

RESEARCH

Open Access



Progress and inequalities in early initiation of breastfeeding among women in Sierra Leone, 2008–2019

Florence Gyembuzie Wongnaah¹, Augustus Osborne^{2*} , Khadijat Adeleye³, Camilla Bangura², Comfort Z. Olorunsaiye⁴ and Bright Opoku Ahinkorah^{5,6}

Abstract

Background Early initiation of breastfeeding, defined as placing a newborn to the breast within the first hour of birth, is vital for improving neonatal survival, strengthening the mother-child bond, and ensuring the delivery of essential nutrients and antibodies. This study examines progress and socioeconomic inequalities in the early initiation of breastfeeding among women in Sierra Leone from 2008 to 2019.

Methods We used data from the three rounds of the Sierra Leone Demographic and Health Survey conducted in 2008, 2013, and 2019. We used the Health Equity Assessment Toolkit developed by the World Health Organisation to calculate the inequality measures among women 15–49 years, which include simple difference (D), ratio (R), population attributable risk (PAR), and population attributable fraction (PAF). The inequality assessment was conducted based on six stratifiers: age, economic status, level of education, place of residence, sex of the child, and sub-national region.

Results In Sierra Leone, the early initiation of breastfeeding rate increased from 48.7% in 2008 to 75.2% in 2019. Higher rates of early initiation of breastfeeding were observed among mothers (15–19 years), women from the lowest wealth quintile, those without formal education, and those residing in rural areas. However, regional inequalities persisted, with the Eastern region showing the lowest rates. The inequality (D) in age increased from –0.2 in 2008 to –1.6 in 2019. The economic status disparity increased from –8.7% in 2008 to –18.4% in 2019. Inequality for education decreased from –10.6 in 2008 to –4.7 in 2019. The increase in place of residence inequality was from –2.6% in 2008 to –13.4% in 2019. For the sex of the child, the disparity increased from –1.5% to –3.6% in 2019. Regional disparity increased from 19.7 in 2008 to 28.6 in 2019. PAR also rose from 8.9 to 11.1 percentage points.

Conclusion Early initiation of breastfeeding has shown substantial improvement in Sierra Leone, highlighting the effectiveness of recent public health interventions. However, inequalities across economic status, level of education, sex of the child, and sub-national region still persist. To sustain these gains and ensure equitable progress, continued policy attention and targeted strategies are essential to address persistent socio-economic and regional inequalities disparities.

*Correspondence:
Augustus Osborne
augustusosborne2@gmail.com

Full list of author information is available at the end of the article



© The Author(s) 2025. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

Keywords Early initiation of breastfeeding, breastfeeding inequalities, Sierra Leone

Background

Breastfeeding, a universally acknowledged pillar of infant and maternal health [1], gains even more prominence with the concept of early initiation of breastfeeding or the “golden hour.” This term refers to the crucial act of breastfeeding within the first hour of birth, which is pivotal in achieving the Sustainable Development Goals (SDGs) [1]. As the World Health Organization (WHO) and UNICEF recommended, early initiation of breastfeeding is essential for optimal infant health and survival [2]. It ensures that newborns receive colostrum, the nutrient-rich “first milk” particularly beneficial for the infant’s immune system. Moreover, early skin-to-skin contact between mother and infant, which facilitates early initiation of breastfeeding, has been shown to increase the likelihood of exclusive breastfeeding for the first one to four months of life and extend the overall duration of breastfeeding [2]. Despite these recommendations, the prevalence of early initiation of breastfeeding varies widely across countries and is influenced by numerous social determinants of health.

Early initiation of breastfeeding prevalence shows significant variation globally. Studies have reported early initiation of breastfeeding rates ranging from as low as 17.7% to as high as 98.4%, with an average global prevalence of 57.6% [3]. In Sub-Saharan Africa, the prevalence is around 59.22%, Rwanda at 86.34%, and the Gambia at 39.44% [4]; in West Africa, 50.60%, with specific countries showing varied rates: Sierra Leone at 75.33% [5]. This places Sierra Leone in a unique position within the region, warranting further investigation into the factors contributing to this relatively high rate and any possible inequalities.

