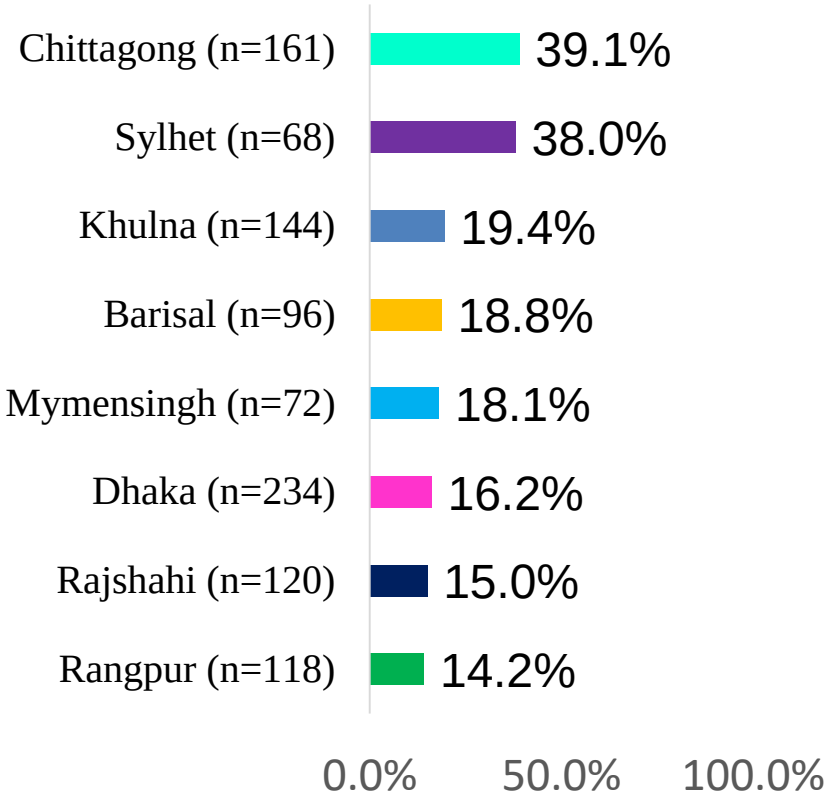


No variation across age

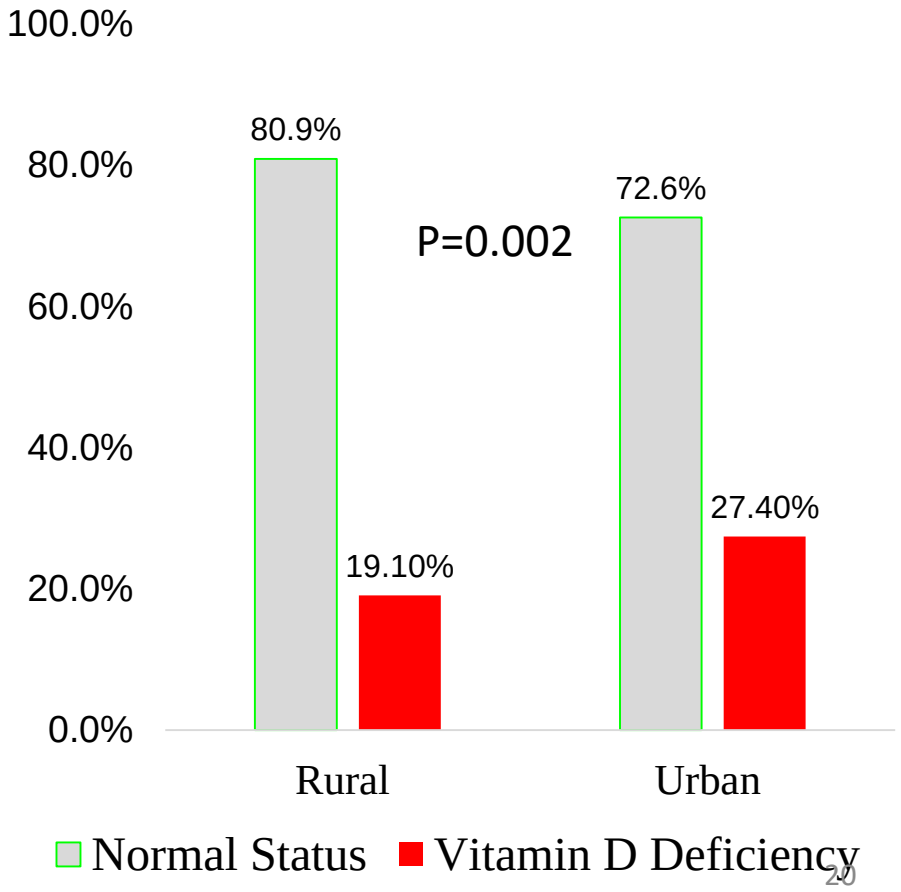


Vitamin D deficiency in children by division and place of residence

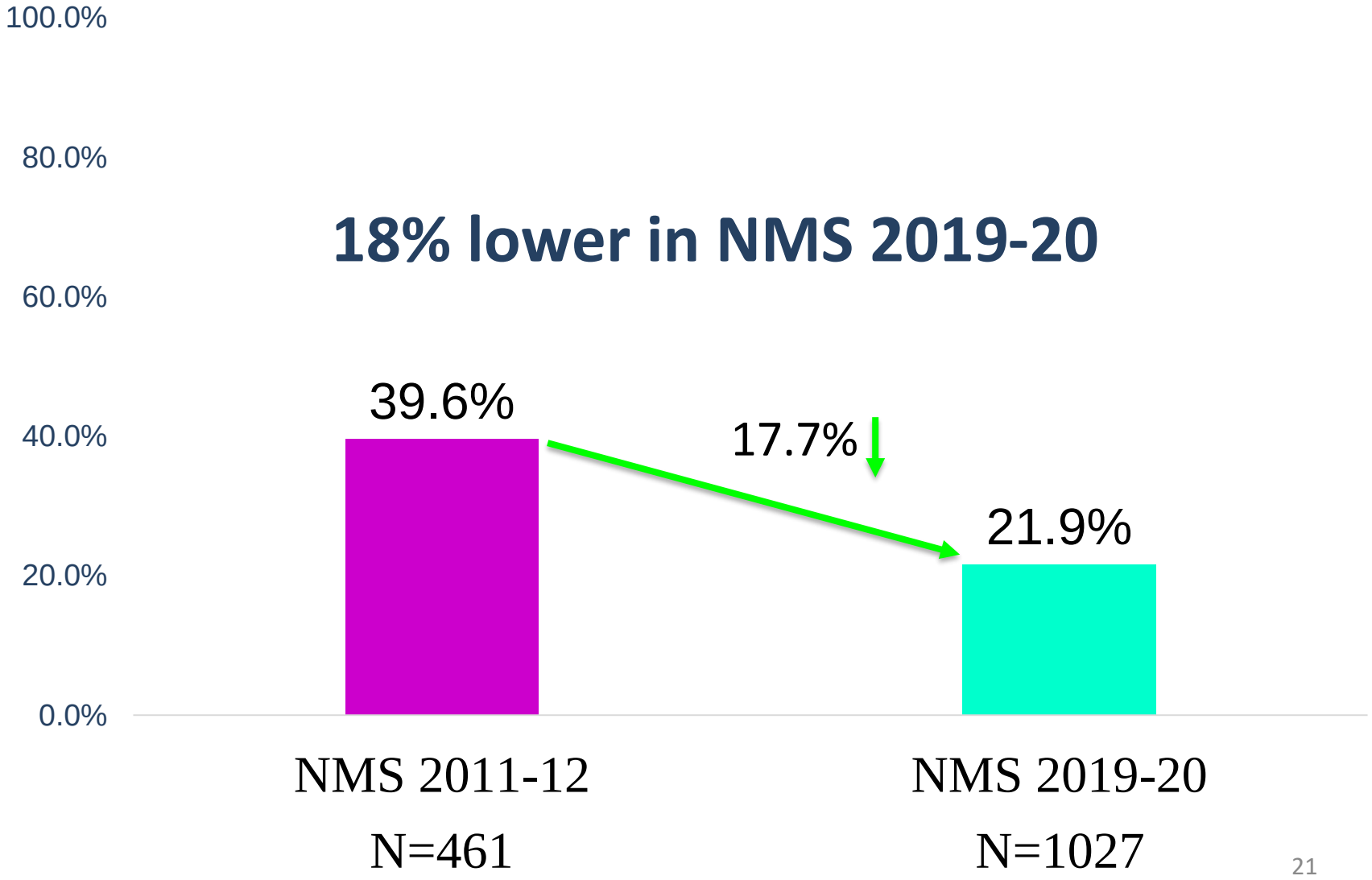
Proportion of vitamin D deficiency varies across division (P=0.001)



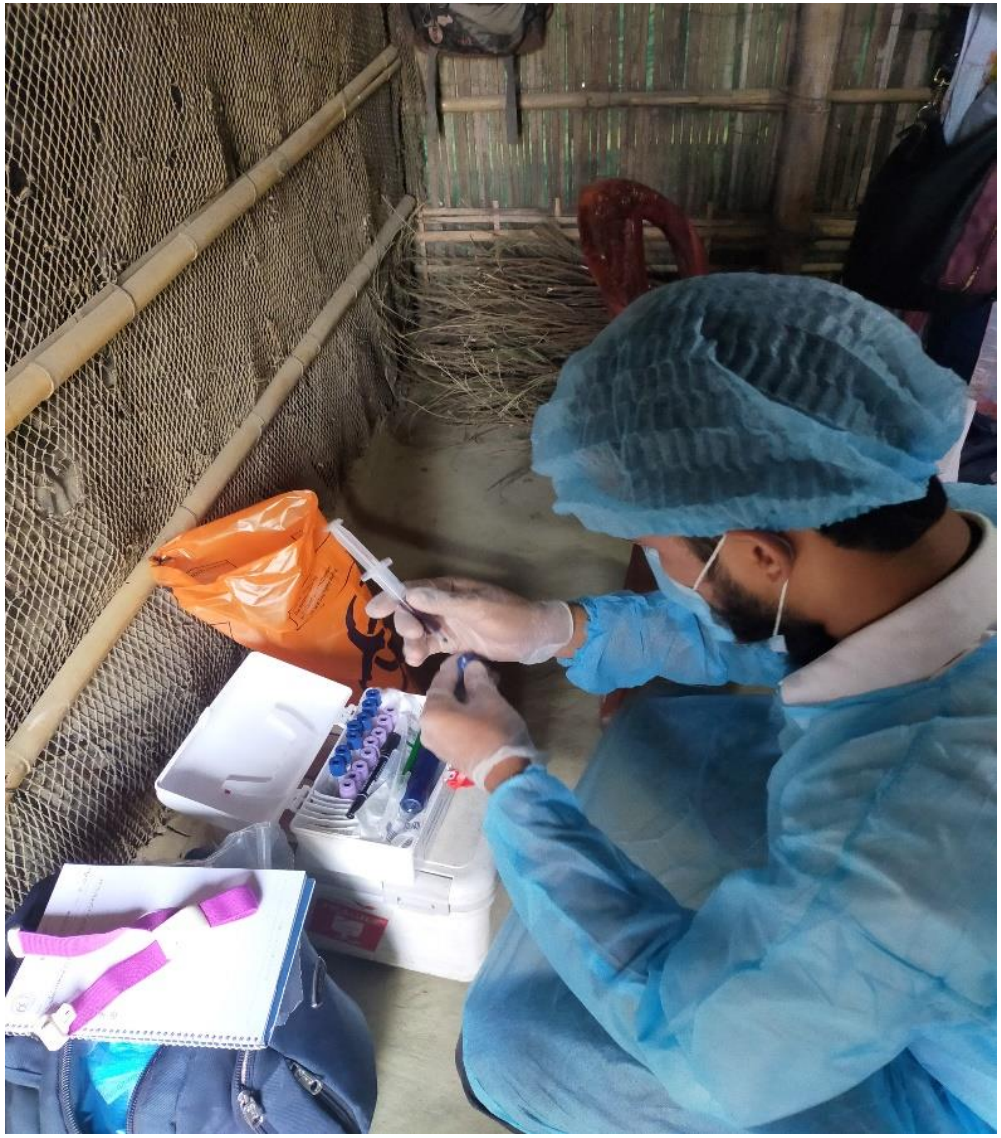
8.3% higher in urban than rural areas



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



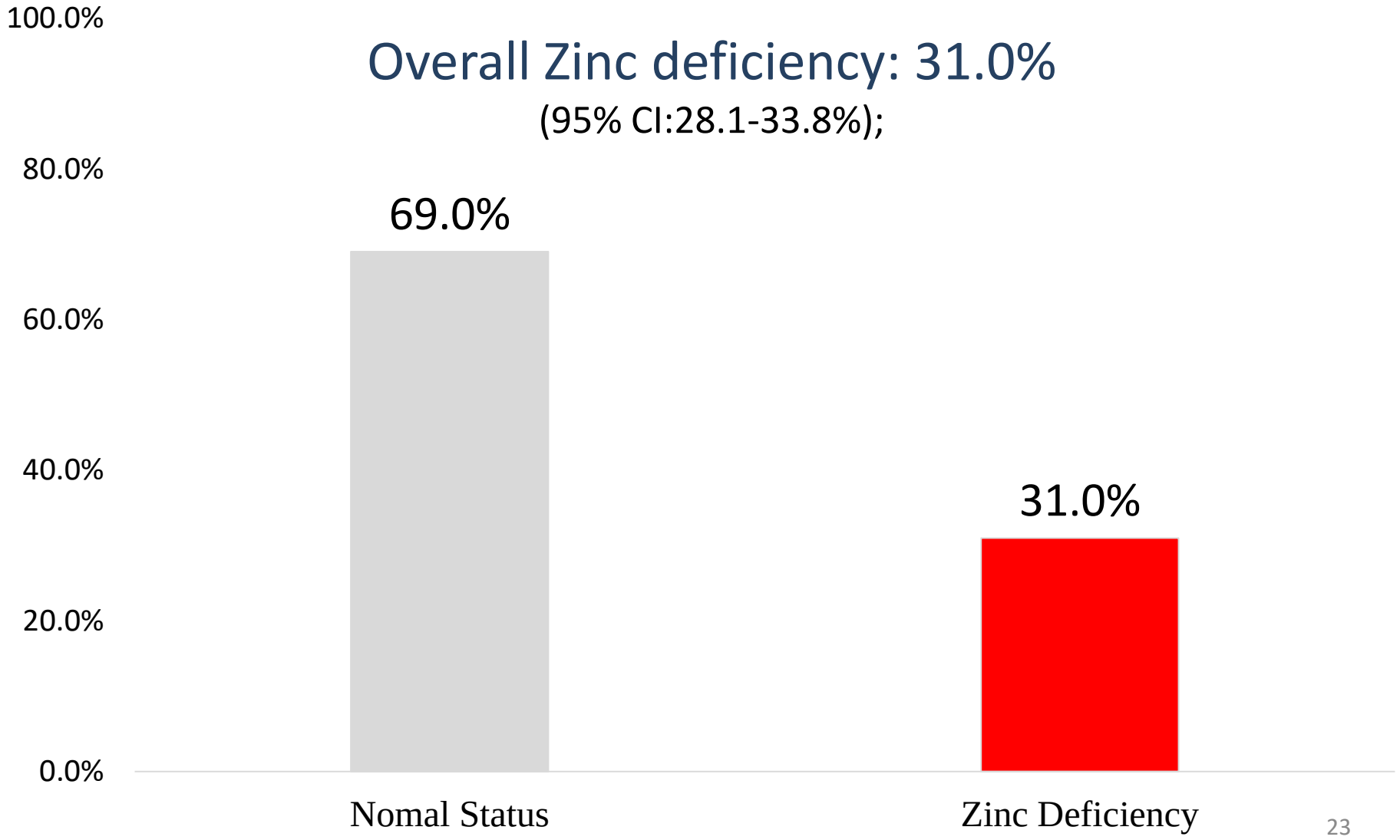
Status of Zinc Deficiency



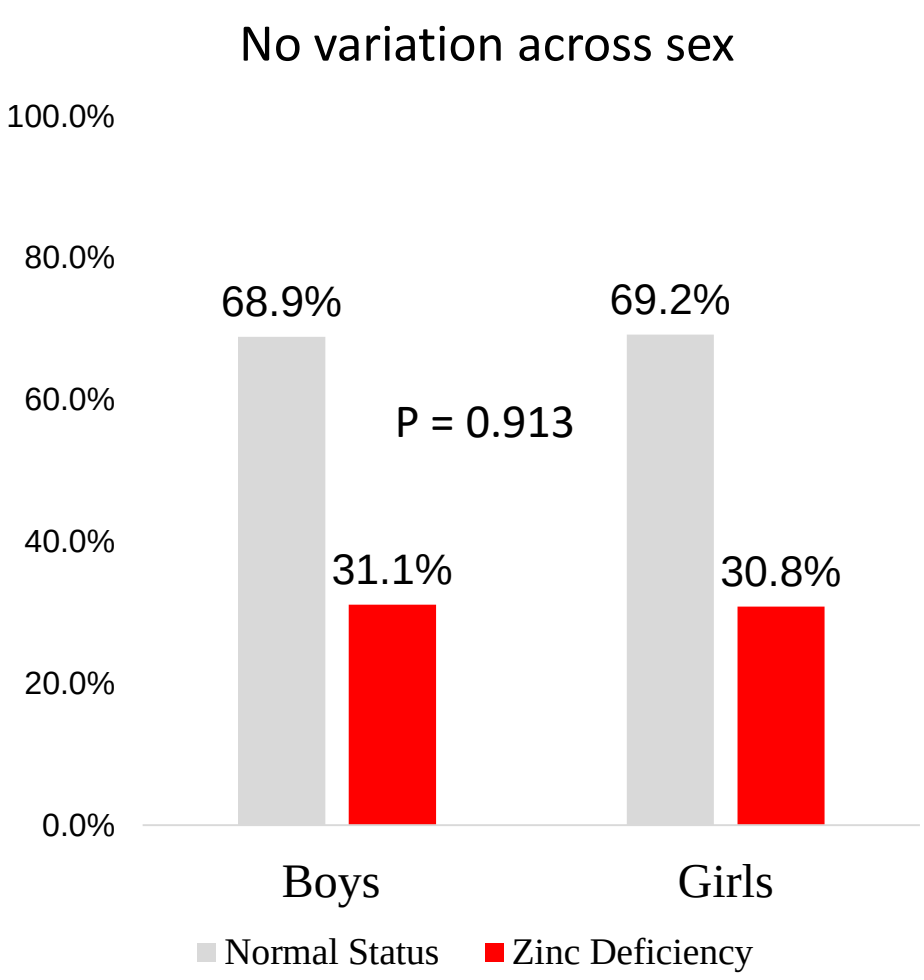
A phlebotomist allocating blood sample during field survey in *Cox Bazar sadar Upazila, Cox Bazar district*

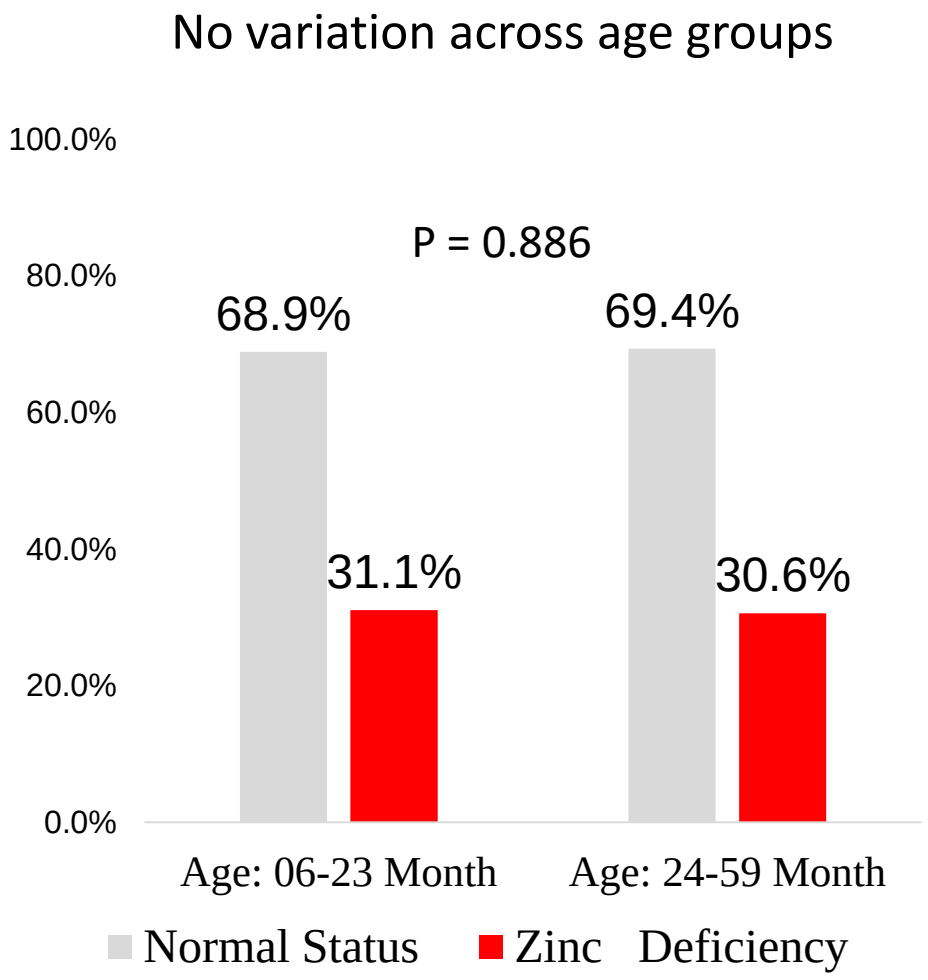
Zinc deficiency in children

N=1023



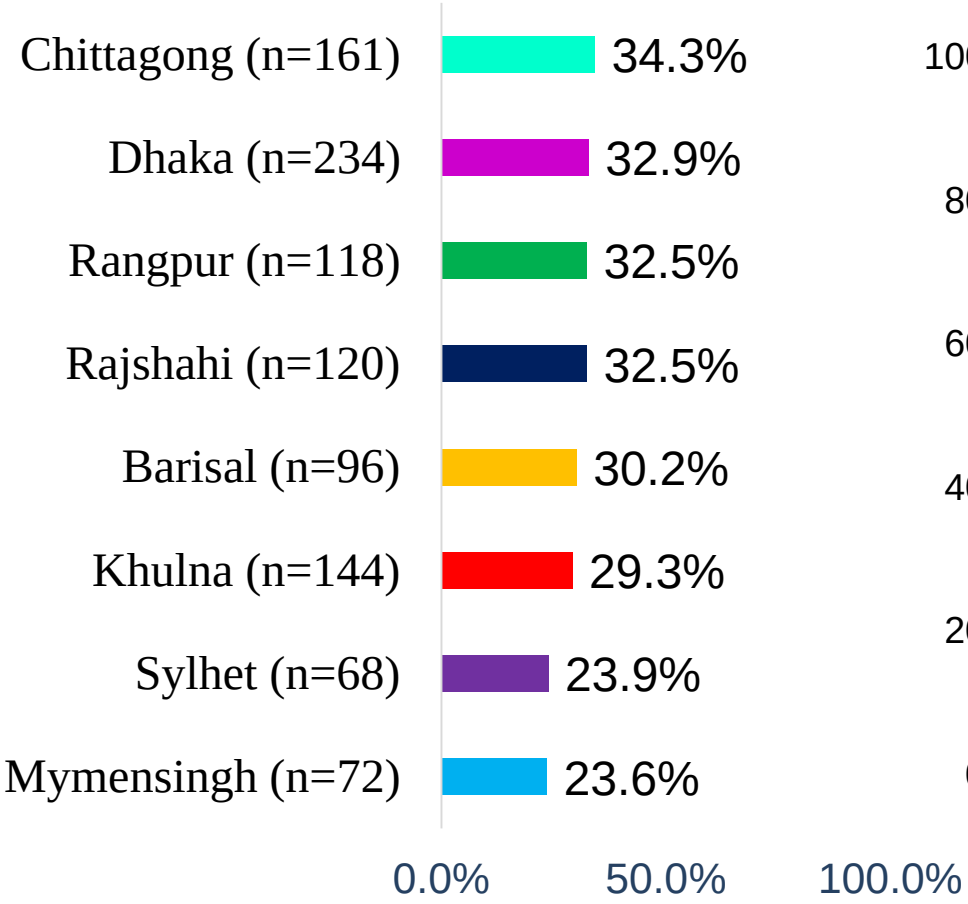
Zinc deficiency in children by sex and age



