

Predictors of Low Birth Weights in the Kassena-Nankana districts of the Upper East Region of Ghana

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Introduction/Background (1)

- Birth weight is the first weight of a new born measured immediately after birth
- Normal birth weight is essential for child survival, development and health later in life health. Low birth-weight defined as weight at birth of less than 2,500 grams
 - WHO
- Studies have shown that though mortality rates for low birth infants are declining but the consequences of survival for these children may be associated with adverse developmental outcomes

Introduction/Background (2)

- Links between low birth weight and pulmonary function, physical growth, neurological outcome, psycho-social development and social disadvantages
- Focus on the relationship between perinatal factors, cognitive and neurological development.

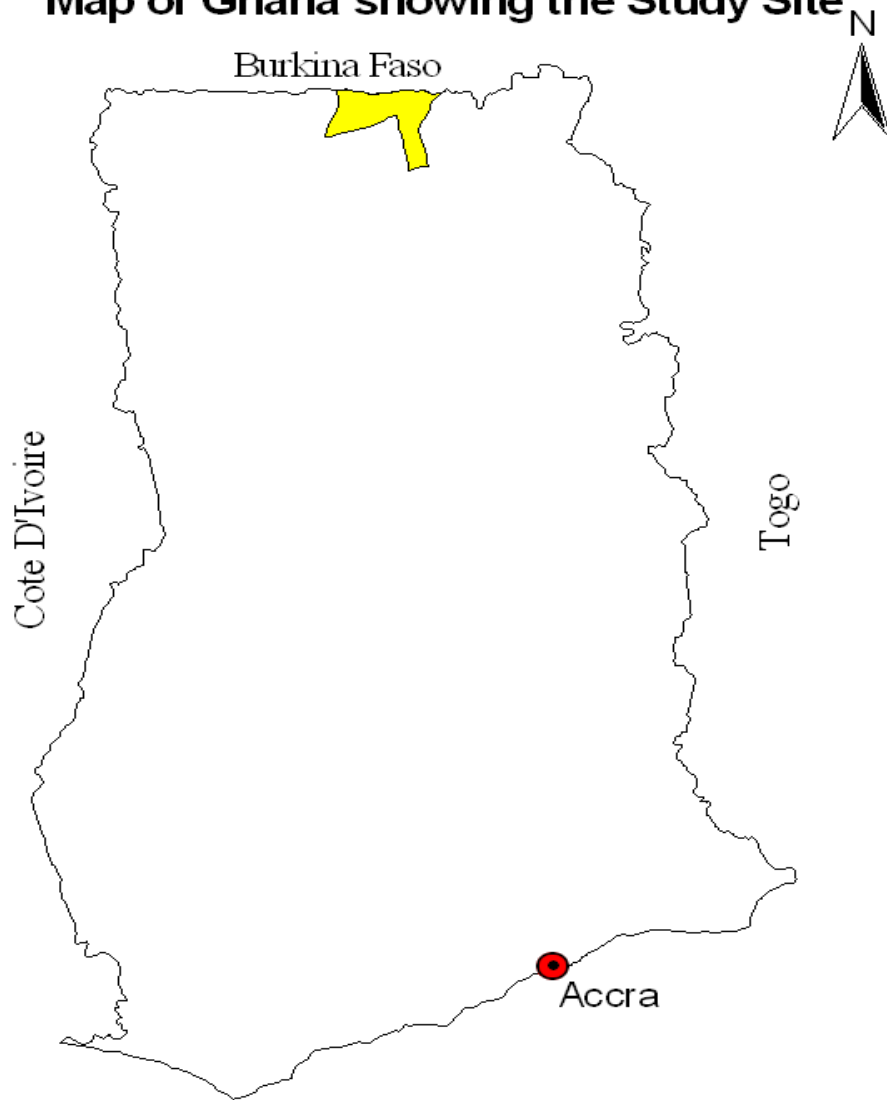
Introduction/Background (3)

- Little known about other factors which are important to child health and development such as the social and home environment
- Prevalence of low birth weight in Ghana is 14.3% (WHO 2011)
 - Greater than recommended threshold of 10% by UNICEF, 2001
- Birth weight single most important determinant of child mortality and morbidity (De Onis et al, 1998)

Study Objective

- To identify maternal and socio-economic factors that influence the weight of newborns delivered in health facilities in a rural northern Ghana setting
- Assess the prevalence of low birth weight in the two Kassena Districts

