

Improving Death Notifications in Hiwot Fana Hospital: The Added Advantage of CHAMPS in Eastern Ethiopia

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BACKGROUND

In 2019 5.2 million children died before celebrating their fifth birthday. 80% of these deaths occurred in Africa, Central and South Asia (*Children: Improving survival and well-being*, 2019). Most of these deaths were preventable, yet their precise causes are often unknown because of gaps in clinical evaluation, disease surveillance, and diagnostic testing. This is especially true in low-resource countries, where mortality rates are highest. Using innovative approaches, Child Health and Mortality Prevention Surveillance (CHAMPS) works to close this information gap by gathering and sharing the scientific evidence needed to save young lives.

CHAMPS is a global surveillance network with sites in seven countries in Africa and South Asia. It works in places where child mortality is highest to identify the specific causes of stillbirth and deaths in under-five children, and shares data with scientists, policymakers, and public health institutions to inform interventions that reduce child mortality (Salzberg et al., 2019). Causes of death for CHAMPS cases are determined by a panel of experts in different medical fields who regularly meet to review multiple sources of data, including microbiology and pathology lab results from postmortem minimally invasive tissue sampling (MITS) procedures, clinical information, and verbal autopsies. During this Determination of Cause of Death (DeCoDe) panel, the group assigns immediate and underlying causes of death to each case and provides recommendations for the prevention of future deaths.

Despite reaching the World Health Organization's Millennium Development Goal 4 of reducing child mortality by two-thirds, Ethiopia still reports a high child mortality rate: 55 deaths per 1,000 live births (EPHI, 2021). While these numbers are alarming, the actual child mortality rate in Ethiopia is likely even higher. In resource-constrained countries, well-functioning mortality registration systems do not exist, and most births and deaths are not legally recorded (Mathers et al., 2005). To improve child health and reduce child mortality, public health programs need reliable and valid data on the magnitude and causes of child death. Collecting, analyzing, and accessing high-quality data is a major stepping stone in progressing toward better health care, better allocation of resources, and timely public health interventions (Measuring Health Systems, 2018).

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LAUNCH OF HOSPITAL MORTALITY SURVEILLANCE

The CHAMPS Ethiopia site was established in 2016 and mortality surveillance began in Harar and Kersa districts in February 2019 at Hiwot Fana Specialized University Hospital (HFSUH), the university referral hospital for Eastern Hararghe with a catchment area covering 5.8 million people.

Before implementing mortality surveillance activities, the CHAMPS Ethiopia site adopted and contextualized training materials and Standard Operating Procedures from the U.S. CHAMPS Program Office at Emory University in Atlanta. The surveillance team was trained according to their role and responsibilities with modules focused on death notification procedures, assignment of mortality case screening IDs and CHAMPS IDs for enrolled cases, criteria to differentiate miscarriage (i.e., termination of pregnancy before 28 weeks of pregnancy or birth weight of less than 1000gm) and stillbirth (i.e., a fetus delivered with no signs of life with a gestational age \geq 28 weeks or weight \geq 1000gm), methods to identify duplicate death reports, how to approach families of the deceased, how to obtain consent, and approaches to grief counseling. Hospital staff received orientation, too, including an overview of CHAMPS' work, training on how to conduct death notifications, including when and whom to notify.

