



## CHAMPS Case Study

# Impact of sharing cause of death results with mothers and families in improving healthcare seeking behavior and pregnancy outcomes in subsequent pregnancies, Baliakandi, CHAMPS Bangladesh

**Shahana Parveen<sup>1</sup>, Dalia Yeasmin<sup>1</sup>, Farhana Hasnat Khan<sup>1</sup>, Syead Tamim Mahmud<sup>1</sup>, Rajib Biswas<sup>1</sup>, Afruna Rahman<sup>1</sup>, Afsana Afrin<sup>1</sup>, Chinelo Ogbuanu<sup>2</sup>, Portia C. Mutevedzi<sup>2</sup>, Emily S. Gurley<sup>3</sup>, Shams El Arifeen<sup>1</sup>, Mohammed Zahid Hossain<sup>1</sup>**

1. Child Health and Mortality Prevention Surveillance (CHAMPS), Bangladesh, icddr,b, Bangladesh
2. CHAMPS Program Office, Task Force for Global Health (TGFH), Atlanta, GA
3. Johns Hopkins University, Maryland, USA

## Background and Context

Bangladesh has made remarkable progress in reducing under-five child mortality, from 144 deaths per 1,000 live births in 1990 to 29 in 2020. However, the decline in neonatal mortality has been comparatively slow, decreasing from 27 to 20 deaths per 1,000 live births over the past decade.<sup>1,2</sup> At the current pace, achieving the Sustainable Development Goal (SDG) 3 target of reducing neonatal mortality to 12 per 1,000 live births by 2030 remains a significant challenge.<sup>2</sup> To reach this target, understanding the precise causes of death is crucial for designing appropriate interventions and guiding effective policy-making or revisions.

In this context, the Child Health and Mortality Prevention Surveillance (CHAMPS) initiative has been operating in Bangladesh since 2017, offering minimally invasive tissue sampling (MITS) to determine the causes of stillbirths and deaths among children under five. From its inception in 2017 to December 2024, CHAMPS Bangladesh has collected MITS samples from over a thousand stillbirths and under-five deaths. More than 92% of these cases involved perinatal deaths (stillbirths and neonates less than seven days old). The CHAMPS-Bangladesh expert panel (DeCoDe) identified several maternal conditions contributing to these perinatal deaths, including placental/cord complications (16%), hypertension-related disorders (13%), and infections (8%). The panel also concluded that over 90% of these perinatal deaths were preventable and emphasized that timely and high-quality antenatal care (ANC) could substantially reduce such losses.

Based on these findings, the CHAMPS team initiated to communicate targeted prevention messages to families of MITS participants who experienced a perinatal death, during the cause of death (CoD) result-sharing sessions. This study aimed to assess the impact of the family CoD result-sharing sessions on the subsequent pregnancies of MITS participants' mothers.

## Intervention

### Key components of the intervention

The intervention was two-pronged, involving both results sharing and systematic follow up of each MITS mothers and continues who subsequently became pregnant:

#### i) Sharing cause of death result through family feedback session

The process of sharing CoD results with MITS participant families at the CHAMPS Bangladesh site begins with preparing a descriptive CoD report within approximately 5.5 months of the MITS procedure. This is done after the expert panel reviews all test reports and supporting information and assigns a specific CoD for each case. The team then contacts the family to schedule a household visit and asks them to invite whom they would like to attend the session.

A gender-balanced team, consisting of one physician and one social and behavioral sciences (SBS) staff member conducts the household visit at the scheduled time. During the session, they explain the CoD result in lay language, provide both case-specific and general prevention messages, and address any questions from family members or other attendees. The session usually includes participants in three levels: family level (parents, family decision-makers, extended relatives); community level (neighbors, community members); and government community health workers, who accompanies the CHAMPS result sharing team, observe the session to strengthen their understanding of CoD and related prevention measures, enabling them to better explain the importance of timely healthcare during their own assigned activities. At the end of the visit, a hard copy of the CoD report is provided to the family to ensure the transparency of our activity and for their further reference for a next pregnancy. **[Figure 1]**