Map of Ghana showing the Study Site



Gulf of Guinea

- Capital
- Kassena-Nanakana District
- National Boundary



Study area

- Total land area is about 1685 sq km
- Population of 160,000 living in about 18,000 compounds with approximately 32,000 households under continues surveillance
- One major hospital that acts as a referral hospital to seven health centers and one private clinic
- Over 40 Community Health Centre (CHCs) to provide primary health care services

Data

- Data was extracted for 8263 women from 2009 to 2011 from the Navrongo HDSS.
- Both maternal and neonatal characteristics were extracted for the analyses
- Weights of newborns were categorized as Normal birth weight (weight greater than or equal to 2.5kg) or Low birth weight (weight less than 2.5kg)
- Socio-economic status which is estimated from the wealth index of the household (used as a proxy for household income) was constructed in quintiles (1 = poorest, 2 = poor, 3 = average, 4 = rich, 5 = richest)

Data Analysis

- Descriptive and analytical statistics were computed, tabulated and displayed in figures. Tests of means, proportions and Chi-square was employed to test for associations,
- Both Uni-variable and Multi-variable logistic regression models were fitted to obtain Unadjusted and Adjusted Odds Ratios for all covariates associated with the outcome variable
- All tests were two-sided and test of significance was set at P value of < 0.05
- The data was captured and validated using Microsoft FoxPro 6 and was analyzed using STATA 12.0 SE

Results



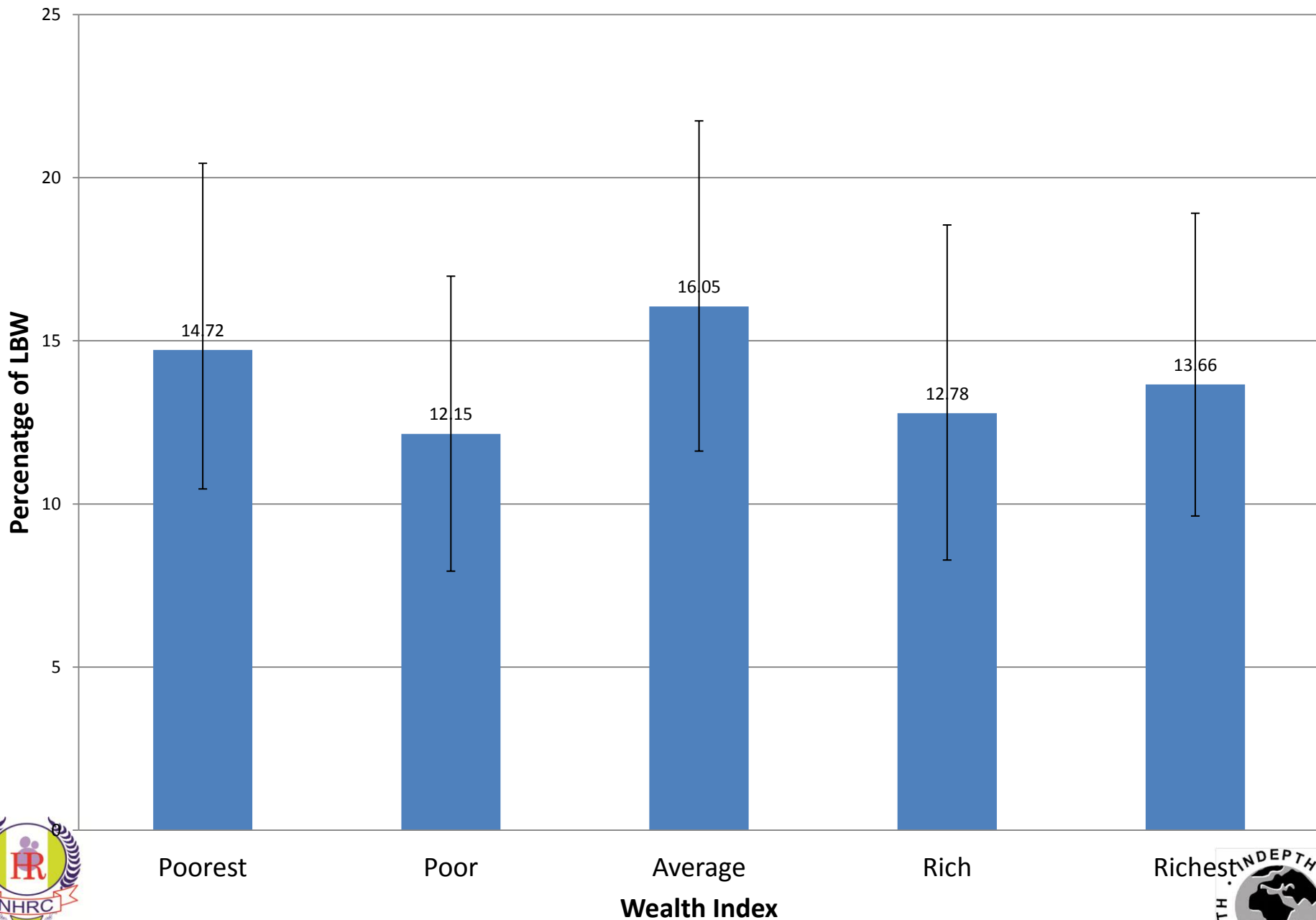
Background Results (1)

