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Title

Translating findings from child mortality audits into life-saving interventions: **CHAMPS Sierra Leone success story.**

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Summary

In 2021, there were 104.7 deaths per 1,000 live births among children under the age of 5 in Sierra Leone (1). From the Child Health and Mortality Prevention Surveillance (CHAMPS) findings of 610 minimally invasive tissue sampling (MITS) cases reviewed from February 2019 to December 2022, the determination of cause of death (DeCoDe) expert panel determined that 72% of deaths were preventable. Of these, 1 in 3 deaths could have been prevented by improving clinical management of cases. Majority (87%) of the reviewed MITS cases were regional facility deaths, underpinning the importance of auditing the clinical management of cases in these facilities.

Understanding the circumstances and full range of factors that contribute to a child's death or health outcome is crucial to preventing future deaths, poor health outcomes, or reoccurrence in other children. The maternal and perinatal death review and response system has been successfully scaled up to referral hospitals in Sierra Leone. However, child death audits/reviews are rarely conducted. Although CHAMPS conducts detailed autopsies and laboratory testing for enrolled cases, the results often take several months to provide feedback to the hospitals. Routine child death audits provide more immediate opportunity for corrective action by the health workers that cared for the deceased child.

As part of the broader quality improvement efforts within the CHAMPS data-to-action strategies in Sierra Leone, child death audits were established at the Makeni Regional Hospital (MRH) and Bo Government Hospital (BGH), in collaboration with the Ministry of Health (national and district levels) as well as the hospital administration and health care providers in each establishment. As of April 2024, 94 child deaths had been reviewed at MRH while 22 deaths had been reviewed at BGH by May 2024. Findings from these reviews have been disseminated with nascent actions already ongoing to resolve some of the modifiable factors delineated.

Background and Context

In Sierra Leone (SL), under-five mortality remains one of the highest in the world. Over 27,000 under five children died in Sierra Leone in 2021, resulting in an under-five mortality rate of 104.7 deaths per 1,000 live births (1). The death of a child is a profound tragedy for the parents, family members, and community, as well as for the health care workers who have provided care for the deceased child antemortem, whether briefly or over a longer period. It is essential to learn from these deaths to prevent future tragedies. A death review or mortality audit is a process that documents the causes and contributing factors of a death, identifies modifiable factors and potential preventive actions, and reviews the outcomes of these actions. While there is substantial information and guidance on maternal audits (3,4,5) and a growing interest in perinatal audits, much less attention has been paid to child death reviews in low and middleincome countries (6).

An effective system for conducting death reviews is thus essential in all health facilities that provide care for children, particularly in hospitals. These processes are also vital for identifying life-saving public health interventions and necessary reforms at community, district, regional and national levels.

Through collaborative efforts between CHAMPS and the Sierra Leone Ministry of Health (SLMoH), the maternal and perinatal death review and response system has been successfully scaled m started as a bottom-up approach which benefitted from funding by a United Kingdom Department for International Development south-to-south initiative.

However, with takeover of the child death reviews by the government, this program reportedly suffered setbacks, becoming relatively expensive, donor-dependent, and less efficient with decreased participation at the facilities (7). Consequently, a sustainable approach that will facilitate institutionalization of child death audits at hospitals in Sierra Leone has become imperative as part of the efforts to reduce child mortality rates in the country.

Aims and Objectives

The aim of our intervention was to address preventable causes of child deaths by improving clinical management of children hospitalized at two regional facilities (Makeni Regional Hospital, MRH and Bo Government Hospital, BGH) through reactivation of weekly hospitalbased child death audits. The approach for these audits was for clinicians and other health care workers at the facilities to select cases on a weekly basis from child deaths occurring in the facilities and review them in detail to identify the gaps in clinical management. It is expected that they will work with hospital management to implement targeted interventions addressing the identified gaps. Specifically, these audits aim to:

01. Reduce preventable child mortality by gathering and strategically using information to guide clinical actions and monitor their impact.
02. Provide guidance, feedback, and support to health facilities.
03. Identify emerging trends in child deaths and initiate public health or clinical actions at the facility and district levels, while coordinating with the national level.