#### ii) Follow up of MITS mothers

In CHAMPS Bangladesh, follow-up with MITS mothers begins three months after the MITS procedure, when a physician of the site's call-in center contacts the mother to inquire about her general health and pregnancy status. If the mother reports being pregnant, the physician counsels her on the importance of attending antenatal care (ANC) visits and is provided with the CHAMPS call-in center number for medical support. Once the pregnancy is confirmed, the physician continues monthly follow-up calls with the mother until the pregnancy outcome is known. This proactive follow-up is designed to promote maternal health and improve pregnancy outcomes through early engagement and continuous support to mothers from CHAMPS. **[See Figure 2].**

Share CoD report within 5.5 months of MITS

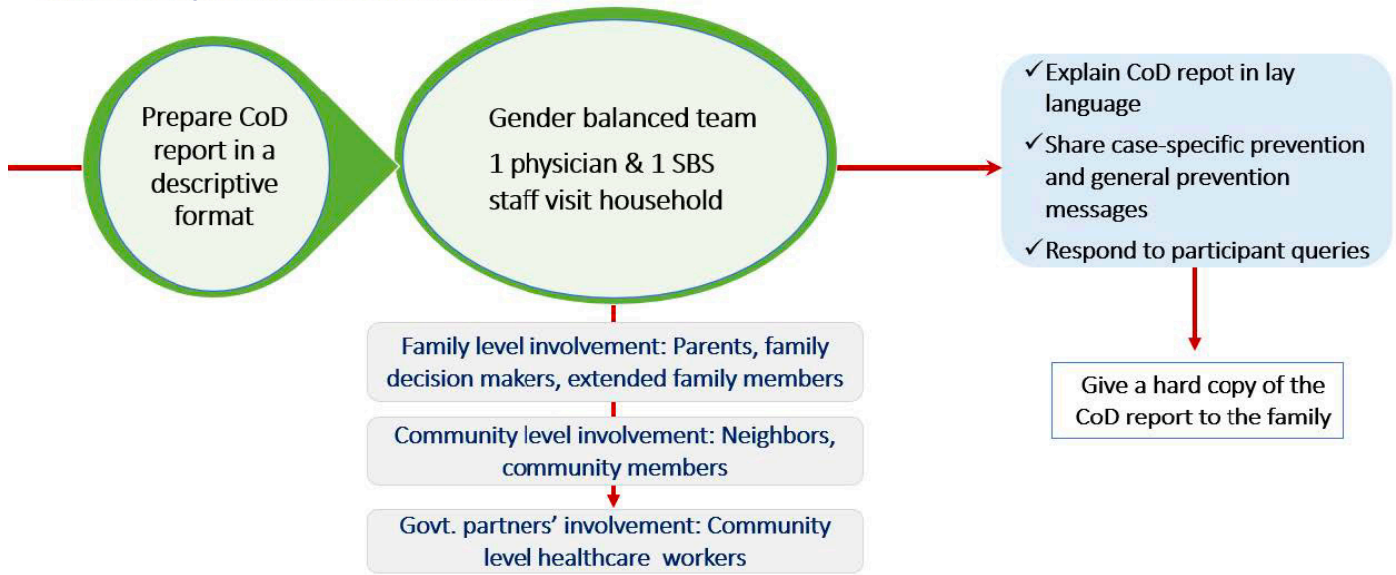


Figure 1. The process of sharing DeCoDe results with MITS families, CHAMPS Bangladesh.