- Overall average birth weight is 2.85kg, 2.9kg for males and 2.8 kg for females
- The proportion of low birth was 13.8% and more in females than males (15.5% vs 12.2% $p < 0.0001$)
- The average maternal age was 28 years, and 11.4% being teenagers.

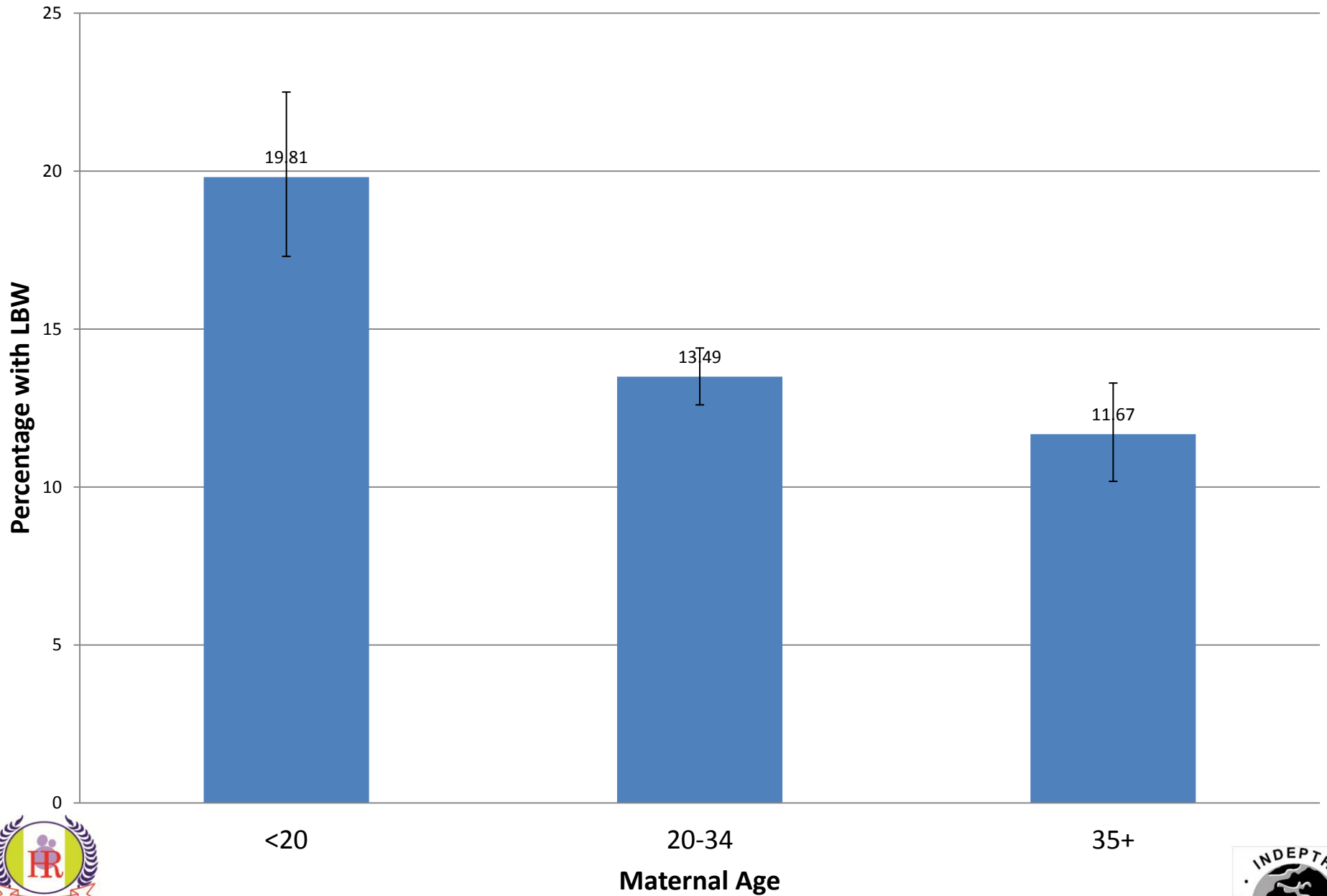
Background Results (2)