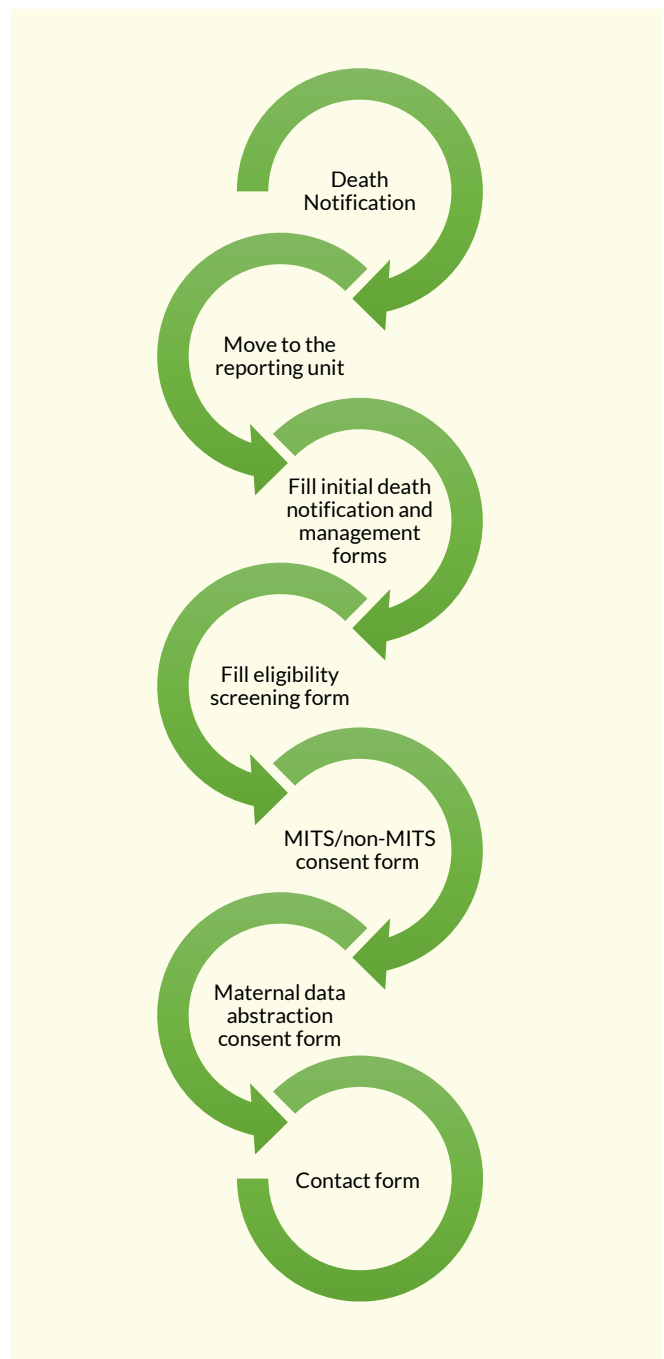
MORTALITY DATA COLLECTION MECHANISM AND TOOLS

The current hospital mortality surveillance team consists of data collectors, counselors, health officers, and a facility research coordinator. Mortality data is collected by fieldworkers from the Neonatal Intensive Care Unit (NICU), maternity and pediatrics wards of HFSUH, 24 hours per day, 7 days per week. Hospital staff notify mortality data collectors immediately after a death occurs via a mortality surveillance phone. After receiving a death notification, the fieldworker reports to the hospital unit to collect information for the initial death notification and management forms,

assigns a screening or report ID, and enters the death into the study log.

The death notification and management forms determine CHAMPS eligibility criteria, residence, and age, and include date and time of death notification, name of the child (if the child was not named, it includes the mother's name with the prefix "baby"), date of birth, date and time of death, place

Figure 1: CHAMPS workflow for eligible cases



of death, caretaker's name, and reporter's name and contact information. The forms and related study logs are also used to identify duplicate death reports. Data collectors are trained to avoid duplicate cases, especially in the case of twin deliveries by adding suffixes like Twin (A/1), Twin (B/2) after the baby's name.

Once CHAMPS eligibility has been confirmed, fieldworkers proceed to complete the MITS eligibility screening form, which includes information about the child, the mother, and MITS and non-MITS eligibility criteria, as well as body availability, legal issues, and the time between death and proposed MITS procedure. Finally, the counselors implement the consent-taking process with the family of the deceased.