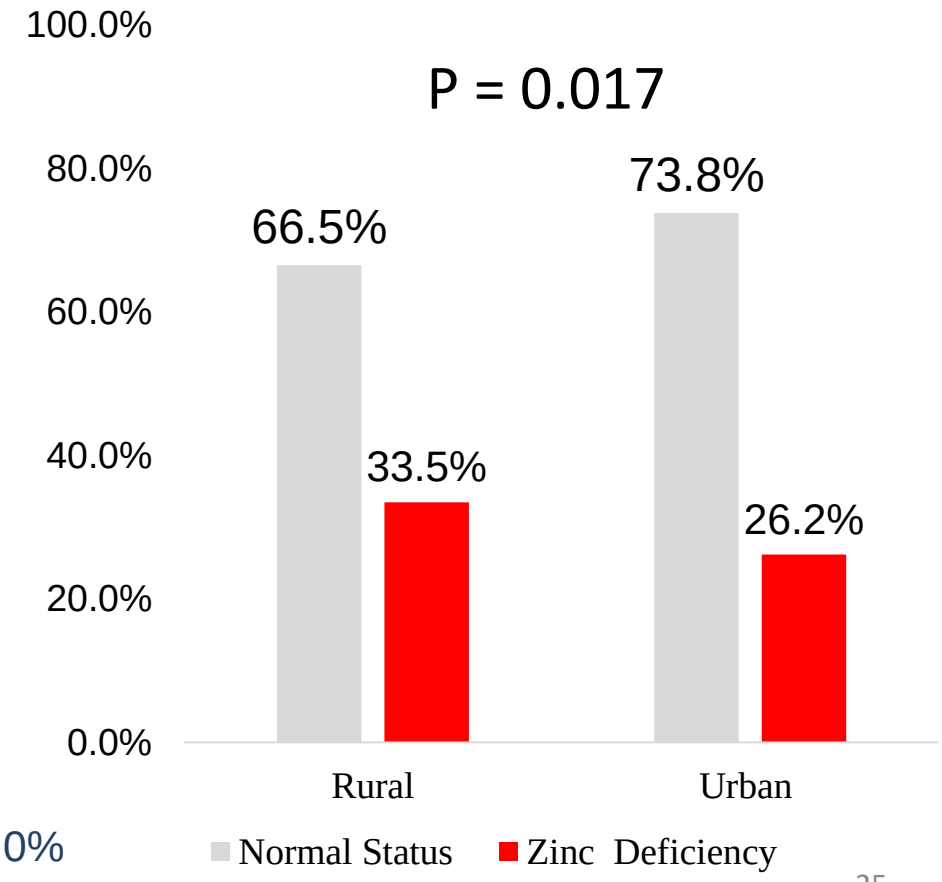


Zinc deficiency in children by division and place of residence

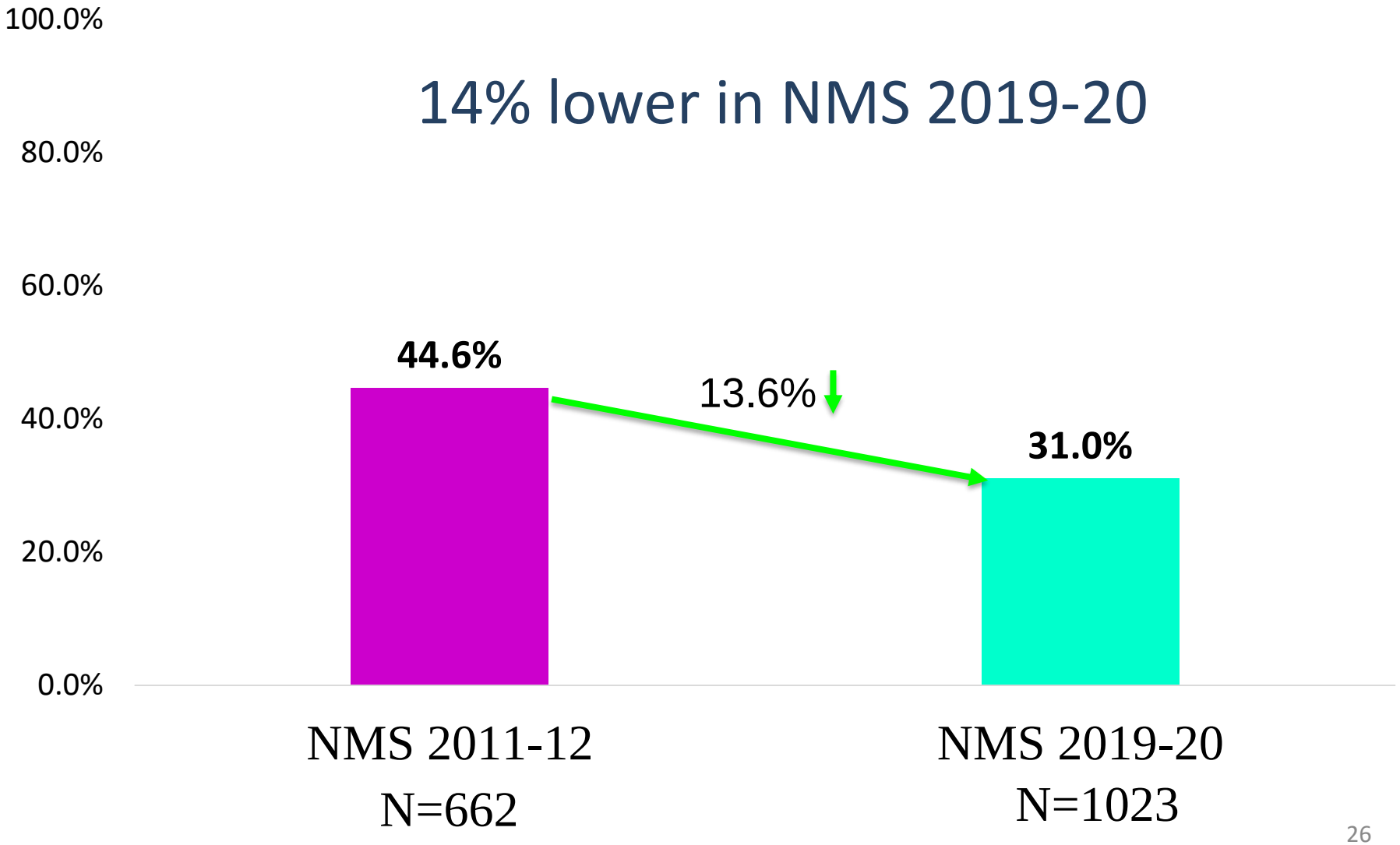
No variation across divisions



7.3% higher in rural than urban children



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

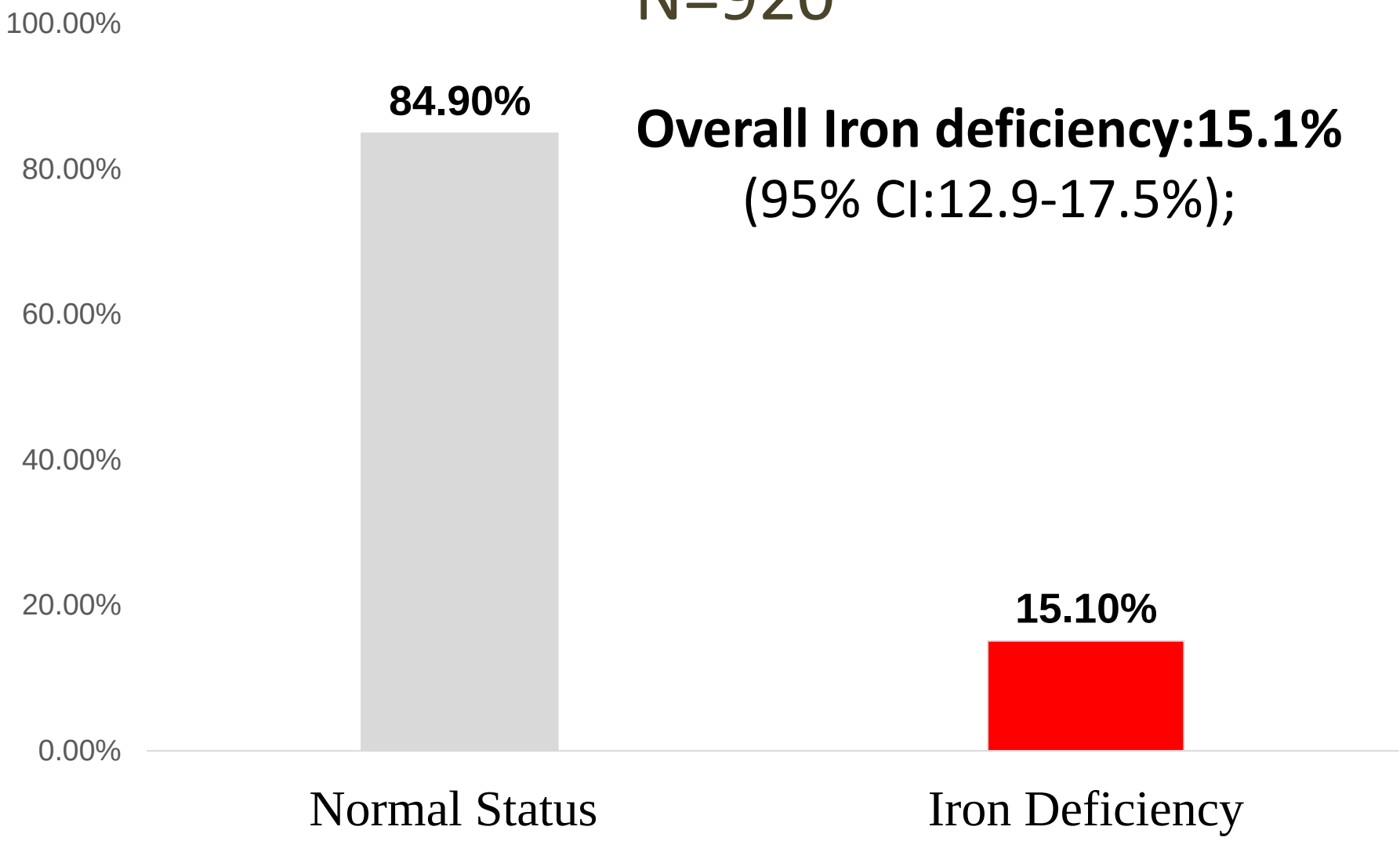


Status of Iron deficiency

The photo was taken during filed survey in *Naikhongchari upazila, Rangamati*

Iron deficiency in children

N=920

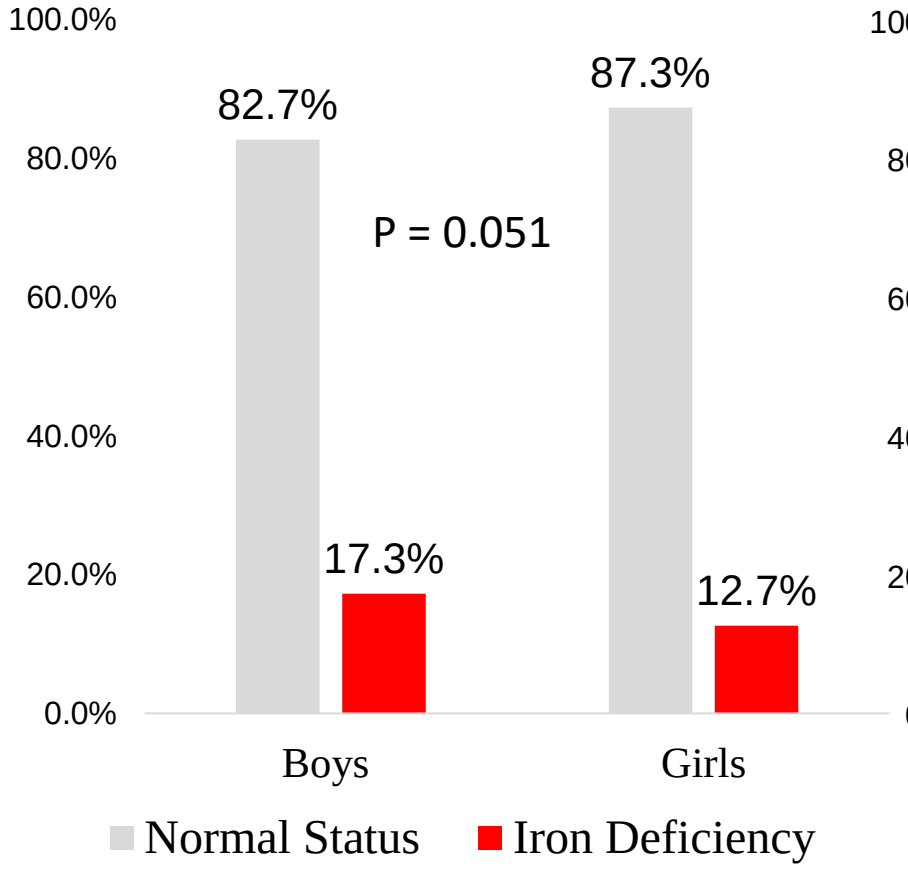


Overall Iron deficiency:15.1%
(95% CI:12.9-17.5%);

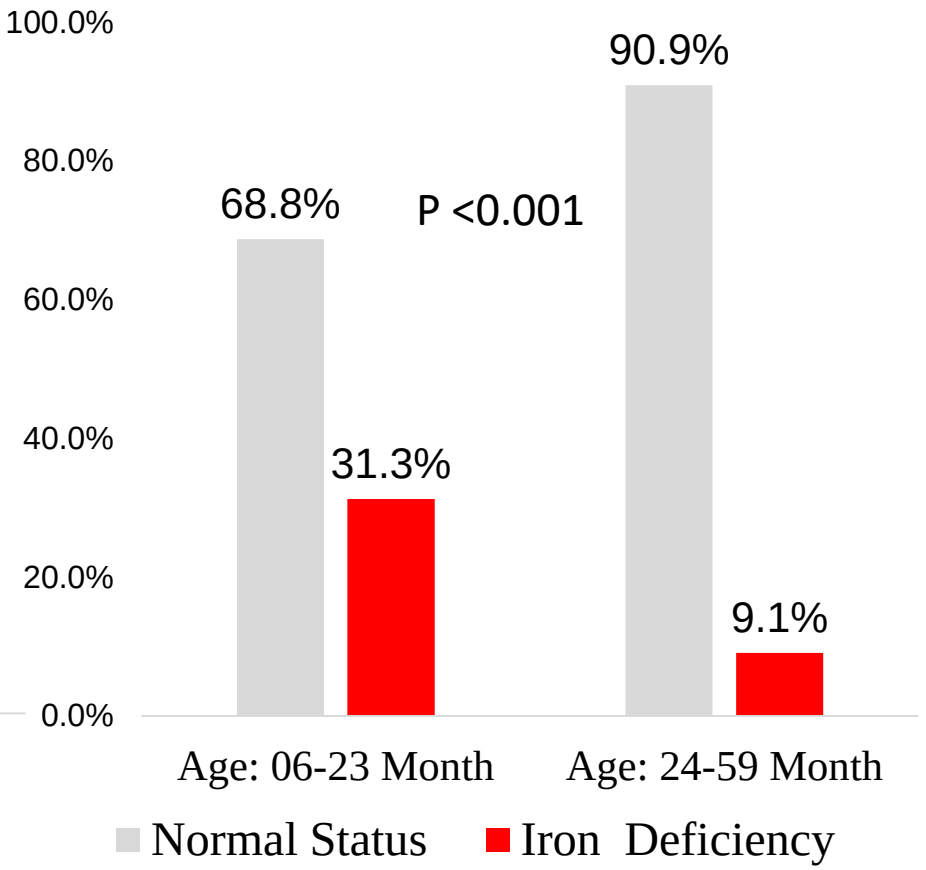
Funded by : National Nutrition Service; PI: Dr. Aliya Naheed

Iron deficiency in children by sex and age

No variations across sex

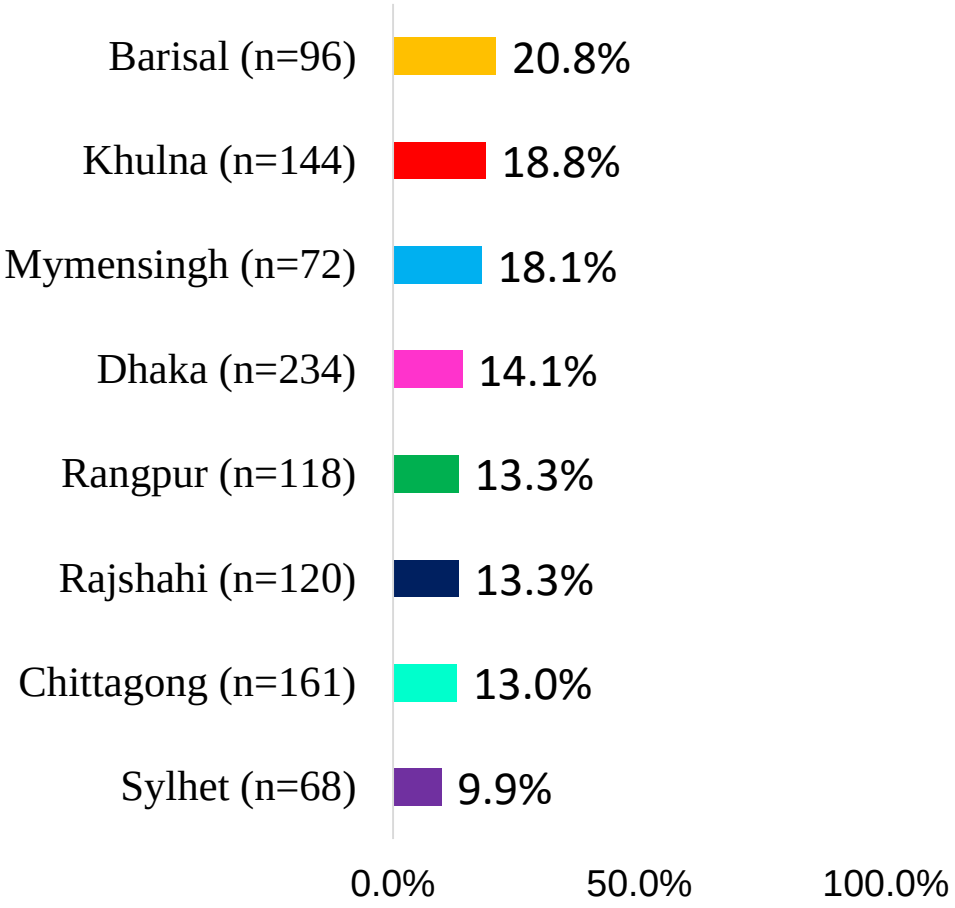


22.2% higher in younger children than older

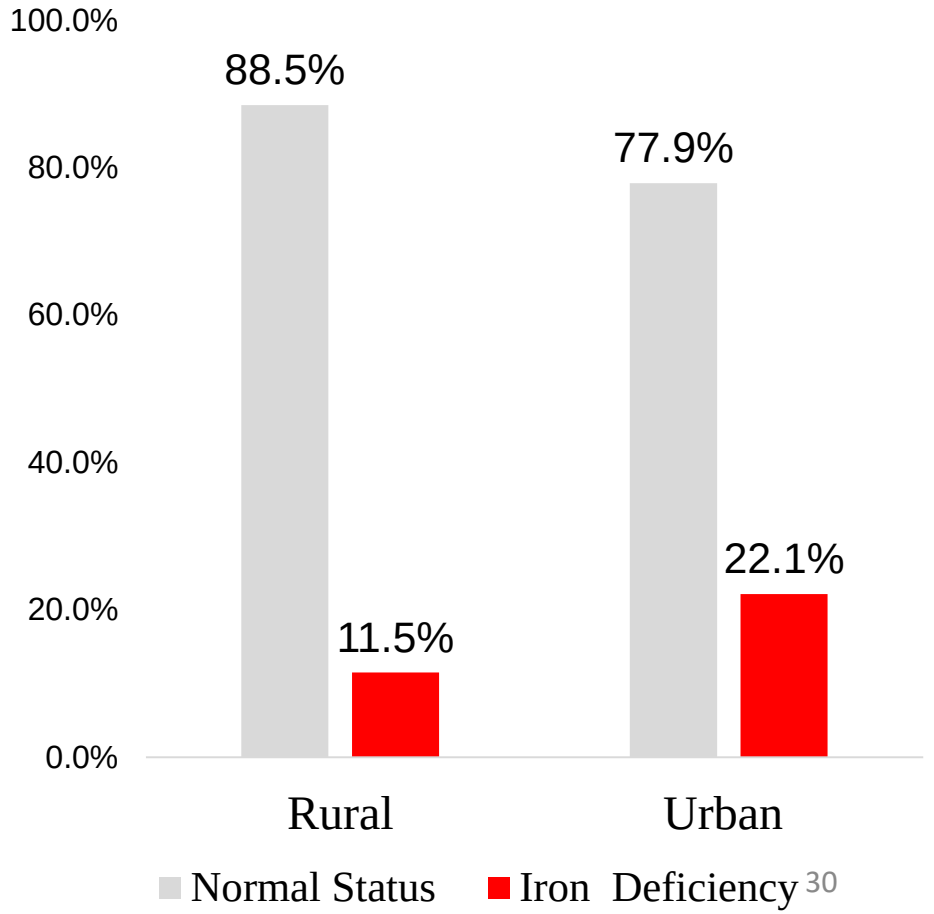


Iron deficiency in children by division and place of residence

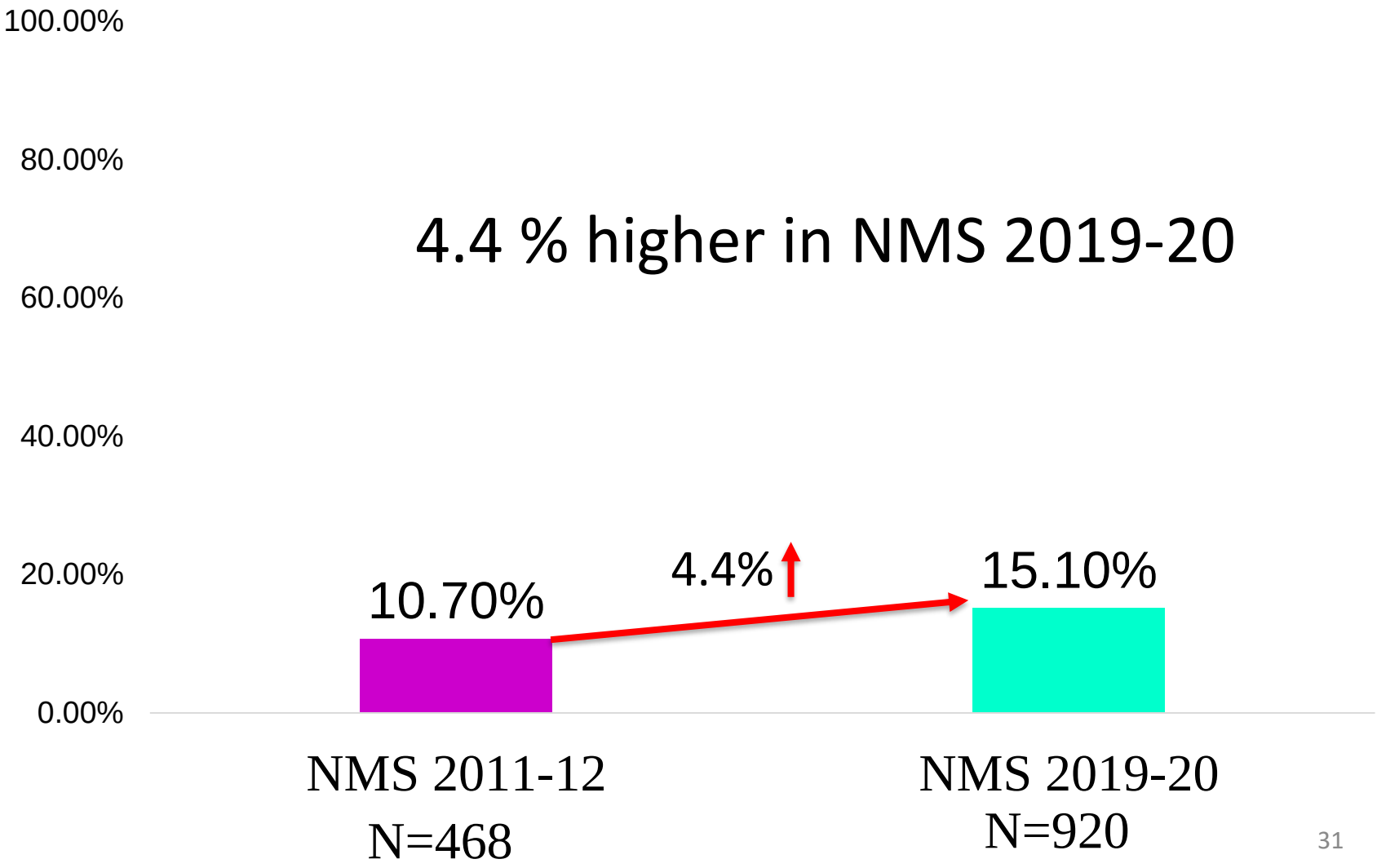
No variation across divisions(P=0.561)



10.6% higher in urban children than rural children



Comparison of Iron deficiency between NMS 2011-12 and NMS 2019-20



Status of Iodine deficiency

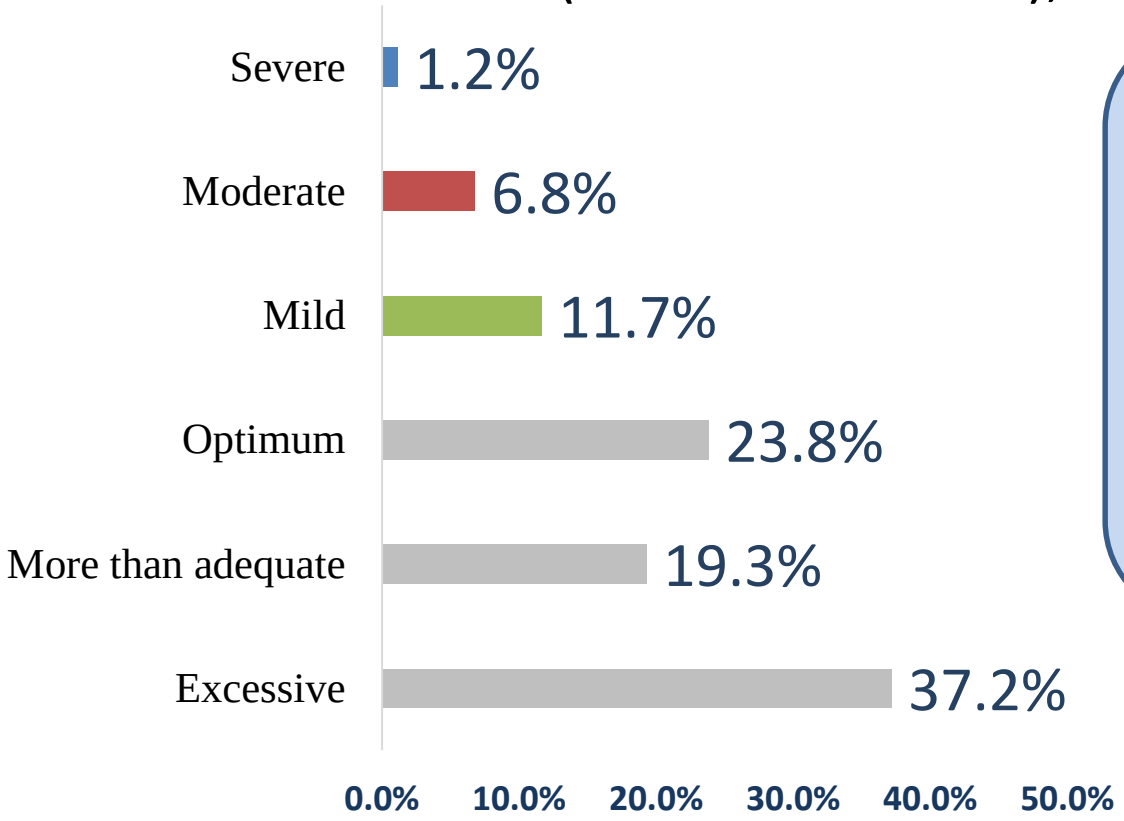
A phlebotomist taking blood sample during field survey in *Dhalar char, Bera Upazila, Pabna*

Iodine deficiency in children

N=1019

Overall Iodine deficiency: 19.7%;

(95% CI: 17.2-22.1);

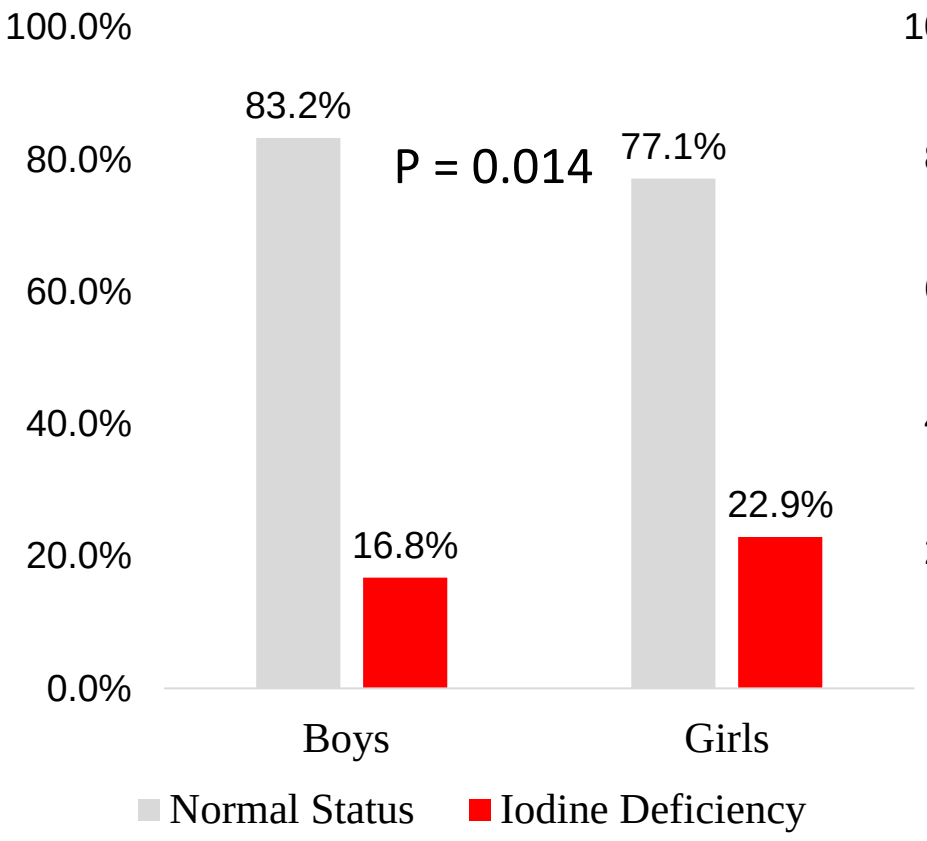


National prevalence of Iodine deficiency was not reported previously

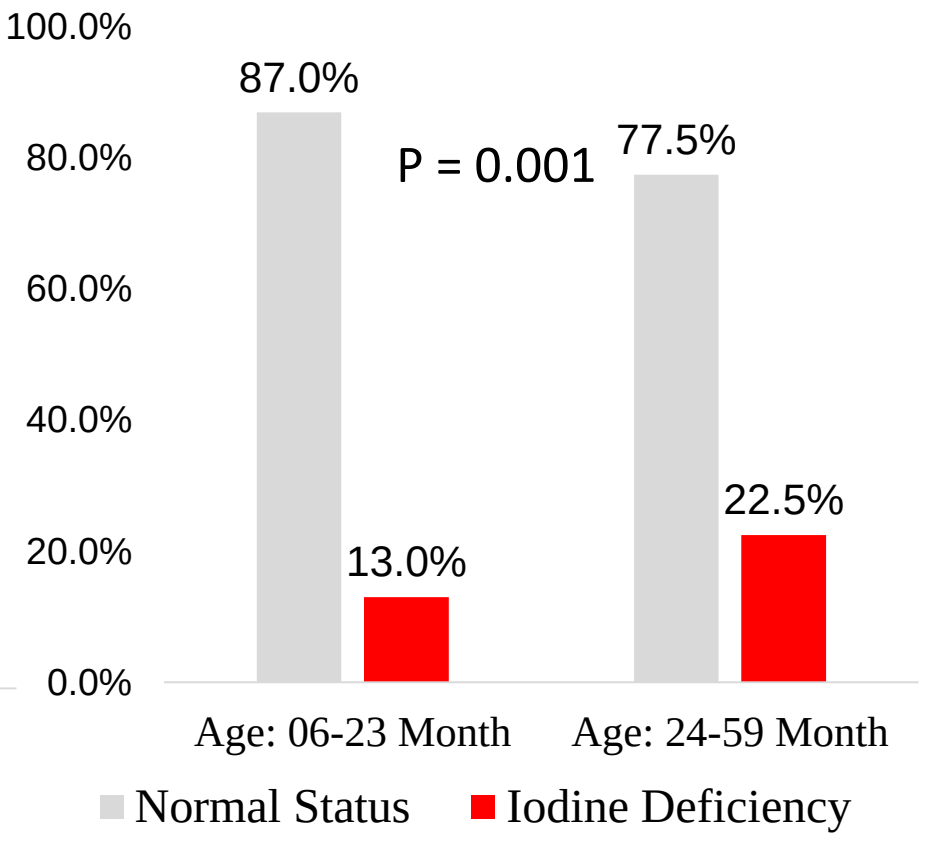
Funded by : National Nutrition Service; PI: Dr. Aliya Naheed