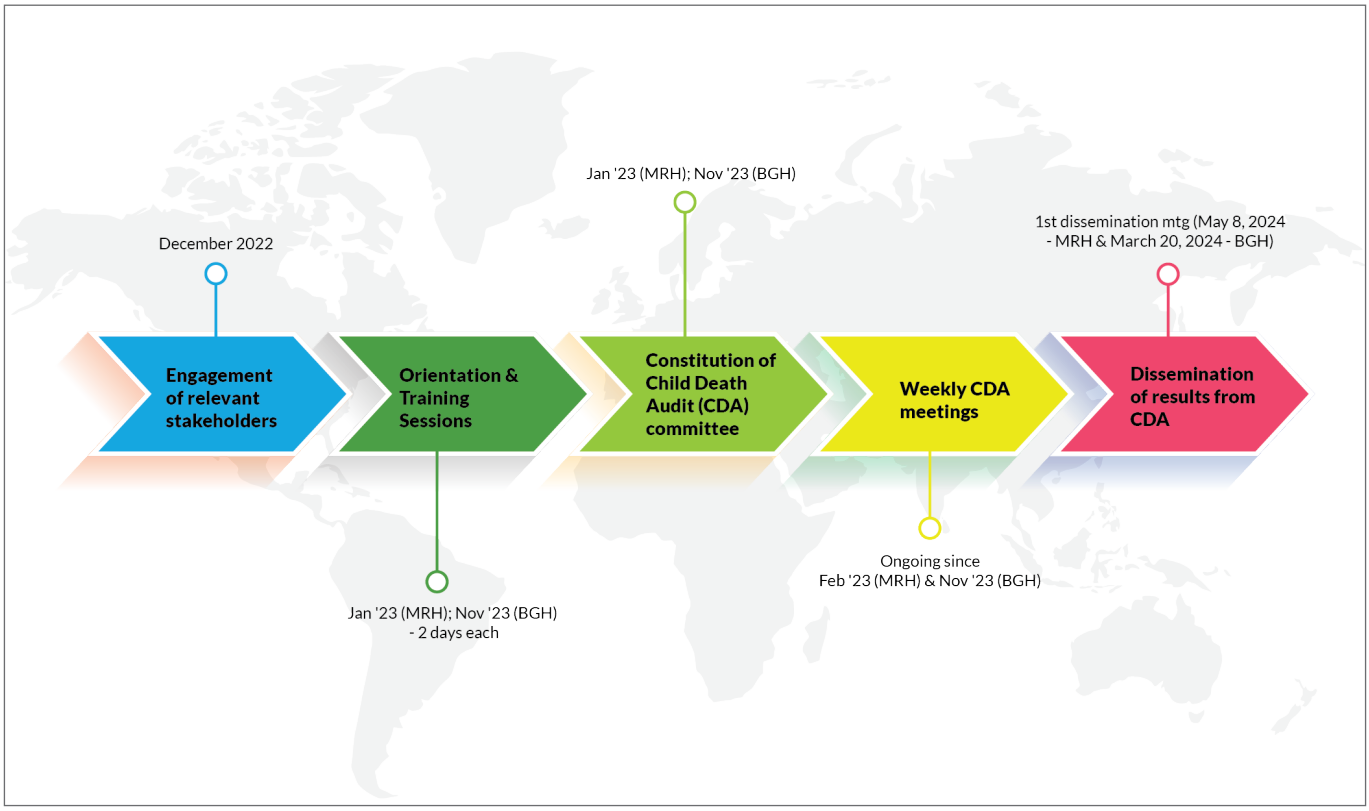

Figure 1. Process we implemented at each district hospital to set up routine child death audit

01 Engagement of relevant stake holders

To successfully introduce child mortality auditsat the two hospitals, relevant stakeholders such as the National Quality Management and Child Health Programs within the Reproductive Maternal Newborn Child and Adolescent Health and Nutrition (RMNCAH+N) Directorate of the Ministry of Health (MoH) and the hospital administration of MRH and BGH were engaged through different stages of planning and implementation. The MoH, specifically through the National Quality Management and Child Health Programs were supported by CHAMPS SL to lead and take ownership of the program to ensure sustainability and acceptance of the process in the health facilities.