HOSPITAL MORTALITY DATA CAPTURING SYSTEM FOR STILLBIRTHS AND UNDER-FIVE DEATHS

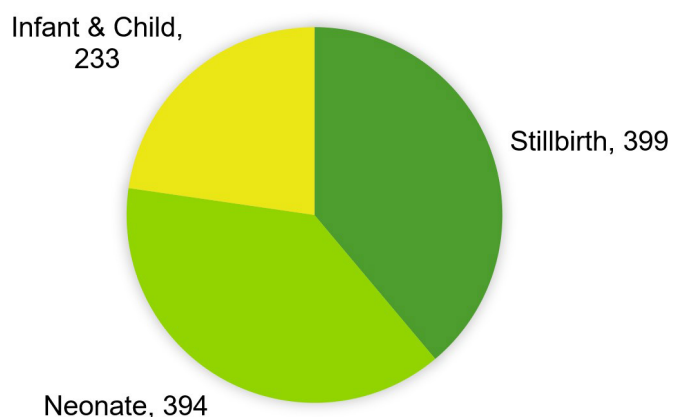
Health Management Information System (HMIS) has become the main reporting platform for public health facilities across Ethiopia since it was established in 2010. The HMIS allows for the routine generation of quality health data that provide support in the decision-making process at all levels for improved health care services (*HMIS Information Use Guide*, 2013). As a public referral hospital, HFSUH uses the HMIS reporting platform and reports to the regional health bureau on a monthly basis. Mortality data for stillbirth, neonates, infant and under-five child deaths are among the reportable events. These data provide important information for tracking the performance of national newborn and child survival strategies (National Strategy for Newborn and Child Survival, 2015).

During the first year of hospital mortality surveillance, there were 1,041 unique deaths captured by CHAMPS at HFSUH. Sixteen death notifications

were flagged as duplicate reports. 80% of deaths were reported by the hospital staff through the mortality surveillance phone, while the remaining 20% of deaths were identified by fieldworkers through ward rounds. Among the total deaths captured in HFSUH, 399 (39%) were stillbirths, 394 (38%) were neonates and the remaining 233 (23%) were under-five infant and child deaths reported between February 4, 2019 and January 31, 2020 (Figure 2). When comparing the first 12 months of death notification data from CHAMPS with hospital reports, the total number of deaths reported through HMIS was 719, where 313 (43.5%) were stillbirths, 244 (34%) neonates and 162 (22.5%) pediatric deaths. CHAMPS' mortality surveillance captured 322 more stillbirths and under-five child deaths compared to the hospital reporting system during the same timeframe (Figure 3).

The 12-month mortality data show a high discrepancy between CHAMPS and HMIS reporting systems. This may be due to different application of case definitions, missed deaths in the emergency and triage areas, higher availability of assigned CHAMPS data collectors, or the fact that CHAMPS reporters

Figure 2: Age distribution of the reported cases through the CHAMPS network from February 4, 2019 to January 31, 2020