Iodine deficiency in children by sex and age

6.1% higher in girls than boys

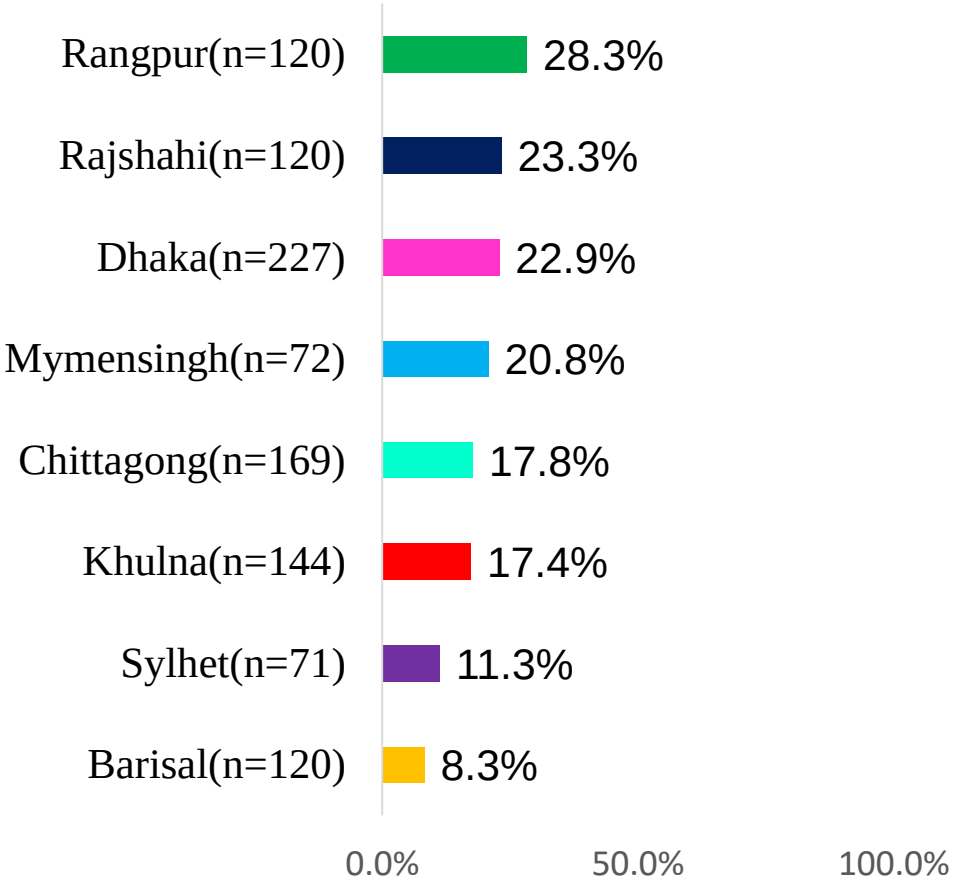


9.5% higher in the older children than the youngers

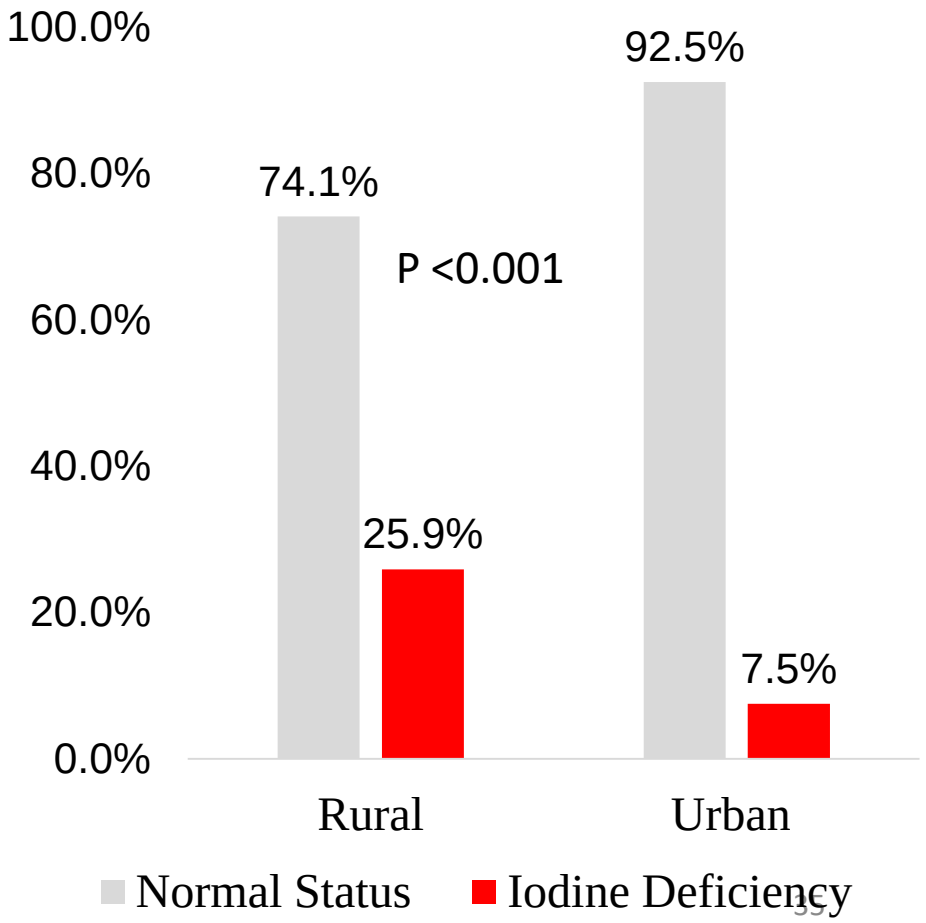


Iodine deficiency in children by division and place of residence

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



18.4% higher in rural children than urban children



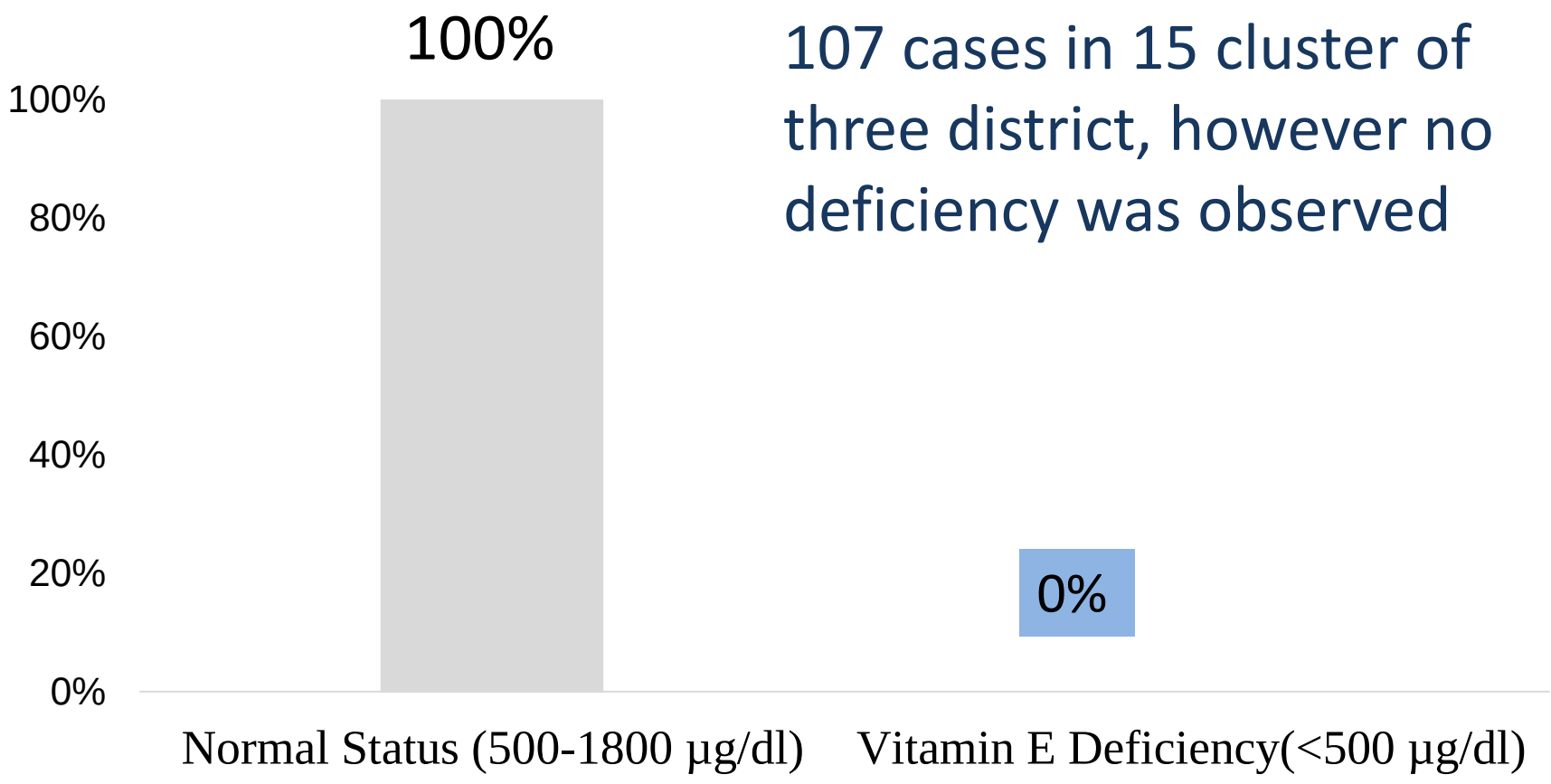
Status of Vitamin E deficiency

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



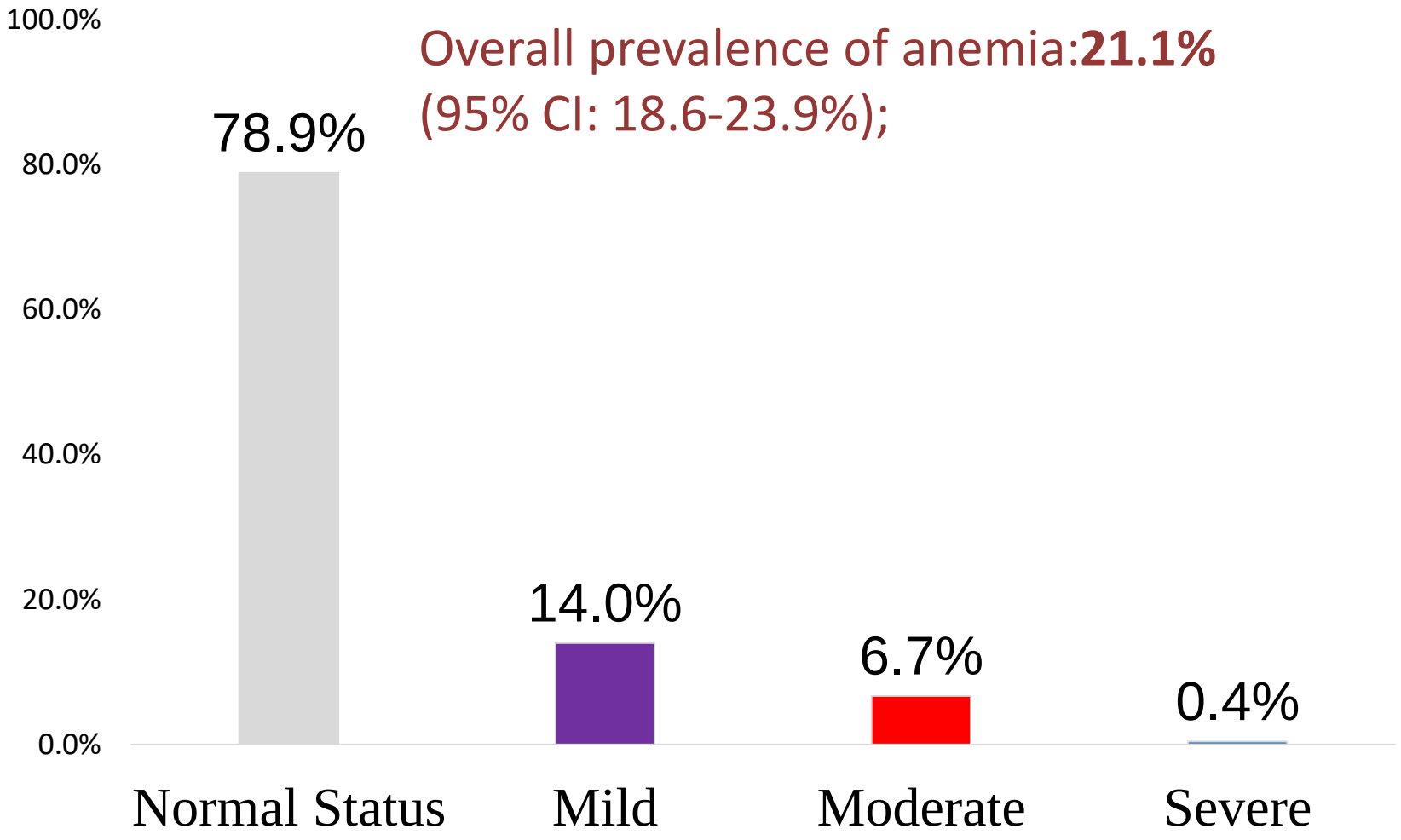
Status of Anemia

The study team taking preparation for field survey in a hard to reach areas of *Rangpur district*

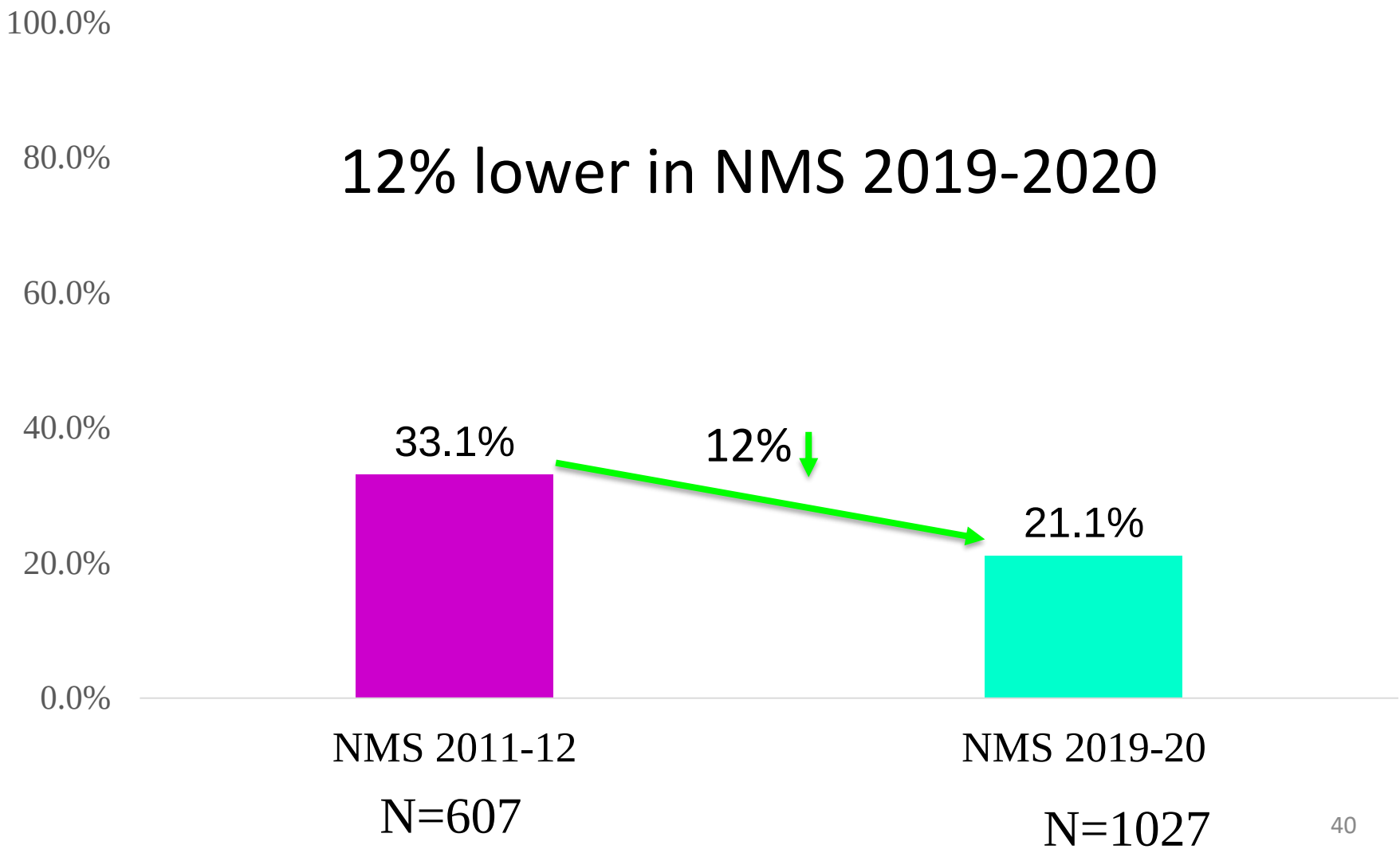
Anemia in children

N=1027

Overall prevalence of anemia:**21.1%**
(95% CI: 18.6-23.9%);

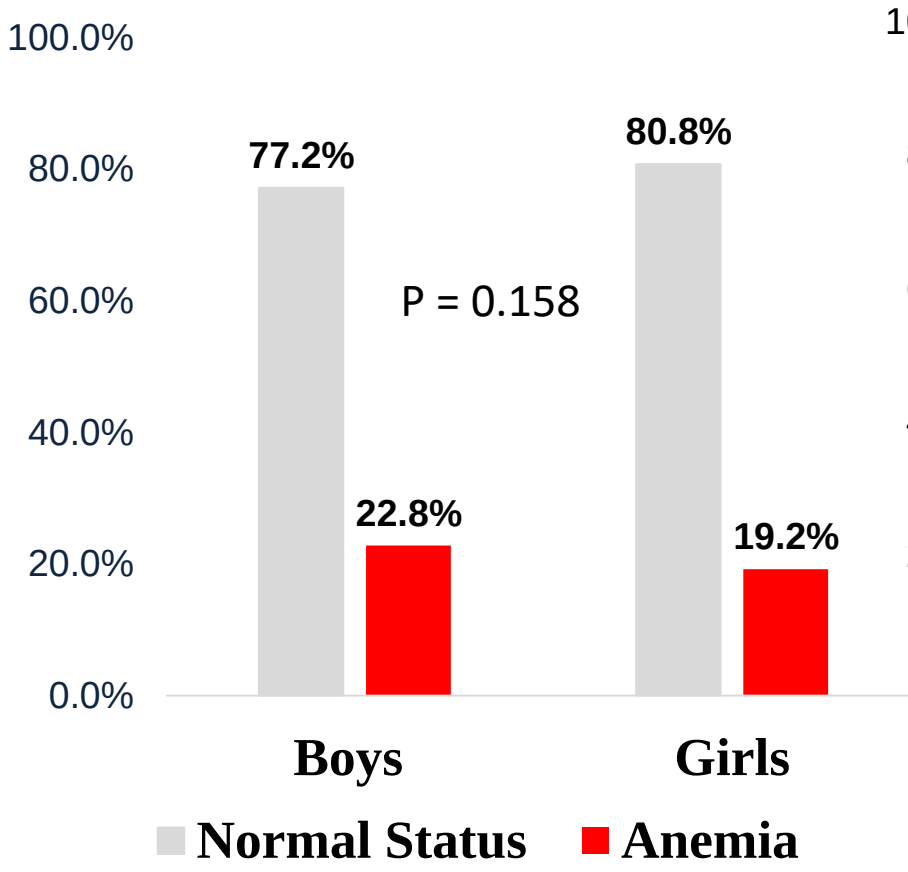


Comparison of mild to severe anemia between NMS 2011-12 and NMS 2019-20

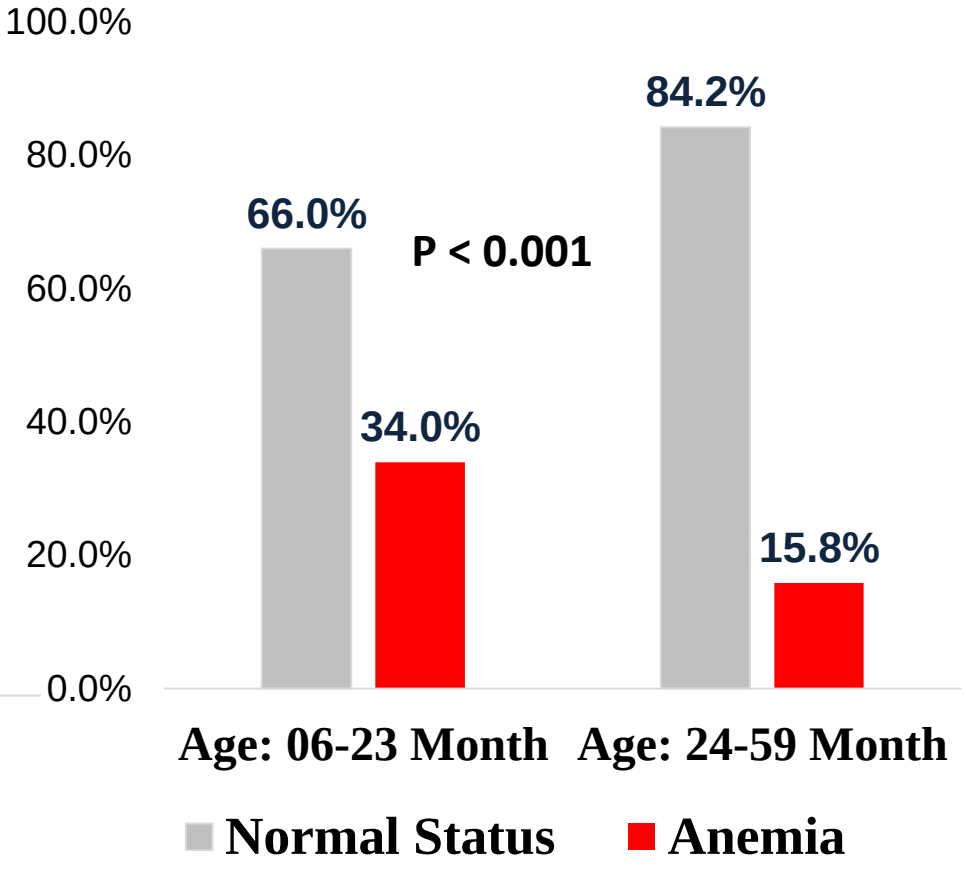


Anemia in children by sex and age

No variations across sex

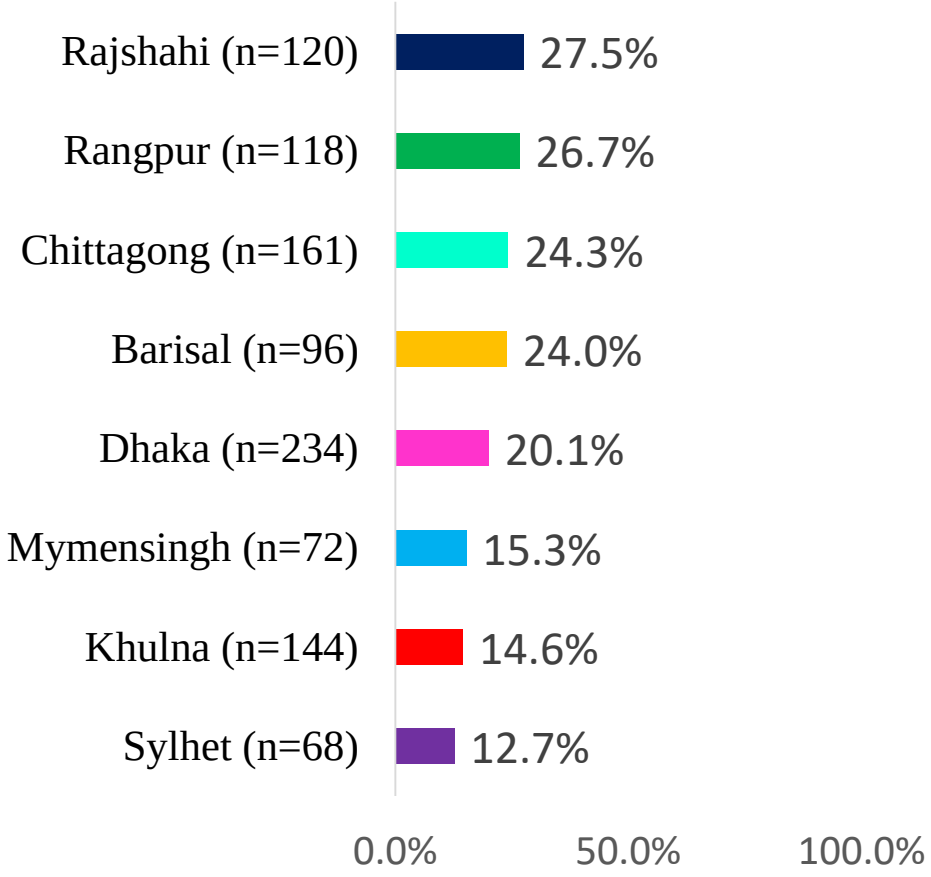


18.2% higher in younger than older children

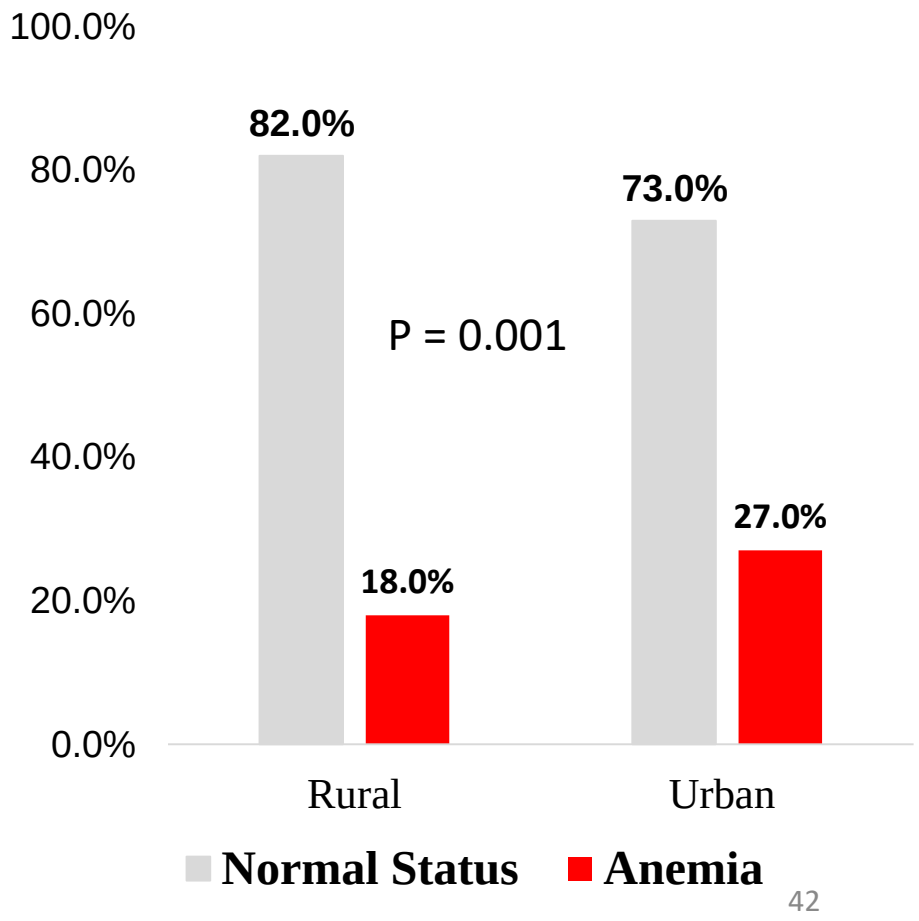


Anemia in children by division and place of residence

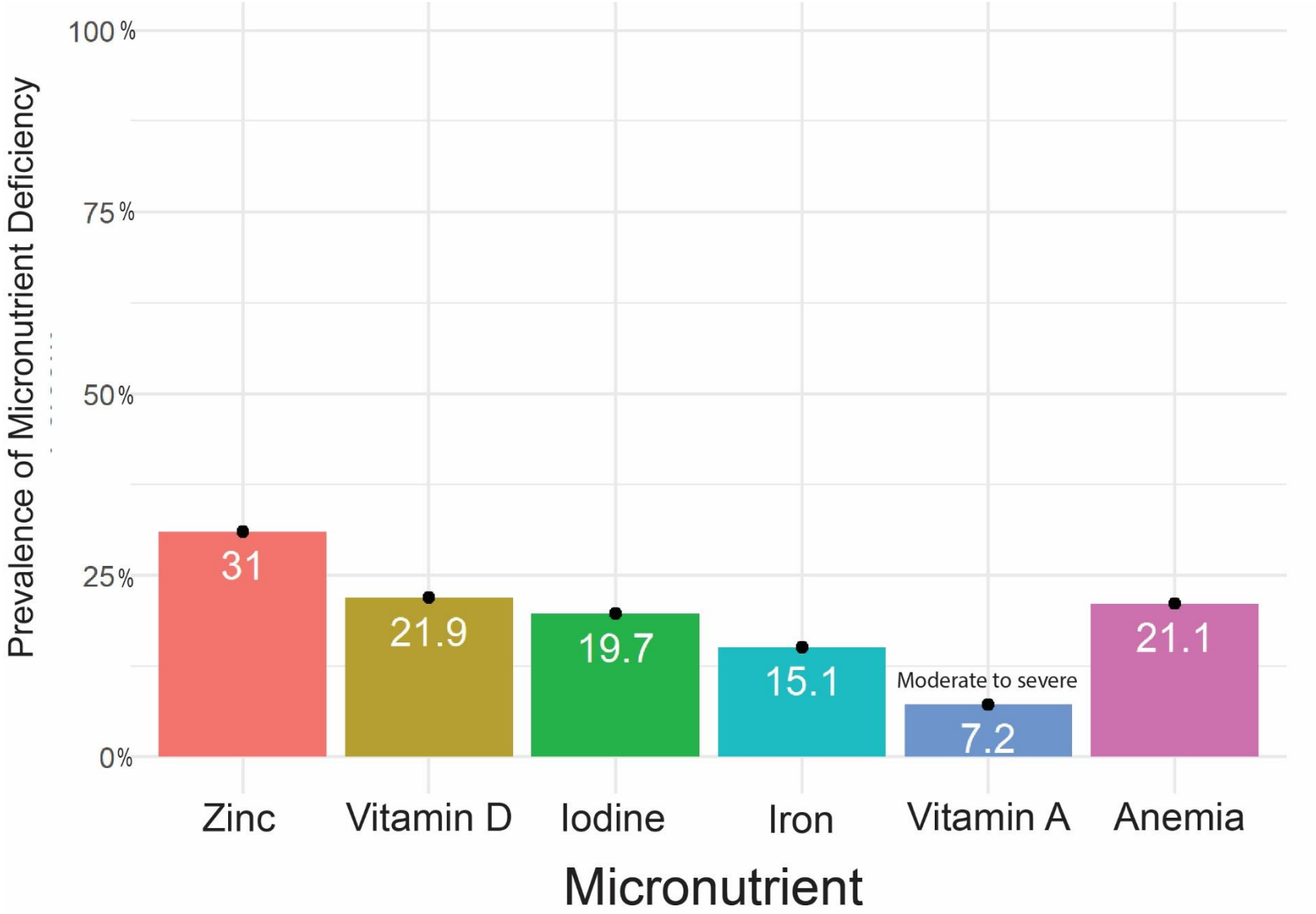
Proportion of anemia varies across divisions



11% Higher in urban than rural children



Snapshot of micronutrient deficiency and anemia among children



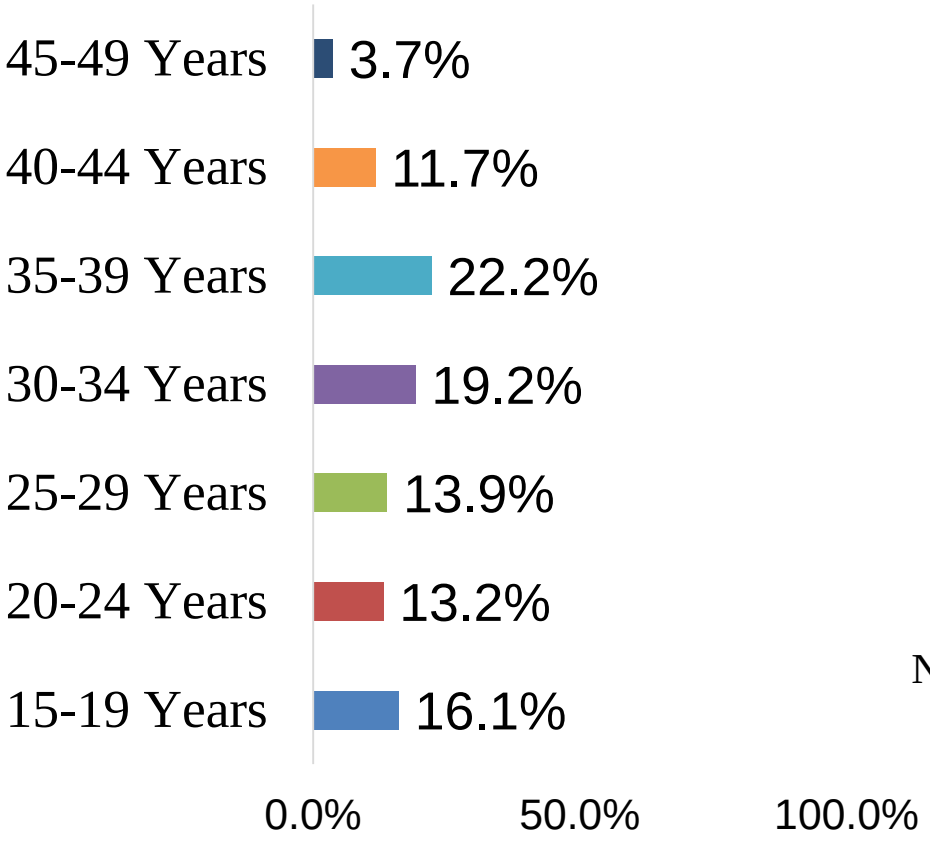
Findings:

Non-pregnant and Non- lactating (NPNL) women (15-49 years)