The social determinants of the health framework highlight how various individual, community, and structural factors shape the early initiation of breastfeeding practices [6]. The individual-level factors are the wealth index, age, gender, and birth order of the infant [7], education [8], and Pain during delivery complications during pregnancy and cesarean delivery [3, 9]. The Healthcare System Factors include the routine practice in the hospitals of separating the newborn from the mother immediately after birth, which was the main reason [10], skin-to-skin contact, and place of delivery [11]. Community-level factors include discarding colostrum, exposure to infant formula advertisements, and no house ownership [12].

Sierra Leone, a West African country emerging from a devastating civil war (1991–2002) and the 2014–2016 Ebola Virus Disease epidemic, has faced significant challenges in rebuilding its health infrastructure and addressing deeply rooted social inequalities [13, 14]. This period

encompasses substantial changes in the country’s health infrastructure and social structures, which likely influenced maternal and child health practices, including early initiation of breastfeeding. Although a few studies on breastfeeding practices have been conducted in Sierra Leone [15–17], many have focused on different aspects of breastfeeding without using measures and datasets to examine the initiation of breastfeeding practices and related inequalities.

The objective of this study is to examine the progress and inequalities in early initiation of breastfeeding among women in Sierra Leone from 2008 to 2019, with a particular focus on the influence of socio-demographic factors and regional disparities. By analyzing these progress and inequalities, the study provides deeper insights into the broader social determinants that shape breastfeeding practices. The findings will offer valuable evidence on key health disparities, supporting health professionals, policymakers, and researchers in post-conflict and low-resource countries. Additionally, publishing these results internationally will contribute to the global discourse on health equity and advance efforts towards achieving the Sustainable Development Goals.

Methods

Study design and data source

The study is cross-sectional and used data from the 2008, 2013, and 2019 Sierra Leone Demographic Health Survey (SLDHS). The SLDHS is a nationwide survey that aims to identify consistent trends and changes in demographic indicators, health indicators, and social issues among individuals of all genders and age groups. The SLDHS employed a cross-sectional design in which participants were selected using a stratified multi-stage cluster sampling method. A detailed description of the sampling methodology can be found in the SLDHS report [18]. This study covered women aged 15–49 in the corresponding SLDHS cycles. The data were made available through the WHO Health Equity Assessment Toolkit (HEAT) online platform for direct use in the study [19]. The WHO HEAT is a software platform developed by the World Health Organization to facilitate the exploration and analysis of health inequalities using disaggregated data and summary measures. This study was meticulously crafted, considering the parameters specified in the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement [20].

Variables

The dependent variable in the study was early initiation of breastfeeding, defined as breastfeeding initiation

within one hour of birth. Women who initiated breastfeeding within this time frame were classified as “yes”, while those who did not were classified as “no”. The assessment of inequality in early initiation of breastfeeding used six stratifiers: maternal age categorized into 15–19 and 20–49 years, economic status measured using wealth quintile categorized as quintile 1 (poorest), quintile 2 (poor), quintile 3 (rich), quintile 4 (richer), quintile 5 (richest), level of education grouped into no education, primary education, secondary/higher education, place of residence classified as rural or urban, sex of the child categorized as female or male, and sub-national region categorized into Eastern, Northern, Southern, Western.

Data analysis

The analysis was performed using the online version of the WHO HEAT software [19]. The input variables included five equity stratifiers: age, economic status, education level, place of residence, sex of the child, and sub-national region. The HEAT software was used to calculate estimates and confidence intervals (CIs) for early initiation of breastfeeding among women in Sierra Leone, considering the aforementioned stratifiers. Four indices were calculated to assess inequality in early breastfeeding initiation. They include; Difference (D)– the absolute difference between groups, population Attributable Risk (PAR)– the absolute risk of early initiation of breastfeeding attributed to the factor under consideration, population attributable Fraction (PAF)– the proportion of early initiation of breastfeeding that can be attributed to the factor and ratio (R)– the relative difference between the groups in early breastfeeding initiation. D and R are simpler, unweighted measures, whereas PAR and PAF are more complex, weighted metrics. D and PAR are absolute measures, while R and PAF are relative. The WHO recognizes both absolute and relative summary measures as essential for deriving actionable policy findings. The complex measures (PAR and PAF) take into account the magnitude of categories within specific population subsets, offering a deeper understanding of inequality. These WHO metrics and their calculations are well-documented in the literature [21, 22].