02 Orientation and Training Sessions

A two-day orientation and training session facilitated by the Directorate of RMNCAH+N was conducted at MRH and BGH (Figure 2) in January 2023 and November 2023 respectively. The training was aimed at building the capacity of health care workers to conduct routine child mortality audits within their facilities.

Figure 2. Child Death Audit Training at Bo Government Hospital

03 Constitution of the Child Death Audit (CDA) Committee

Following the training at each hospital, a functional child death audit committee was constituted and comprised of:

- Clinical staff from relevant units in the hospital such as pediatric, resuscitation, InPatient Feeding (IPF), pharmacy, laboratory/blood bank and monitoring and evaluation (M/E) units.
- Key hospital decision makers to effectively implement recommendations and drive change, namely the Medical Superintendent (MS), Matron and representative(s) of the District Health Management Team (DHMT).

The child death audit committee at each hospital was established with the overall guiding principle of ensuring a non-accusatory environment for participants to freely discuss findings and suggest interventions that are practical and implementable (See Supplementary materials – Appendix A for the full list of guiding principles).

04 Weekly Child Death Audit Meetings

The child death audit meetings were incorporated into the pediatric unit's weekly review meetings at both hospitals (Figure 3). They were conducted using the World Health Organization's 6-step cycle (Figure 4). However, the 6th step of evaluation of implemented action plans is yet to be systematically undertaken.

