Prevalence, Trends, and Determinants of Low Birth Weight in Nepal: A Pooled Analysis of NDHS (2011-2022) Data with Multiple Imputation

Usha Singh[1] Prearna Khadka1

[1]New ERA, Rudramati Marga, Kalopul, Kathmandu, Nepal

Background

- Low birth weight (LBW) is a weight at birth of less than 2,500 grams.
- Globally, 15-20 percent of all births are born with LBW, accounting 50% of births from low and middle-income countries (UNICEF, 2014).
- LBW is associated with neonatal and infant mortality.
- Using only health facility data to estimate the prevalence of low birth weight (LBW) in developing countries can lead to selection bias because it represents only a subset of births and excludes many home deliveries (Boerma et al., 1996; Devaguru et al., 2023).

Objective

- To estimate missing birth weights by means of imputation using NDHS 2022.
- To find out the prevalence of LBW by combining both estimated and measured birth weight using the NDHS 2022 data.
- To identify trends of LBW and factors associated with it in the last ten years (2011-2022).

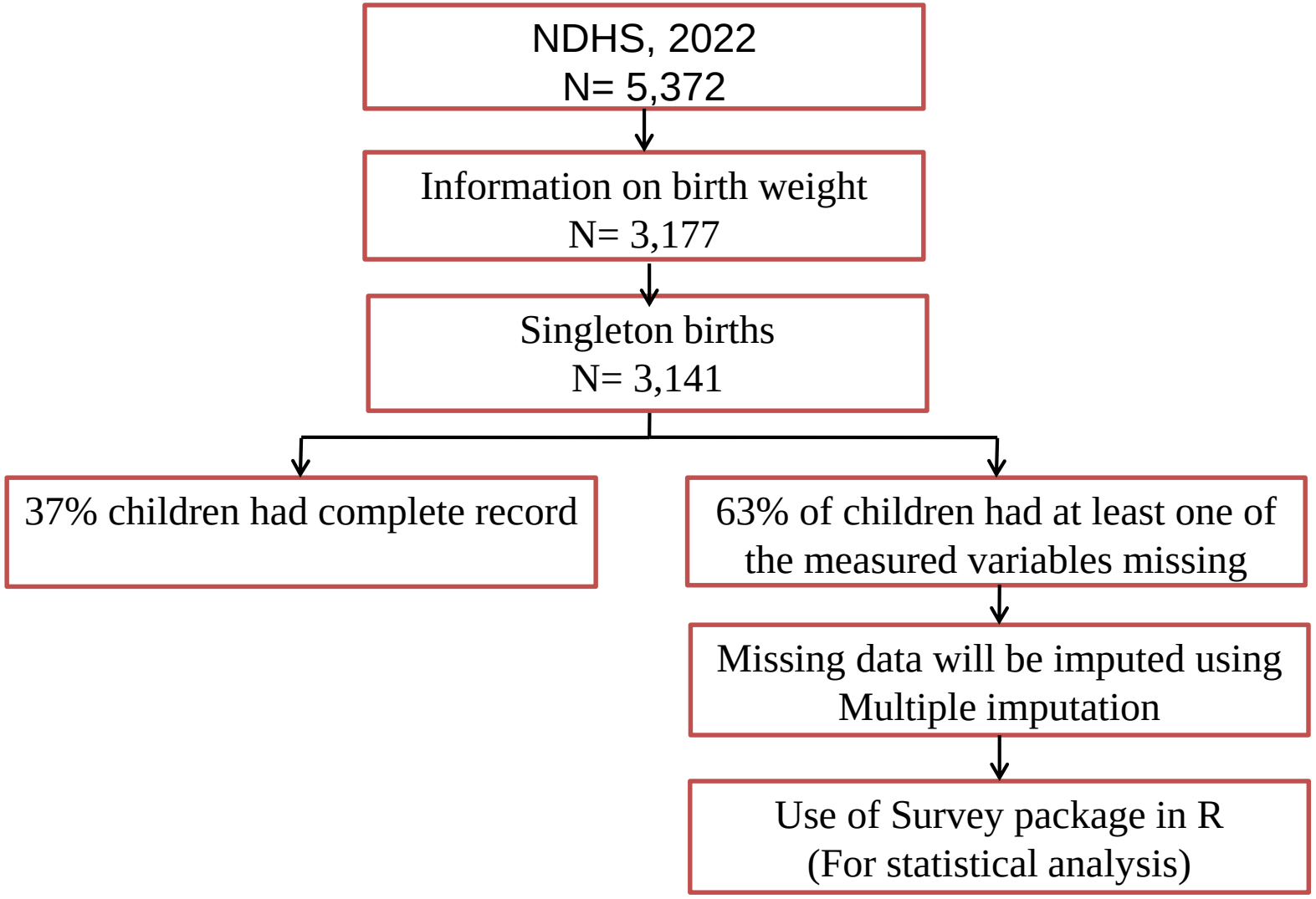
Methodology

- Data source: Child dataset of NDHS, 2022, 2016 and 2011.

- Study variables
  - Dependent variable: Birth weight
  - Independent variable: Mother's age at child's birth, mother's education, mother’s BMI, ANC visit during pregnancy, consumption of iron tablets during pregnancy, parity, birth interval, cooking fuel, child’s sex, ethnicity, province, residence, and wealth index
  - Auxiliary variable: Size at birth

The study variables were categorized based on a previous similar study (Khanal, 2014).

Methodology: for identifying the prevalence of LBW using the NDHS 2022 data



Methodology: for identifying trends of LBW over ten years period)

Table: Details of three-year child datasets

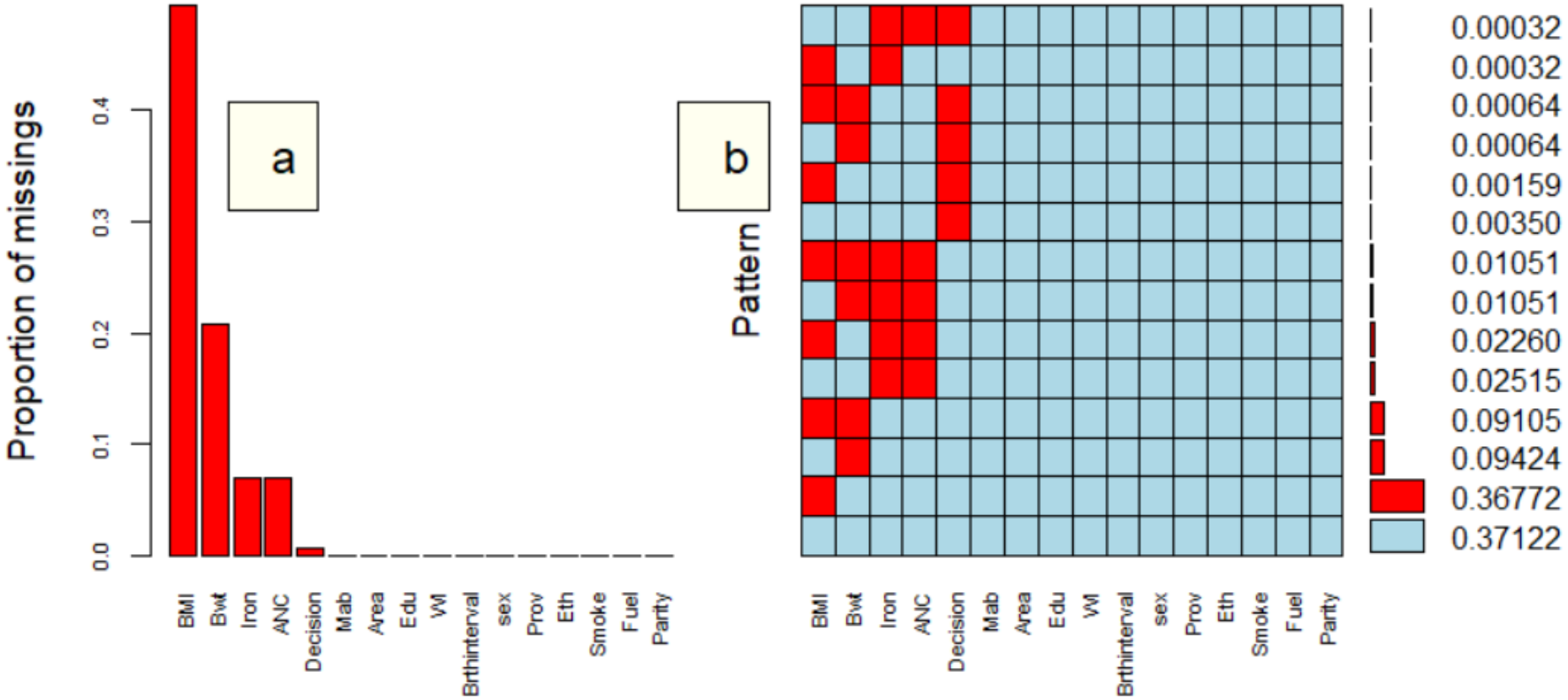
Year	Children records	Singleton births	Missing birth weight	Percent of missing birth weight
2011	5,306	5,240	3,318	63.3%
2016	5,038	4,969	1,921	38.7%
2022	5,372	3,141	652	20.8%