Characteristics of NPNL women

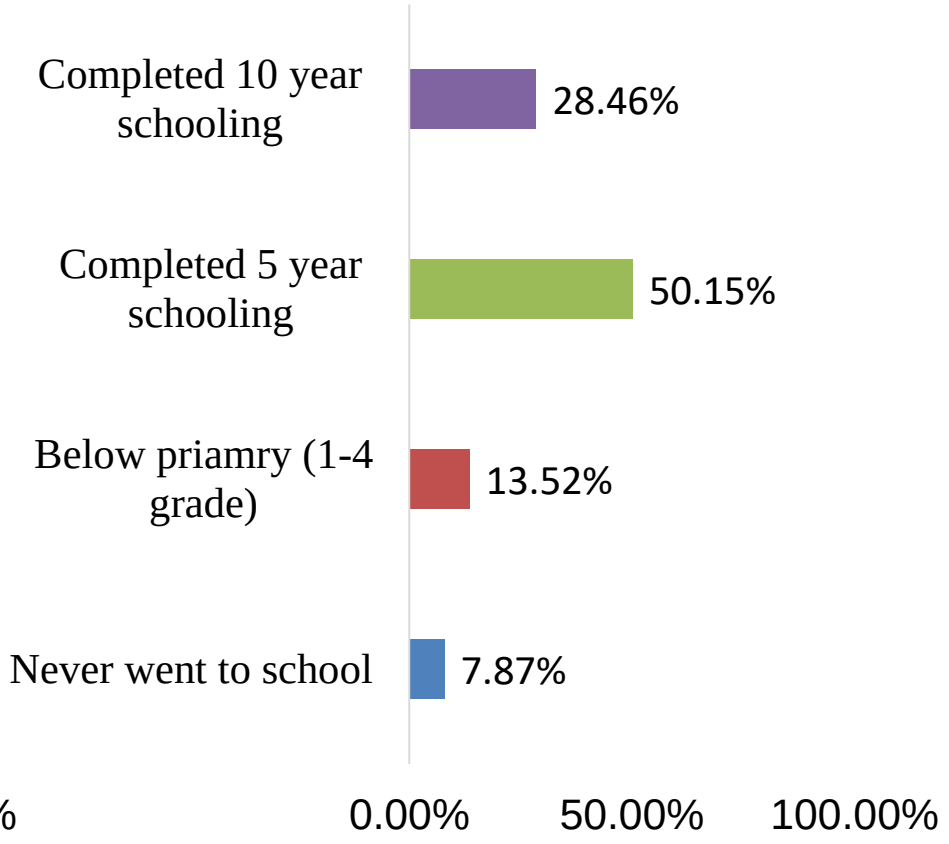
Age Mean(SD)= 30 (SD:8) years

Distribution of age in NPNL women



Education status

Majority completed at least primary education

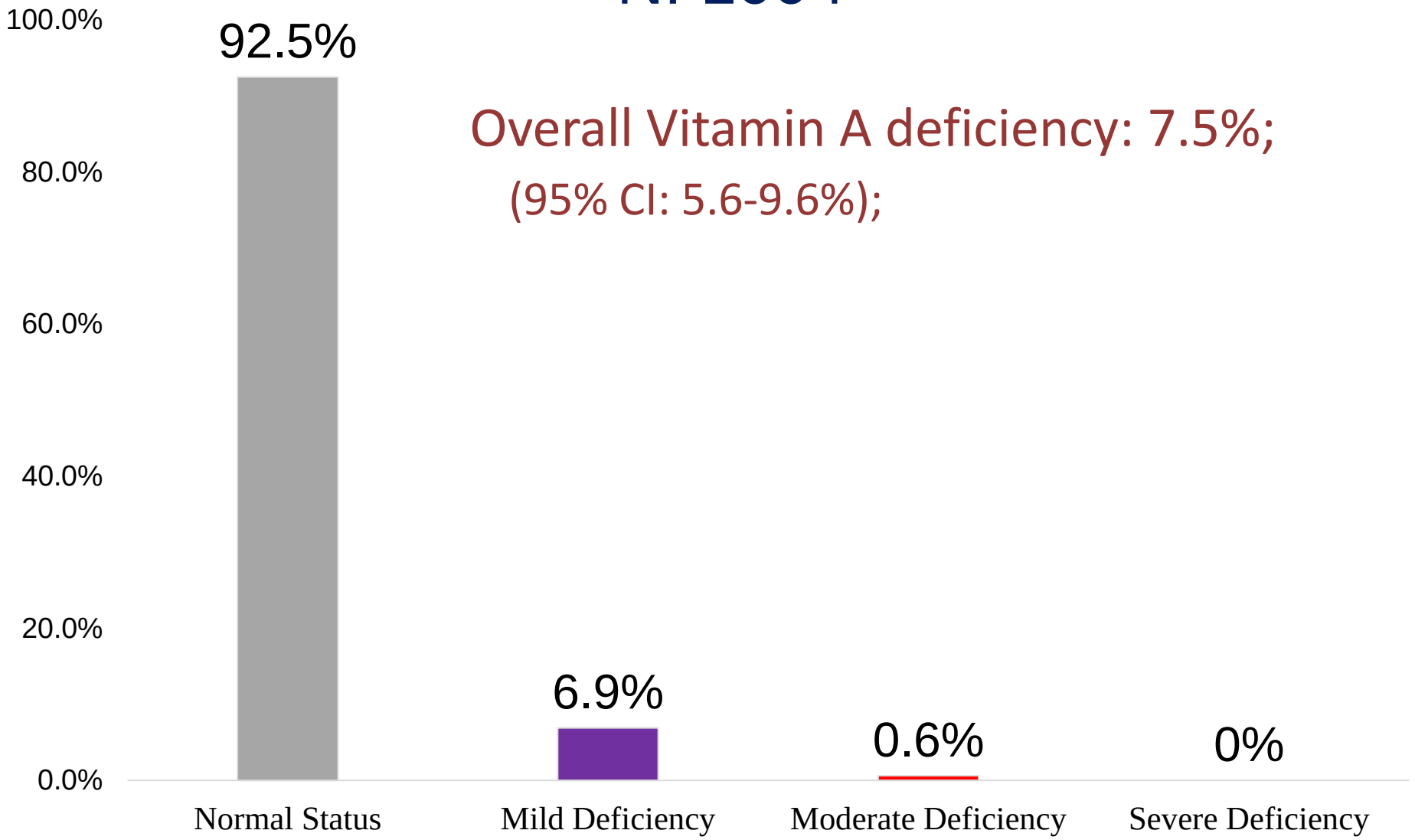


Status of Vitamin A Deficiency

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

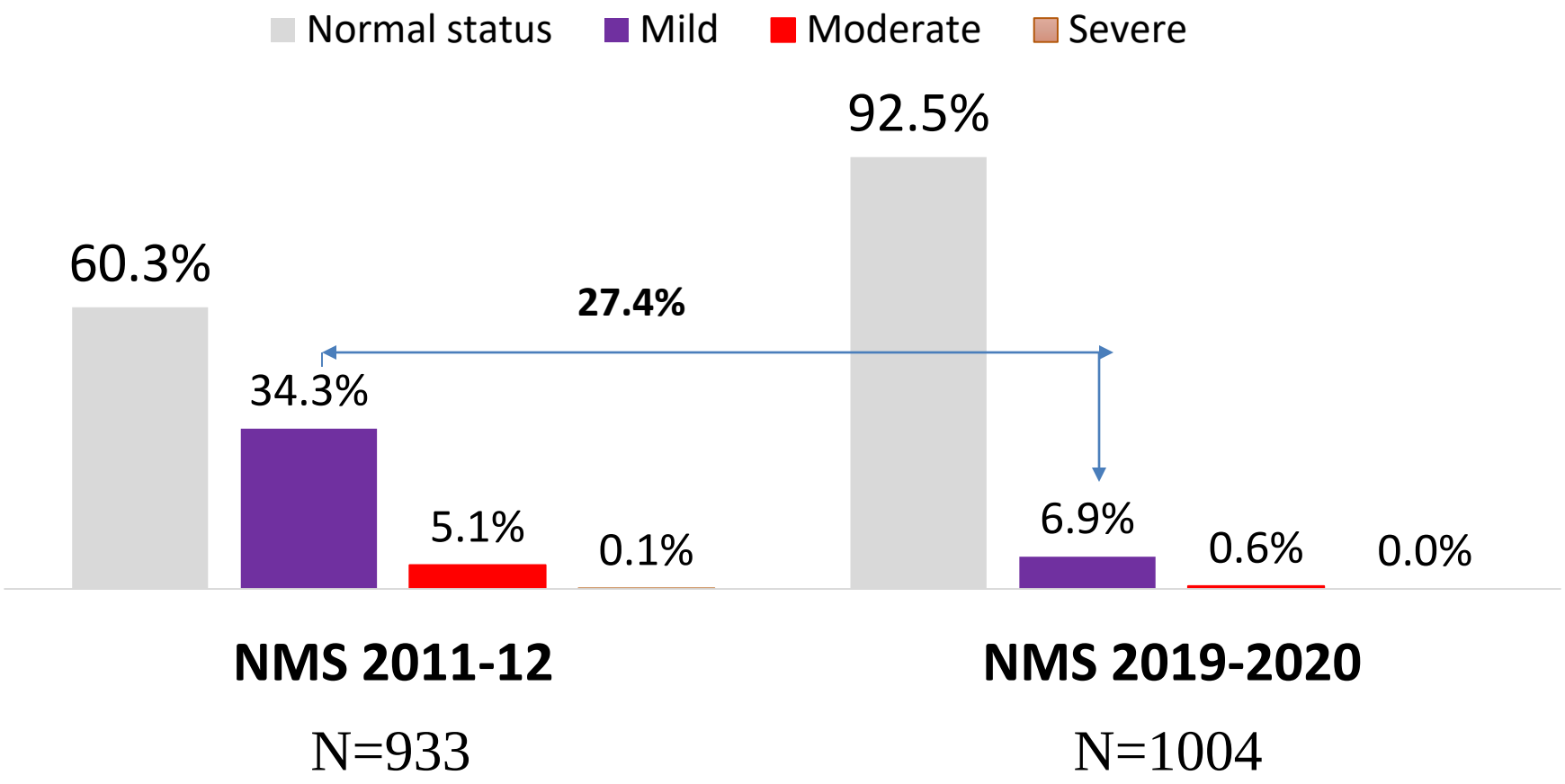


Overall Vitamin A deficiency: 7.5%;
(95% CI: 5.6-9.6%);

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

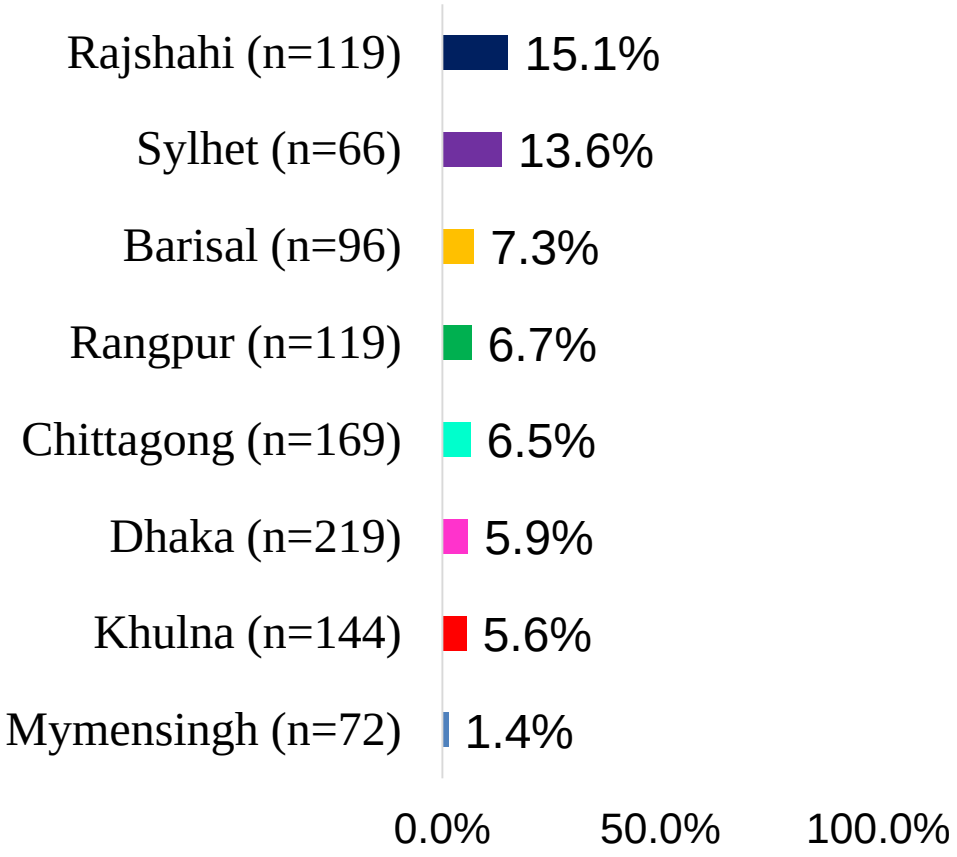
Comparison of Vitamin A deficiency in NPNL Women between NMS 2011-12 and NMS 2019-20

Mild to severe Vitamin A deficiency reduced 32%

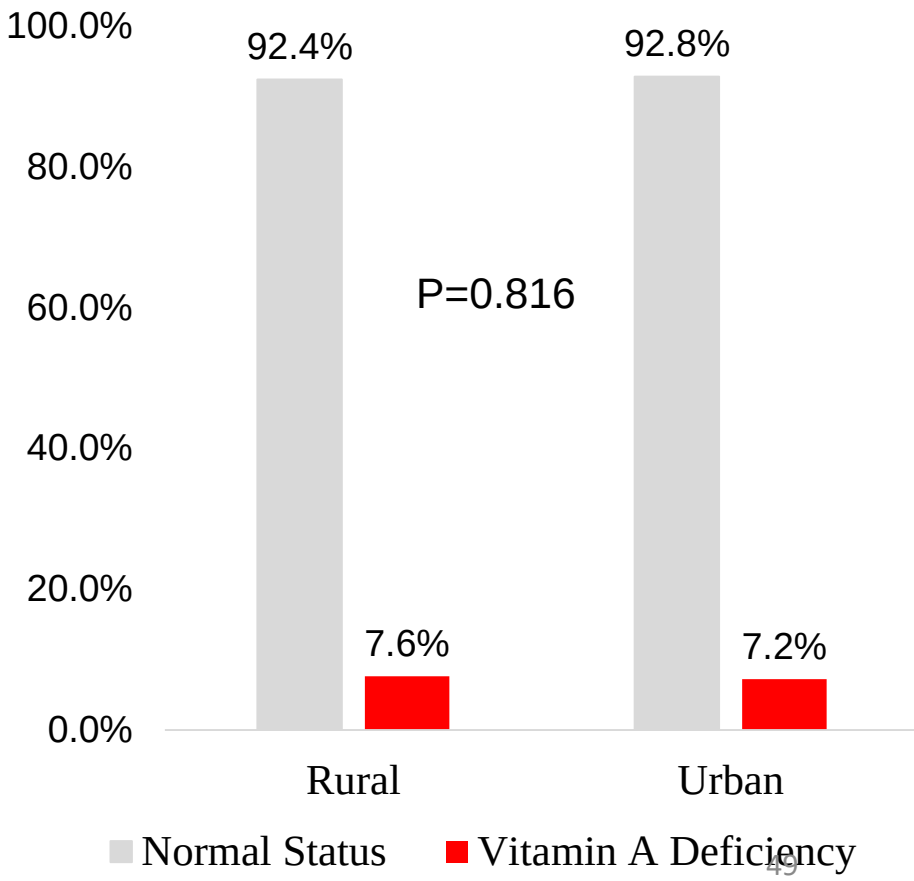


Vitamin A Deficiency in NPNL Women by division and place of residence

Proportion of Vitamin A deficiency varies across divisions

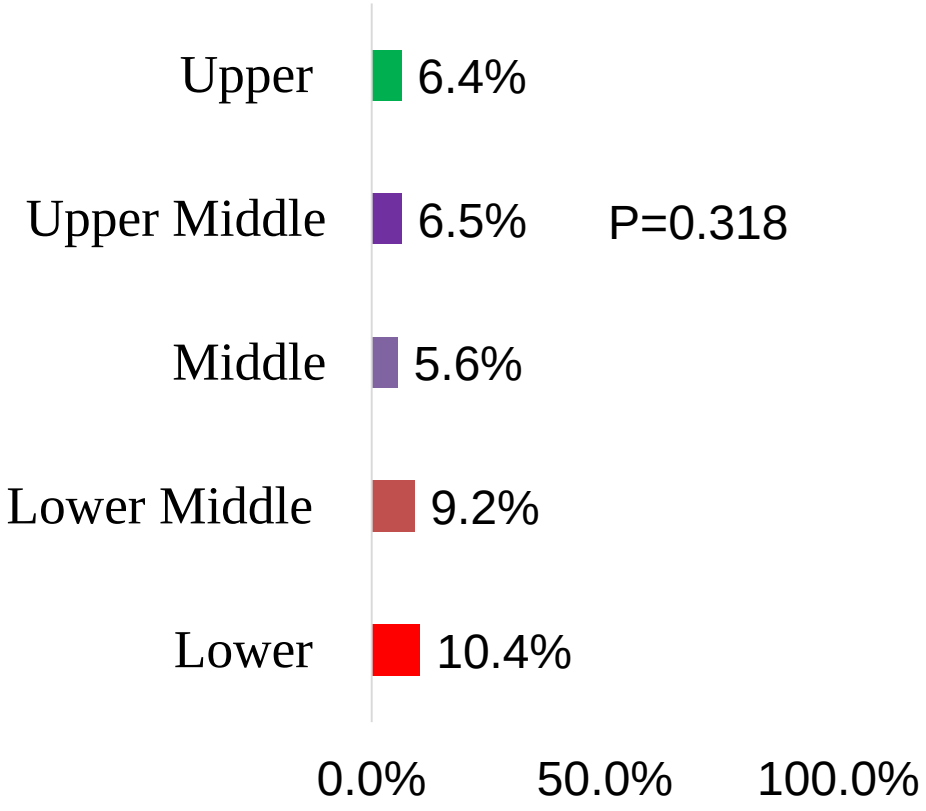


No difference across place of residence

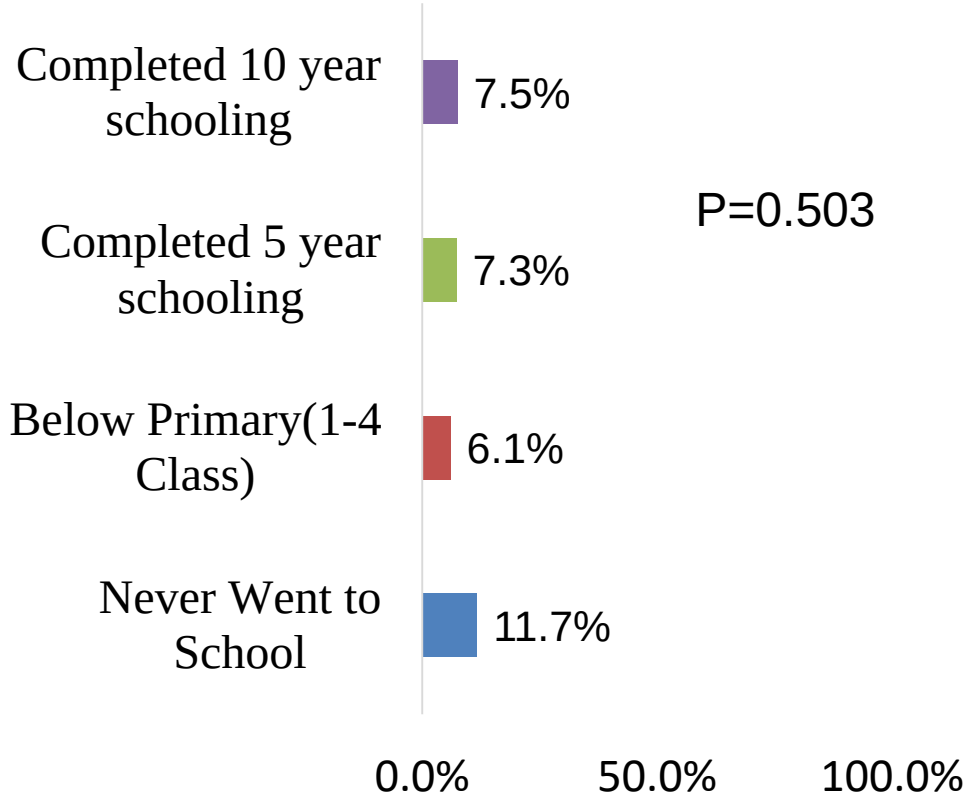


Vitamin A Deficiency in NPNL women by wealth index and education

No difference across **wealth index** classes



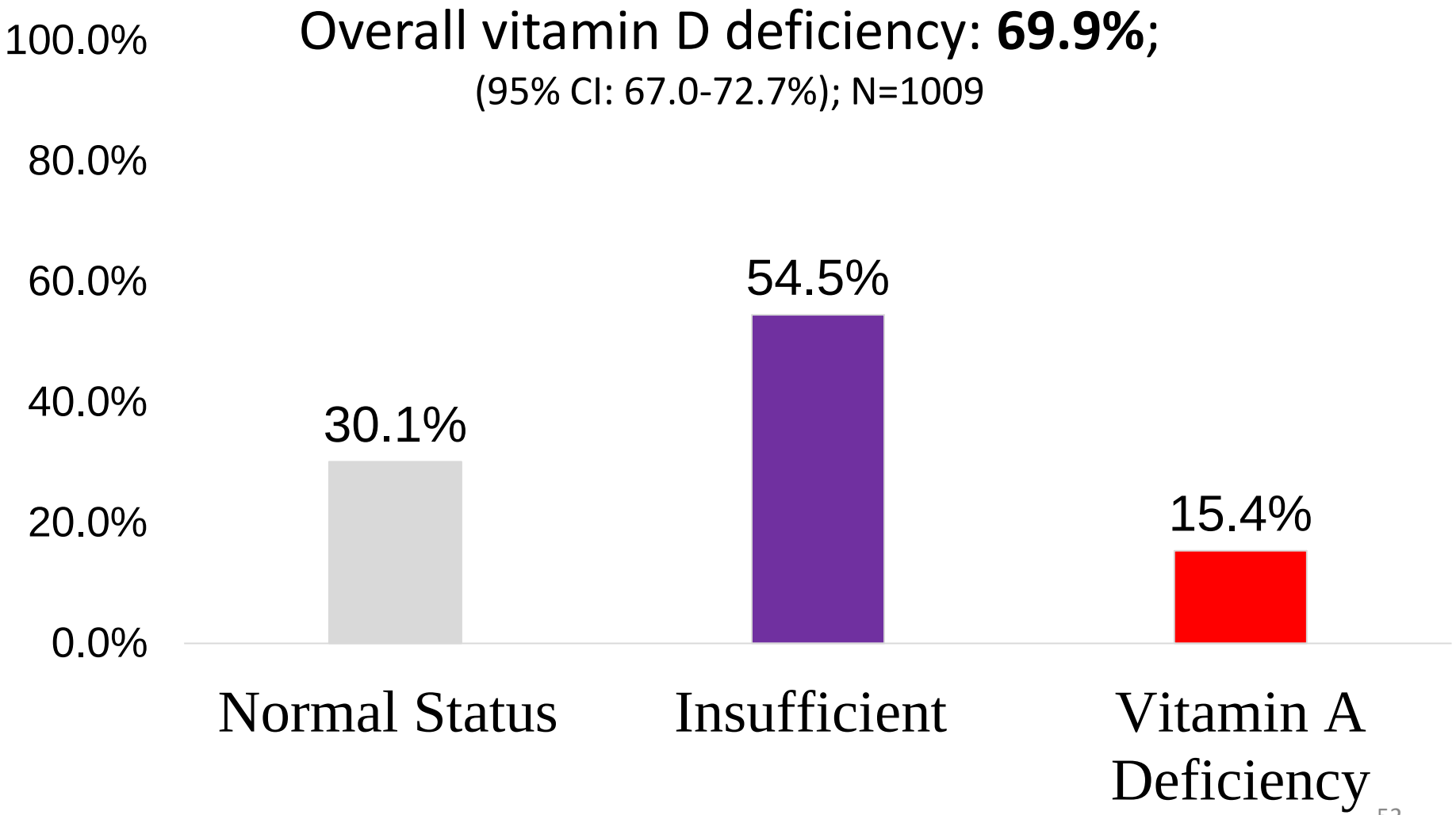
No difference across **education group**



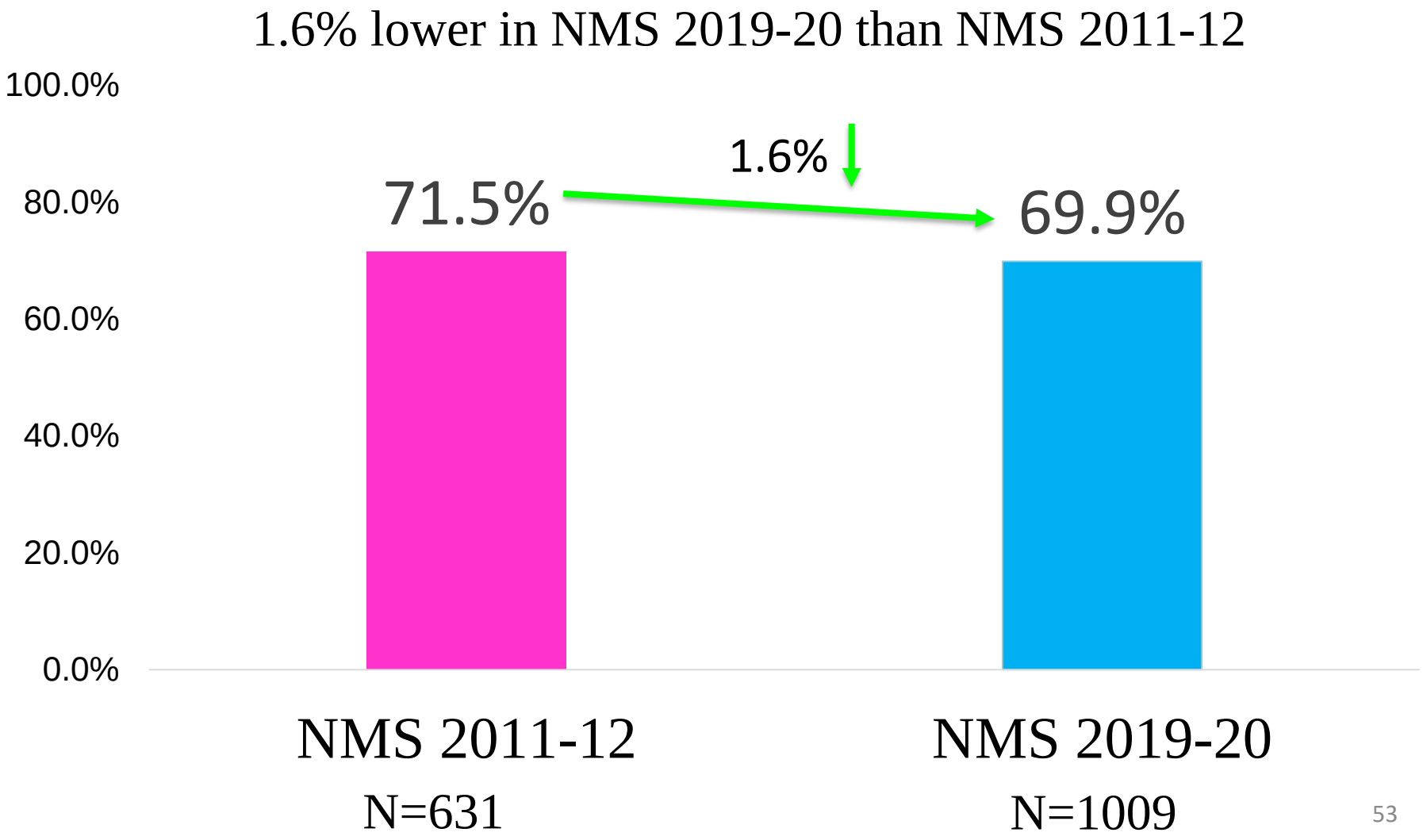
Status of Vitamin D deficiency

The study team visiting hard to reach area for field survey, *Jamuna Char, Sariakandi Upazila,Bogra*

Vitamin D deficiency in NPNL women

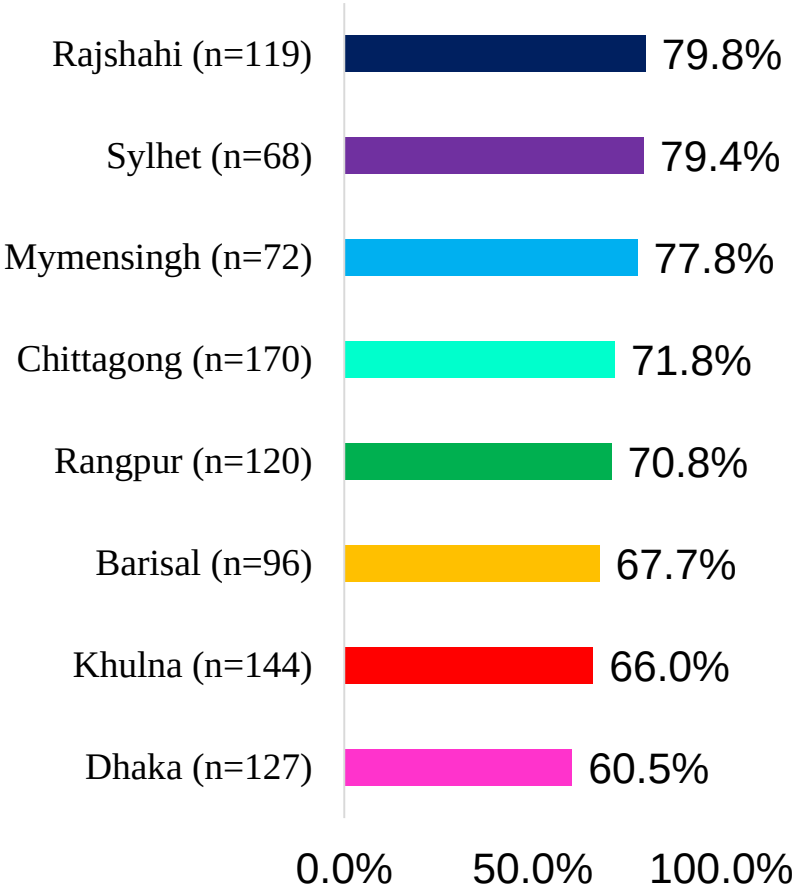


Comparison of Vitamin D deficiency in NPNL Women between NMS 2011-12 and NMS 2019-20

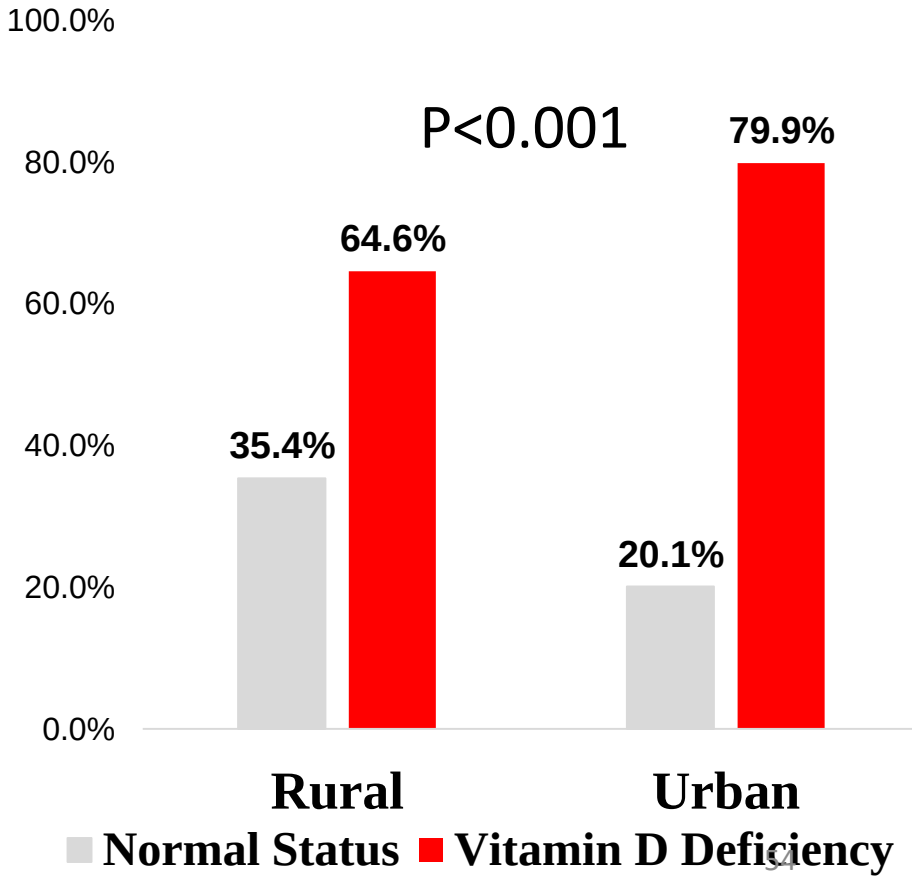


Vitamin D Deficiency in NPNL women by division and place of residence

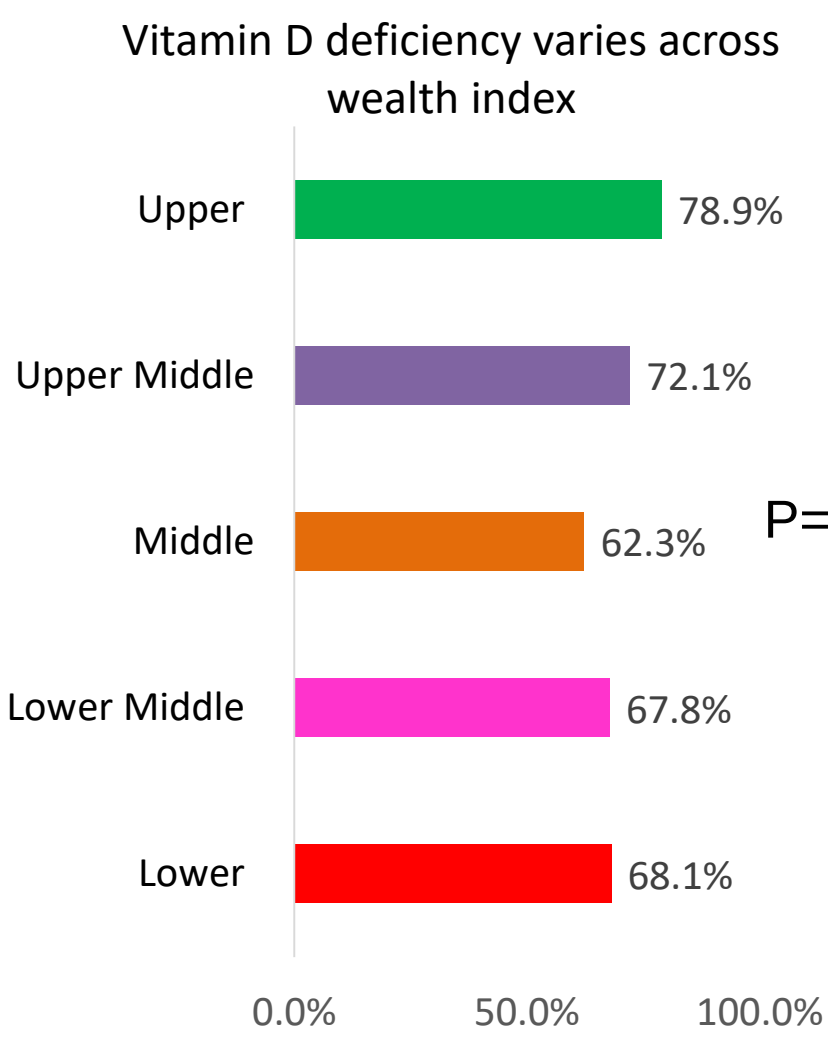
Proportion of Vitamin D deficiency varies across divisions



