Death of preceding child and utilisation of healthcare services in West Africa

Abstract

Research discourse about effects of child mortality on subsequent birth has identified behavioural replacement as a potential mechanism. Available evidence from high mortality settings of sub-Saharan Africa supports this hypothesis. Extending the argument further, an empirical question of research interest is "does experience of under-five death motivate women in high mortality settings of sub-Saharan Africa to seek preventive and curative health interventions for their subsequent children? We analysed the most recent reproductive history data from demographic and health surveys conducted in selected West African countries. Outcome variables included the following health and survival interventions for the index child: treatment of diarrhoea and symptoms of acute respiratory tract infection (ARI) as well as full vaccinations. Results showed that the odds of diarrhoea treatment were two times higher following the death of a preceding child in Benin (OR_{adj}=1.97, CI: 1.24, 3.13). No such pattern was observed in the other five countries. Similarly, no significant relationship was observed between death of preceding child and treatment of ARI symptoms. The index child was more likely to be fully vaccinated following death of predecessor in Liberia (OR_{adj}=1.97, CI: 1.16, 3.35). These findings suggest that childbearing women rarely learnt lessons from childhood mortality experiences.

Keywords: Child survival interventions; mortality; succeeding children;

BACKGROUND

Child mortality remains a significant public health challenge in West Africa, where under-five mortality rates are among the highest globally. According to recent statistics, the region experiences approximately 76 deaths per 1,000 live births, a figure far above the global average. Despite improvements in healthcare access, nutritional status, and immunization coverage, the region still faces pervasive challenges linked to poverty, inadequate healthcare infrastructure, and limited access to quality services. One under-explored dimension of this issue is how the death of a child under the age of five affects healthcare utilization for surviving or subsequent children.

While several studies have investigated the determinants of childhood mortality, the consequences and response of mothers especially for subsequent births have received lesser empirical attention. In pronatal African settings, Child death can affect family stability, woman's health and psychological status, socio-economic security and reproductive behaviour (Defo, 1998). Of these potential effects, the fertility response to child loss (or mortality) is arguably the most studied. The consensus evidence from analysis of micro-level data is that death of a child is significant driver of subsequent fertility behaviour among women in sub-Saharan Africa (Defo, 1998, Ewemade et al., 2019). These often operate via shorter birth intervals aided by discontinuation of contraceptive use. This situate well within the "behavioural replacement hypothesis" which is one of the four pathways by which child mortality influence fertility (Preston, 1978). Logically, and judging from the replacement hypothesis, it is expected that when a woman gives birth after the death of a child, she would want to take extra preventive and curative measures to ensure that the child survive. That is all things being equal, uptake of child health interventions should be higher in those who experienced death of a preceding child.

The loss of a child is a traumatic event, and it has the potential to influence parental behaviour, particularly in terms of health-seeking decisions for the remaining children. Parents who have experienced such a loss may become either more proactive in seeking healthcare services for subsequent children or, conversely, may be deterred by previous negative healthcare experiences. These behavioural responses are critical in shaping the overall health outcomes for families in West Africa, where healthcare systems often suffer from inefficiencies and inequities

Given the critical role that early healthcare interventions play in reducing mortality and improving health outcomes, understanding whether under-five deaths influence healthcare-seeking behaviours is essential. Findings from this study could provide valuable insights for healthcare policymakers, potentially informing targeted interventions aimed at improving healthcare utilization among high-risk populations. By identifying whether families who have experienced child loss are more or less likely to seek healthcare for subsequent children, this research aims to contribute to efforts to reduce child mortality and improve the overall well-being of children in West Africa.

The empirical question of research interest in this paper is "does experience of under-five death motivate women in high mortality settings of sub-Saharan Africa to seek preventive and curative health interventions for their subsequent children?"

METHODS

Data sources

We extracted birth history data from demographic and health survey (DHS) conducted between 2018 and 2020 in six West African countries. The DHS is a cross-sectional household survey conducted every five years on nationally representative samples in several developing countries since the 1990s. Uniformity of sample design, survey questionnaire and variables across countries permit pooling of data and conduct of multi-country analysis.
We selected study countries based on two criteria: (1) availability of demographic and health survey (DHS) data collected not earlier than 2015 and (2) having under-five mortality rate exceeding the average for sub-Saharan Africa – 78 per 1000 live birth. Consequently, the following seven countries all from Western Africa were included: Benin (2018); Mali (2018); Nigeria (2018); Guinea (2018); Liberia (2019/2020); Sierra Leone (2019)

Variables

Outcome variables included the following health and survival interventions for the index child: full vaccination, treatment of diarrhoea and symptoms of acute respiratory tract infections (ARI). Definition and derivation of outcome variables followed same procedure used in previous studies (Akinyemi et al., 2016, Akinyemi et al., 2019). A child aged 12-23 months was classified as having received full vaccination if he/she had received *Bacillus Calmette–Guérin (*BCG) vaccination against tuberculosis; three doses of vaccine to prevent diphtheria, pertussis, and tetanus (DPT) ; at least three doses of oral polio vaccine (OPV); and one dose of measles vaccine (WHO, 2015). A child with diarrhea in the past two weeks was classified as having received treatment if the mother reported visiting a public or private health facility for care. A similar criterion was used for symptoms of ARI (cough at any time in the last 2 weeks, breathing faster than usual with short, rapid breaths or have difficulty breathing). We also plan to explore a composite coverage indicator as an outcome variable.