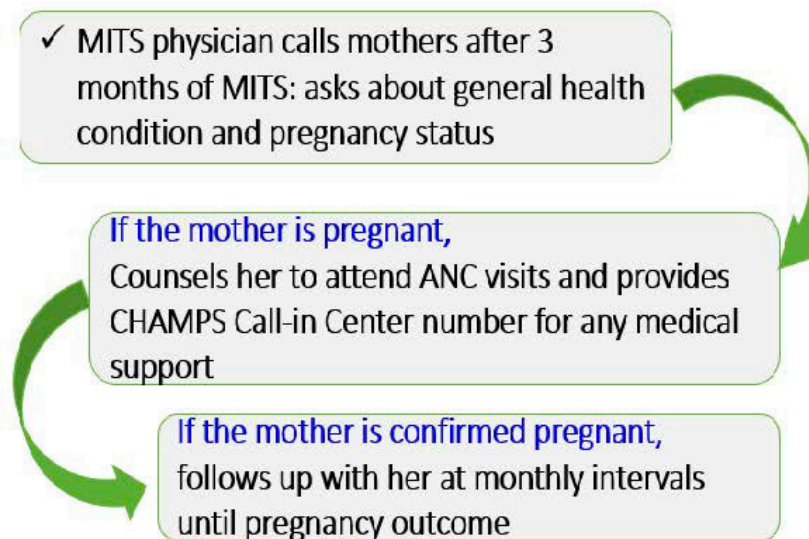


Figure 2: Follow up of MITS mothers, CHAMPS Bangladesh

## Impact of interventions

### Data analysis:

To assess the impact of the intervention, both quantitative and qualitative methods were used.

#### 1. Quantitative assessment:

To compare changes in pregnancy care and outcomes before and after a MITS experience, we conducted quantitative analysis between mothers in the intervention group and the comparison group:

##### **Intervention group:**

The intervention group comprised mothers in Baliakandi (one of the catchment areas of the site) who experienced a perinatal death and participated in MITS between September 2017 and December 2024. Of the 258 total MITS cases during this period, 224 involved perinatal deaths, among them CoD results were shared with 216 families. From this group, 84 mothers later had a subsequent pregnancy and were included in the analysis as the intervention group. This allowed for evaluation of the potential influence of MITS result-sharing on healthcare seeking behavior and pregnancy outcomes in subsequent pregnancies [Figure 3].

##### **Comparison group:**

The comparison group included 677 mothers from the same geographic area who also had a similar

experience of perinatal deaths but were not enrolled in MITS (this includes cases approached for MITS but only consented for Non-MITS, as well as cases never approached for MITS consent). Mothers in this group who subsequently became pregnant during the same period as the intervention group were considered as the comparison group in this study [Figure 3].

#### 2. Qualitative assessment:

Through the qualitative assessment we explored-

- the perceptions of mothers, family members and community members on the influence of MITS results sharing during subsequent pregnancies.
- the contribution of family result-sharing sessions in strengthening the capacity of government community-level health workers in their routine activities.

We approached first 40 eligible enrolled MITS mothers who subsequently became pregnant and based on their availability, interviewed 27 mothers. In some cases, their family members (n=04) were also participated in the interview. Additionally, we interviewed 10 government community level health workers who had accompanied the CHAMPS team during a result sharing session.

Furthermore, we reviewed the immediate reactions, queries and responses of attendees from all 36 result sharing sessions.