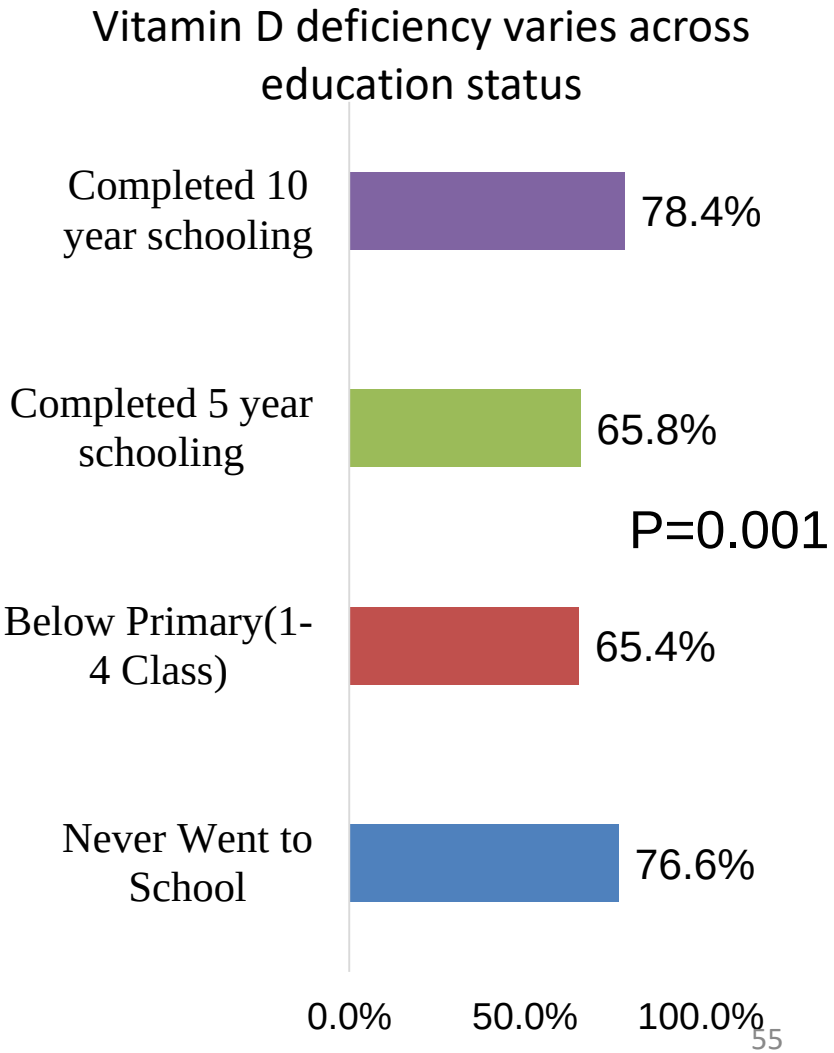
15.3 % higher in urban than rural areas



Vitamin D Deficiency in NPNL women by wealth index and education



P=0.006



P=0.001

Status of

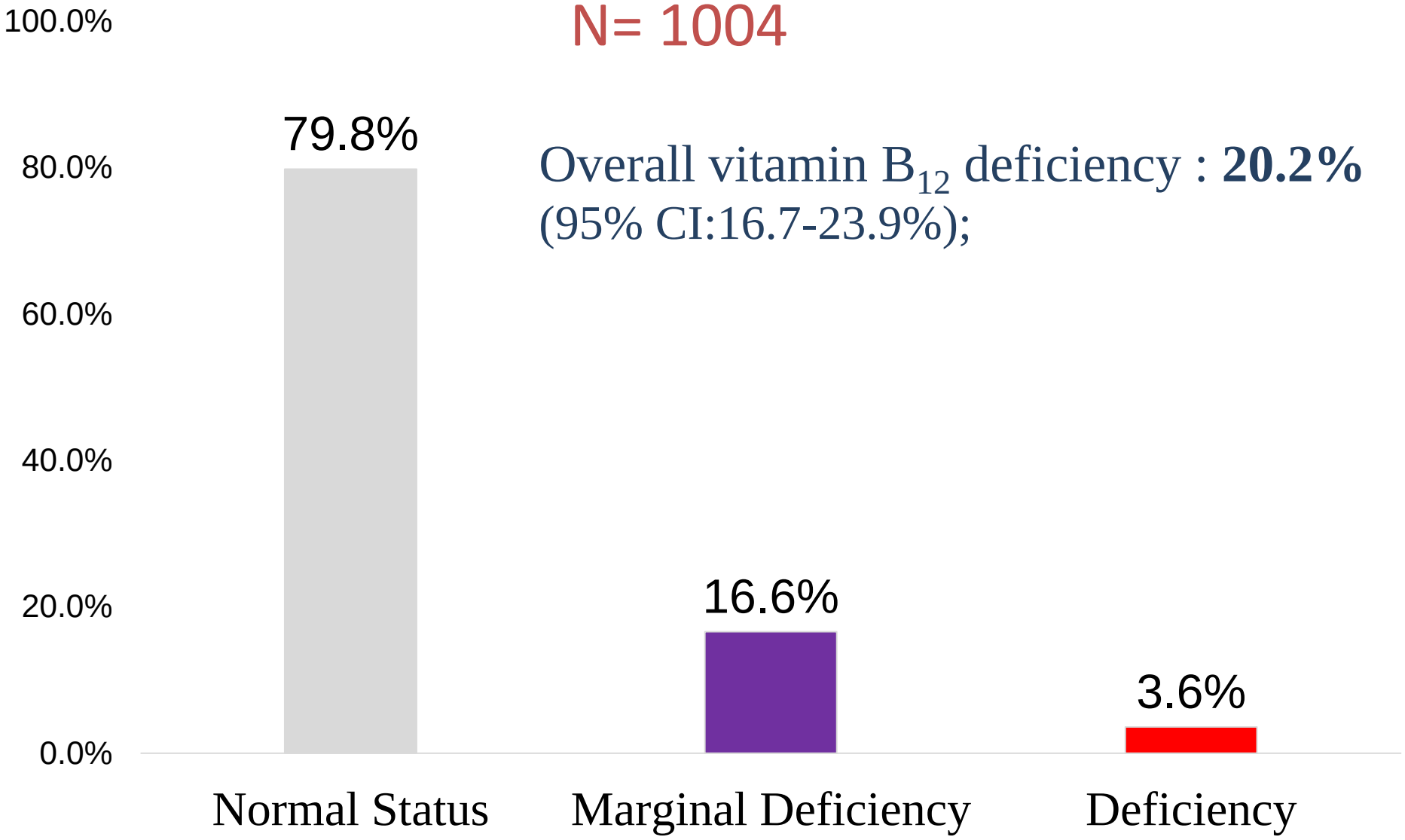
Vitamin B12

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

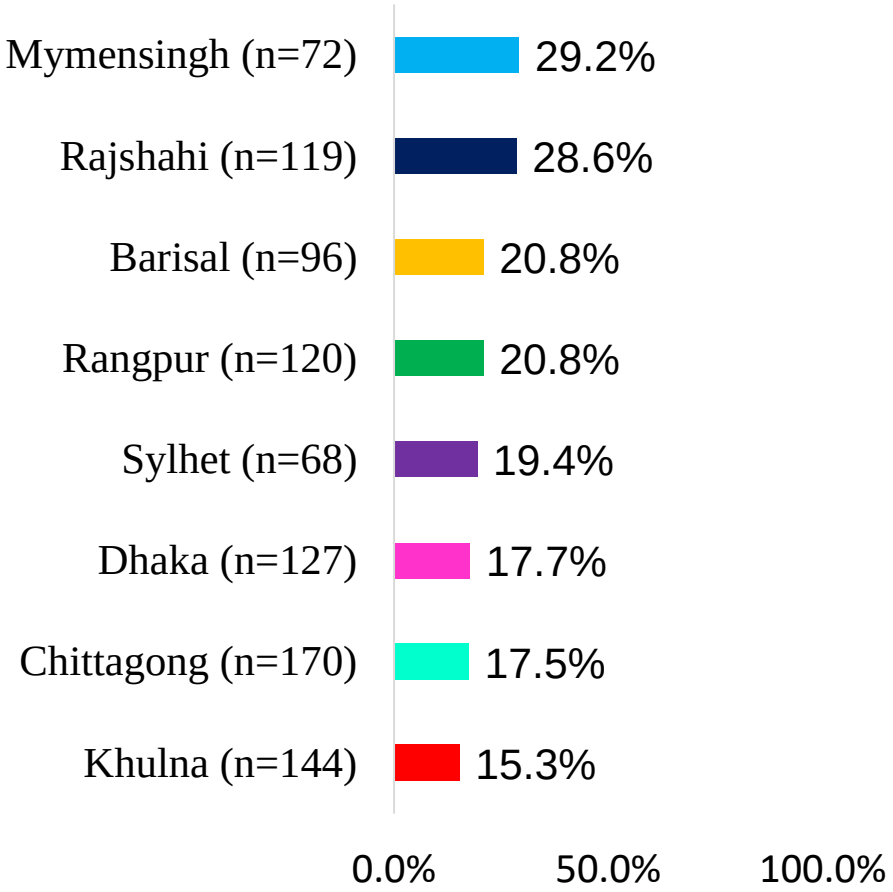
N= 1004



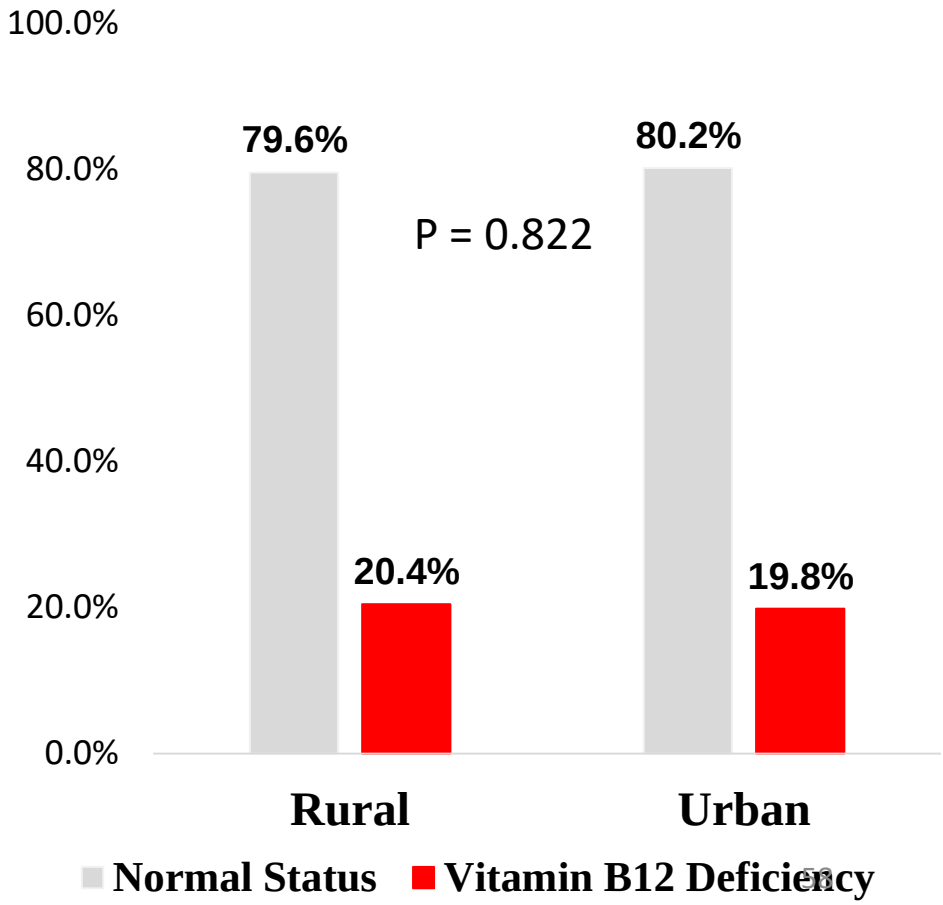
Overall vitamin B_{12} deficiency : **20.2%** (95% CI:16.7-23.9%);

Vitamin B12 Deficiency in NPNL women by division and place of residence

Proportion of Vitamin B12 varies across divisions

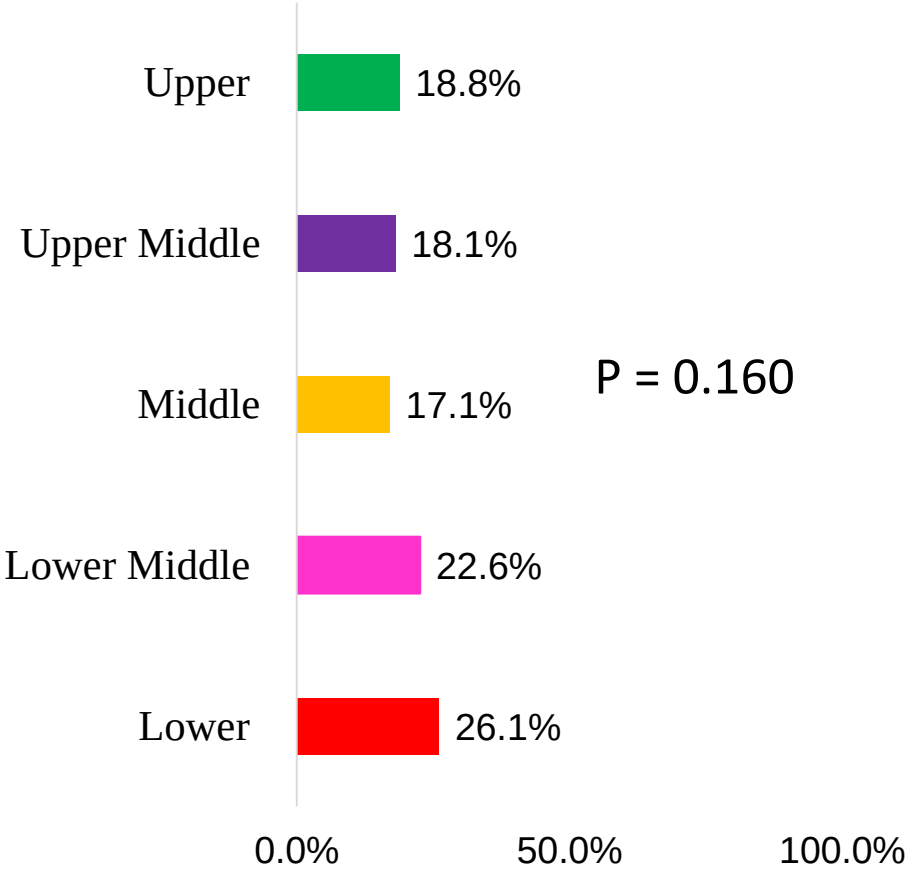


No variation across place of residence

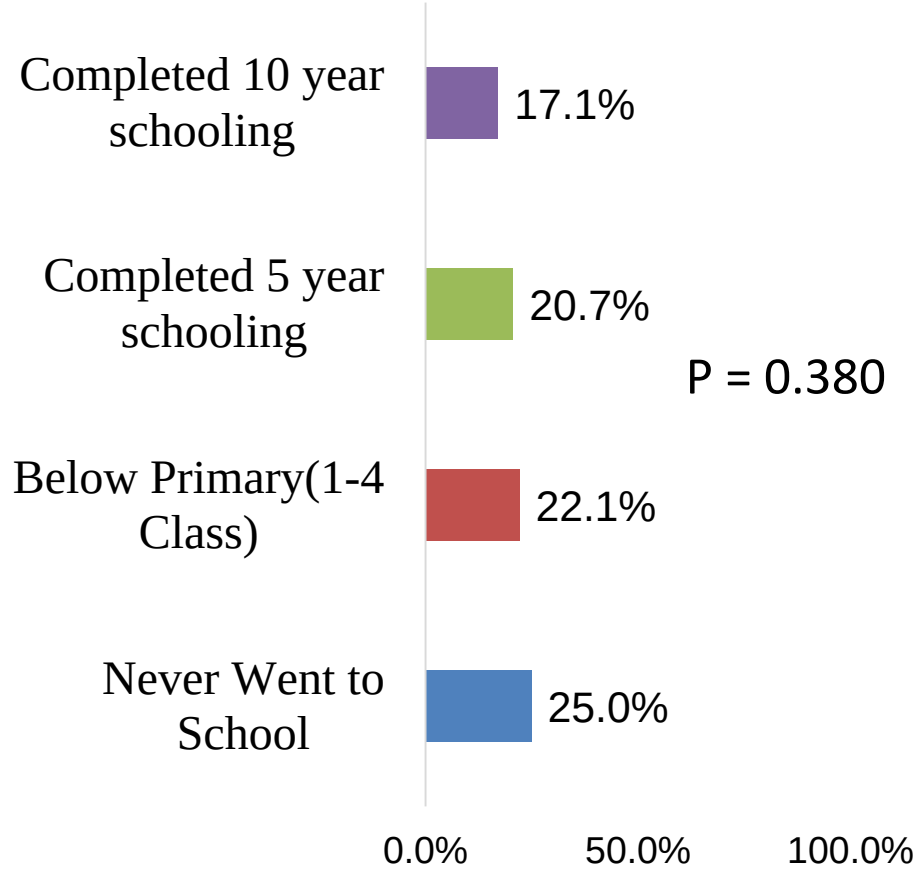


Vitamin B12 Deficiency in NPNL women by wealth index and education

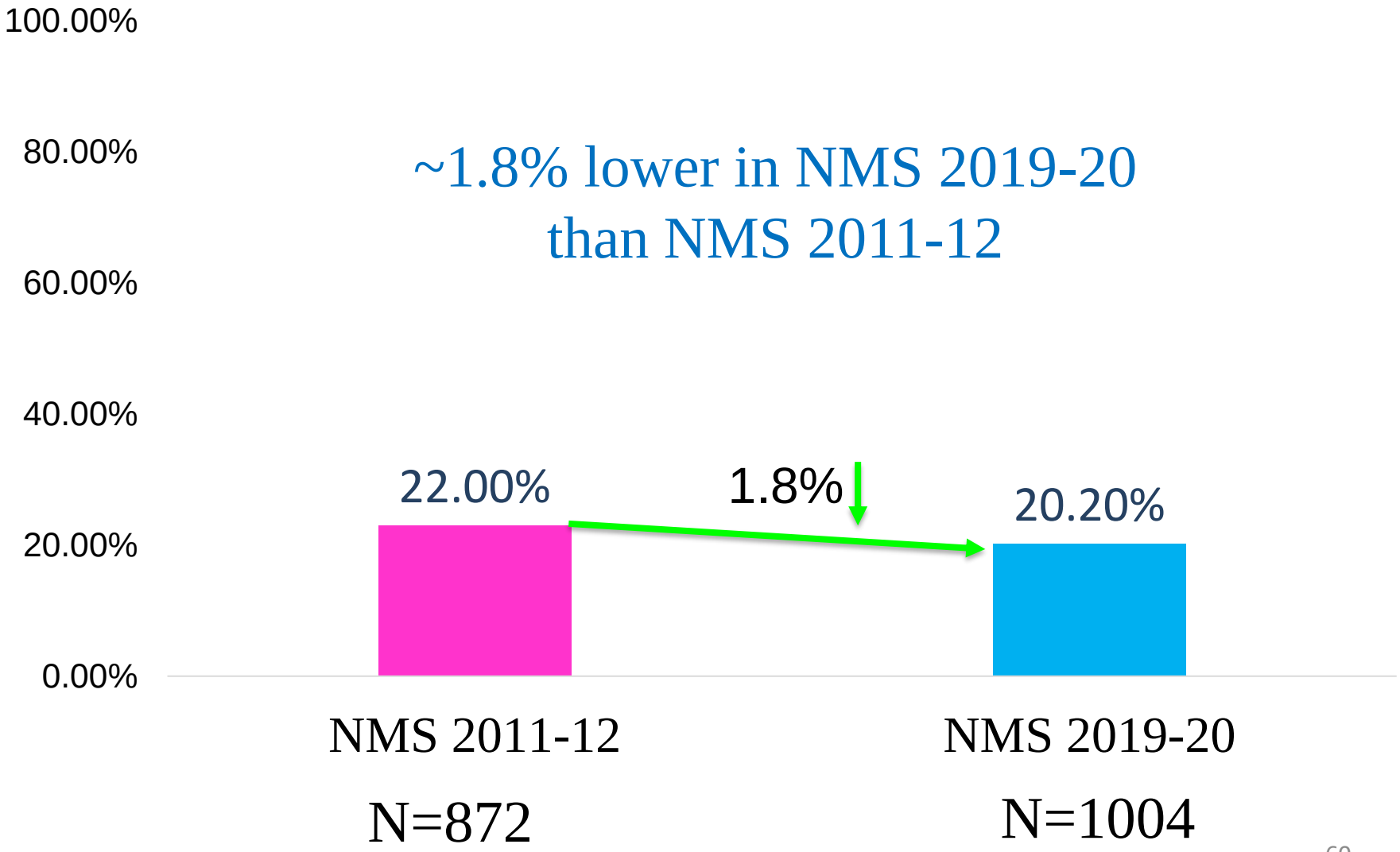
No variation across the socioeconomic status



No variation across the education groups



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

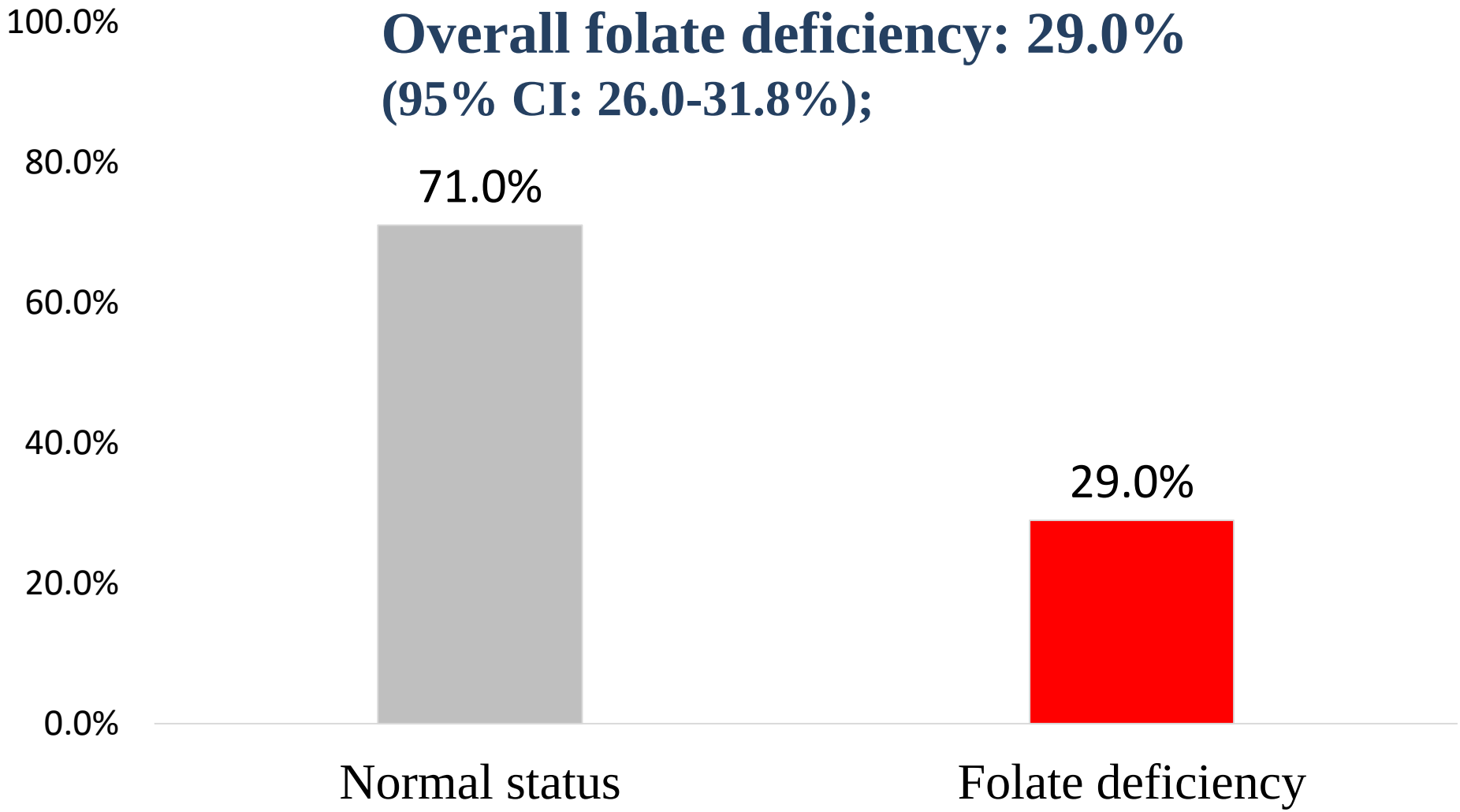


Status of Folate deficiency

Dr. Mahfuza Haque, DPM from the National Nutrition Service visited filed site of Rangamati Sadar Upazila, Rangamati on 28th December,2020

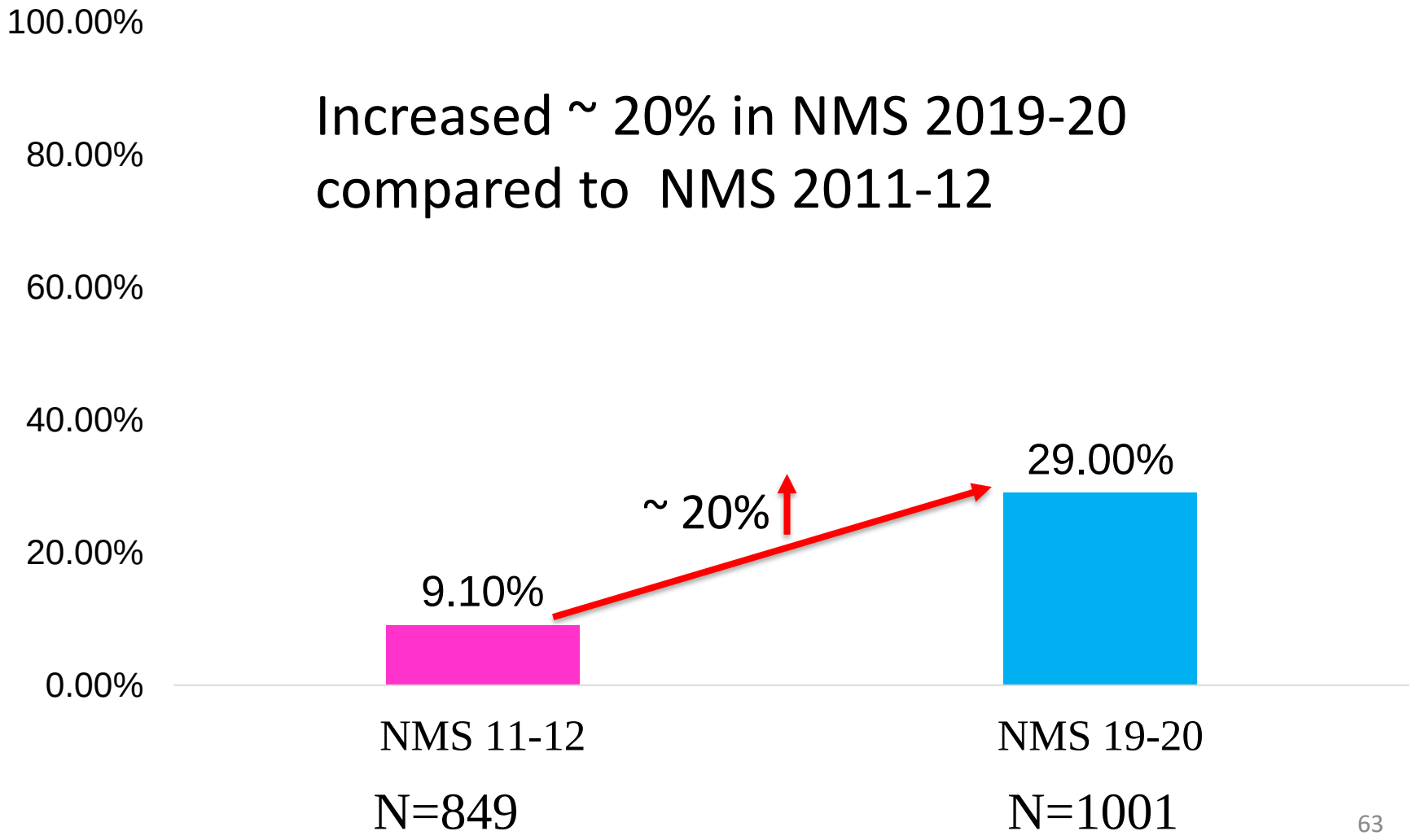
Folate deficiency in NPNL women

N=1001



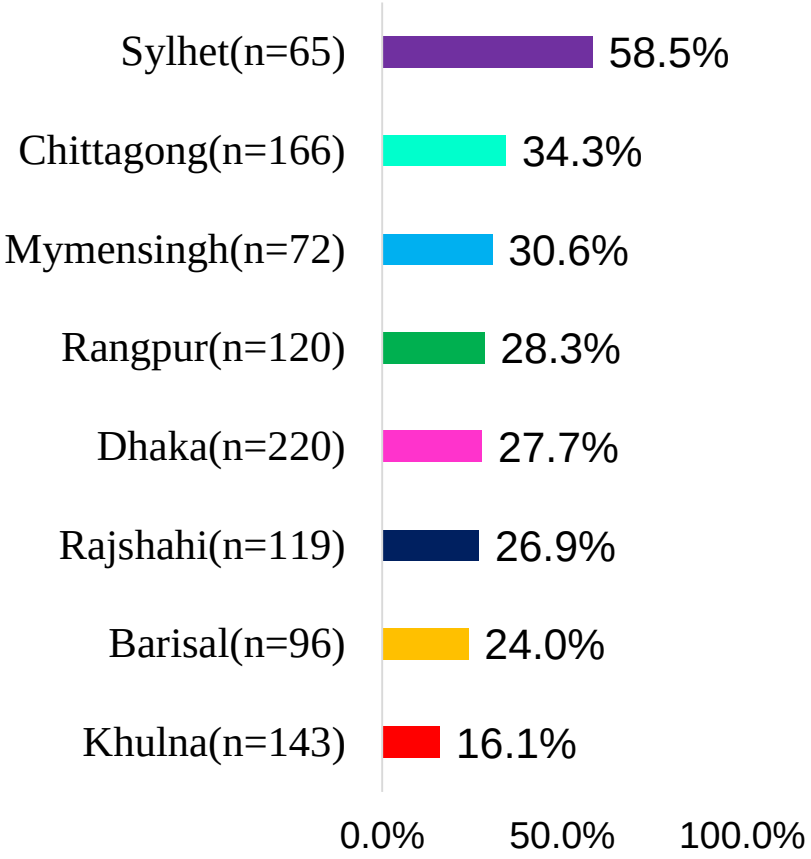
Funded by : National Nutrition Service; PI: Dr. Aliya Naheed

Comparison of Folate deficiency in NPNL Women between NMS 2011-12 and NMS 2019-20