Results

Table 1 shows the proportion of women in Sierra Leone who initiated breastfeeding early (within 1 h of birth) across different inequality categories between 2008 and 2019. There has been a significant increase in early initiation of breastfeeding across all categories between 2008 and 2019. In 2008, the overall proportion was approximately 48.7%, whereas by 2019, it had increased to 75.2%. Mothers between 15 and 19 years old consistently showed the highest rates of early initiation across all years. There seems to be a considerable increase for this

age group compared to others, particularly between 2013 and 2019. The richest quintile (Quintile 5) has the lowest rates throughout the period. The poorest quintile (Quintile 1) showed the most significant improvement, reaching levels similar to those of the middle quintiles (2 and 3) by 2019. Mothers with no education consistently had the highest initiation rates. Education levels improved at all levels by 2019. Rural areas initially had higher rates than urban areas but exhibited a steeper increase by 2019. Similar rates of early initiation of breastfeeding were observed among males and females. The Northwestern region, with data available only for 2019, recorded the highest rate of early initiation rate. In contrast, the Eastern region consistently had the lowest rates while, The Northern and Southern regions showed significant improvement by 2019.

Table 2 shows the inequality in early initiation of breastfeeding among women in Sierra Leone between 2008 and 2019. For several inequality dimensions, PAR and PAF values indicated minimal overall impact at the population level, however the difference (D) values for economic status, residence, and education indicate that meaningful disparities persist in these areas. The D in age increased from –0.2 in 2008 to –1.6 in 2019. The economic status disparity increased from –8.7% in 2008 to –18.4% in 2019. Inequality for education decreased from –10.6 in 2008 to –4.7 in 2019. PAF and PAR were zero in 2008 and 2019, indicating no further improvement. D increased from –2.6% in 2008 to –13.4% in 2019 for place of residence inequality. For the sex of the child, the disparity increased from –1.5% to –3.6% in 2019. Regional disparity increased from 19.7 in 2008 to 28.6 in 2019. PAR increased from 8.9 to 11.1 percentage points, indicating that in the absence of regional inequality, early initiation of breastfeeding rates could have been 11.1 percentage points higher in 2019.

Discussion

Between 2008 and 2019, Sierra Leone saw a significant increase in early initiation of breastfeeding within the first hour of birth, rising from 48.7% to 75.2%. The most notable progress occurred between 2013 and 2019, likely driven by targeted interventions, increased public awareness campaigns, and improvement in healthcare practices. By 2019, The prevalence of early initiation of breastfeeding among women in Sierra Leone exceeds the recommended target of 70% [23]. This rate was also higher than previously reported studies conducted in Sierra Leone, which found a rate of 55.14% [24]. It also exceeds the approximately 50% average reported in LMICs (3), as well as the 55.1% rate reported in a study across multiple sub-Saharan African countries. [25]. However, in a multi-country study, our findings were lower than those reported in Burundi (85.0%), Rwanda

Table 1 Proportion of early initiation of breastfeeding among women in Sierra Leone by inequality stratifiers, 2008–2019

Last 10 years' response of early initiation of breastfeeding among women in State & Community												
Dimension	2008 (48.7%)			2013 (53.8%)			2019 (75.2%)			UB	LB	UB
	N	%	LB	UB	N	%	LB	UB	N			
Age												
15–19 years	389	48.3	42.3	54.4	966	51.5	47.2	55.8	663	76.6	72.8	79.9
20–49 years	2088	48.1	44.9	51.3	3853	54.3	51.1	57.5	3286	74.9	72.6	77.1
Economic status												
Quintile 1 (poorest)	570	51.0	45.2	56.7	1110	56.1	50.0	62.0	917	81.9	78.7	84.8
Quintile 2 (Poor)	535	48.3	42.3	54.5	1011	55.0	50.6	59.3	866	78.1	74.2	81.5
Quintile 3 (Rich)	516	51.2	46.1	56.2	1056	59.7	54.8	64.4	791	76.8	72.8	80.4
Quintile 4 (Richer)	475	48.8	43.6	54.0	922	54.9	49.4	60.2	752	71.8	67.3	75.9
Quintile 5 (richest)	379	42.2	35.4	49.3	719	38.5	33.1	44.1	622	63.4	57.3	69.2
Education												
No education	1819	50.5	47.1	53.8	3117	55.6	52.0	59.1	2036	77.1	74.5	79.6
Primary education	339	47.5	41.4	53.7	735	54.1	49.4	58.7	609	74.9	70.2	79.0
Secondary or higher education	319	39.8	34.0	46.0	967	47.8	43.3	52.4	1303	72.4	69.1	75.5
Residence												
Rural	1797	49.4	46.1	52.8	3580	57.5	54.1	61.0	2558	79.9	77.6	82.1
Urban	680	46.8	40.7	53.0	1239	42.9	37.7	48.3	1391	66.5	62.4	70.4
Sex												
Female	1275	49.5	46.1	52.8	2421	53.5	50.0	57.0	1940	77.1	74.5	79.4
Male	1202	47.9	43.9	51.9	2398	54.0	50.6	57.4	2009	73.4	70.5	76.2
Region												
East	499	37.9	32.8	43.2	1112	30.5	24.7	36.9	847	75.0	70.2	79.3
North	1113	57.6	52.3	62.8	1997	72.7	68.5	76.5	795	75.1	70.8	79.0
Northwestern												
South	506	46.5	42.5	50.6	1048	50.7	45.3	56.1	816	86.4	83.6	88.7
West	357	39.0	33.2	45.1	661	40.8	33.8	48.1	733	57.8	51.5	63.8