- Only the birth weight information for children <2 years of age was utilized.

- The pooled dataset contained 10,115 children records (NDHS 2011: 2,928 records, NDHS 2016: 4,046 records and NDHS 2022: 3,141 records.

Data Management

Percentage and pattern of missing data



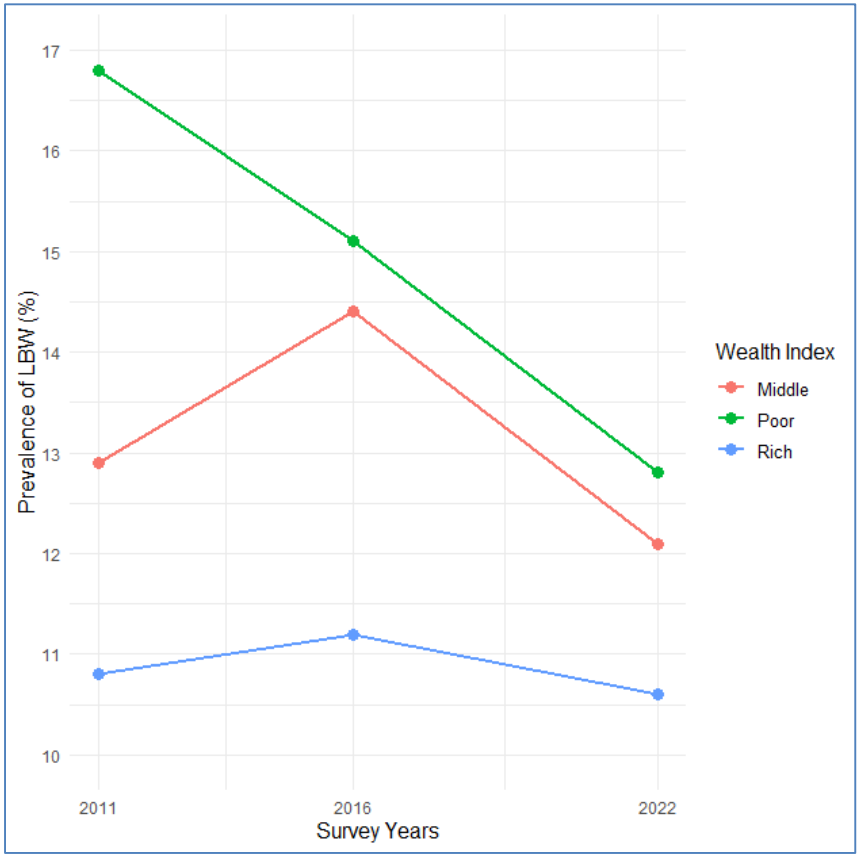
Prevalence of LBW: Using NDHS 2022

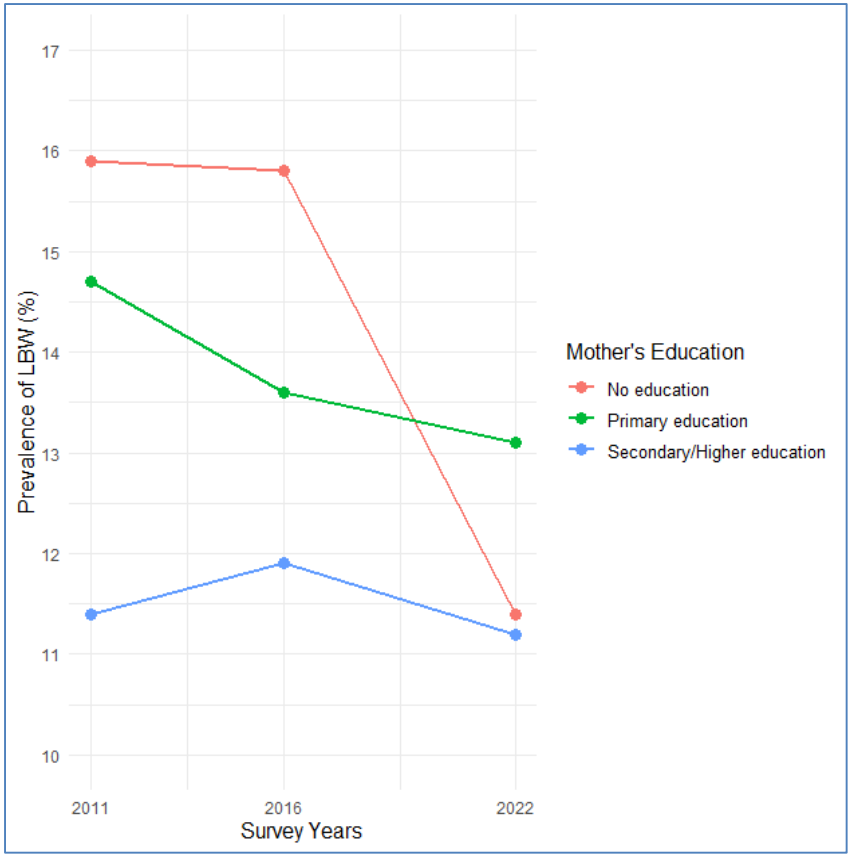
- The overall prevalence of LBW is 11.8 percent (95% CI=10-13%) after imputation.

- The women who were underweight with a BMI <18.5 (adjusted OR 2.14, 95% CI =1.33, 3.45) had a greater chance of giving birth to LBW babies.
- Women who visited ANC 0-3 times (adjusted OR 1.93, 95% CI =1.29, 2.86) were more likely to give birth to LBW infants than those who visited four or more times.