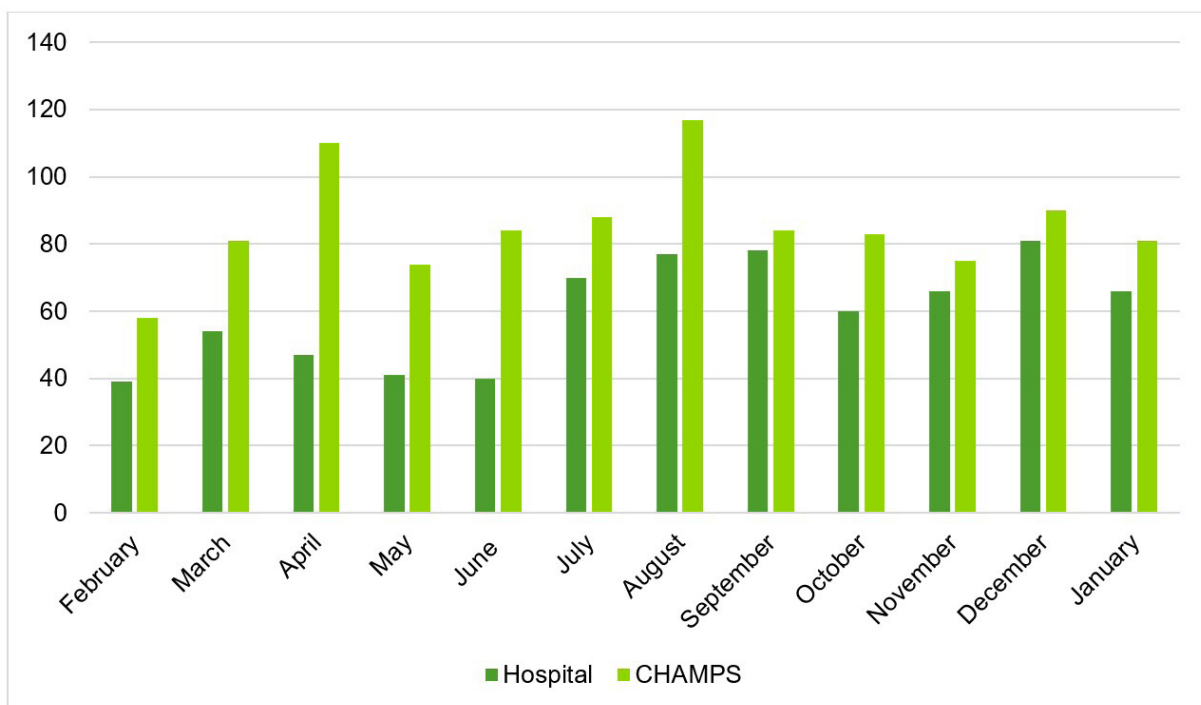


received incentives. During the surveillance period, it was noted that despite the consistent and similar classification of stillbirths, the hospital reporting system relied more on the weight of the fetus while CHAMPS considered gestational age in addition to the weight of the fetus. Neonates and children under five who died in transport to the hospital did not receive a patient chart and admission number, and therefore were not captured by the hospital reporting system. Studies and data validation assessments performed in Ethiopia show data accuracy of the HMIS report is less than the expected level (<80%) and most of the health facilities either over-report or under-report deaths (Health Data Quality Review, 2016; Wude et al., 2020; Yarinbab et al., 2018). A similar study in India on the identification of perinatal mortality through different surveillance systems showed a significant discrepancy in the number of deaths reported (Mony et al., 2015) which aligns with our findings.

WORKING TOGETHER TO IMPROVE HOSPITAL DEATH NOTIFICATION SYSTEMS

Accurate and timely data is essential to the continued improvement of health care and public health systems. For that reason, the CHAMPS team shares their data with the hospital on a bi-monthly and quarterly basis with the head nurses and hospital data quality team, respectively. In the first five months of CHAMPS surveillance, the hospital reported 68% of the total deaths captured by CHAMPS, with a high discrepancy in the number of neonatal and pediatric deaths. In the following months (months 6-10 of surveillance), the hospital team showed a 6% increase, reporting 74% of the deaths captured by CHAMPS. The CHAMPS team also works with the Harari and Oromia Regional Health Bureaus and Ethiopian Public Health Institute (EPHI) to share mortality surveillance data and DeCoDe results and inform new solutions for accurately recording deaths.

Figure 3: Institutional stillbirth & under-five death reports from the hospital HMIS data and CHAMPS active mortality surveillance from February 2019 to January 2020



RECOMMENDATIONS AND NEXT STEPS

For the CHAMPS network:

1. Share CHAMPS surveillance data with the hospital, regional health bureaus and other stakeholders.
2. Provide regular supervision and refresher trainings for CHAMPS mortality data collectors.
3. Share the case study findings with the hospital, regional health bureaus, and other stakeholders to highlight benefits and findings from the CHAMPS death notification system.
4. Determine approach for training data collectors in hospital systems, prioritizing data collection in the community where deaths are often missed.