N: Sample; LB: Lower Bound; UB: Upper Bound

Table 2 Inequality indices of early initiation of breastfeeding among women in Sierra Leone, 2008–2019

Dimension	2008			2013			2019		
	Est.	LB	UB	Est.	LB	UB	Est.	LB	UB
Age									
D	-0.2	-7.0	6.5	2.7	-2.5	8.1	-1.6	-5.8	2.5
PAF	0	-0.0	0.0	1.0	1.0	1.0	0	-0.0	0.0
PAR	0	-0.8	0.8	0.5	-0.1	1.2	0	-0.5	0.5
R	0.9	0.8	1.1	1.0	0.9	1.1	0.9	0.9	1.0
Economic status									
D	-8.7	-17.7	0.2	-17.6	-25.7	-9.4	-18.4	-25.1	-11.7
PAF	0	-0.0	0.0	0	-0.0	0.0	0	-0.0	0.0
PAR	0	-4.5	4.5	0	-3.3	3.3	0	-3.4	3.4
R	0.8	0.6	1.0	0.6	0.5	0.8	0.7	0.7	0.8
Education									
D	-10.6	-17.4	-3.7	-7.7	-13.5	-1.9	-4.7	-8.8	-0.6
PAF	0	-0.1	0.1	0	-0.0	0.0	0	-0.0	0.0
PAR	0	-5.0	5.0	0	-2.8	2.8	0	-1.9	1.9
R	0.7	0.6	0.9	0.8	0.7	0.9	0.9	0.8	0.9
Residence									
D	-2.6	-9.6	4.4	-14.6	-20.9	-8.3	-13.4	-17.9	-8.8
PAF	0	-0.0	0.0	0	-0.0	0.0	0	-0.0	0.0
PAR	0	-3.1	3.1	0	-2.3	2.3	0	-1.9	1.9
R	0.9	0.8	1.0	0.7	0.6	0.8	0.8	0.7	0.8
Sex									
D	-1.5	-6.7	3.6	0.4	-4.3	5.3	-3.6	-7.3	0.1
PAF	0	-0.0	0.0	0.4	0.4	0.4	0	-0.0	0.0
PAR	0	-2.0	2.0	0.2	-1.1	1.6	0	-1.3	1.3
R	0.9	0.8	1.0	1.0	0.9	1.1	0.9	0.9	1.0
Region									
D	19.7	12.3	27.1	42.1	34.8	49.5	28.6	21.9	35.2
PAF	18.3	18.3	18.4	35.1	35.0	35.1	14.8	14.7	14.8
PAR	8.9	6.7	11.1	18.9	17.1	20.6	11.1	8.8	13.4
R	1.5	1.2	1.7	2.3	1.9	2.9	1.4	1.3	1.6

Est: Estimate; LB: Lower Bound; UB: Upper Bound

(80.5%), Mozambique (76.7%), and Malawi (76.3%) [25, 26]. These gains may be partly attributed to policy actions such as the Breast Milk Substitutes Act enacted in 2021. As noted by the WHO and UNICEF (2023), this legislation was designed to protect breastfeeding amidst rising use of substitutes, and likely contributed to the upward trend in this study. s, [23, 27]. The present study found minimal inequalities in the early initiation of breastfeeding over time across most dimensions, including age, wealth quintile, child sex, maternal education, place of residence, while notable disparities persisted across regions.