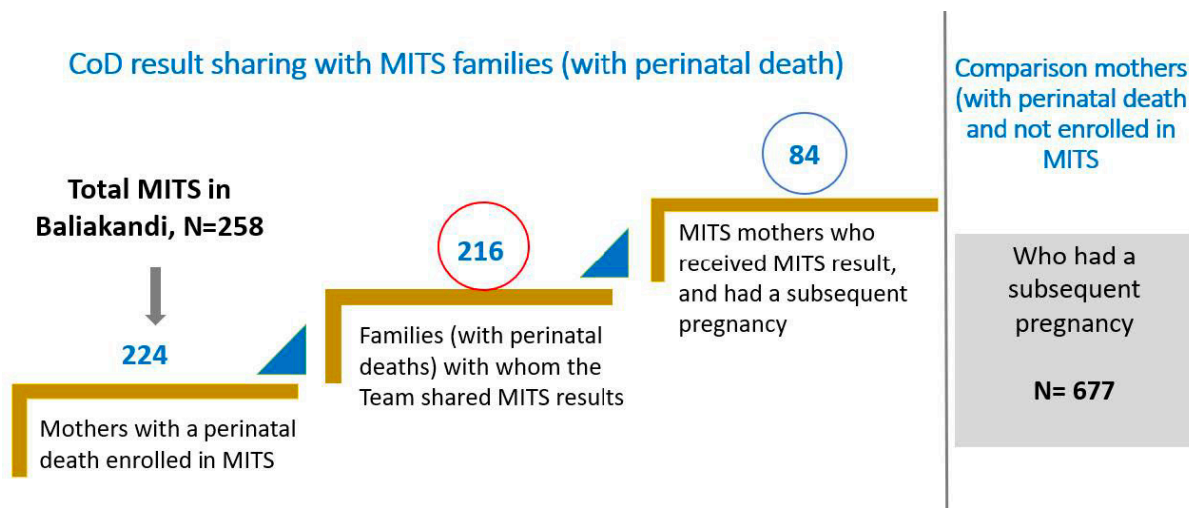


Figure 3: MITS mothers and comparison mothers with subsequent pregnancies, Baliakandi, CHAMPS Bangladesh, September 2017 - December 2024.

## Results

### Quantitative

The comparison shows that among the intervention group, the proportion of mothers attending 1 to 3 ANC visits declined from 51% in MITS-associated pregnancies to 37% in post-MITS pregnancies, while optimal ANC uptake ( $\geq 4$  visits) increased significantly from 33% to 49% ( $p = 0.001$ ). Mothers with no ANC also rose slightly, from 5% to 14% [Figure 4.1].

On the other hand, in the comparison group, 1 to 3

ANC visits also decreased from 44% in death associated pregnancies to 37% in subsequent pregnancies, whereas optimal ANC uptake increased from 38% to 49% ( $p < 0.001$ ). The proportion with no ANC also rose from 6% to 12% [Figure 4.2].

The chi-square tests confirmed significant improvements in ANC uptake in both groups (intervention:  $p = 0.001$ ; comparison:  $p < 0.001$ ). Notably, the proportion of mothers attending receiving four or more ANC visits in subsequent pregnancies was greater in the intervention group (1.43) compared to the comparison group (1.27).

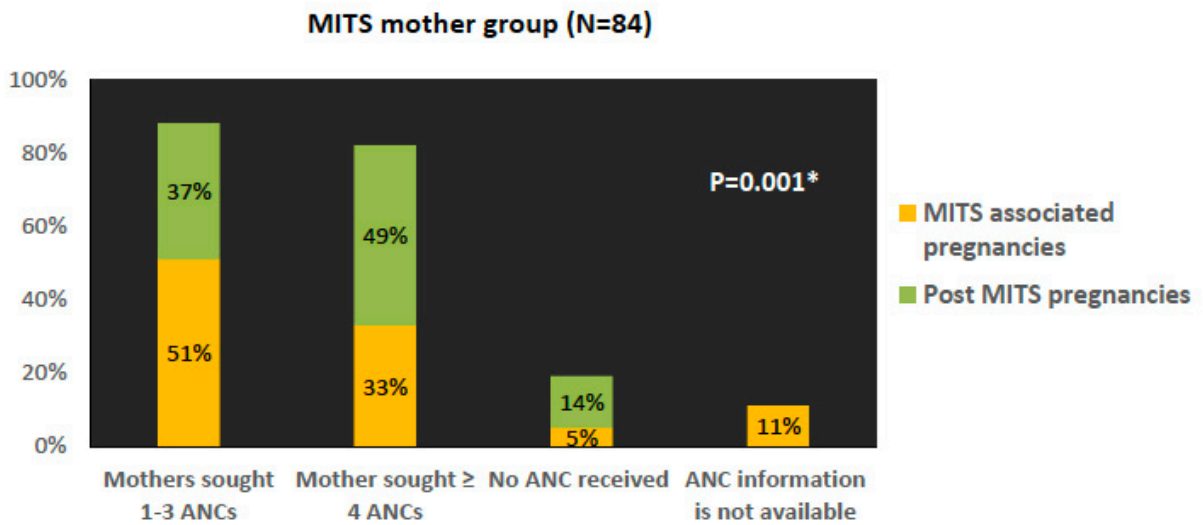


Figure 4.1: ANC care attendance among MITS mothers in their subsequent pregnancies, Baliakandi, CHAMPS Bangladesh, September 2017 - December 2024.