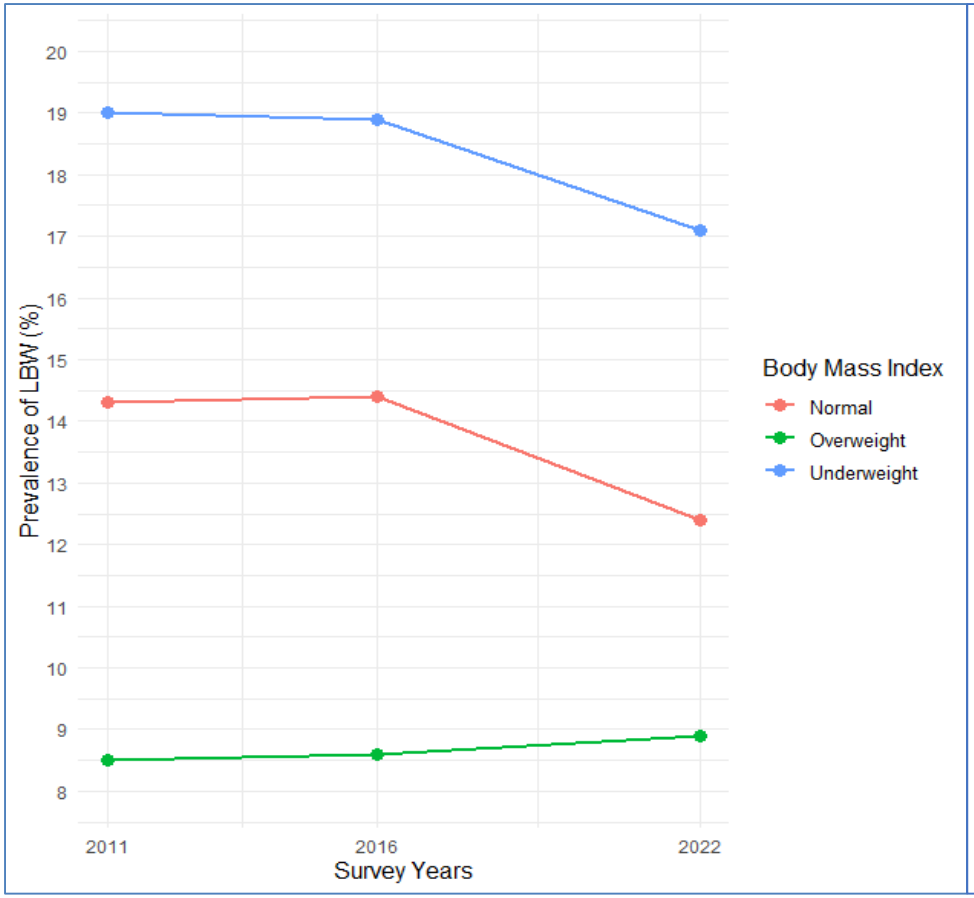
- The prevalence of LBW has decreased from 14.0% in 2011 to 11.9% in 2022. However, the difference in year-wise (2011, 