Figure 3. Weekly Child Death Audit Meeting at Makeni Regional Hospital

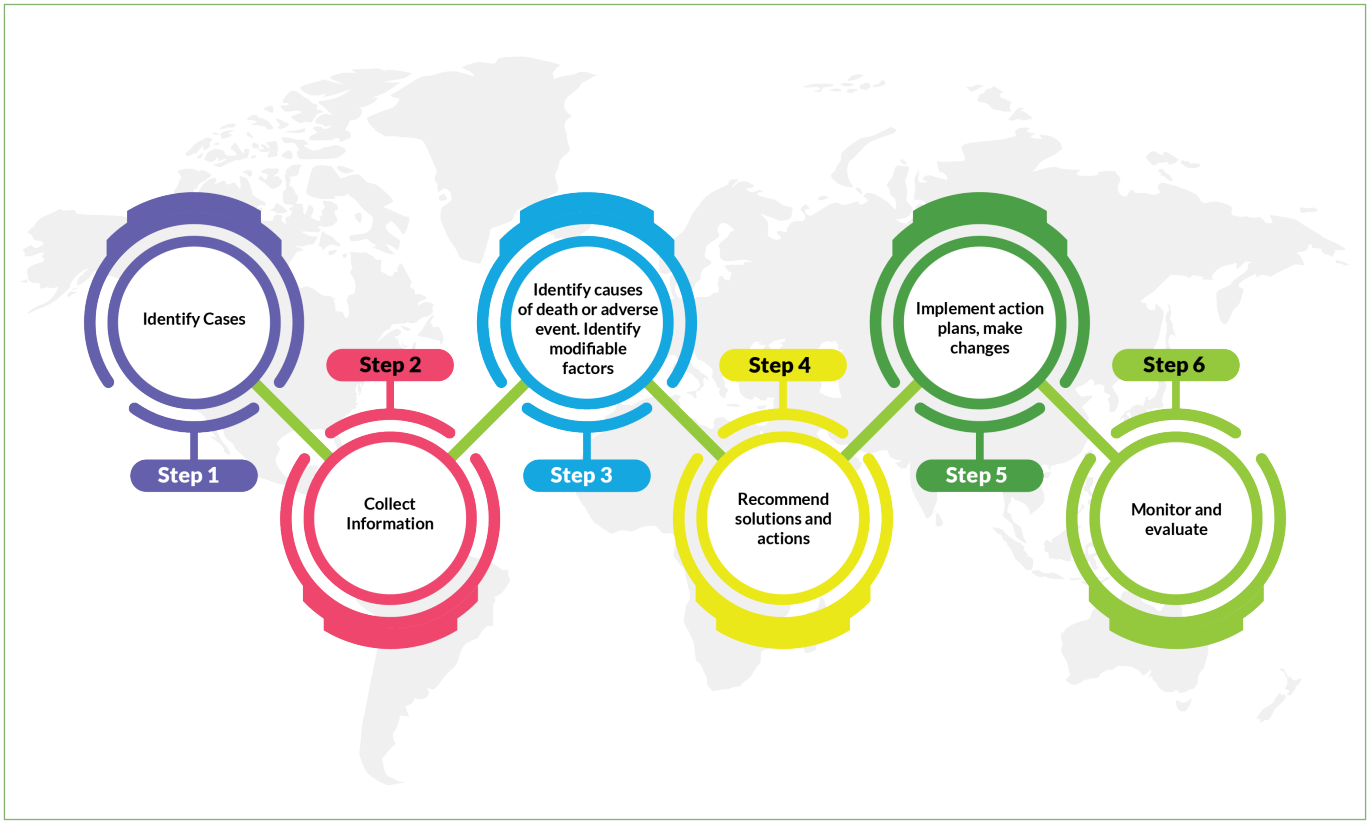

Figure 4. Facility audit and review cycle
Source: World Health Organization's Operational guide for facility-based audit and review of paediatric mortality, p27.

05

Dissemination of results from the child death audits

Findings from the child death audits have been disseminated widely in stakeholder meetings at Makeni (Figure 4) and Bo (Figure 5; See Supplementary materials, Appendix B for details of these meetings). This dissemination has enabled the DHMT to garner support from the community, district council leaders, paramount chiefs and partner organizations to find solutions to the issues raised. To reduce child mortality, CHAMPS is providing support to the hospital and district leadership to follow-up on meeting action points to enhance provision of timely good quality health care.

Figure 5. Cross section of participants at the CDA Stakeholders feedback meeting at Makeni on May 8th, 2024 (The chairman of paramount chiefs, Bombali District addressing the participants on the need to support the health care workers at the hospital).

Figure 6. Participants at CDA Stakeholders Feedback Meeting at BGH on March 20th, 2024.

Impact of interventions

01 Successes

- The establishment of functional child death audits at MRH and later at BGH has garnered commendation and interest from the MoH as noted in various national and regional forums. Currently, MRH and BGH are the only hospitals in Sierra Leone where child death audits are routinely conducted. These hospitals have become positive examples and success stories of introduction and adoption of child death audits in thecountry.

- The child death audits have been successfully integrated into the weekly review meetings of the pediatric units at both hospitals. This integration means that the audit meetings do not require additional financial support, thereby enhancing sustainability and encouraging ownership among staff.

- Additionally, the child death audits at both hospitals have become crucial training and learning opportunities for healthcare workers. Importantly, these audits now serve as a central training hub for student nurses, student Community Health Officers (CHO), and student Physician Assistants (PA) during their mandatory clinical rotations in pediatric units.