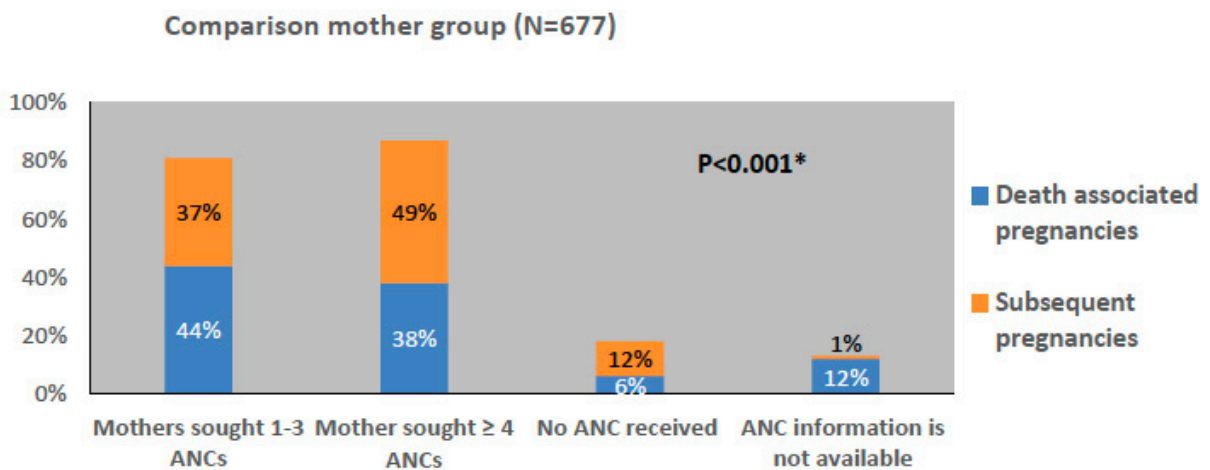


Figure 4.2: ANC attendance among comparison mothers in their subsequent pregnancies, Baliakandi, CHAMPS Bangladesh, September 2017 - December 2024.

## Qualitative findings

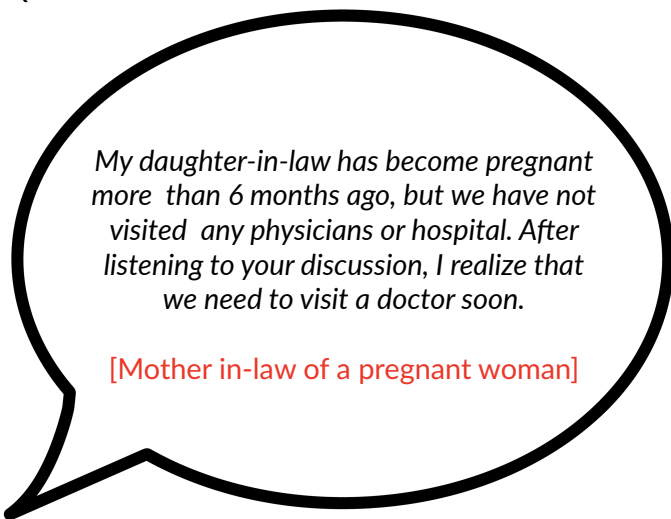
### *Individual level: Seeking pregnancy care during subsequent pregnancy*

From the interviews, most mothers reported noticeable changes in their health-seeking behavior during subsequent pregnancies. They explained that these changes were influenced by their past experience of child loss and the information received during MITS result-sharing sessions. Of the 27 mothers interviewed, 70% (19/27) attended four or more ANC visits, with 63% initiating ANC within the first trimester (8-12 weeks). In contrast, 30% (8/27) did not seek any ANC during first 16-weeks of their pregnancies but deliberately underwent ultrasound sonography (USG) after the fifth month of pregnancy. The perception of 'no need to go for an ANC until any complication' drove as the predominant factor for not seeking any care within recommended timing of first ANC visit. Most mothers sought care from qualified physicians at private chambers or clinics. They also reported adhering to the advice provided by MITS physicians, including attending ANC on time, taking adequate rest, consuming nutritious food, and exercising caution in their daily movements during pregnancy period.