Contrary to previous studies that reported lower rates of early initiation of breastfeeding among young mothers [28, 29], our study found that young mothers aged 15–19 years consistently exhibited the highest rates of early initiation of breastfeeding across all years, with a significant increase observed particularly between 2013 and 2019. This might be attributed to health interventions and educational campaigns that have effectively reached younger

mothers. Improved access to healthcare and support systems, as well as socioeconomic and cultural shifts might also have contributed to these higher rates. Additionally, policy changes to improve maternal and child health may have disproportionately benefited younger mothers [30]. In Freetown, Sierra Leone, findings from a survey indicate that antenatal visits to health facilities, during which breastfeeding counseling is provided, have been shown to positively impact early initiation of breastfeeding and exclusive breastfeeding rates [31]. Supporting this, a recent systematic review of infant and young children feeding practices in sub-Saharan Africa reported a 20% increase in early initiation of breastfeeding within 3 months of implementing breastfeeding educational interventions [32]. The PAF of 0 suggests that the overall improvement in initiation rates was not due to reduced inequality by age but relatively broad-based public health efforts such as improved caregiver knowledge and attitudes and health facility infrastructure and supplies that benefit all mothers [33].

The study found that, from 2013 to 2019, mothers in the richest quintile consistently had the lowest early initiation of breastfeeding rates. In contrast, mothers in the poorest quintile showed significant improvement, reaching rates similar to those in the middle quintiles by 2019. The observed improvement in the poorest quintile suggests that targeted community-based health education programs could have effectively increased early breastfeeding rates. These strategies may include outreach and the provision of breastfeeding support to economically disadvantaged groups [34]. The finding is in line with previous studies [35]. However, the low rates in the richest quintile highlight the need for tailored strategies to address their potential barriers, such as workload or misconceptions about breastfeeding due to previous experiences [36]. These findings support the global goal of reducing health disparities and achieving equitable health outcomes across socioeconomic groups [37].

Mothers with no education and those living in rural areas had the highest initiation of breastfeeding rates, with improvements observed across all education levels by 2019. This aligns with previous studies in Bangladesh, which reported relatively higher early initiation of breastfeeding rates among less educated women. The findings are also linked to the observation that rural women, who typically have lower educational attainment, exhibited higher rates of early initiation of breastfeeding compared to their urban counterparts [38]. These patterns underscore the potential influence of educational and geographical factors on breastfeeding practices. Educational interventions targeting rural areas and less educated mothers might be an effective approach to further increasing early initiation of breastfeeding rates. Strategies could involve community leaders and healthcare workers to ensure the message reaches women with limited formal education. However, these findings differ from previous studies in underserved areas of Sierra Leone, which reported low rates of early initiation of breastfeeding [39]. The differences may be affected by methodological differences and cultural variations among the study populations.

The study found notable regional disparities in early initiation of breastfeeding rates, with the Eastern region consistently lagging across the study periods. Significant disparities were also found in Ethiopia [40] and Bangladesh [35] studies. The low prevalence of early initiation of breastfeeding in the Eastern region could probably be due to the increased Caesarian section rate among women. A previous study in West Africa shows delays in breastfeeding initiation due to cesarean delivery [5]. It is suggested that mothers face considerable discomfort after a cesarean section, leading to a delay in starting breastfeeding [41]. The cultural norms of the community, as well as access to healthcare facilities and information,

may also explain the disparities observed [18]. Region-specific healthcare interventions, such as those designed to address breastfeeding after Cesarean sections, could help improve early initiation rates. These could include counseling and support programs in the Eastern region to assist mothers post-delivery.

Strengths and limitations

The study used six equity dimensions to assess the trend and magnitude of inequalities in the early initiation of breastfeeding in Sierra Leone. Using absolute and relative inequality measures offers a comprehensive perspective on the magnitude and trends of inequality in women's early initiation of breastfeeding in Sierra Leone. The government and policymakers can quickly identify areas to maintain the gains achieved by the country, ensuring women breastfeed their babies within one hour of delivery, as the results are categorised by equity dimensions: economic status (wealth), educational attainment, place of residence, and provincial region. Limitations of this study include those inherent to the Demographic and Health Survey data, such as recall bias and cross-sectional design, as well as analytic limitations related to the HEAT tool, which may not capture all aspects of inequality or allow for advanced modeling.