- These audits highlight critical systemic issues within the hospital that extend beyond the responsibilities of nurses and clinicians. These issues are now being escalated to the hospital management, DHMT, national MoH, and various health partners for solutions. For example,

    - The lack of nebulizer at the pediatric ward, which had led to the death of children with respiratory illnesses was addressed after being brought to the attention of the MRH management. The hospital was able to source a nebulizer from the hospital store and it is now in use at the pediatric ward.
    - Likewise, the issue of children dying of hypoglycemia (low blood sugar) at the pediatric ward which was of grave concern during the onset of child death audits at BGH has been resolved by the provision of glucometers by CHAMPS to the children's wards. Glucometer strips are also being provided by CHAMPS on a regular basis, while working with the national stores to ensure regular supplies
    - outside of CHAMPS support.
    - Unavailability of emergency drugs is being addressed partially by the provision of the first two doses of emergency drugs such as 50% dextrose, Augmentin, etc. by the CHAMPS programme. This is usually helpful where a patient is unable to afford them and there is stock out of such drugs under the Free Health Care System.

- As the leading programme on child death audits in Sierra Leone, CHAMPS was invited to a press briefing held in February 2024 at the Ministry of Foreign Affairs and International Cooperation Conference Room in Freetown. Dr. Austin Demby, Minister of Health, emphasized the urgent need for concerted efforts to improve child health in Sierra Leone under the theme: "A Call to Action for Child Health." https://mohs.gov.sl/minister-ofhealth-austin-demby-declares-child-health-a-priority-that-needs-urgent-intervention/ Top of the list of 10 actionable things the Minister listed as priorities to achieve zero preventable child death is the reporting of all child deaths and a review of at least two (2) of those deaths on a weekly basis. Following this declaration, the Child Health Program Manager reached out to CHAMPS to support the scale up of child death audits to the 16 districts including the training of recently appointed child health focal persons across the 16 districts on child death reporting tools. With CHAMPS support, the training was conducted in March 2024 with 71 participants in attendance, from across all 16 districts. Recently, with support of WHO, CHAMPS and other partner organizations, refresher trainings are being conducted in Bo, Kenema, PortLoko and Bombali districts.

Impact of interventions

02

Lessons learned

Empowering the staff at MRH and BGH to take ownership of and drive the implementation of child mortality audits has been crucial to improving the quality of care at the pediatric wards in the respective hospitals.

Close collaboration with MRH, BGH, the MoH, and DHMT, along with working through established structures (such as the pre-existing weekly review meetings at the pediatrics unit) fosters adoption and ownership, thereby enhancing the potential for sustainability.

Several action points emanated from the stakeholder feedback meetings at Makeni and Bo including:

- The Constitution of a district committee/task force on child death audits to follow up on all the action points/potential solutions raised by the participants (Makeni).
- Mentoring nurses on established protocols such as the Emergency Triage Assessment and Treatment (ETAT) protocol and the Integrated Community Case Management (iCCM) protocol, as well as correct documentation and use of basic equipment (Bo).
- Orientation of nurses and mothers to appropriate feeding of critically ill-children (Makeni & Bo).
- Engagement with private hospitals and PHU's in-charges on the referral process to avoid delays in referrals (Makeni & Bo).
- Constitution of an emergency committee headed by the Deputy Mayor to pull partners together to resolve the lack of accommodation for doctors posted to the district for housemanship and the incessant lack of emergency drugs at the paediatric unit (Bo).

Scaling up child death audits across all hospitals in Sierra Leone with limited resources is possible with strong leadership and commitment at both hospital and MoH levels, as well as in collaboration with partners.

> *"The death of a child is a profound tragedy for the parents, family members, and community, as well as for the health care workers who have provided care for the deceased child"*

Impact of interventions

03

Challenges

Insufficient commitment by hospital management and the national MoH to the recommendations and action plans arising from the child death audits. When the same recommendations come up multiple times and are not acted upon, this leads to demotivation of the audit committees.

Although the child death audits have gained traction at the MoH level, with interest from the Child Health Program, there is no national structure in place for effective reporting, coordination and monitoring of findings from the audits orthe impact of the actions taken in response. The sixth step in child death audits, monitoring and evaluation of the actions taken, has not been done as there were no established national standards/indicators in use by the Ministry of Health. However, CHAMPS is working with the Child Health Program to reactivate the National Child Death Situation Room, which is intended to collate findings and recommendations from all district focal points on a weekly basis.