2016, and 2022) prevalences of LBW was not statistically significant.

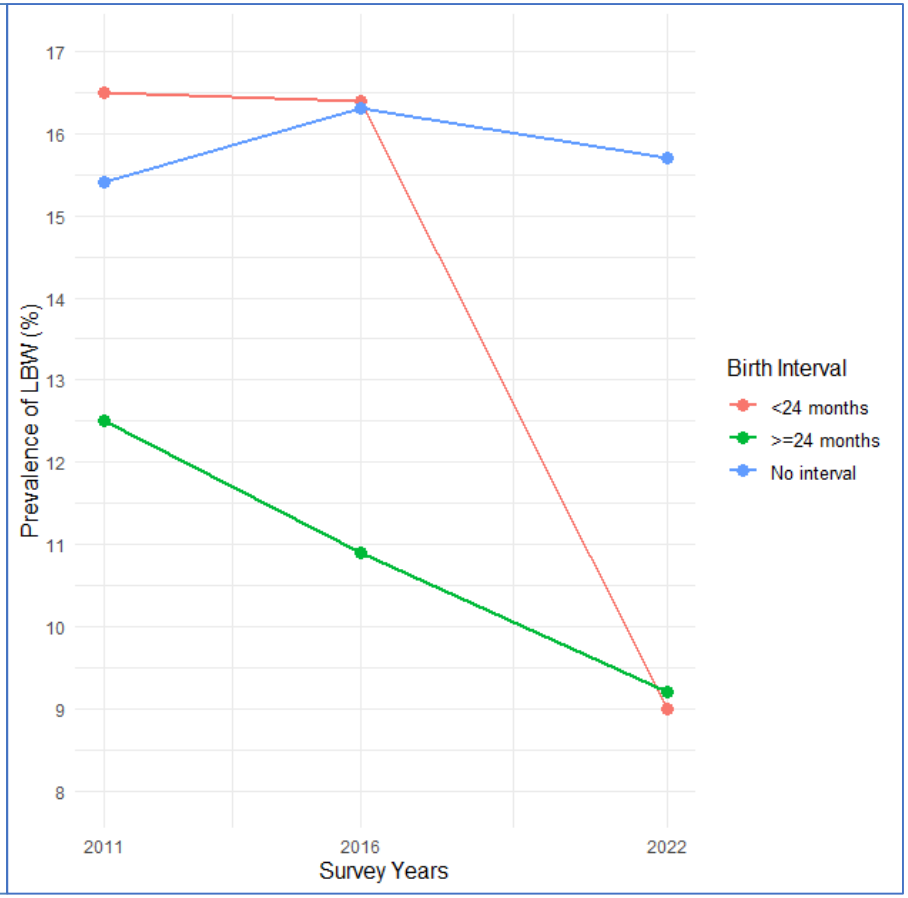
Trends of LBW by WI and Mother's Education