Conclusion

This study analysed trends in early initiation of breastfeeding in Sierra Leone from 2008 to 2019, revealing a significant increase from 48.7% to 75.2%. Sierra Leone exceeded global targets for early breastfeeding initiation, outperforming averages in low- and middle-income countries. Young mothers aged 15–19 consistently exhibited high initiation rates, possibly due to effective health interventions and educational campaigns. Economic status and place of residence gaps have also widened, indicating that mothers from richest households and urban areas continue to face greater challenges. Although educational inequality has narrowed, it remains a concern, and disparities related to the sex of the child have increased slightly. Regional disparities persisted, with the Eastern region lagging. The study underscores the importance of monitoring existing policies to maintain the achievement regarding breastfeeding practices. Future research should address these complexities to enhance maternal and child health outcomes through improved breastfeeding practices.

Abbreviations

D	Difference
HEAT	Health Equity Assessment Toolkit
DHS	Demographic Health Survey
PAF	Population Attributable Fraction
PAR	Population Attributable Risk
R	Ratio
WHO	World Health Organization

Acknowledgements

We are grateful to MEASURE DHS and the World Health Organization for making the dataset and the HEAT software accessible.

Author contributions

AO and BOA contributed to the study design and conceptualisation. AO and BOA performed the analysis. AO, FGW, KA, CB, CZO, and BOA developed the initial draft. All the authors critically reviewed the manuscript for its intellectual content. All authors read and amended drafts of the paper and approved the final version. AO had the final responsibility of submitting it for publication.

Funding

This study received no funding.

Data availability

The dataset used can be accessed at <https://whoequity.shinyapps.io/heat/>.

Declarations

Ethics approval and consent to participate

This study did not seek ethical clearance since the dataset are freely available in the public domain.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

¹Department of Global Public Health, Karolinska Institutet, Stockholm, Sweden

²Department of Biological Sciences, School of Basic Sciences, Njala University, PMB, Freetown, Sierra Leone

³Elaine Marieb College of Nursing, University of Massachusetts, Amherst, USA

⁴Department of Public Health, Arcadia University, 450 S Easton Road, Glenside, PA 19038, USA

⁵REMS Consultancy Services Limited, Sekondi-Takoradi, Western Region, Ghana

⁶Faculty of Health and Medical Sciences, The University of Adelaide, Adelaide, Australia