Impact of interventions

04

Recommendations

A death review without subsequent action will not improve the quality of care received or reduce mortality. The recommendations made during the process must be implemented as doing otherwise will lead to frustration and demoralization among staff, subsequently resulting in decreased participation in the review process.

Disseminating audit findings and recommendations at multiple levels is crucial to supporting the implementation of changes. Communicating key messages to those who can implement the recommendations and solutions derived by the committee can make a significant difference in saving lives.

Establishing monitoring indicators that provide a quick snapshot of whether the system and outcomes are improving quality of care in the pediatric unit, along with more detailed periodic evaluations, will be useful.

Conclusion

The importance of child death audits and reviews lie in accurately recounting each case while the memory of the case is still fresh and discussing strategies to prevent similar deaths or adverse outcomes in the future. While not all deaths are preventable, audits fulfill the obligation of health professionals to continuously learn and improve the quality of care.

Affiliations

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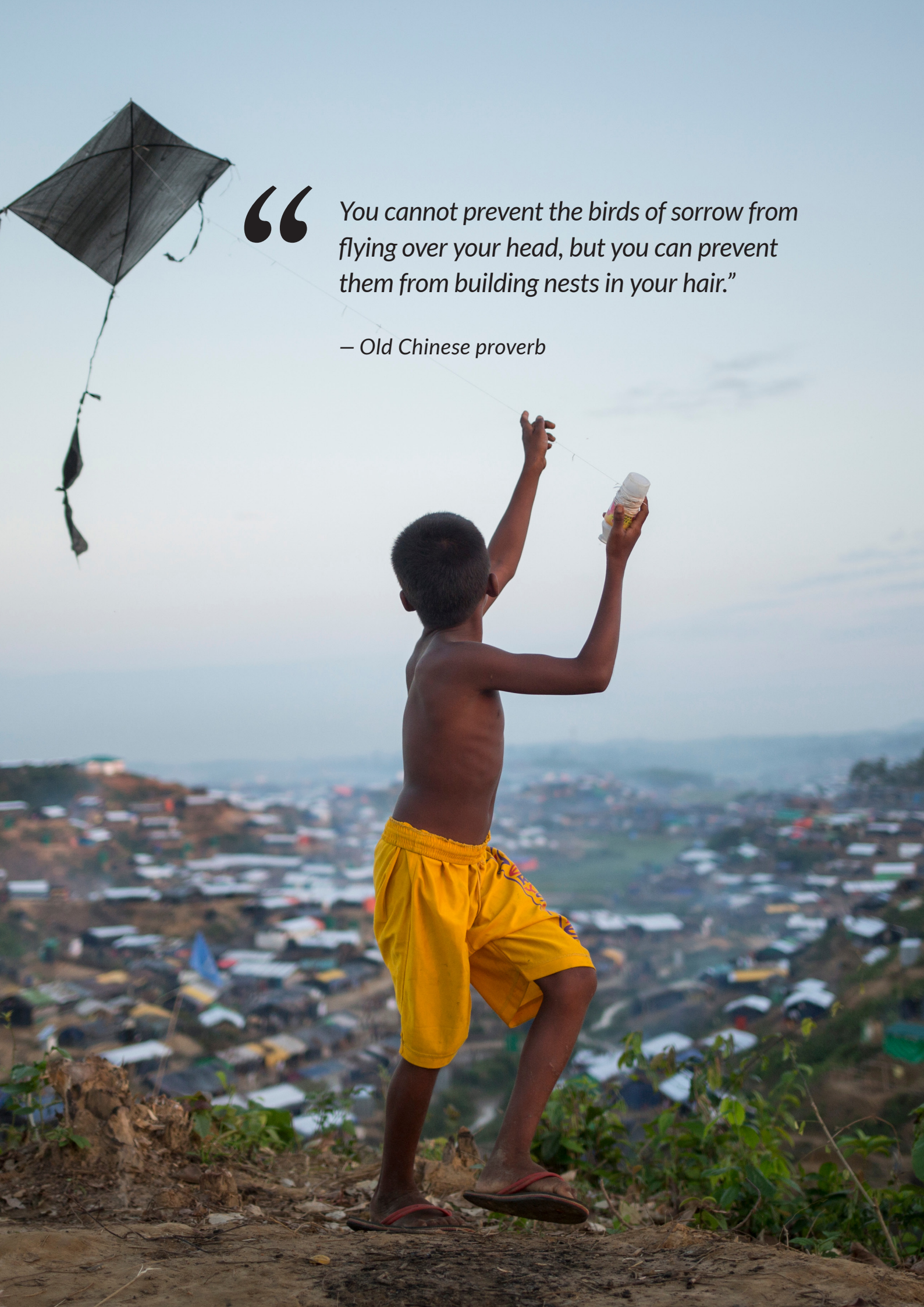