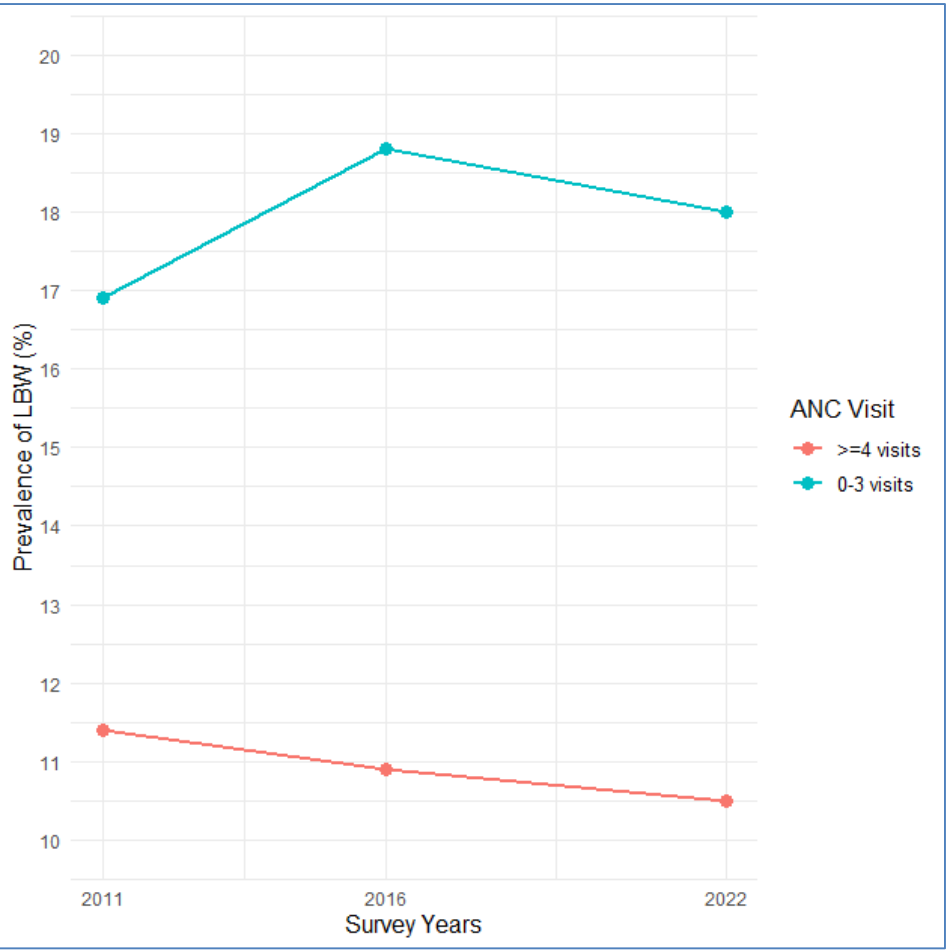


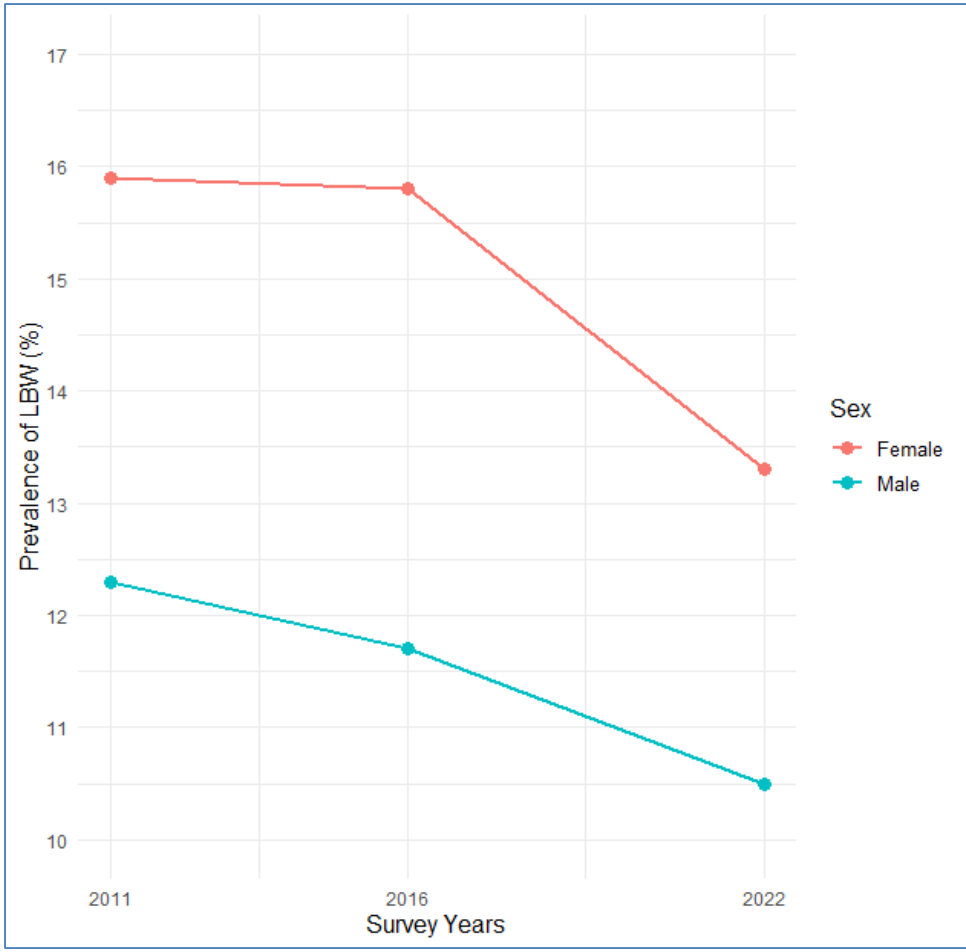
Trends of LBW by BMI and Birth Interval





Trends of LBW by ANC Visit and Sex of Child





Results from Multiple Analysis

Variables	Adjusted OR	95% CL	*p-value*
Body Mass Index (BMI)			0.000*
>23.0 (Overweight)	1		
18.5-23.0 (Normal)	1.48	1.12-1.97	
<18.5 (Underweight)	2.15	1.54-3.00	
Birth Interval			
>= 24 months	1		0.016*
<24 months	1.26	0.90-1.76	
No interval	1.86	1.27-2.73	
ANC Visit During Pregnancy			
Four or more visits	1		0.000*
0-3 visits	1.74	1.40-2.15	
Gender of Baby			
Male	1		0.000*
Female	1.36	1.14-1.62	

Conclusion

- Accounting for missing birth weight through multiple imputation yields more unbiased estimates of LBW prevalence and determinants in Nepal.

- Although modest progress has been made over the past decade, LBW remains a significant concern, particularly among undernourished mothers and those with inadequate ANC utilization.

- Strengthening maternal nutrition, promoting adequate birth spacing, and ensuring at least four ANC visits are critical to further reducing LBW and improving neonatal outcomes in Nepal.


धन्यवाद
THANK YOU

Brief Bio of the Presenter

Miss Singh is an M&E and data analysis professional with extensive experience managing large-scale quantitative and qualitative studies across Nepal. She holds a Master's degree in Research Methodology. She has conducted descriptive and inferential statistical analysis for multiple national health surveys. She has authored five peer-reviewed articles.