

"District level variation of anemia in India" Bandita Boro, PhD Research Scholar, Jawaharlal Nehru University, New Delhi.

5th Asian Population Association Conference, 3rd-5th August, 2021.

INTRODUCTION

Anaemia affects an estimated 2.36 billion individuals globally (Stevens

et al. 2013), specially women and children (Vos et al. 2016). India, Bangladesh and Nepal carries the largest burden of anaemia globally (WHO.2007).. Anaemia is a major concern being associated with higher maternal mortality rates, lower infant birth weights, and worse developmental outcomes in children. Progress to reduce anaemia has been slow despite substantial economic growth and 50 years of programmatic efforts.

Understanding the trends and patterns of anaemia within the most vulnerable groups i.e., women and children, is necessary for planning and policy interventions. Therefore, we aimed to estimate trends in the complete distributions of haemoglobin concentration and anaemia prevalence by severity for children aged 6-59 months and nonpregnant and non-lactating women by districts.

Table 1.1: Odds ratio and confidence interval for prevalence of any anaemia for women and children, NFHS 4(2015-2016).

	Women aged 15-49 years		Children aged 6-59 months	
Background	Odds Ratio	95% CI	Odds Ratio	95% CI
characteristics				
Sex				
Male@				
Female			1.06***	1.03-1.08
Place of residence				
Urban@				
Rural	1.03***	1.00-1.05	1.03**	1.00-1.06
Education level				
No education@				
Primary	1.04***	1.01-1.07	1.12***	1.08-1.16
Secondary	1.12***	1.09-1.14	1.21***	1.18-1.25
Higher	1.28**	1.23-1.32	1.35***	1.20-1.42
caste				
ST@				
SC	1.04***	0.98-1.03	1.02 ***	0.98-1.06
OBC	1.14***	1.11-1.21	1.09***	1.05-1.13
General	1.21***	0.88-0.96	1.16***	1.11-1.21
Others	0.92***	1.11-1.33	1.27***	1.19-1.36
Religion				
Hindu@				
Muslim	1.01	0.98-1.03	0.87***	0.85-0.90
Christian	1.16***	1.11-1.21	1.69***	1.60-1.79
Sikh/Buddhist/Jain	0.92***	0.88-0.96	0.91***	0.85-0.98
others	1.22***	1.11-1.33	1.15***	1.04-1.27
Wealth Quintile				
Poorest@				
Poorer	0.95***	0.92-0.98	0.99	0.96-1.03
Middle	0.88***	0.86-0.91	0.96***	0.92-0.99
Richer	0.89***	0.86-0.92	0.96**	0.92-1.00
Richest	0.97*	0.94-1.01	1.01	0.96-1.06

RESULTS...CONT

Figure 4: Prevalence of anaemia among women aged 15-49 years (Hb <12.0 g/dL)



OBJECTIVES

- > To examine changes in anaemia among, non-pregnant and nonlactating women and children in India from 2006 to 2016 at national and district levels, and
- \succ To identify drivers of anaemia and estimate their contribution to changes in these outcomes over time.
- \succ To analyze the spatial correlation of anemia among women and its children across 640 districts of India

DATA SOURCE

- Changes in adjusted haemoglobin (Hb) and anaemia among nonpregnant and non-lactating women (15-49 age group) from NFHS 2, 3 and 4 and children (6-35 months) in India from NFHS 2 (1998) and 6-59 months from NFHS 3 and NFHS 4 (2016)
- > For children: mild anemia (10.0-10.9 grams/decilitre), moderate anemia (7.0-9.9 g/dl), and severe anemia (less than 7.0 g/dl).
- > For non-pregnant and non-lactating women : Mild anaemia (10.0-11.9 g/dl, moderate anaemia (7.0-9.9 g/dl) and severe anaemia (less than 7.0 g/dl).

 \triangleright \mathbb{R} = Reference Category

P- Value: - *** < 0.01, ** <0.05 & * <0.1</p>

Figure 2: Prevalence of anaemia among children aged 6-59 months (Hb <11.0 g/dL)

Figure 5: Moran I and Lisa Clusters map for non-pregnant women (15-49 years) suffering from any anaemia (Hb <12.0 g/dL)



METHODS

- \triangleright Drivers of anaemia was identified using binary logistic regression.
- > District level prevalence of anaemia for 640 Indian districts was estimated using National Family Health Survey 4th round (NFHS-4, 2015-16). For this the sample of non-pregnant and non-lactating women 15-49 years (n= 547,521), and children 6-59 months (n=220,487) has been taken.
- QGIS software package has been used to generate the descriptive maps of prevalence of anaemia for women and children across 640 districts of India over NFHS-4 rounds.
- The shape files was exported from QGIS to GeoDa for advanced geospatial analyse, such as Moran I and LISA maps.

RESULTS

Fig 1.1: Trends in percentage of anaemia level from 1998-99 to 2015-2016 for women aged 15-49 years and children 6-59 months.



Figure 3: Moran I and Lisa Clusters map for children (6-59 months) suffering from any anaemia (Hb <11.0 g/dL)



- anaemia among children aged 6-59 months in the period between 2006 and 2016. This progress can be attributed due to improvement in nutrition and health interventions in children (Nguyen et al. 2018).
- On the other hand, anaemia has increased considerably over the years among non-pregnant and non-lactating women, which may be more likely due to inadequate policy focus on them(Nguyen et al. 2018).
- > Socio-economic status is an important determinant of the prevalence of anaemia for both women and children.
- The hotspots found in case of anaemia among women were in the eastern, western regions and Northern regions of India particularly in the states like Bihar, West Bengal, Odisha, Jammu & Kashmir and some districts of Rajasthan, Gujarat and Madhya Pradesh.
- > The districts of Uttar Pradesh, Madhya Pradesh (Central region), and parts of Bihar, Orissa, and Gujarat showed a high prevalence



no mild moderate severe

Note: for NFHS 2 the anaemia level is for 6-35 months

of anaemia among children. Previous studies depicted that parental income and education predicts childhood anaemia (Jain et al. 2005).

 \succ Child health outcomes are the worst in Central, Eastern and Northern, India due to poor quality of health-care infrastructure (Puri et al. 2020).

CONCLUSION

- \succ The maps reflect persisting inequalities in the prevalence of Anemia among women and children that may soon be reduced by further progress.
- \succ Overall, the districts of the low performing states have higher prevalence of anaemia.
- > Yet, the rise in Anemia rates exemplified by well off districts requires more investigations to understand the source of this fixation.
- Tackling Anemia in India requires investments in women's education and socioeconomic status along with continued focus on improving health and nutrition.