“You cannot prevent the birds of sorrow from flying over your head, but you can prevent them from building nests in your hair.”

— Old Chinese proverb

Supplementary Material

Appendix A:
Guiding principles for the Child Death Audits

The child mortality audit committee at each hospital was established with the following guiding principles:

1. Commitment to weekly meetings which is essential for sustainability.
2. Encouragement of open discussions during the meetings all the while maintaining confidentiality.
3. Voluntary but strongly encouraged attendance and participation from relevant clinical staff.
4. Maintenance of a non-victimizing and non-threatening atmosphere, so that all staff feel free to contribute to the discussions.
5. Open acknowledgement by team leaders of their own shortcomings so that junior staff can follow suit.
6. Use of meetings as educational and learning opportunities to address relevant subjects related to quality of care.
7. Adoption of a team approach to problem-solving, gathering diverse perspectives on modifiable factors and solutions.
8. Respect and acknowledgement of all health care workers' efforts and consideration of their perspectives.
9. Movement from specific cases to general issues to identify common patterns of avoidable events.
10. Avoidance of finger-pointing; emphasis on collective improvement opportunities.
11. Consideration of the entire health system, not just hospital care, when analyzing modifiable factors in each case.
12. Provision of feedback to and involvement of all staff in the audit process.

Appendix B:
Data dissemination of the Child Death Audit Findings

On May 8, 2024, the Makeni Regional Hospital in partnership with CHAMPS SL conducted a stakeholders' feedback meeting on the 94 child deaths reviewed from February 2023 to April 2024. Findings revealed that the most frequent immediate cause of death (27%) was anemic heart failure while malaria accounted for 56% of the underlying causes of death. Most (55%) of the cases died within 24 hours of presentation at the hospital. Modifiable factors delineated include late presentation at the hospital, non-recognition of unstable vital signs during transfusion, non-functional/lack of monitoring device for oxygen saturation (SpO2), lack of essential emergency drugs amongst others.

The meeting was well attended with over 50 stakeholders including traditional chiefs, media houses, representatives from non-governmental organizations, DHMT, and MoH staff in attendance (See Facebook link to meeting, YouTube link of the media report, etc. below). In the same vein a similar meeting was held at Bo Government Hospital on March 20, 2024, where the findings of the child death audits of 15 cases were disseminated. Several action points emanated from both meetings, and these are being addressed at various levels.

Crown Agents Global Youtube channel on the CDA meeting at Makeni
https://www.youtube.com/watch?v=TWjjMe2QSTE

Facebook link to Stakeholders' feedback meeting at Makeni, Bombali District:
https://www.facebook.com/share/v/QQH94hZ4CAr7djMB/?mibextid=w8EBqM

Newspaper articles following Stakeholder feedback meeting in Makeni

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The CHAMPS network uses innovative approaches to generate and share knowledge that improves understanding and prevention of child mortality.

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