Received: 1 July 2024 / Accepted: 12 July 2025

Published online: 07 August 2025

References

1. World Health Organization. Protecting, supporting and promoting breastfeeding. 2024 [cited 2024 Jun 28]. Available from: <https://www.who.int/western-pacific/activities/protecting-supporting-and-promoting-breastfeeding>
2. World Health Organization. Early initiation of breastfeeding to promote exclusive breastfeeding. 2023 [cited 2024 Jun 28]. Available from: <https://www.who.int/tools/elena/interventions/early-breastfeeding>
3. Takahashi K, Ganchimeg T, Ota E, Vogel JP, Souza JP, Laopaiboon M, et al. Prevalence of early initiation of breastfeeding and determinants of delayed initiation of breastfeeding: secondary analysis of the WHO global survey. *Sci Rep*. 2017;7:44868.
4. Ameyaw EK, Adde KS, Paintsil JA, Dickson KS, Oladimeji O, Yaya S. Health facility delivery and early initiation of breastfeeding: cross-sectional survey of 11 sub-Saharan African countries. *Health Sci Rep*. 2023;6:e1263.
5. Terefe B, Belachew TB, Asmamaw DB, Wassie GT, Azene AG, Eshetu HB, et al. Determinants of early initiation of breastfeeding following birth in West africa: a multilevel analysis using data from multi-country National health surveys. *PLoS ONE*. 2024;19:e0302143.
6. World Health Organization. A conceptual framework for action on the social determinants of health. Geneva: World Health Organization. 2010. Available from: <https://www.who.int/publications/i/item/9789241500852>
7. John JR, Mistry SK, Kebede G, Manohar N, Arora A. Determinants of early initiation of breastfeeding in Ethiopia: a population-based study using the 2016 demographic and health survey data. *BMC Pregnancy Childbirth*. 2019;19:69.
8. Wako WG, Wayessa Z, Fikrie A. Effects of maternal education on early initiation and exclusive breastfeeding practices in sub-Saharan Africa: a secondary analysis of demographic and health surveys from 2015 to 2019. *BMJ Open*. 2022;12:e054302.
9. Vaz JS, Gatica-Domínguez G, Neves PA, Videlletti LP, Barros AJ. Early initiation of breastfeeding is inversely associated with public and private c-sections in 73 lower- and middle-income countries. *Sci Rep*. 2022;12:21081.
10. Ahmed AE, Salih OA. Determinants of the early initiation of breastfeeding in the Kingdom of Saudi Arabia. *Int Breastfeed J*. 2019;14:13.
11. Birhan TY, Alene M, Seretew WS, Tadesse AA. Magnitude and determinants of breastfeeding initiation within one hour among reproductive women in Sub-Saharan Africa: evidence from demographic and health survey data: a multilevel study. *BMC Public Health*. 2022;22:1062.
12. Bruno Tongun J, Sebit MB, Mukunya D, Ndeezzi G, Nankabirwa V, Tylleskar T, et al. Factors associated with delayed initiation of breastfeeding: a cross-sectional study in South Sudan. *Int Breastfeed J*. 2018;13:1.
13. Bertone MP, Samai M, Edem-Hotah J, Witter S. A window of opportunity for reform in post-conflict settings? The case of human resources for health policies in Sierra Leone, 2002–2012. *Confl Health*. 2014;8:1.
14. Edoka I, McPake B, Ensor T, Amara R, Edem-Hotah J. Changes in catastrophic health expenditure in post-conflict Sierra Leone: an Oaxaca-blinder decomposition analysis. *Int J Equity Health*. 2017;16:1.
15. James PB, Kaikai AI, Bah AJ, Steel A, Wardle J. Herbal medicine use during breastfeeding: a cross-sectional study among mothers visiting public health facilities in the Western area of Sierra Leone. *BMC Complement Med Ther*. 2019;19:1.
16. Van Breevoort D, Tognon F, Beguin A, Ngegbai AS, Putoto G, van den Broek A. Determinants of breastfeeding practice in Pujehun district, Southern Sierra Leone: a mixed-method study. *Int Breastfeed J*. 2021;16:42.
17. Koroma AS, Stephenson KB, Iversen PO, Manary MJ, Hendrixson DT. The effect of breastfeeding practices of undernourished mothers in rural Sierra Leone on infant growth and mortality. *Children*. 2024;11:233.
18. Statistics Sierra Leone (Stats SL), ICF. Sierra Leone demographic and health survey 2019. Maryland, USA: Freetown, Sierra Leone, and Rockville; 2020.
19. World Health Organization. Health equity assessment toolkit plus (HEAT plus): software for exploring and comparing health inequalities in countries. Geneva: World Health Organization; 2024.
20. Von Elm E, Altman DG, Egger M, Pocock SJ, Götzsche PC, Vandenbroucke JP. The strengthening of reporting of observational studies in epidemiology (STROBE) statement: guidelines for reporting observational studies. *Int J Surg*. 2014;12:1495–9.
21. World Health Organization. Handbook on health inequality monitoring: with a special focus on low- and middle-income countries. Geneva: World Health Organization; 2013.
22. Hosseinipoor AR, Nambiar D, Schlottheuber A, Reidpath D, Ross Z. Health equity assessment toolkit (HEAT): software for exploring and comparing health inequalities in countries. *BMC Med Res Methodol*. 2016;16:1.
23. World Health Organization, UNICEF. Global breastfeeding scorecard 2023: rates of breastfeeding increase around the world. Geneva: World Health Organization; 2023.
24. Issaka AI, Agho KE, Renzaho AMN. Prevalence of key breastfeeding indicators in 29 sub-Saharan African countries: a meta-analysis of demographic and health surveys (2010–2015). *BMJ Open*. 2017;7:e014145.
25. Ekholuenetale M, Barrow A. What does early initiation and duration of breastfeeding have to do with childhood mortality? Analysis of pooled population-based data in 35 sub-Saharan African countries. *Int Breastfeed J*. 2021;16:1.
26. Bolarinwa OA, Ahinkorah BO, Arthur-Holmes F, Aboagye RG, Ameyaw EK, Budu E, et al. Sex inequality in early initiation of breastfeeding in 24 sub-Saharan African countries: a multi-country analysis of demographic and health surveys. *PLoS ONE*. 2022;17:e0267703.
27. World Health Organization, UNICEF and WHO welcome Sierra Leone's Breast Milk Substitute. Act 2021. 2021 [cited 2024 Jun 28]. Available from: <https://www.afro.who.int/news/unicef-and-who-welcome-sierra-leones-breast-milk-substitute-act-2021>
28. Hossain M, Islam A, Kamarul T, Hossain G. Exclusive breastfeeding practice during first six months of an infant's life in Bangladesh: a country-based cross-sectional study. *BMC Pediatr*. 2018;18:69.
29. Ekholuenetale M, Mistry SK, Chimoriya R, Nash S, Soyizode AM, Arora A. Socioeconomic inequalities in early initiation and exclusive breastfeeding

