Factors associated with low birth weight among under-five children in sub-Saharan Africa: Analysis of Demographic and Health survey data of 58,857 children

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Background

Low birth weight is a major public health problem which contributes to a series of poor health outcomes (WHO, 2023). It has been linked to health conditions such as foetal and neonatal mortality and morbidity, inhibited growth and cognitive development and non-communicable diseases at a later stage in life (WHO, 2023). In 2020, 19.8 million newborns suffered from low birth weight which represents about 15% of babies born globally in that year (UNICEF, 2023). Distribution by regions shows that 24.9% occurred in South Asia, 14.4% in Eastern and Southern Africa, 13.5% in West and Central Africa, 12.9% in Middle East and North Africa, 9.6% in Latin America and Caribbean, 8.7% in East Asia and Pacific, 8.1% in North America and 7.6% in Europe and Central Asia (UNICEF, 2023).

In order to ensure that considerable efforts are made towards reducing the prevalence of low birth weight, the World Health Assembly set a 2030 low birth weight target for countries and regions. Reports indicate that only 14 countries are on track to achieve this target with 10 of them in North America, Europe and Australia and New Zealand (UNICEF, 2023). While Asia and Latin America and Caribbean have largest proportion of countries with reversal in progress, majority of countries in sub-Saharan Africa are off-track (UNICEF, 2023).

This indicates that many countries in sub-Saharan Africa are not going to achieve this target. This is in spite of the huge resources committed to improvement in child health in the region. It is in view of this and the quest to understand better the factors influencing low birth weight that this study has been embarked upon. Also, most studies on low birth weight focused on individual countries in sub-Saharan Africa. This study, however, pooled data from most recent surveys of selected countries in sub-Saharan Africa in order to provide a more robust result that would enhance the identification and application of appropriate interventions for the reduction in low birth weight and promotion of overall child health in the region.

Methods

The data for this study were extracted from the Demographic and Health Surveys (DHS) of 15 countries in sub-Saharan Africa. DHS is a cross-sectional survey that provides information on population and health at local and national levels. Information relating to background characteristics, birth history, antenatal, delivery and postnatal care, breastfeeding, weight at birth, childhood mortality and morbidity was obtained through questionnaire from women within the reproductive age of 15-49. In view of the focus of this study, the data used were obtained from kids recode which involved 58,857 children under the age of 5. In order to ensure that the results are not affected by large differences in the years of the data, the countries selected were limited to those whose surveys were conducted between 2015 and 2021. The outcome variable is birth weight which is dichotomized as 1 if less than 2.5 kg (low birth weight) and 0 otherwise. Analysis involved frequency distribution of respondents according to background characteristics. Chi-Square test was used to examine the association between the outcome variable and each independent variable. Binary logistic regression was used to determine the factors associated with low birth weight.

Results

The study shows that countries with the highest prevalence of children with low birth weight are Mauritania (22.9%), Mali (16.5%) and Madagascar (12.2%). About 10% of children in sub-Saharan Africa experienced low birth weight. While proportion of children with low birth weight is higher among non-working women (11.5%), 11% of those whose mothers reported having no education experienced low birth weight. Results further show that the odds of having children with low birth weight increased by 42% for women that have no education compared to their counterparts with secondary or higher education. The chances of having children with low birth weight reduced by 19% among children from richer households. While the odds of having children with low birth weight increased by 19% among non-working women compared to working women, the odds increased by 31% for female children compared to male children. Children of women who attended antenatal care less than 4 times are 35% more likely to experience low birth weight compared to children of women who attended antenatal care 4 or more times. Also, first order birth children are 55 times more likely to experience low birth weight than their counterparts who are of third or higher order birth. The chances of experiencing low birth weight increased by

31% for children from households with unsafe method of stool disposal compared to children from households with safe method of stool disposal

 Conclusion

This study revealed that 1 in every 10 newborns in sub-Saharan Africa has low birth weight. The factors contributing to this prevalence of low birth weight include illiteracy among women, household poverty, unemployment among mothers, sex of child, poor antenatal care attendance, first order birth and poor waste disposal system. These factors constitute obstacles to achieving the 2030 low birth weight target of World Health Assembly and the third goal of the Sustainable Development Goals (SDGs) which emphasizes promotion of healthy lives and well-being for all at all age. There is a need for appropriate interventions tailored towards reducing the prevalence of low birth weight in all the countries involved in this study. Such interventions should take the factors highlighted above into consideration.

Table 1. Percentage of children with low birth weight in Sub-Saharan Africa

Country	Year of survey	Number of children	Children with low birth weight (<2.5kg) (%)
Angola	2015-2016	6,765	10.1
Benin	2017-2018	12,256	11.3
Burundi	2016-2017	6,096	8.9
Cameroon	2018	4,618	7.1
Gambia	2019-2020	3,951	8.9
Guinea	2018	3,582	11.4
Liberia	2019-2020	2,566	9.1
Madagascar	2021	5,929	12.2
Malawi	2015-2016	5,384	11.3
Mali	2018	8,908	16.5
Mauritania	2019-2021	10,568	22.9
Nigeria	2018	11,704	6.4
Rwanda	2019-2020	3,821	6.2
Sierra Leone	2019	4,540	4.8
Zambia	2018	9,100	8.5

Table 3. Logistic regression of factors associated with low birth weight among under-five children in Sub-Saharan Africa

Variable	Low birth weight	
	Crude Odds ratio (95% CI)	Adjusted Odds ratio (95% CI)
Mother's age		
15-24	1.33*** (1.20-1.48)	1.19 (0.98-1.45)
25-34	0.97 (0.88-1.06)	0.97 (0.83-1.13)
35+	1	1
Education		
None	1.32*** (1.21-1.45)	1.42*** (1.22-1.60)
Primary	1.14** (1.05-1.25)	1.27** (1.09-1.48)
Sec/higher	1	1
Household wealth		
Poorest	1.22** (1.09-1.38)	0.89 (0.73-1.11)
Poorer	1.23** (1.09-1.39)	0.98 (0.81-1.19)
Middle	1.25*** (1.11-1.39)	1.01 (0.84-1.23)
Richer	1.07 (0.94-1.21)	0.81* (0.68-0.96)
Richest	1	1
Employment status		
Not working	1.21*** (1.12-1.31)	1.19** (1.06-1.33)
Working	1	
Media exposure		
Not exposed	1.16*** (1.08-1.26)	1.12 (0.99-1.26)
Exposed	1	1
Sex of child		
Male	1	1
Female	1.28*** (1.19-1.37)	1.31*** (1.18-1.46)
Number of under-five children in household		
≤4	1	1
≥5	1.38** (1.15-1.65)	1.22 (0.96-1.54)
ANC attendance		
No visit	1.37** (1.11-1.69)	1.22 (0.92-1.62)
Less than 4 visits	1.39*** (1.28-1.51)	1.35*** (1.21-1.51)
4 or more visits	1	1
Birth order		
First order birth	1.39*** (1.29-1.52)	1.55*** (1.29-1.86)
Second order birth	1.09* (1.01-1.20)	1.13 (0.96-1.34)
Third or higher order birth	1	1
Type of toilet facility		
Improved	1	1
Non-improved	1.13** (1.05-1.22)	0.98 (0.87-1.11)
Child's stool disposal method		
Safe disposal	1	1
Unsafe disposal	1.27*** (1.16-1.39)	1.31*** (1.17-1.46)

Level of significance at *p<0.05, **p<0.01, ***p<0.001