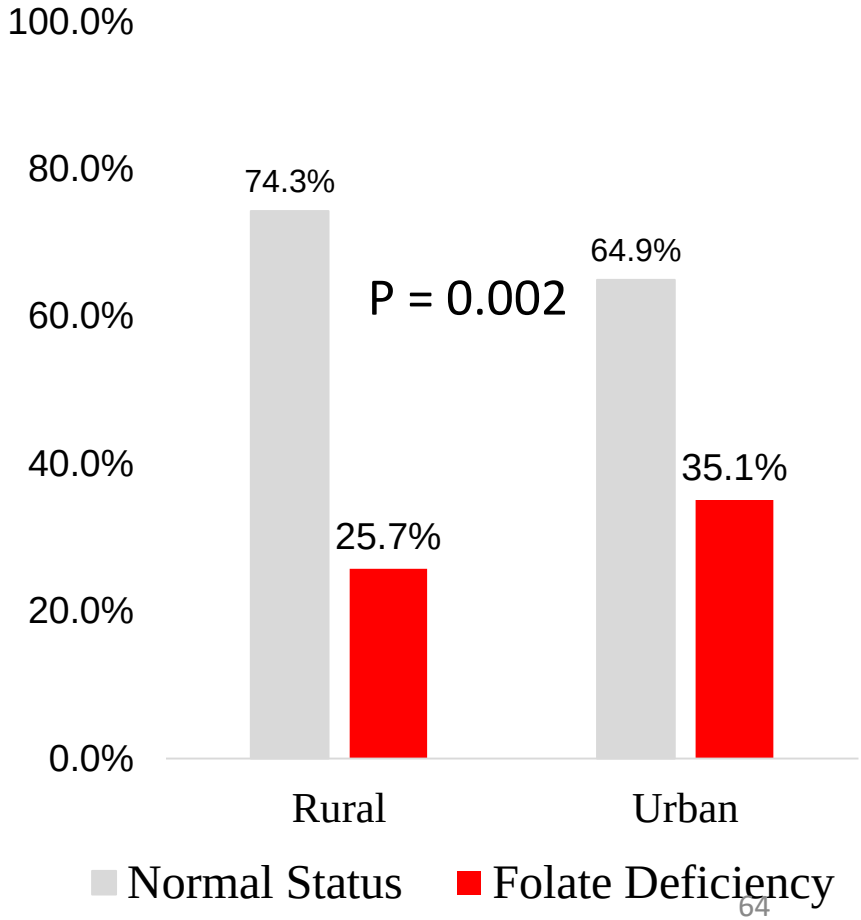


Folate deficiency in NPNL women by division and place of residence

Proportion of folate deficiency varies across divisions

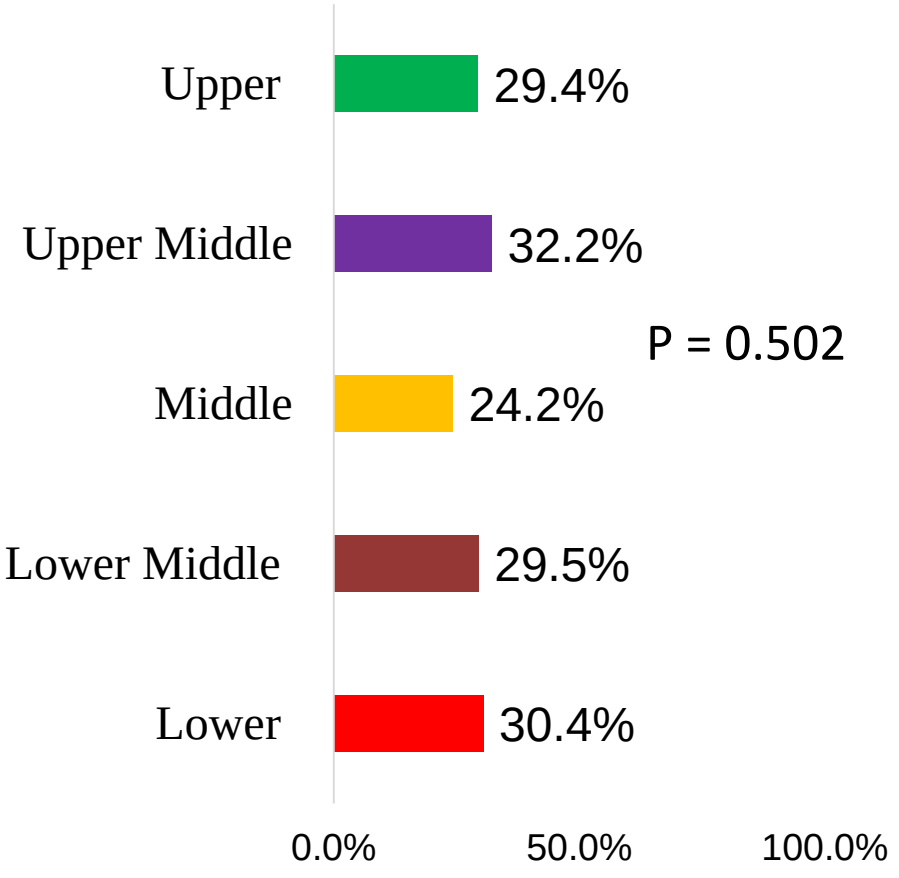


11% higher in urban than rural areas

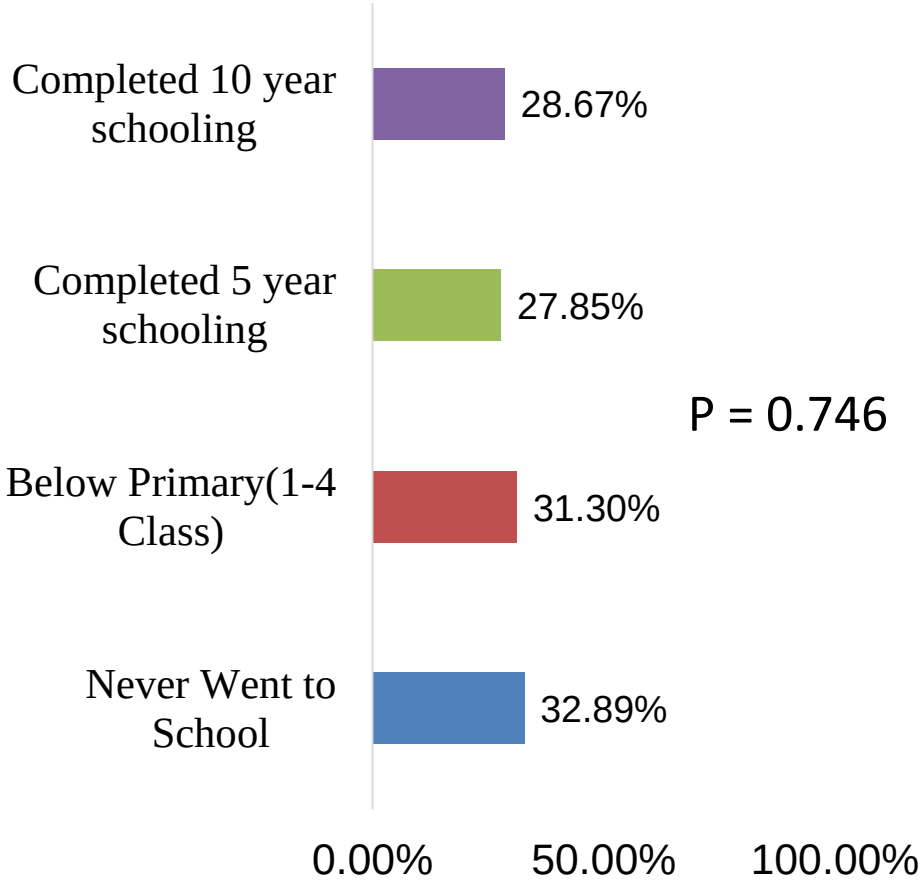


Folate deficiency in NPNL women by wealth index and education

No difference across the socioeconomic status



No variation across the education group



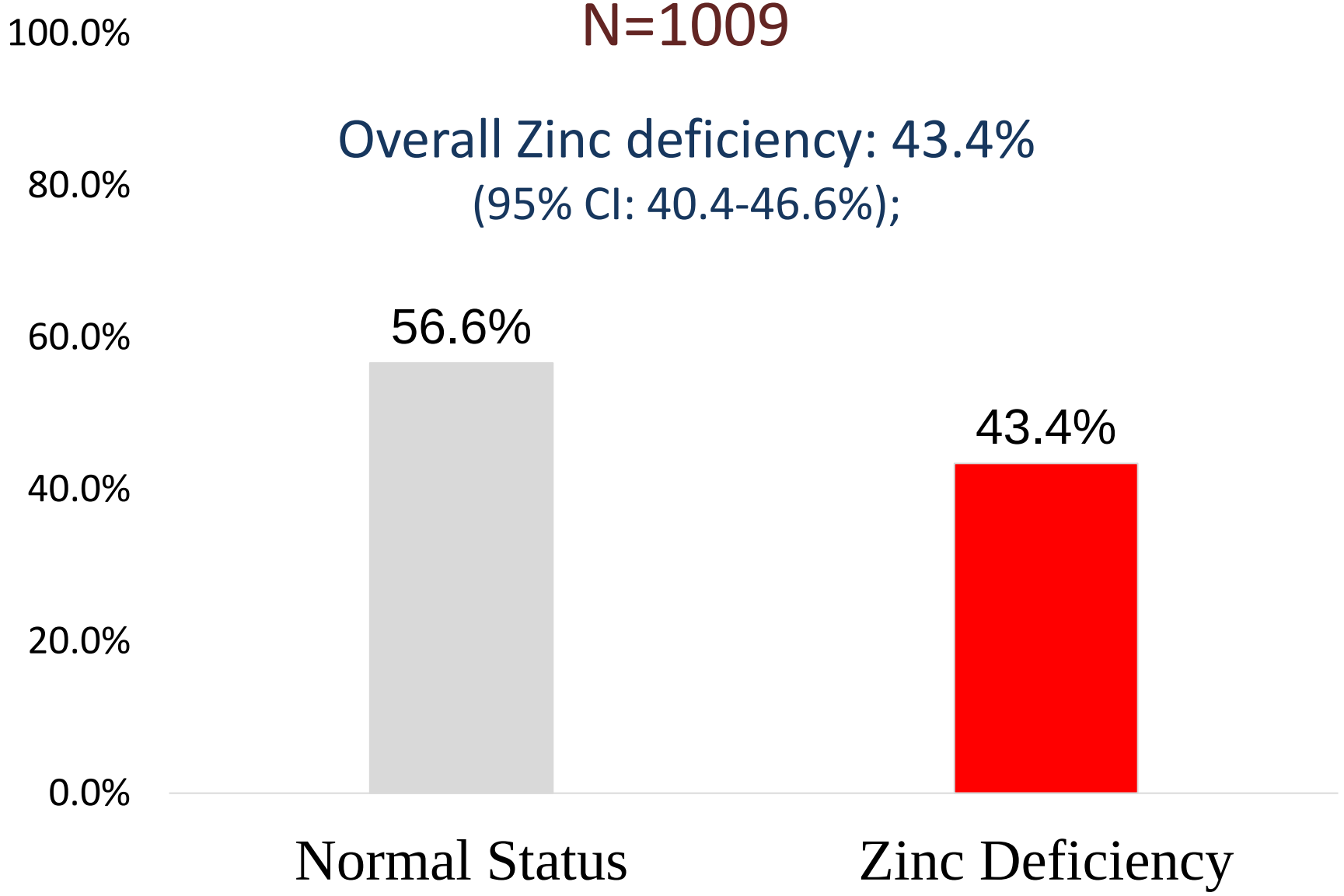
Status of Zinc deficiency

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

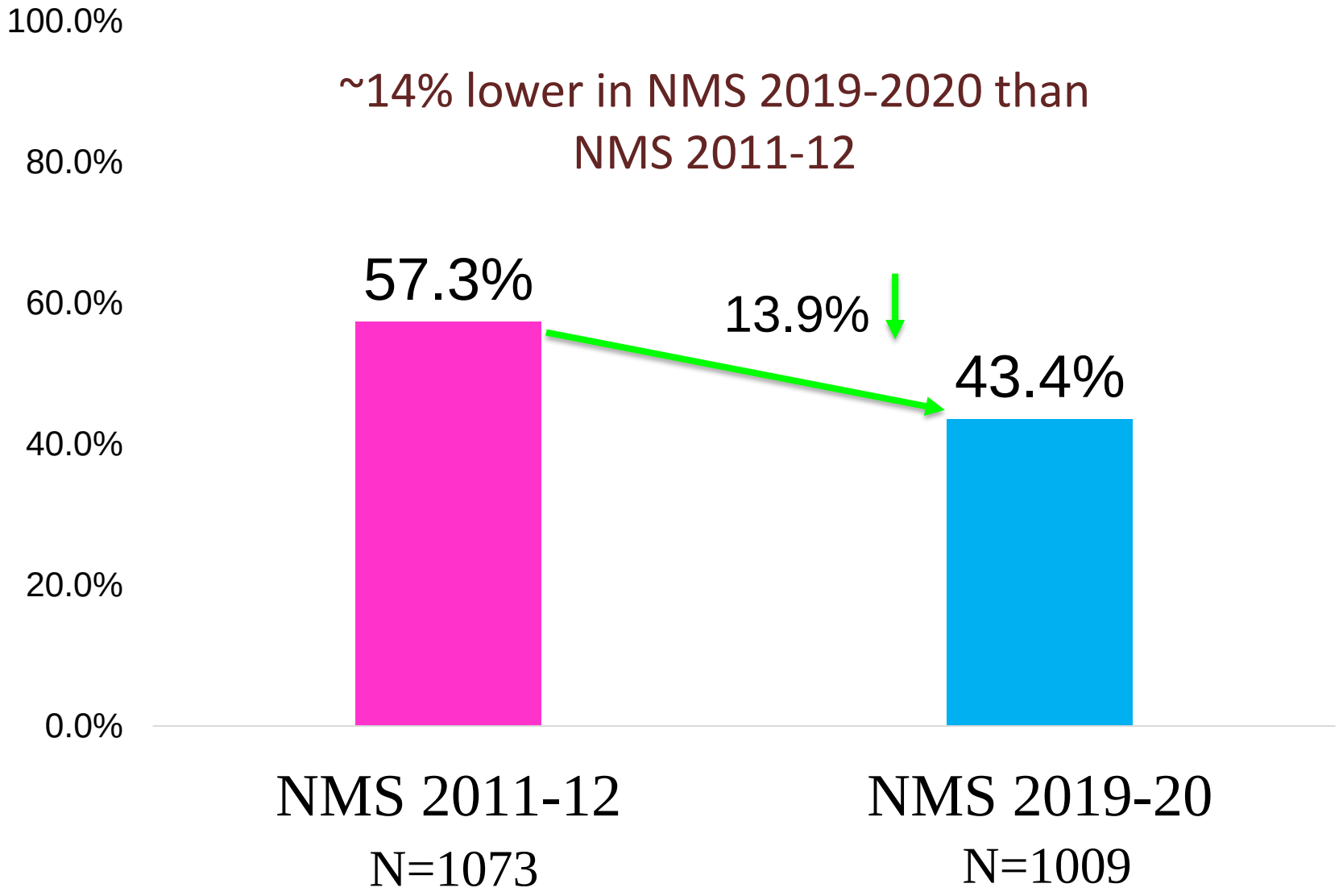
N=1009

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



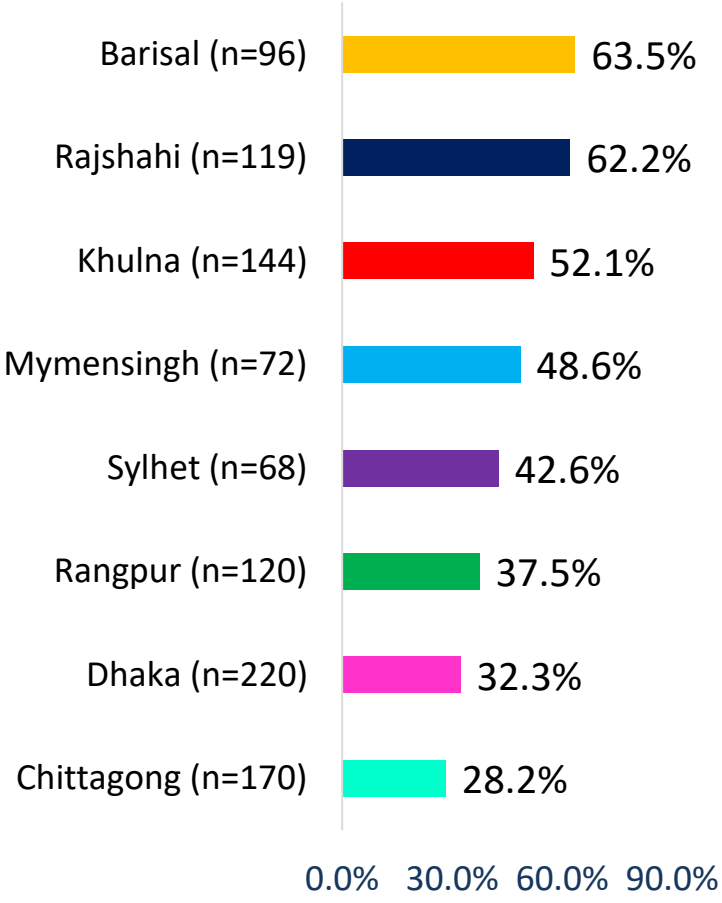
Funded by : National Nutrition Service; PI: Dr. Aliya Naheed

Comparison of Zinc deficiency in NPNL Women between NMS 2011-12 and NMS 2019-20

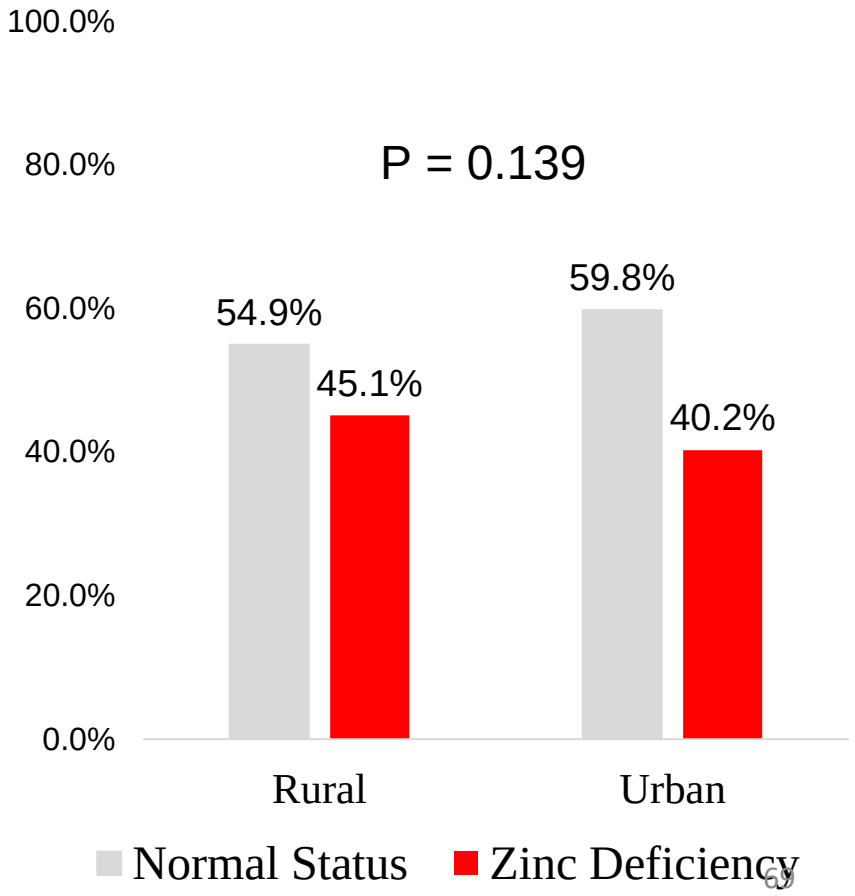


Zinc deficiency in NPNL women by division and place of residence

Proportion of Zinc deficiency varies across divisions

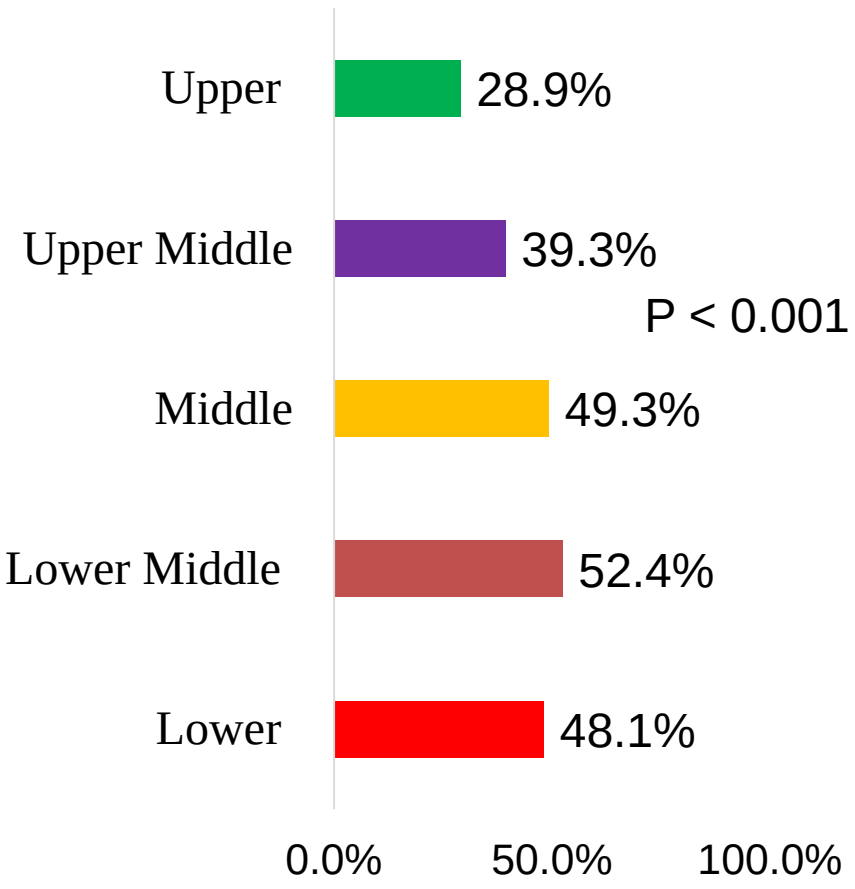


No variation between Rural and urban

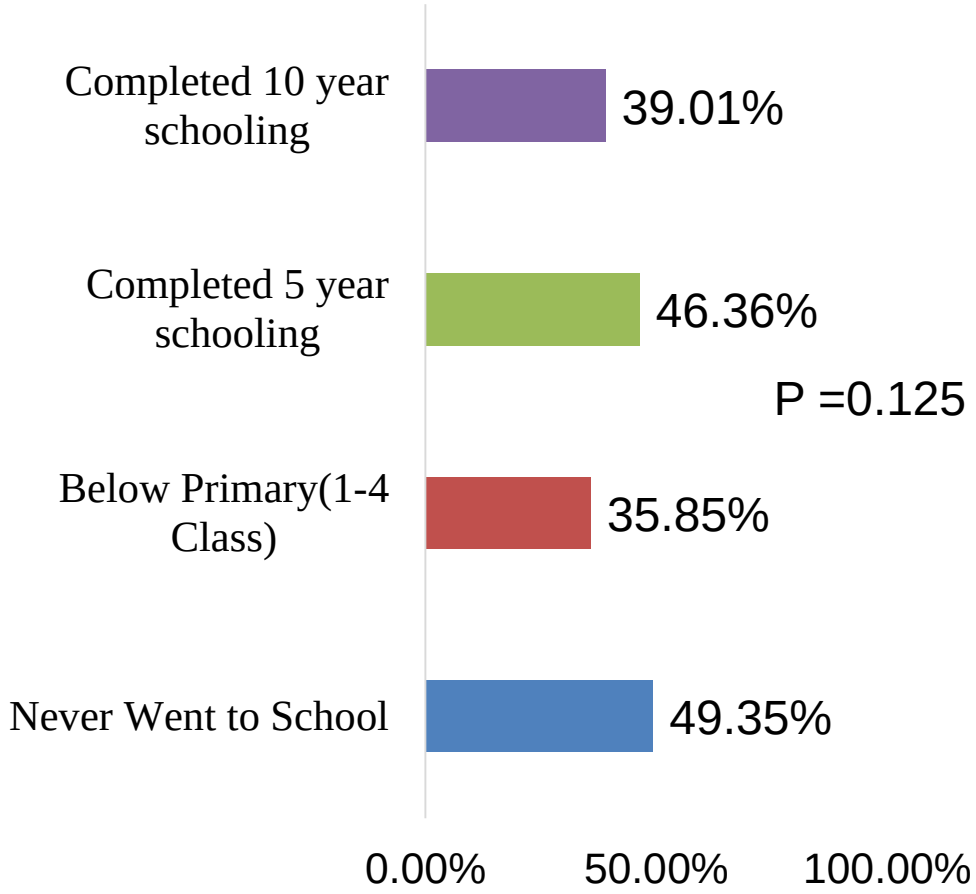


Zinc deficiency in NPNL women by wealth index and education

Zinc deficiency varies across wealth index



No variation across the education group

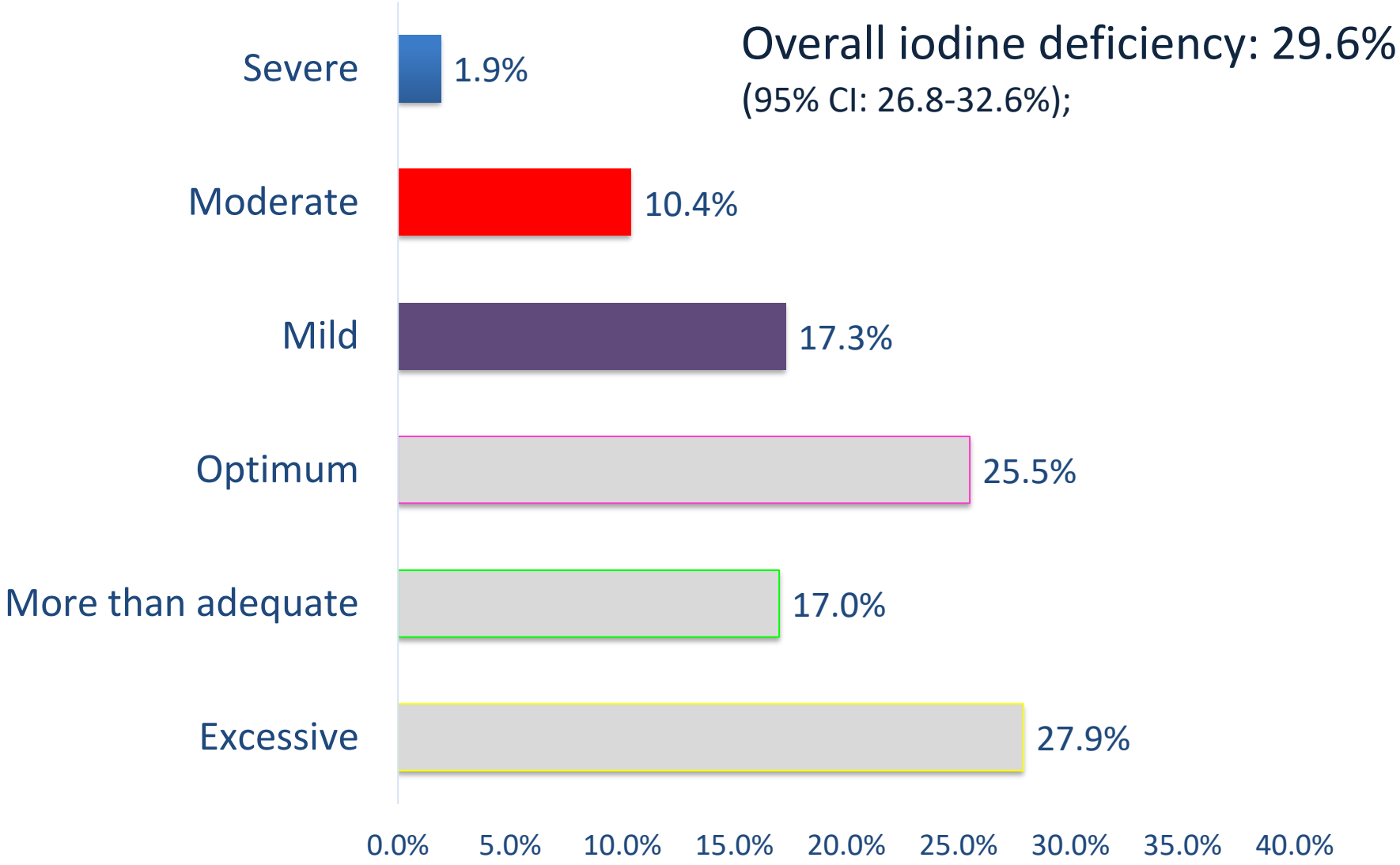


Status of Iodine deficiency

Rapot building with the community before conducting field survey, Bandarban district

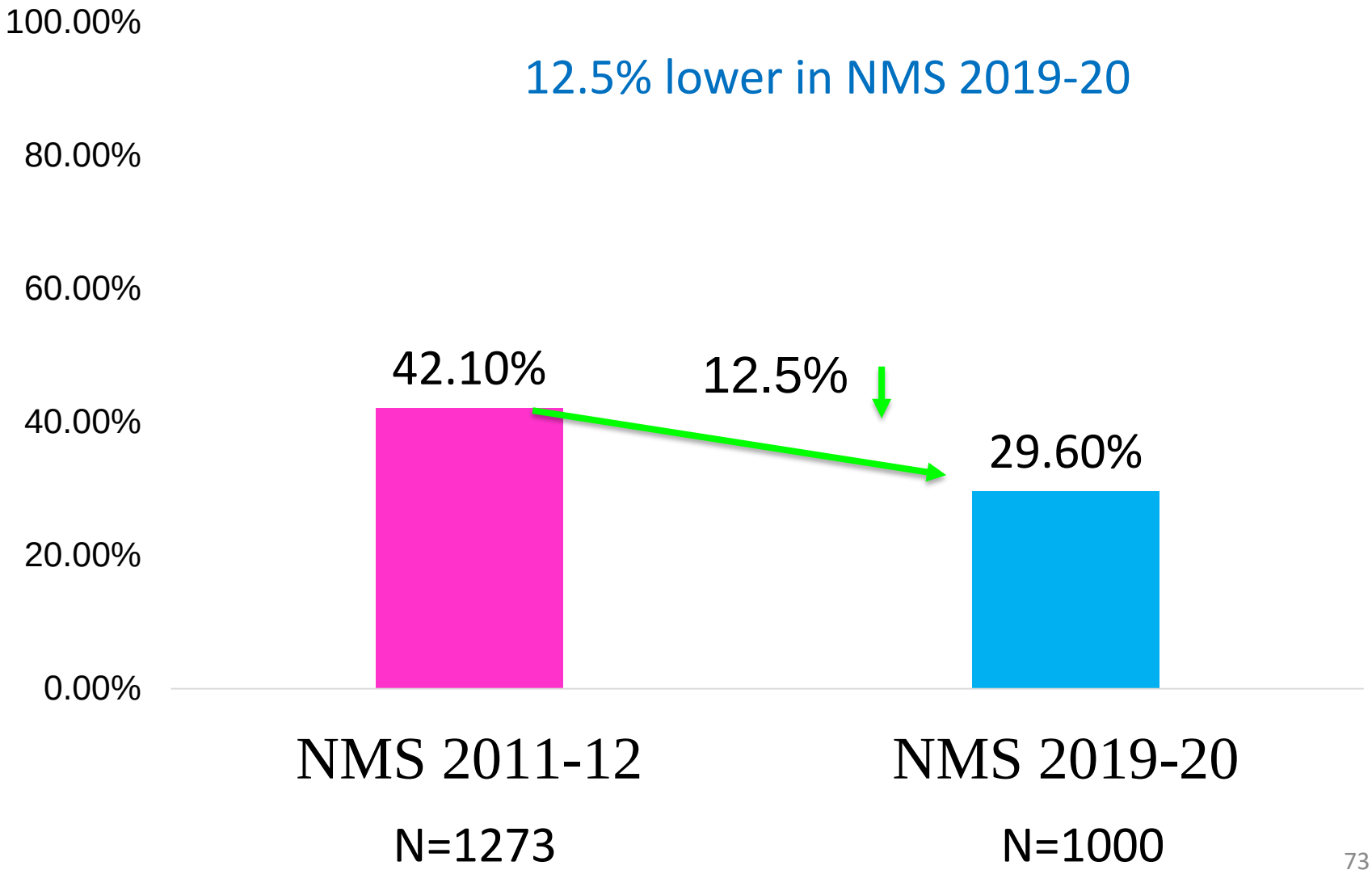
Iodine deficiency in NPNL women

N= 1000



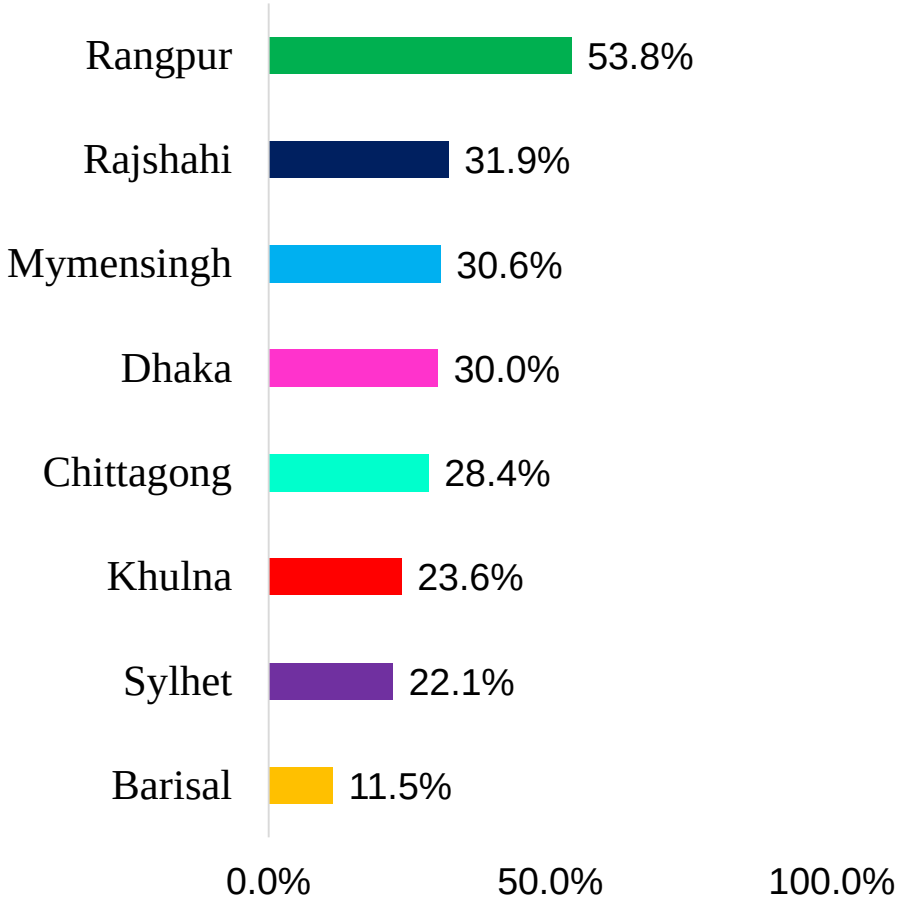
Funded by : National Nutrition Service; PI: Dr. Aliya Naheed