- About 30.5% had not attained any formal education
- About 23.2% of the mothers were in the poorest quintile while 18.2% were in the rich quintile.
- About 83.3% of the mothers were married

Distribution of wealth index and LBW

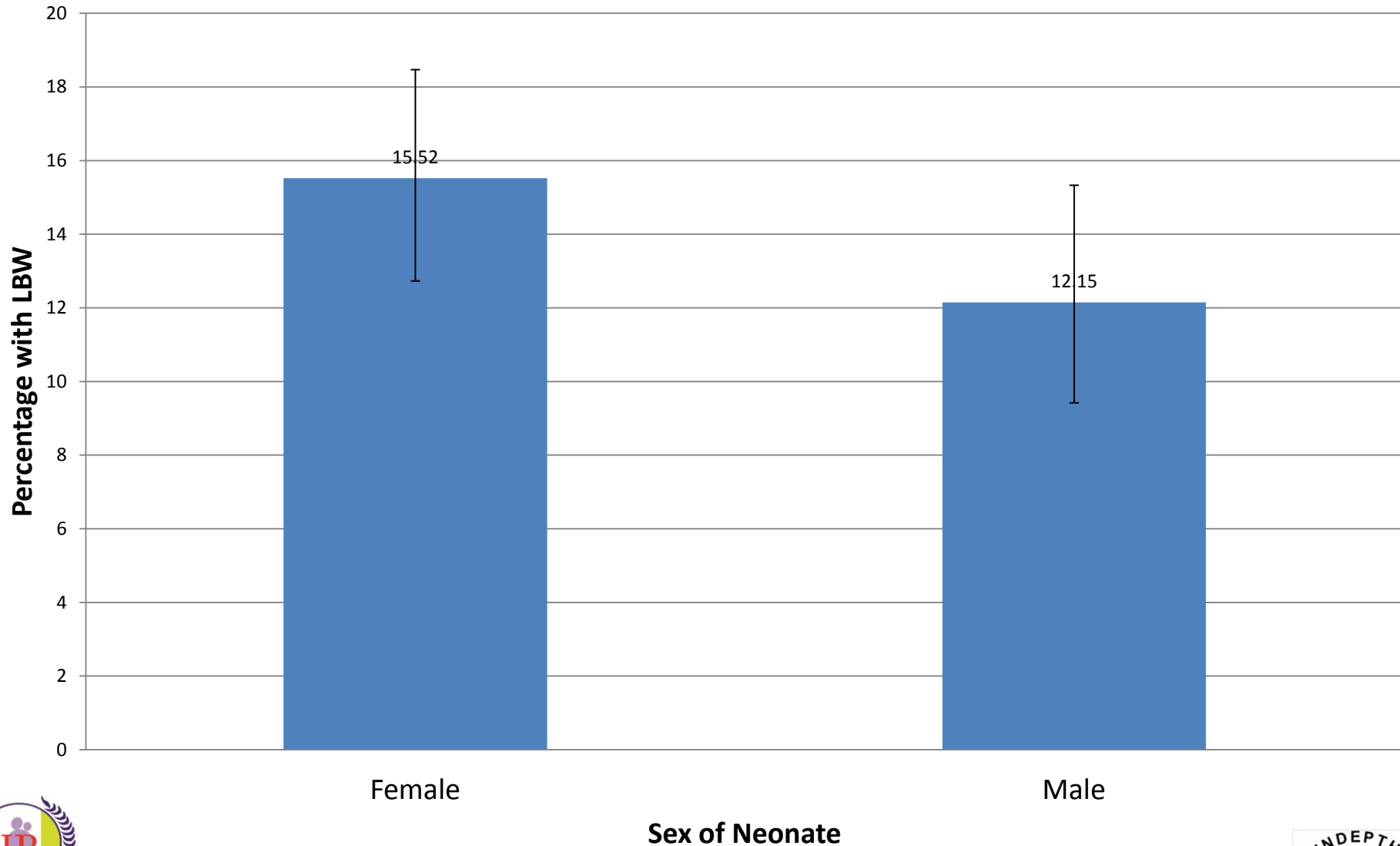


Distribution of Maternal Age and LBW

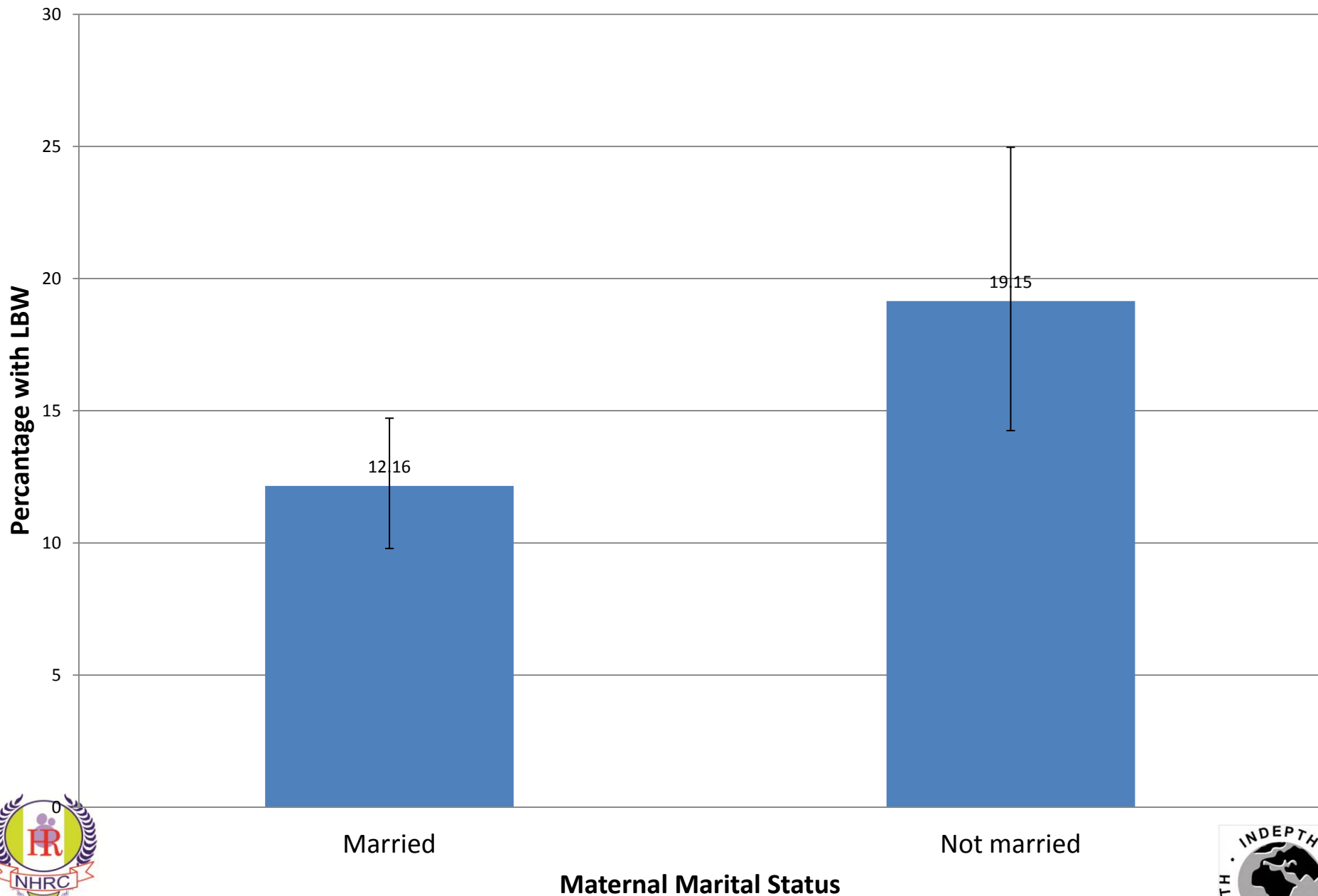


Distribution of Sex of Neonate and LBW

Distribution of Neonate Sex and LBW



Distribution of Maternal marital status and LBW



Logistic regression

Predictors	N	Unadjusted OR (95% CI)	P-value	Adjusted OR (95% CI)	P-value
<u>Sex of Child</u>					
Male	502	Ref		Ref	
Female	641	1.33 (1.17, 1.51)	<0.0001	1.32 (1.14, 1.52)	<0.0001
<u>Mothers age</u>					0.004
15-19 years	186	Ref		Ref	
20-34years	759	0.63 (0.53, 0.75)	<0.0001	0.69 (0.55, 0.87)	0.002
34+ years	285	0.54 (0.43, 0.67)	<0.0001	0.65 (0.49, 0.85)	0.002
<u>Mother education</u>					0.069
No education	293	Ref		Ref	
Primary	311	0.98 (0.82, 1.16)	0.793	0.88 (0.73, 1.06)	0.176
JHS	265	1.21 (1.01, 1.45)	0.038	1.08 (0.88, 1.33)	0.476
SHS	105	1.17 (0.92, 1.49)	0.194	1.16 (0.87, 1.54)	0.299
Tertiary	41	1.24 (0.87, 1.77)	0.228	1.49 (0.95, 2.34)	0.079

<u>Socio-economic status</u>					0.0006
Poorest	214	Ref		Ref	
Poor	218	0.80 (0.65, 0.98)	0.032	0.81 (0.65, 1.02)	0.069
Average	222	1.11(0.90, 1.36)	0.325	1.13 (0.91, 1.42)	0.273
Rich	180	0.85 (0.69, 1.05)	0.134	0.65 (0.49, 0.87)	0.004