For Hiwot Fana Hospital, Regional Health Bureau and other stakeholders interested in establishing or improving a death notification system within a health facility:

1. Ensure supportive supervision and training at each level of health care.
2. Use the generated data for decision-making or program improvement at each level.
3. Strengthen the hospital quality improvement team to monitor and evaluate the hospital activities and engage in operational research.
4. Strengthen partnership with local, national and international research centers and universities to use the generated hospital data for service improvement.
5. Encourage PhD students to generate quality research papers on mortality to promote and share their work with the hospital and other stakeholders.
6. Enable hospital quality officers to use triangulated data (service report, research, and assessment results) instead of relying on the service report alone.
7. Develop feedback mechanisms between hospitals and CHAMPS.
8. Standardize stillbirth definitions following World Health Organization recommendations.

REFERENCES

- Ethiopian Public Health Institute (EPHI) [Ethiopia] and ICF. 2021. *Ethiopia Mini Demographic and Health Survey 2019: Final Report*. Rockville, Maryland, USA: EPHI and ICF. Retrieved August 14, 2019 from <https://dhsprogram.com/publications/publication-FR363-DHS-Final-Reports.cfm>.
- Health Data Quality Review: System Assessment and Data Verification for Selected Indicators* (2016). Ethiopian Public Health Institute & World Health Organization. Retrieved April 3, 2020 from <https://www.ephi.gov.et/images/pictures/download2009/V6%20Final%20DV-SA%20Report%20Jan%202017.pdf>.
- Mathers, C. D., Fat, D. M., Inoue, M., Rao, C., & Lopez, A. D. (2005). Counting the dead and what they died from: an assessment of the global status of cause of death data. *Bulletin of the World Health Organization*, 83(3), 171–177.
- Measuring Health Systems Strengthening and Trends: A toolkit for countries*. (2018, June). World Health Organization. Retrieved June 30, 2020 from https://www.who.int/healthinfo/statistics/toolkit_hss/EN_PDF_Toolkit_HSS_Introduction.pdf.
- Ministry of Health Federal Democratic Republic of Ethiopia. (2013, July 11). *HMIS Information Use Guide: Technical Standards Area 4: Version 2*. Retrieved May 17, 2020, from <https://www.measureevaluation.org/resources/publications/ms-13-70.html>.
- Mony, P. K., Varghese, B., & Thomas, T. (2015). Estimation of perinatal mortality rate for institutional births in Rajasthan State, India, using capture-recapture technique. *BMJ Open*, 5(3). <https://doi.org/10.1136/bmjopen-2014-005966>
- National Strategy for Newborn and Child Survival in Ethiopia 2015/16-2019/20*. (2015, June). Maternal and Child Health Directorate Federal Ministry of Health. Retrieved May 15, 2020 from <https://www.healthynewbornnetwork.org/hnn-content/uploads/nationalstrategy-for-newborn-and-child-survival-in-ethiopia-201516-201920.pdf>.
- Salzberg NT, Sivalogan K, Bassat Q, Taylor AW, Adedini S, El Arifeen S, et al. Child Health and Mortality Prevention Surveillance (CHAMPS) Methods Consortium (2019). Mortality Surveillance Methods to Identify and Characterize Deaths in Child Health and Mortality Prevention Surveillance Network Sites. *Clinical infectious diseases: an official publication of the Infectious Diseases Society of America*, 69(Suppl 4):S262-S73.
- World Health Organization. (2019, September). *Children: Improving survival and well-being*. Retrieved July 3, 2020, from <https://www.who.int/news-room/fact-sheets/detail/children-reducing-mortality>.
- Wude, H., Woldie, M., Melese, D., Lolaso, T., & Balcha, B. (2020). Utilization of routine health information and associated factors among health workers in Hadiya Zone, southern Ethiopia. *PLoS One*, 15(5). <https://doi.org/10.1371/journal.pone.0233092>
- Yarinbab, T., & Assefa, M. (2018). Utilization of HMIS Data and Its Determinants at Health Facilities in East Wollega Zone, Oromia Regional State, Ethiopia: A Health Facility Based Cross-Sectional Study. *Research and reviews: journal of medical and health sciences*, 7, 4-9.