Comparison of Iodine deficiency in NPNL Women between NMS 2011-12 and NMS 2019-20

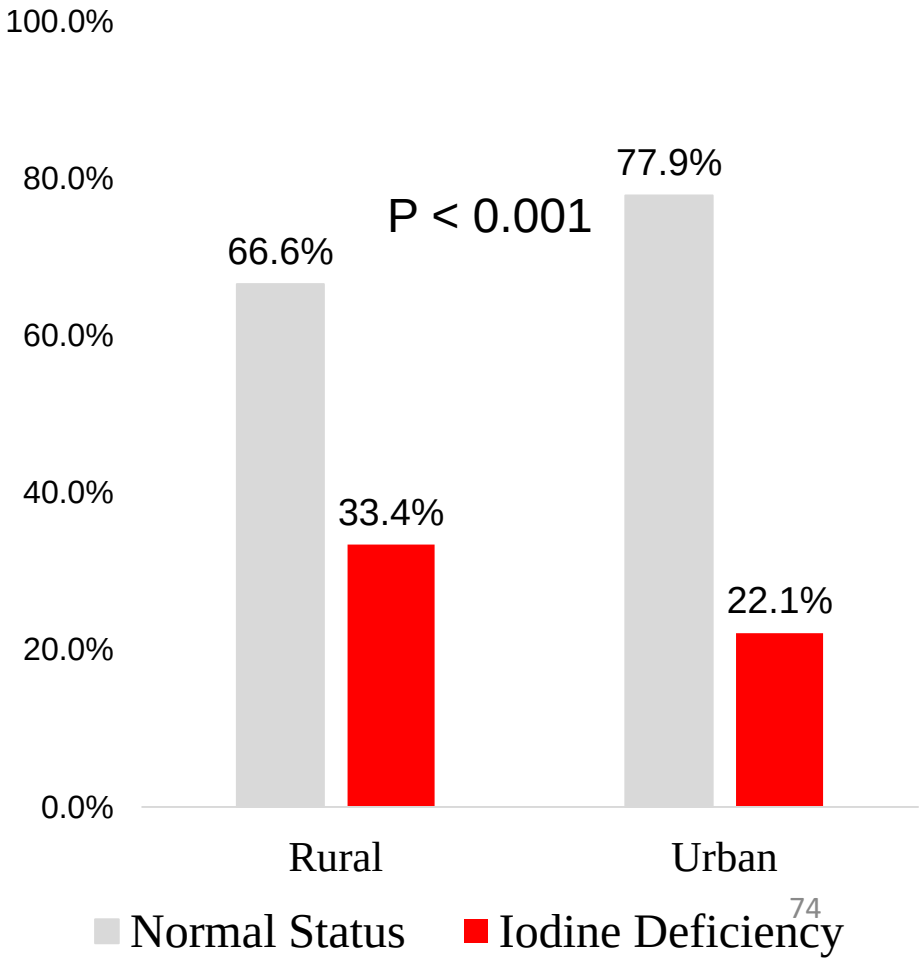


Iodine deficiency in NPNL women by division and place of residence

Proportion of Iodine deficiency varies across division

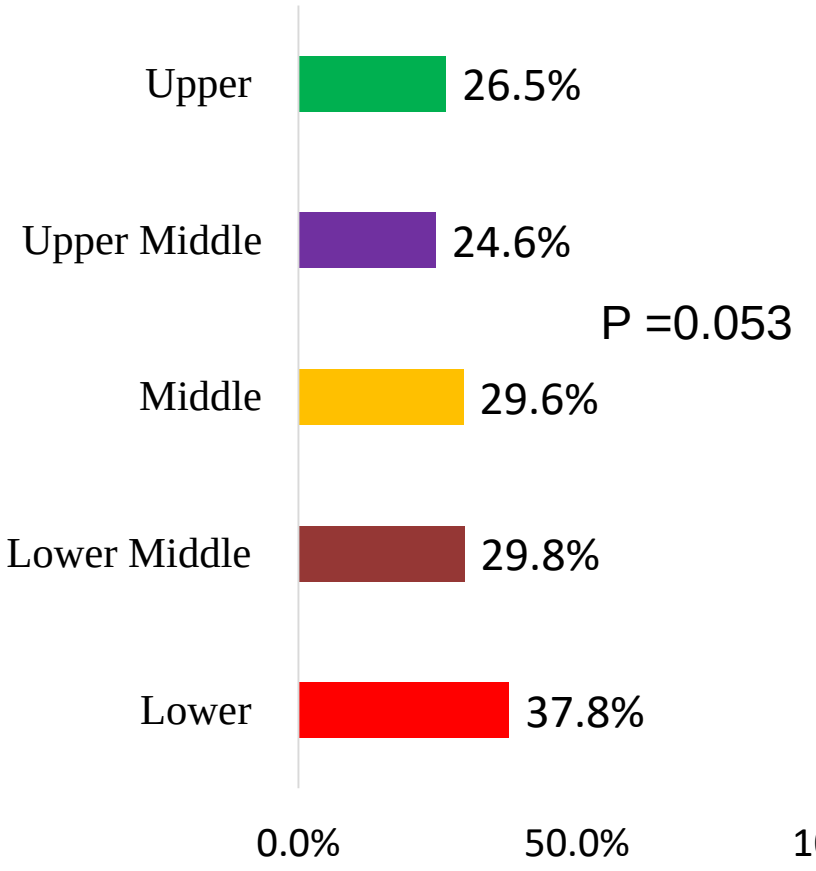


~11% higher in rural areas than urban areas

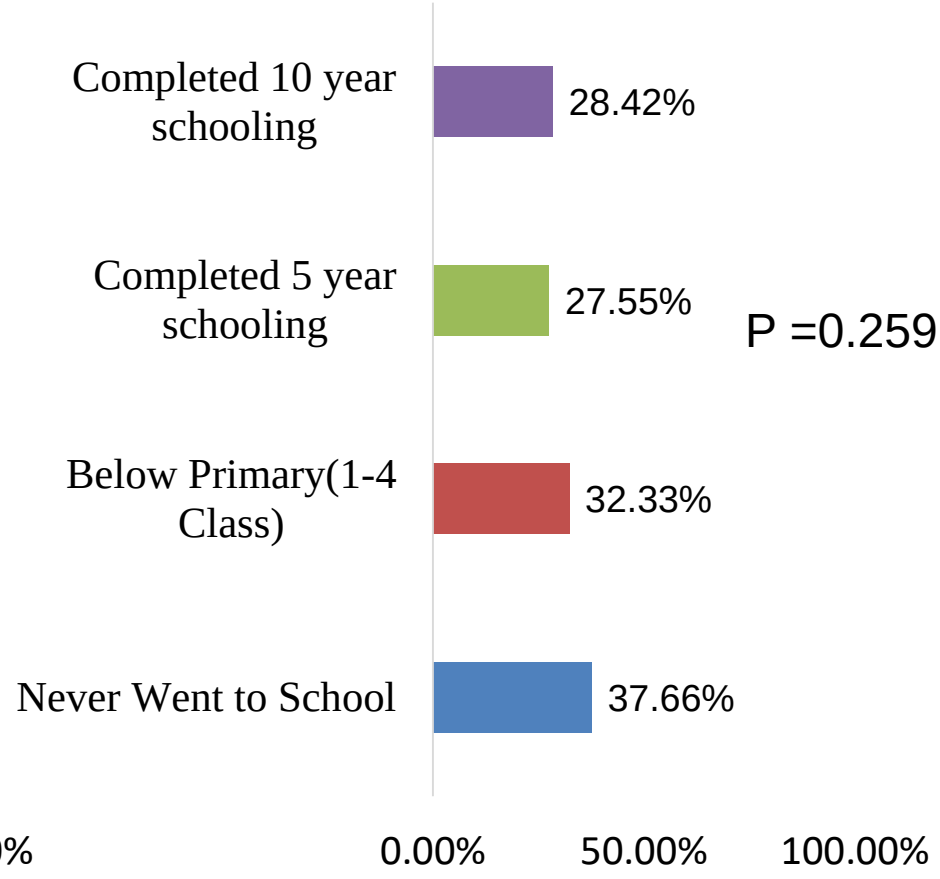


Iodine Deficiency in NPNL women by wealth index and education

No difference across the socio-economic classes



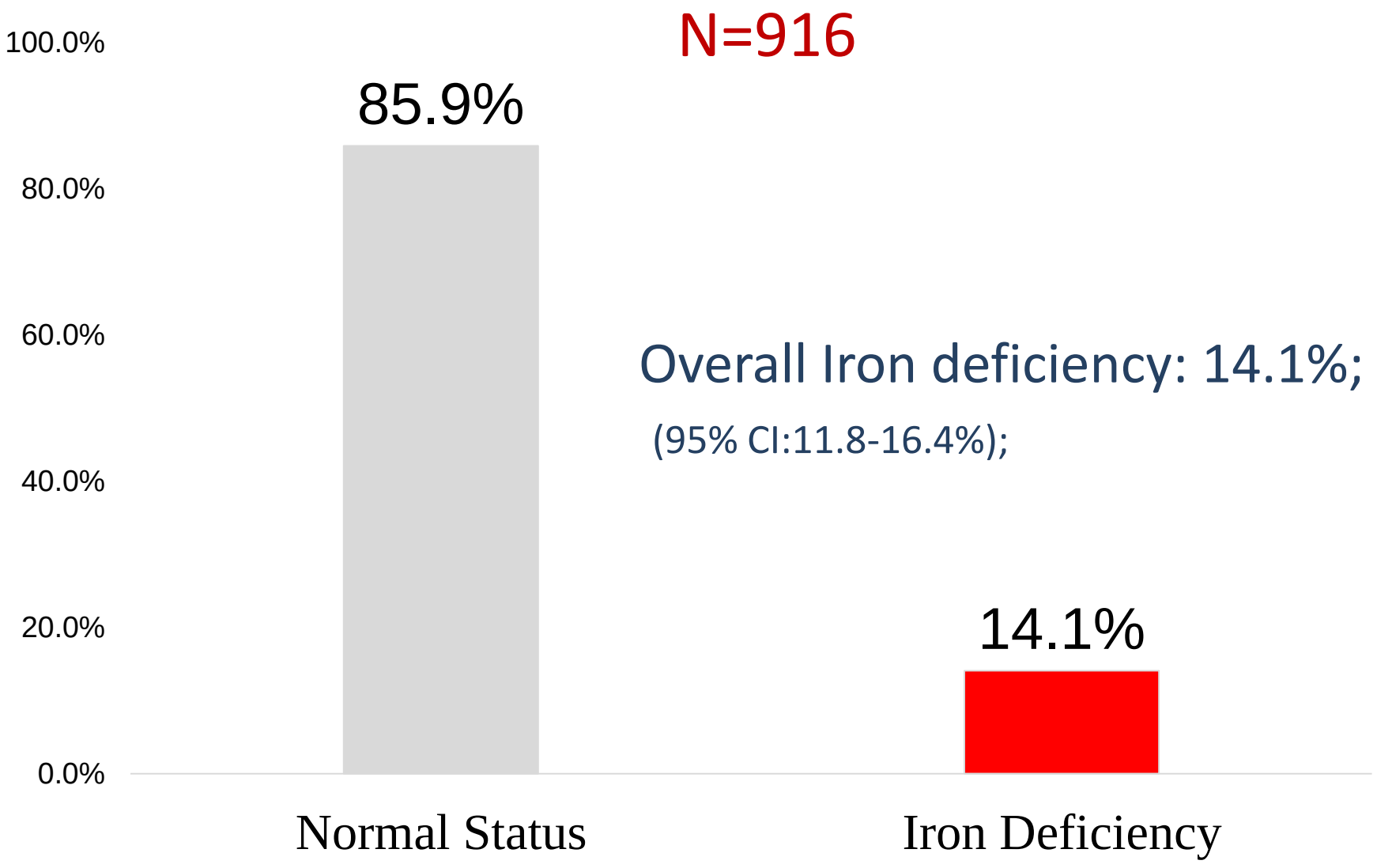
No variation across the level of education



Status of Iron deficiency

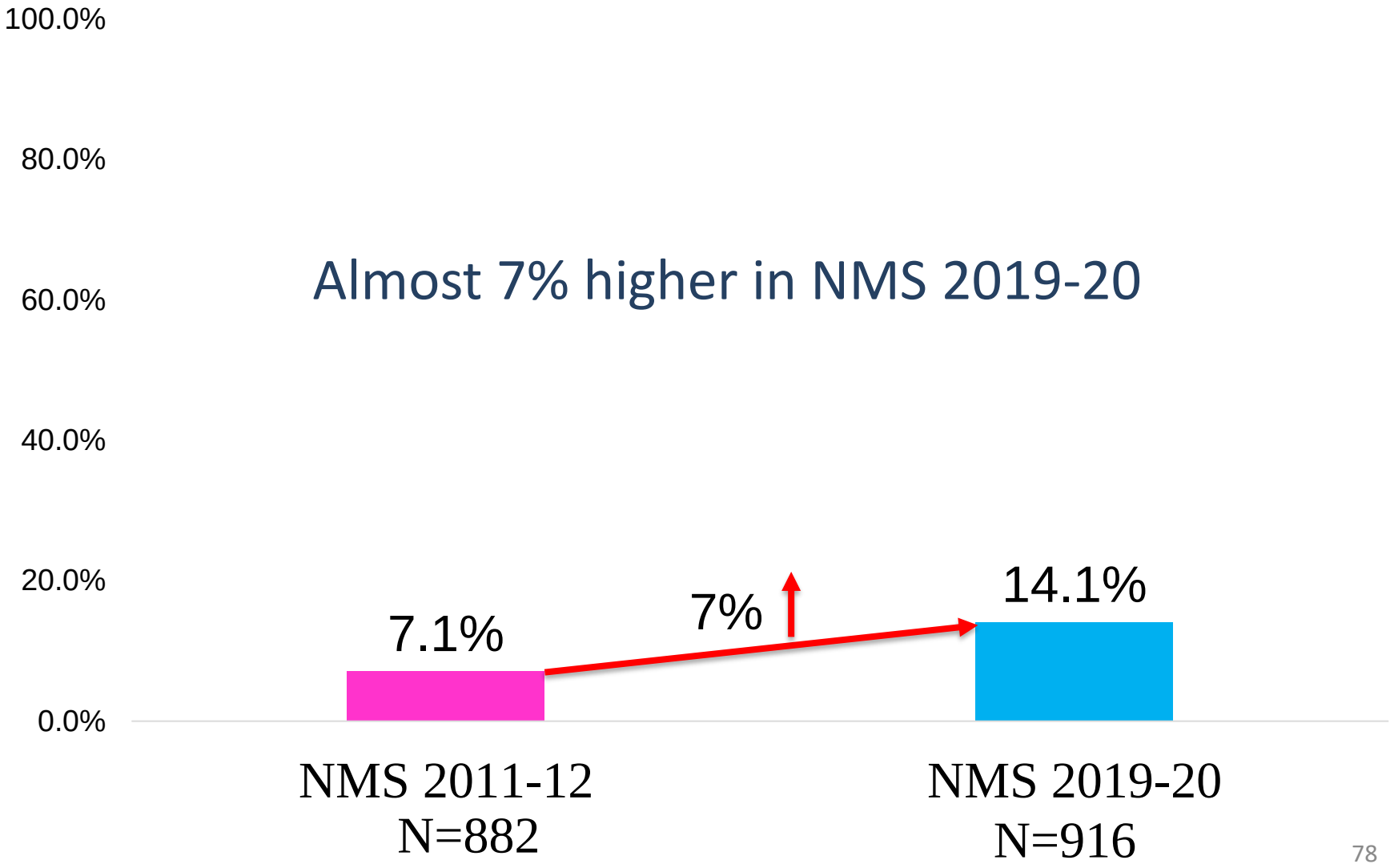
A field research assistant collecting data from a NPNL women of Marma community, Manikchari, Khagrachari

Iron deficiency in NPNL women



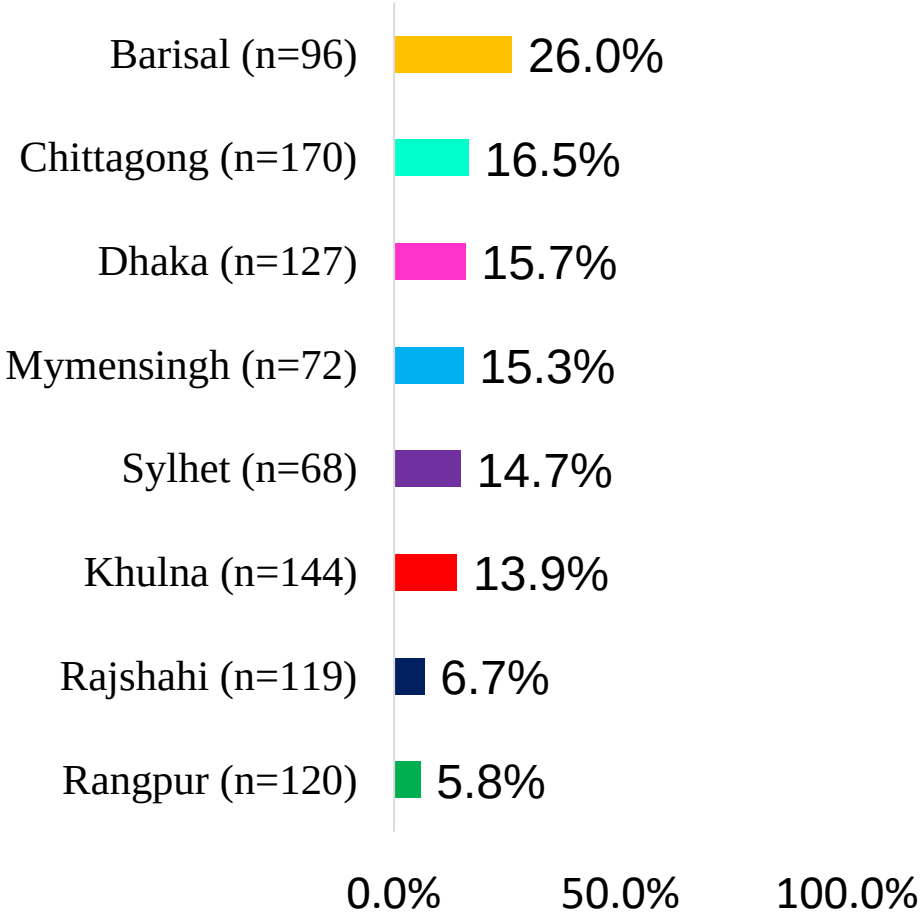
Funded by : National Nutrition Service; PI: Dr. Aliya Naheed

Comparison of Iron deficiency in NPNL Women between NMS 2011-12 and NMS 2019-20

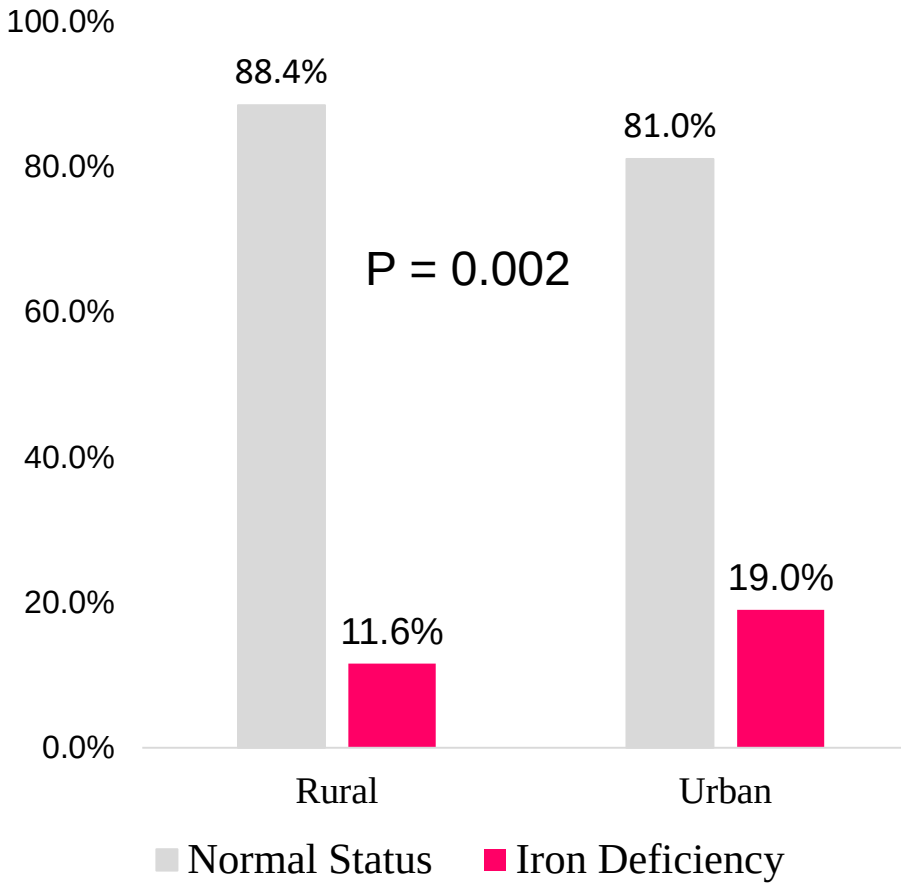


Iron deficiency in NPNL women by division and place of residence

Proportion of Iron deficiency varies across divisions

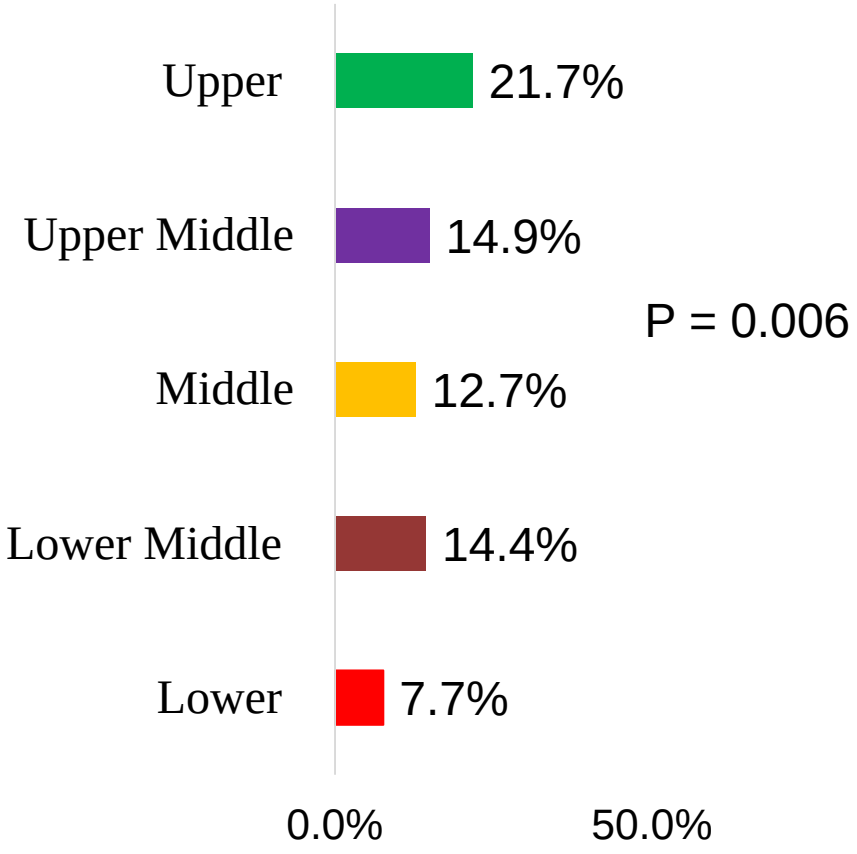


7.6% higher in urban areas than rural areas

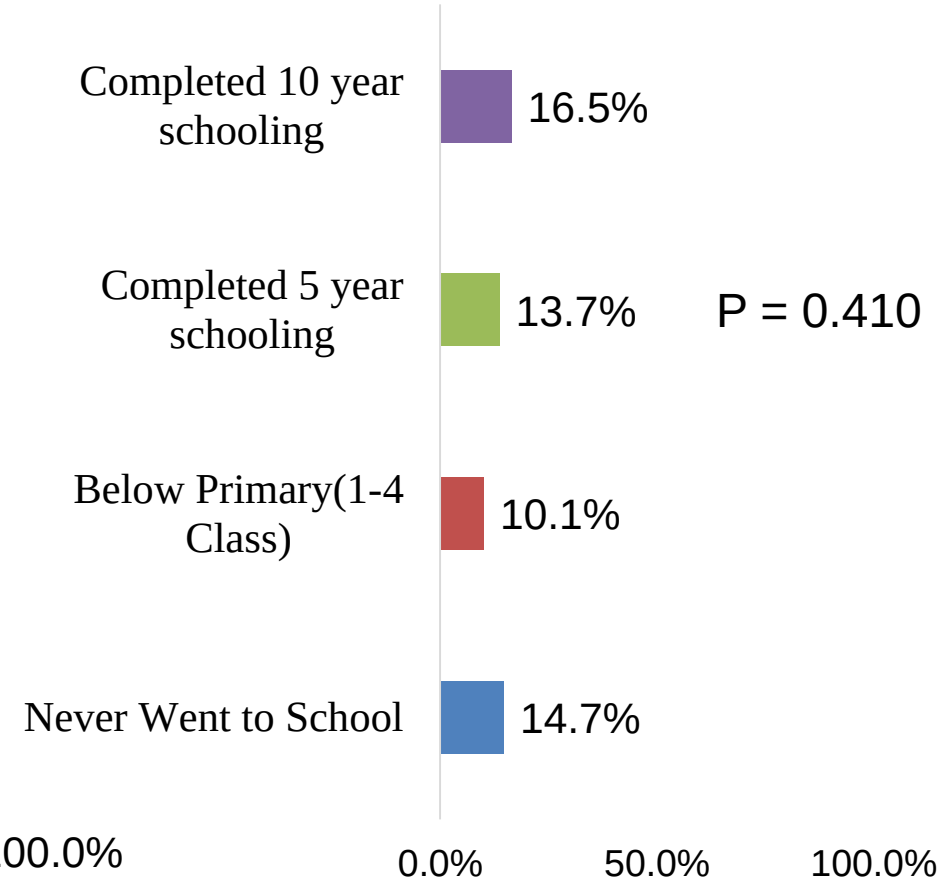


Iron deficiency in NPNL women by wealth index and education

Iodine deficiency varies across wealth index



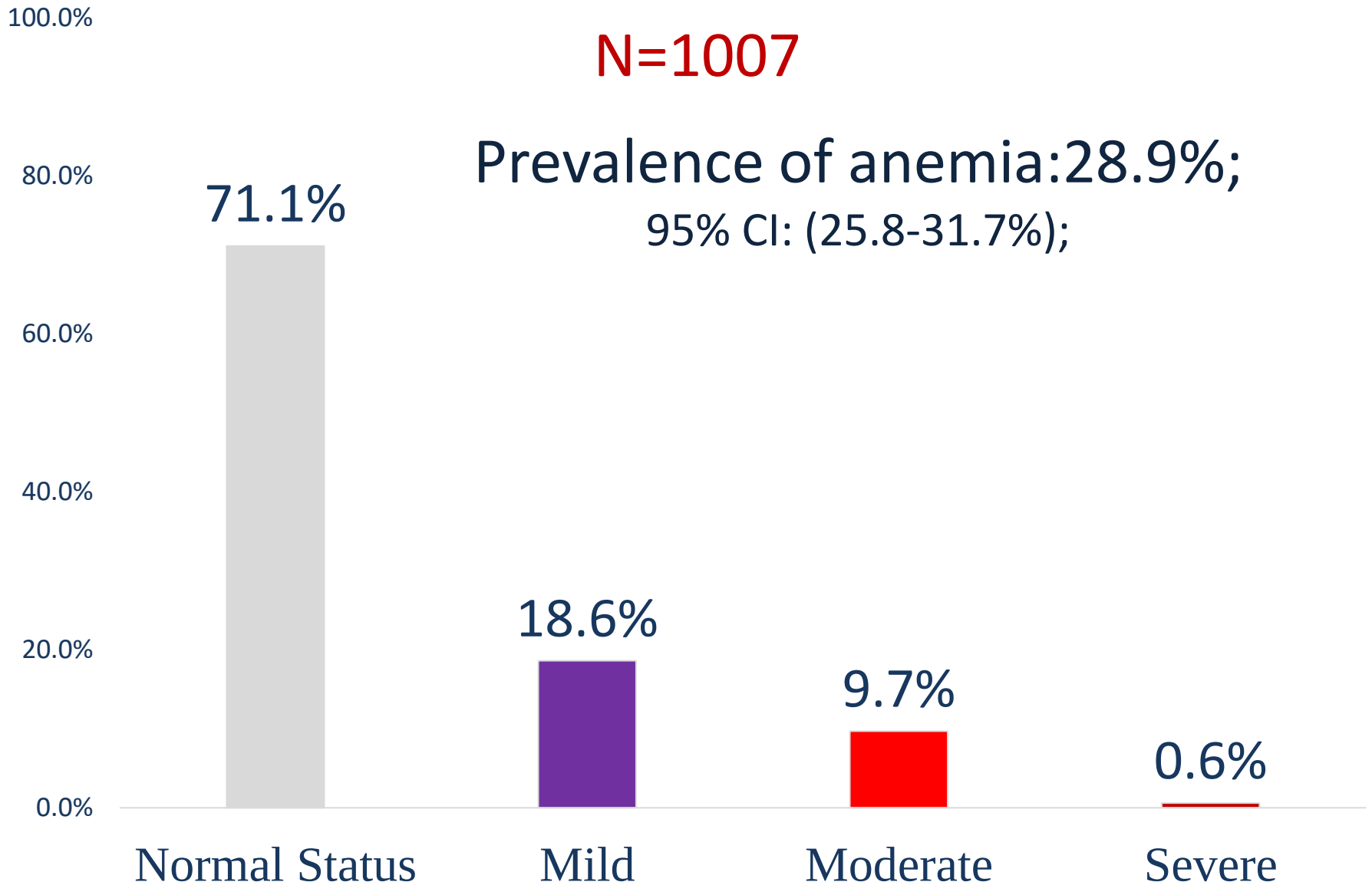
No variation across the level of education