Richest	77	0.92 (0.75, 1.12)	0.397	0.86 (0.69, 1.09)	0.212
<u>Marital status</u>					0.0002
Married	711	Ref		Ref	0.0002
Not married	224	1.71 (1.45, 2.02)	<0.0001	1.44 (1.19, 1.74)	<0.0001
<u>Ethnicity</u>					0.1311
Kasenna	590	Ref		Ref	
Nankana	412	0.88 (0.77, 1.01)	0.077	0.86 (0.73, 1.01)	0.068
Builsa	34	1.20 (0.82, 1.76)	0.339	1.19 (0.79, 1.82)	0.403
Others	30	0.94 (0.63, 1.39)	0.755	0.21 (0.41, 1.30)	0.290
<u>Religion</u>					0.8432
Traditional	395	Ref		Ref	
Catholic	271	1.05 (0.89, 1.24)	0.566	0.99 (0.82, 1.22)	0.989
Other Christian	304	0.97 (0.82, 1.14)	0.700	0.93 (0.77, 1.13)	0.469
Islam	94	1.06 (0.82, 1.36)	0.618	1.11 (0.81, 1.53)	0.520

Discussion (1)

- Male neonates had about 68% decreased odds of being born with low birth weights compared to their female colleagues; (OR=1.32 95% CI 1.14, 1.52, p-value < 0.0001)
 - Consistent with most studies
- Neonates born to married mothers were significantly heavier than neonates born to single mothers.
 - Consistent with Foix- L’Helias and Blondel in their work published in the year 2000

Discussion (2)

- The 20-34 year age group had odds decreased by 31% (OR=0.69 95% CI 0.55, 0.87, p-value=0.002) compared to under 20 year group.
- The 35 plus year age group had odds decreased by 35% (OR=0.65, 95% CI 0.49, 0.85, p-value=0.002) compared to under 20 year group.
- Consistent with MacLeod and Kielyin 1988
- Contrast Foix-L'Helias and Blondel
 - (found that in France a maternal age above 34 years and below 20 years were important risk factors for low birth weight)

Discussion (3)

- Poor group had 19% decreased odds when compared to poorest, (OR=0.81; 95% CI 0.65, 1.02, p-value=0.069).
- Rich group had 35% decreased odds when compared with the Poorest (OR=0.65, 95% CI (0.49, 0.87, p-value=0.004)
- Socio-economic status significantly influence birth weight
 - Consistent Kehinde et al, 2013
 - Consistent with Spencer et al , 1999

Discussion (3)

- Results for LBW predictors vary most like due to
 - Socio-economic factors
 - Race
 - Ethnic difference
 - Impact of social environment
 - Nature of Funding of health care services.

Conclusion/Recommendation

- High prevalence of LBW.
 - 13.8%
- Female neonates, neonates born to teenage mothers and neonates of single mothers are more prone to be born with low birth weight relative to their counterparts in this poor resource setting
- Interventions geared at reducing the effect of low birth weight of infants in resource poor settings should put more emphasis on this category of neonates so as to decrease the effects of low birth weight on the health and survival of these neonates

Limitations

- Data limitation-
 - Malaria in pregnancy influences birth
 - ANC data not available

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Thank you for your attention