Analysis

The main explanatory variable was survival status of immediate preceding child. Relevant demographic and socio-economic characteristics were controlled in multivariable analysis. Analysis was restricted to second and high order births because the main explanatory variable will not be applicable to first births. Analysis involved the use of descriptive statistics and lagged logit models (Akinyemi et al., 2018). Each outcome was analysed separately for each country. Unadjusted and adjusted models were fitted to explore the relationship between death of preceding child and use of child healthcare services. Strength of association between variables was quantified as adjusted odds ratio (OR_{adj}) with 95% confidence interval (95% CI). In further sensitivity analyses, we will employ propensity score matching which is a statistical technique for causal inference from observational data.

PRELIMINARY RESULTS

Death of preceding child and uptake of child healthcare services

Across five of the six countries (Mali, Nigeria, Guinea, Liberia and Sierra Leone), there was no markable difference in uptake of treatment for diahhroea symptoms by survival status of the preceding child (Table 1). Utilization of orthodox care for symptoms of ARI was slightly higher for children whose predecessors died in Mali and Liberia while the reverse was the case in Nigeria (Table 1). For full vaccination, the levels were similar irrespective of the survival status of the preceding child except in Liberia where children whose predecessors died recorded a slightly higher level of full vaccination (Table 1).

Table 1: Uptake of child healthcare services according to survival status of preceding child in West Africa

	Diahhrea Treatment (%)		**Treatment of ARI symptoms (%)**		**Full vaccination (%)**	
Country	**Alive**	**Dead**	**Alive**	**Dead**	**Alive**	**Dead**
Benin	23.1	34.0	24.6	25.2	56.6	52.2
Mali	26.4	28.2	24.7	38.9	44.2	46.8
Nigeria	61.9	65.0	67.2	57.0	31.0	25.7
Guinea	37.9	41.5	46.0	43.3	22.6	24.3
Liberia	40.9	34.2	48.2	58.8	49.0	64.2
Sierra Leone	69.4	67.4	73.8	67.0	55.7	61.0

Results from multivariable logit models showed that death of immediate preceding child in Benin and Liberia was associated with uptake of diarrhoea treatment and full vaccination respectively (Table 2). In 5 of the 6 countries analysed, no significant relationship was observed between survival status of preceding child and utilisation of children healthcare services

Table 2: Adjusted OR for the relationship between death of preceding child and utilisation of child healthcare services in West Africa

	Diahhrea Treatment	Treatment of ARI symptoms	Full vaccination
Country	**Adj OR (95% CI)**	**Adj OR (95% CI)**	**Adj OR (95% CI)**
Benin	1.97 (1.24, 3.13)*	1.14 (0.66, 1.98)	0.94 (0.65, 1.34)
Mali	1.14 (0.72, 1.80)	1.73 (0.85, 3.54)	1.16 (0.79, 1.72)
Nigeria	1.13 (0.76, 1.79)	0.61 (0.31, 1.17)	1.09 (0.86, 1.39)
Guinea	1.25 (0.68, 2.32)	0.93 (0.39, 2.21)	1.27 (0.73, 2.21)
Liberia	0.72 (0.40, 1.28)	1.63 (0.74, 3.59)	1.97 (1.16, 3.35)*
Sierra Leone	0.68 (0.34, 1.36)	0.90 (0.42, 1.92)	1.35 (0.92, 1.99)

CONCLUSION

Our findings showed that death of preceding child was not associated with any of the child healthcare services in most countries. These results are similar to those found in a similar study which also revealed that death of a preceding child did not motivate for better utilisation of maternal healthcare services in Nigeria (Akinyemi et al., 2018). The main intention in these studies was to explore whether childbearing women learn any lessons from childhood mortality experiences to improve their childcare practices and behaviour. The available evidence suggests that this is rarely so.

There are many unanswered questions in this discourse. For example, what do childbearing women think about the causes of childhood deaths? Do they see any linkage between use or non-use of child healthcare services and wellbeing/survival of their children? Even though the effectiveness of maternal and child health interventions are empirically proven, how much of these information is available to women especially those without formal education and living in rural areas? This is one area where health awareness and advocacy programmes may need some tinkling. There is a need for strategies to increase demand for these effective child health services among those that are most vulnerable and at risk of experiencing childhood deaths.

Secondly, stronger objective evidence could have been possible if there was data on use of healthcare services for all children. Then, it would have been possible to deeply investigate the health-seeking behaviour for all children born to the same mother. These can be explored with data from health and demographic surveillance systems if relevant variables are available. Lastly, it is also important to situate the findings within the overall system designed for promoting child health and survival in different countries. We also plan to deploy advanced techniques for causal inference from observational data to further objectively investigate whether prior experience of childhood death motivates mother to seek healthcare for subsequent children.

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