Status of Anemia

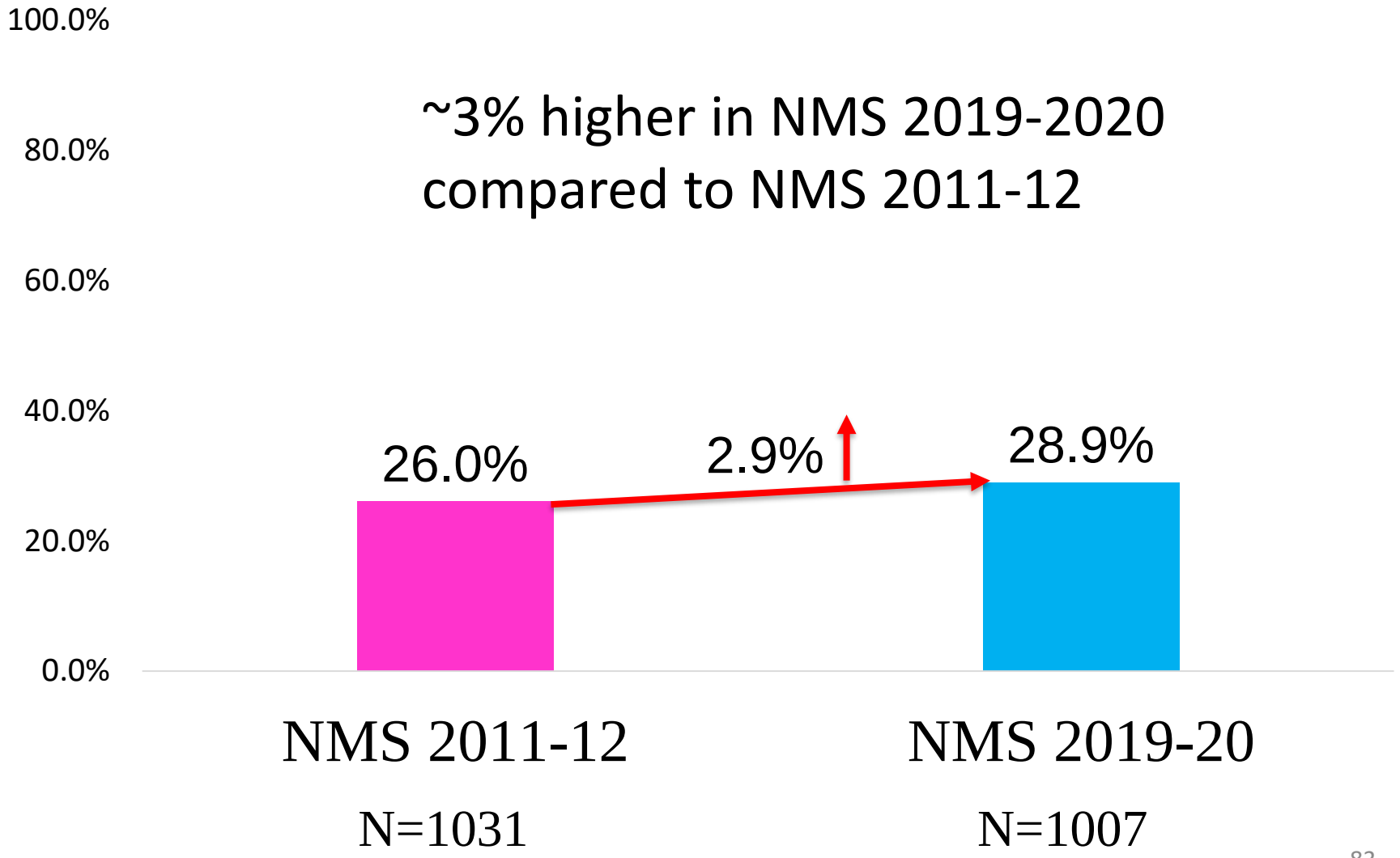
Field site: Shutki palli, Cox Bazar

Anemia in NPNL women



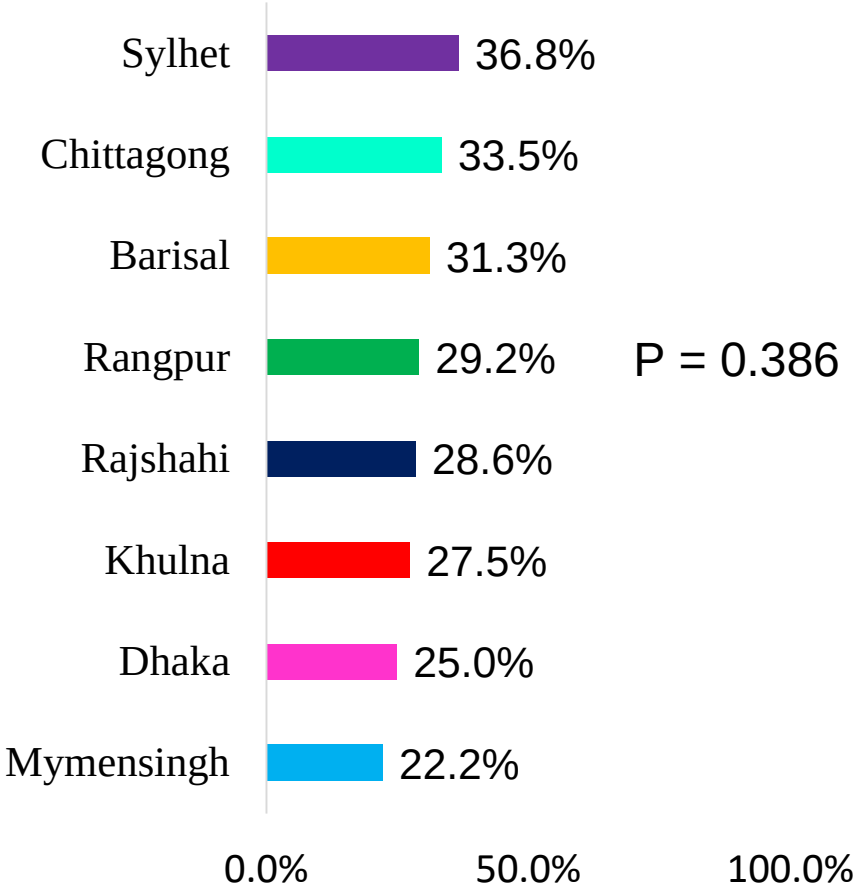
Funded by : National Nutrition Service; PI: Dr. Aliya Naheed

Comparison of Anemia in NPNL Women between NMS 2011-12 and NMS 2019-20

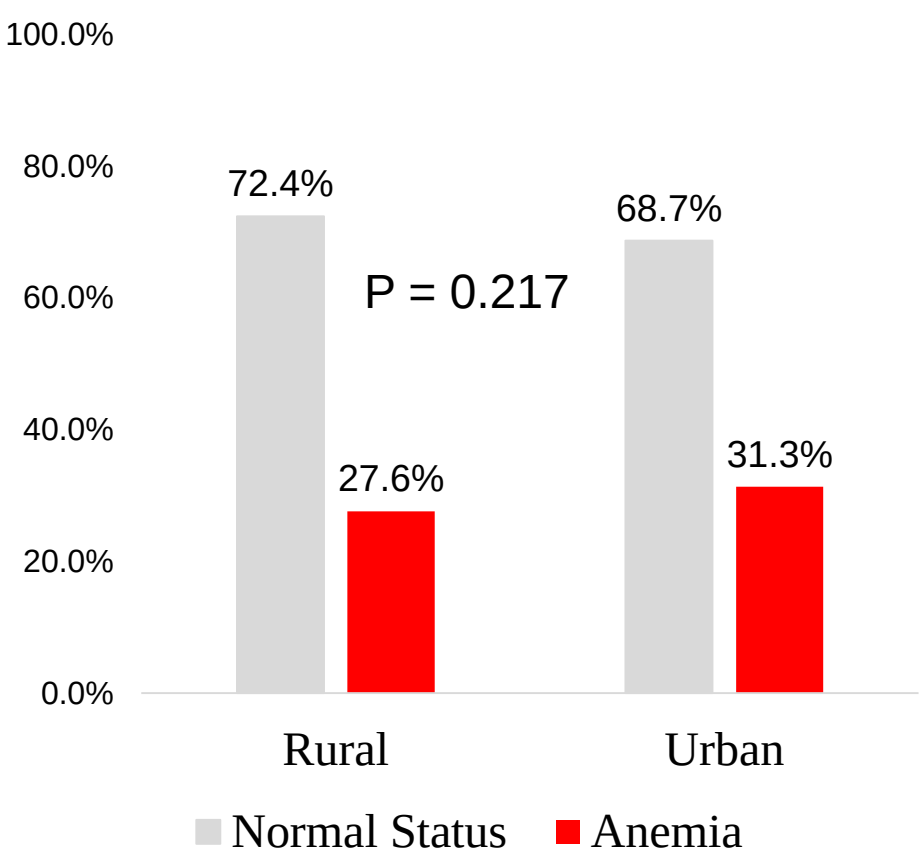


Status of anemia in NPNL women by division and place of residence

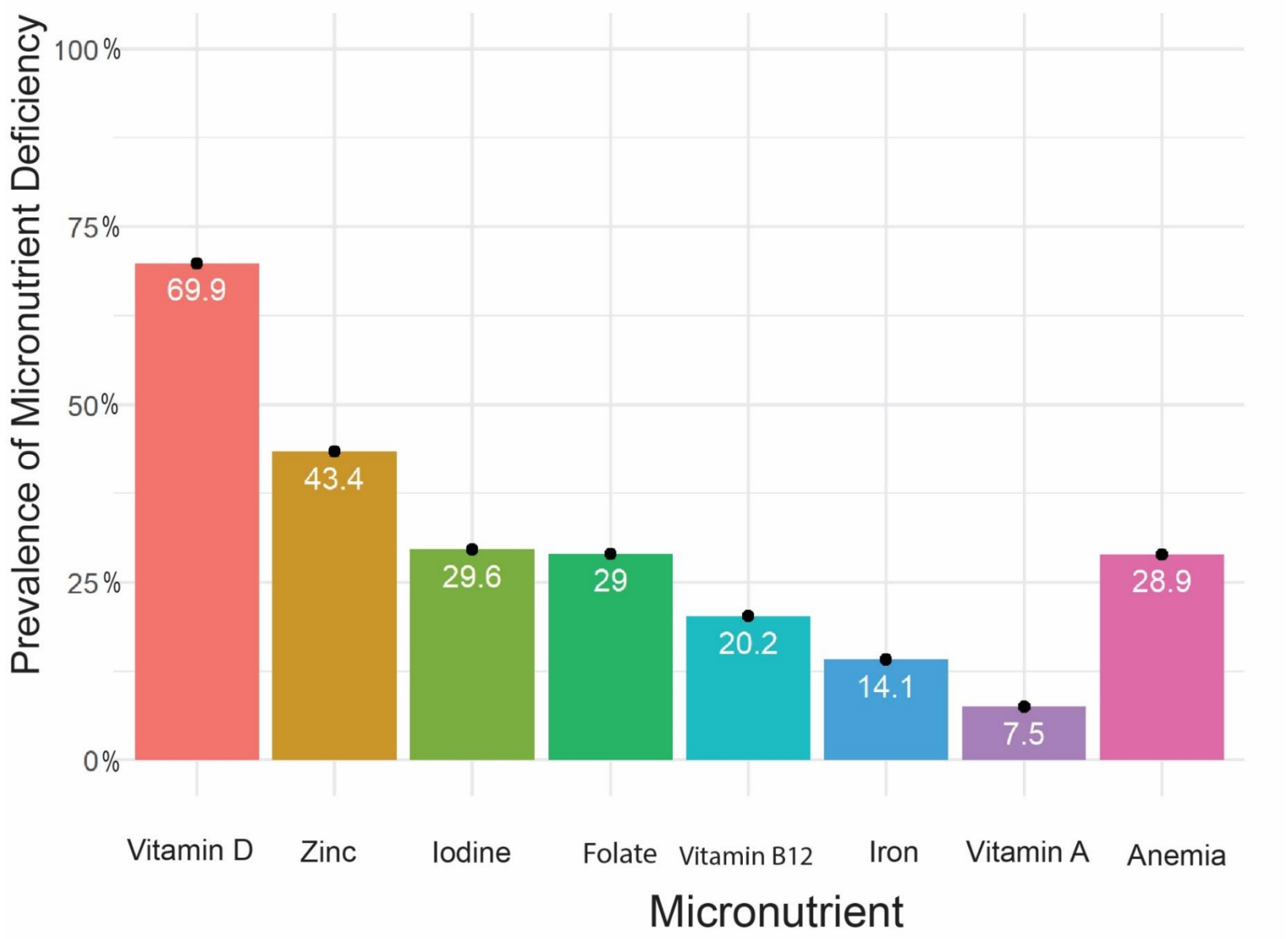
No variation across divisions



No difference between urban and rural areas

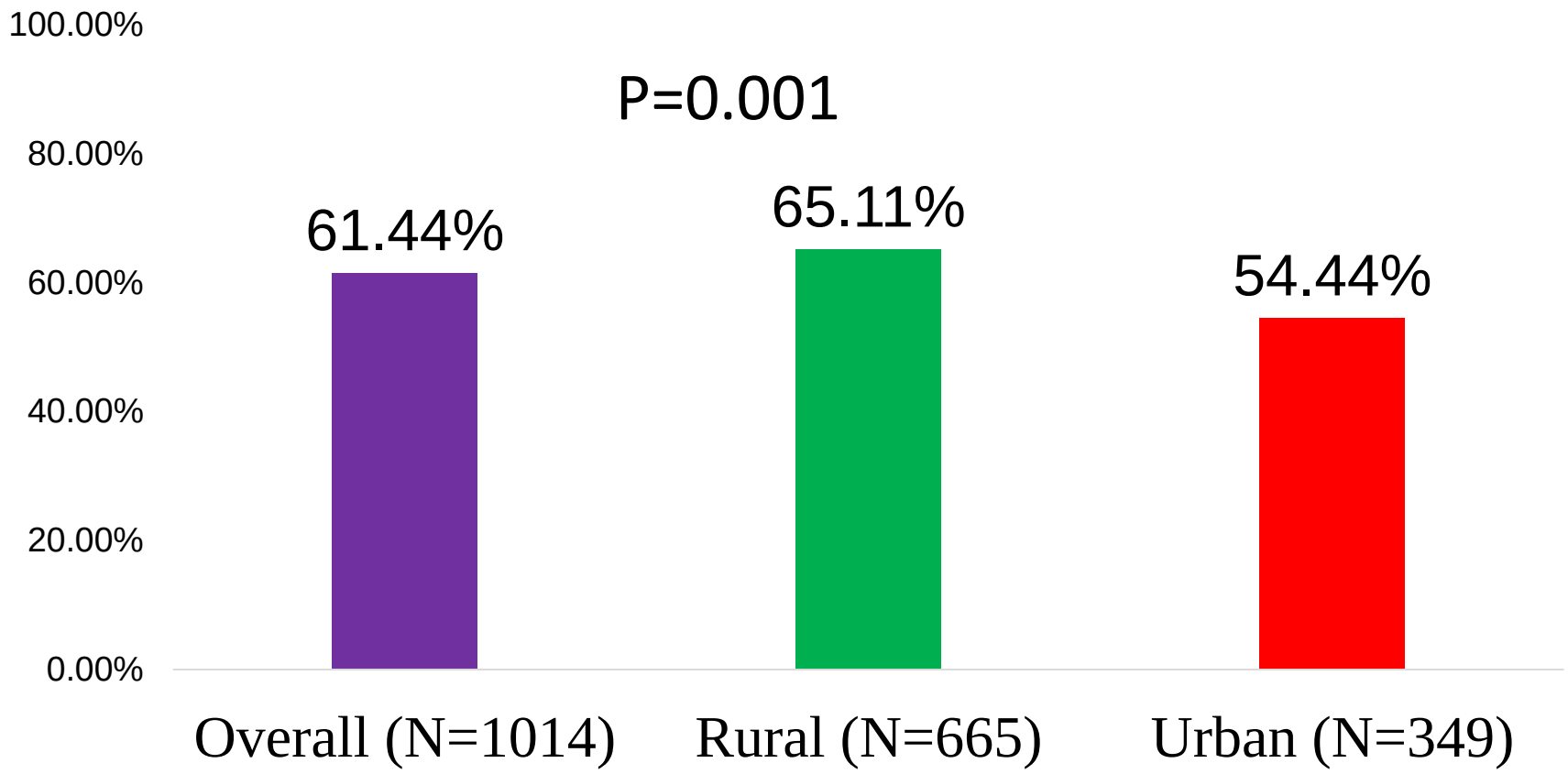


Snapshot of micronutrient deficiency and anemia among NPNL women



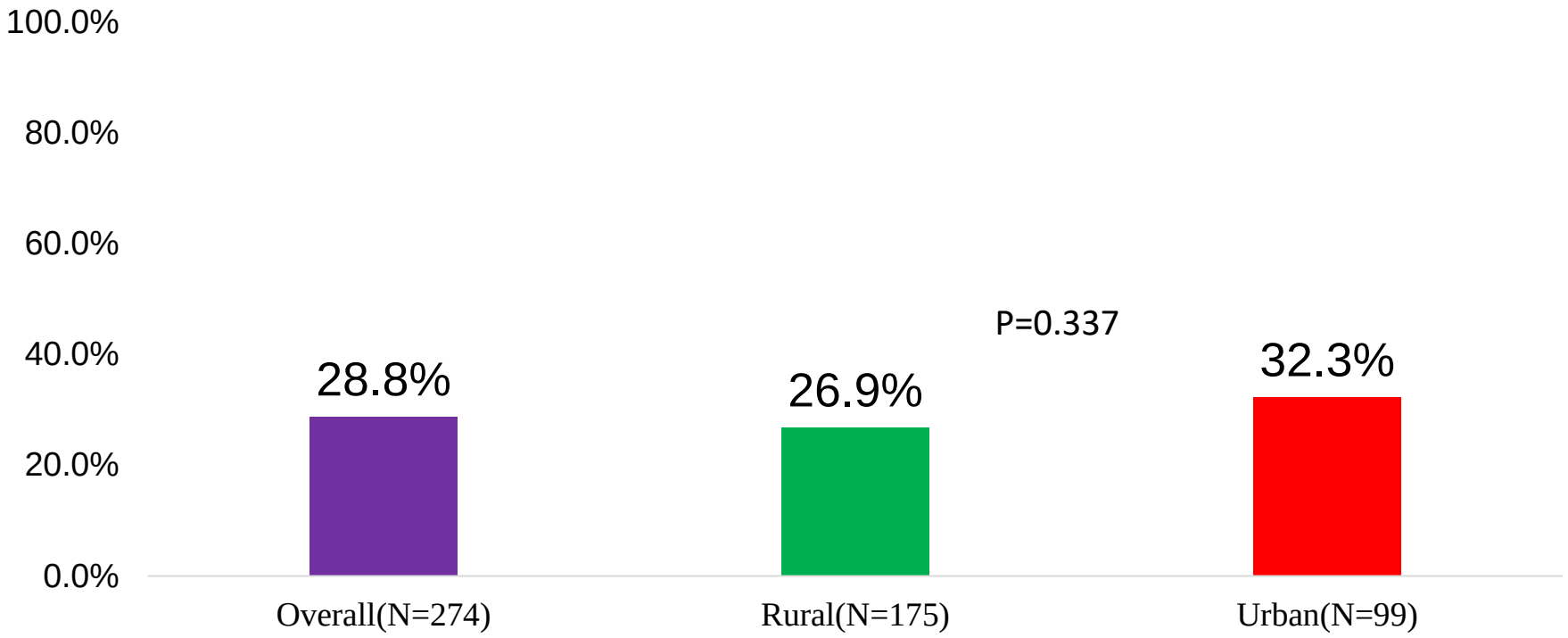
Dietary Diversity, Food insecurity, Food fortification status

Almost 61 % NPNL women does not meet the minimum dietary diversity **(MDD-W)**



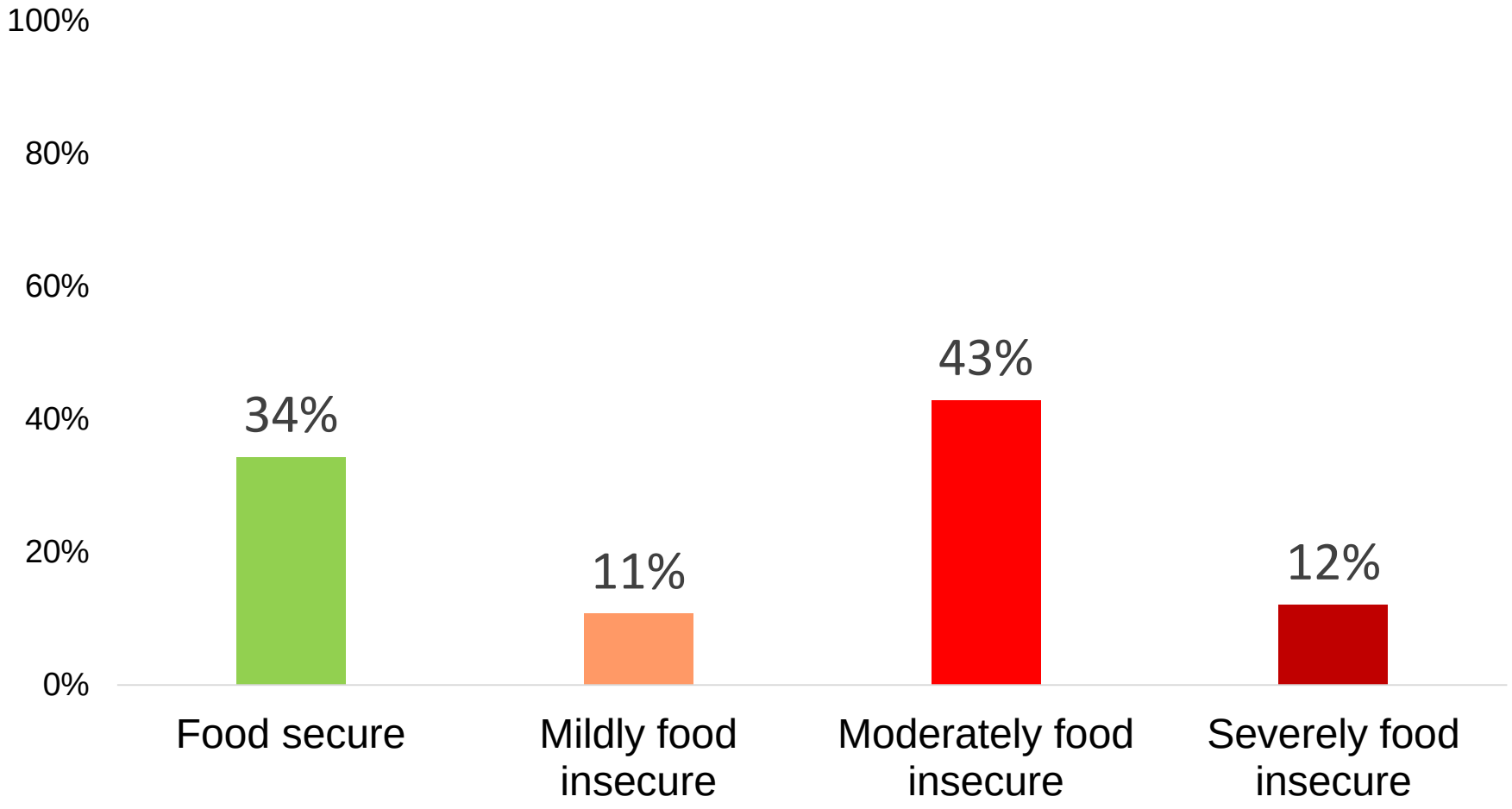
Overall 28.8% of children (6-23 months) meet the good IYCF practice

No significant variations between urban and rural areas



Good Practice (ICFI score = 6)

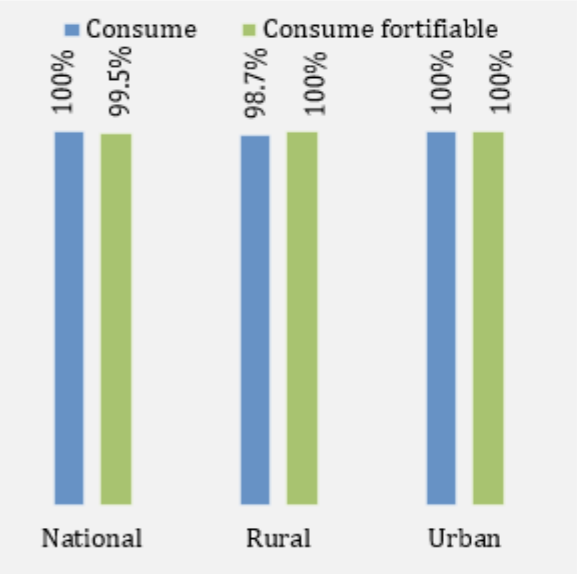
Mild to severe food insecurity at the household level: 66%



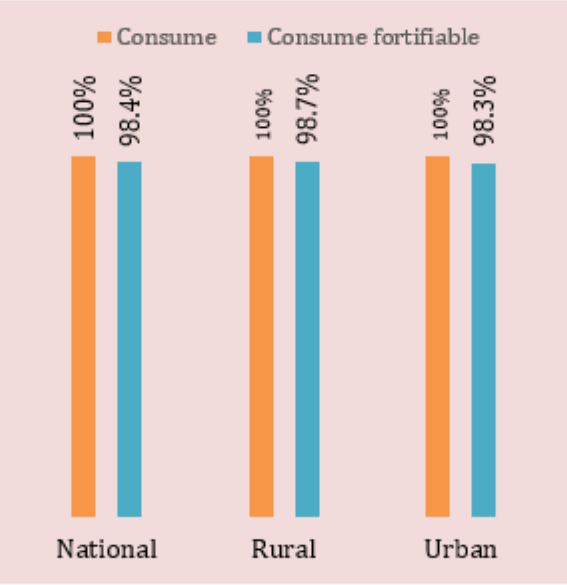
Household coverage of salt, oil and rice

- 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).

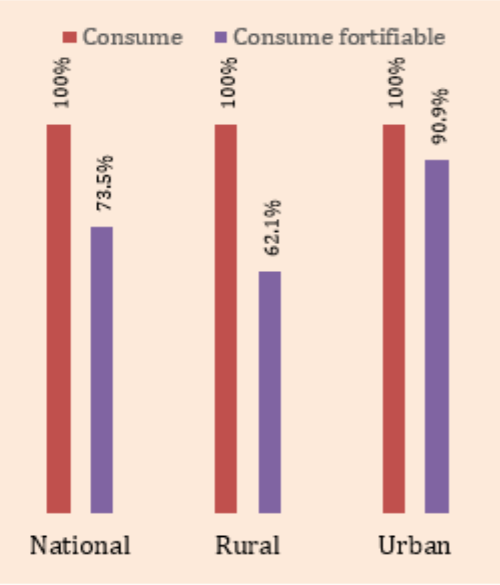
A. Salt



B.Oil



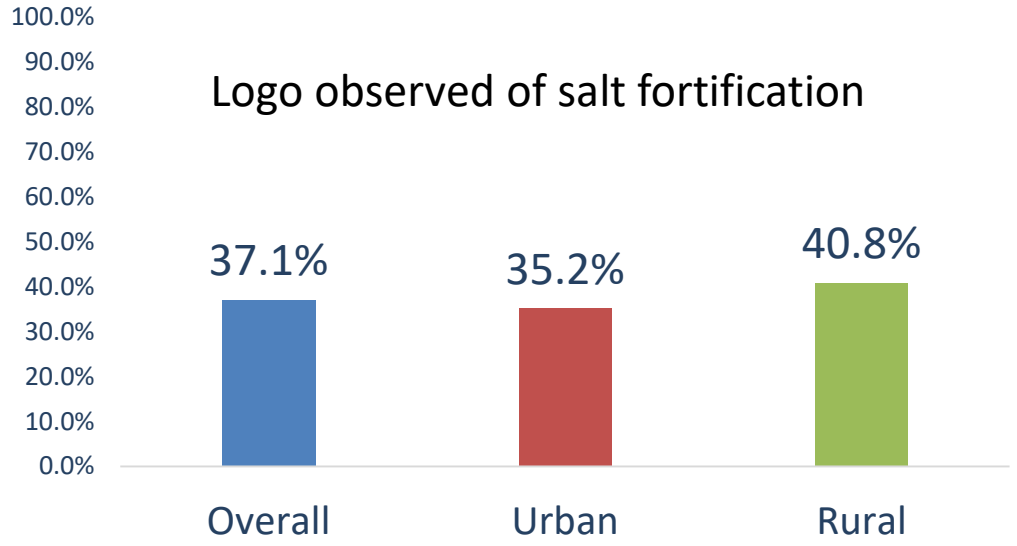
C. Rice fortification



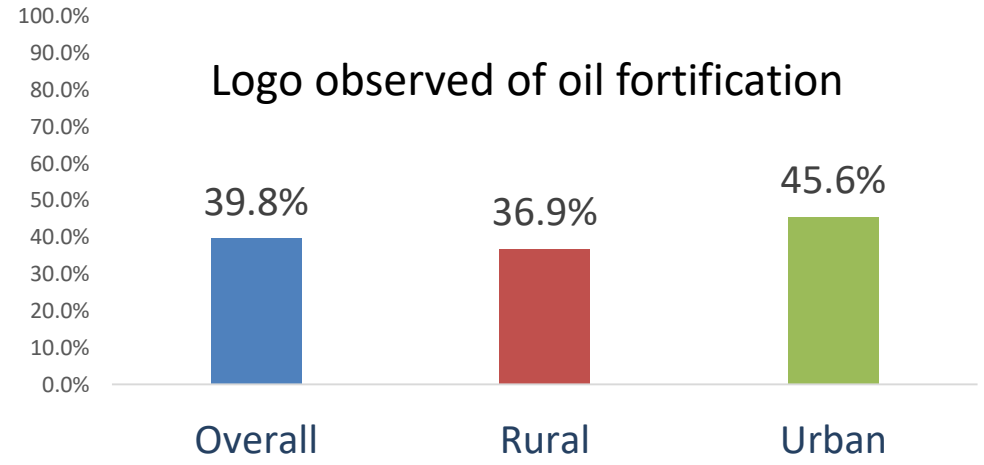
Note:"Consumes fortifiables" means the food vehicle used by the household was industrially processed (i.e. not made at home). .

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

Vitamin A deficiency

One out 13 NPNL Women	One out of two children

Vitamin D deficiency

One out two NPNL women	One out of five children

Zinc deficiency

Three out of seven NPNL W	One out of three children

Iron deficiency

Two out of twelve children	Two out of twelve children

Vitamin B12 deficiency

One out of five NPNL women

Folate deficiency

Two out of seven NPNL women

Iodine deficiency

One out of three NPNL women	One out of five children

Anemia

One out of five	One out of three

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***