- practices in bangladesh: findings from the 2018 demographic and health survey. *Int Breastfeed J*. 2021;16:18.
30. World Health Organization. Maternal, newborn and child health (MNCH) strategy 2021–2025. Geneva: World Health Organization; 2021.
 31. Helen Keller International. Evaluation of knowledge, attitudes, and practices of mothers in relation to exclusive breastfeeding and complementary feeding of their children in clinics served by Helen Keller International in Freetown, Sierra Leone after the introduction of a multi-faceted intervention. 2024 [cited 2024 Jun 28]. Available from: https://books.google.com.sl/books/about/Evaluation_of_Knowledge_Attitudes_and_Pr.html?id=mtMRgEACAAJ
 32. Lassi ZS, Rind F, Irfan O, Hadi R, Das JK, Bhutta ZA. Impact of infant and young child feeding (IYCF) nutrition interventions on breastfeeding practices, growth and mortality in low- and middle-income countries: systematic review. *Nutrients*. 2020;12:722.
 33. Kinshella MLW, Prasad S, Hiwa T, Vidler M, Nyondo-Mipando AL, Dube Q, et al. Barriers and facilitators for early and exclusive breastfeeding in health facilities in Sub-Saharan africa: a systematic review. *Global Health Res Policy*. 2021;6:21.
 34. Khatib MN, Gaidhane A, Upadhyay S, Telrandhe S, Saxena D, Simkhada PP, et al. Interventions for promoting and optimising breastfeeding practices: an overview of systematic review. *Front Public Health*. 2023;11:1208719.
 35. Kundu S, Chowdhury SSA, Hasan MT, Sharif AB. Inequalities in early initiation of breastfeeding in bangladesh: an Estimation of relative and absolute measures of inequality. *Int Breastfeed J*. 2023;18:10.
 36. Roberts D, Jackson L, Davie P, Zhao C, Harrold JA, Fallon V, et al. Exploring the reasons why mothers do not breastfeed to inform and enable better support. *Front Global Women's Health*. 2023;4:1148719.
 37. Maani N, Abdalla SM, Ettman CK, Parsey L, Rhule E, Allotey P, et al. Global health equity requires global equity. *Health Equity*. 2023;7:192–6.
 38. Ariful Islam M, Mamun ASMA, Murad Hossain M, Bharati P, Saw A, Lestrel PE, et al. Prevalence and factors associated with early initiation of breastfeeding among Bangladeshi mothers: a nationwide cross-sectional study. *PLoS ONE*. 2019;14:e0215733.
 39. Kanu JS, Tang Y, Liu Y. Assessment on the knowledge and reported practices of women on maternal and child health in rural Sierra leone: a cross-sectional survey. *PLoS ONE*. 2014;9:e105936.
 40. Amare T, Dellie E, Amare G, Vozza I. Trends of inequalities in early initiation of breastfeeding in ethiopia: evidence from Ethiopian demographic and health surveys, 2000–2016. *Biomed Res Int*. 2022;2022:1.
 41. Walker M. Breastfeeding the late preterm infant. *J Obstetric Gynecologic Neonatal Nurs*. 2008;37:692–701.

Publisher's note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.