### *Family level*

Female family elders, typically mother in-laws or sister in-laws, who are the influential decision makers, expressed that the prevention messages explained by (CHAMPS) physicians during the result-sharing sessions were very helpful and stated that they would follow the advice. (See Quotation A)

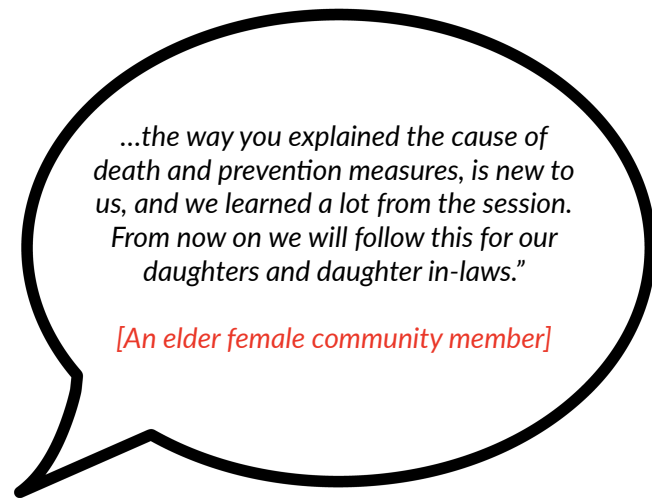
### Quote A:



*My daughter-in-law has become pregnant more than 6 months ago, but we have not visited any physicians or hospital. After listening to your discussion, I realize that we need to visit a doctor soon.*

*[Mother in-law of a pregnant woman]*

### Quote B:



*...the way you explained the cause of death and prevention measures, is new to us, and we learned a lot from the session. From now on we will follow this for our daughters and daughter in-laws."*

*[An elder female community member]*

### *Community level*

Community members who attended the result-sharing sessions reported that they learned important new information from these discussions. Elderly female community members emphasized that everyone should know the prevention messages, particularly those involved in decision making in a family, so they could apply them to safeguard their own family members. (See Quotation B)

### *At the government Community Health Worker (CHW) level*

Government CHWs reported that participating in the result-sharing sessions helped them gain a better understanding of causes of death. They also learned how to connect CoD findings with preventive measures and share this information with families in a structured way. They emphasized that this knowledge improved their ability to raise awareness among mothers about necessary precautions and motivate them to seek timely and appropriate healthcare to prevent future deaths.

## Lessons learned & recommendations

Feedback from the community result sharing sessions suggests that family follow-up result-sharing sessions could serve as an effective platform for disseminating information on the leading causes of death (CoD) and associated preventive measures. These sessions not only help to convey the seriousness and intensity of the problem but also create opportunities to engage MITS participant mothers as advocates who can share and reinforce key messages within their communities. By leveraging this approach, the sessions have the potential to promote greater awareness, encourage timely ANC, and increase care seeking from qualified physicians on time, ultimately contributing to improved maternal and child health outcomes.

## References

1. National Institute of Population Research and Training (NIPORT), ICF.: Bangladesh Demographic and Health Survey 2022. In.; 2024.
2. SDG Target 3.2 End preventable deaths of newborns and children under 5 years of age [[https://www.who.int/data/gho/data/themes/topics/sdg-target-3\\_2-newborn-and-child-mortality](https://www.who.int/data/gho/data/themes/topics/sdg-target-3_2-newborn-and-child-mortality)]
3. M., Sarker, M., & Young, L. (2019). Impact of mHealth messages on maternal and newborn health care practices: A quasi-experimental study in rural Bangladesh. *BMC Medical Informatics and Decision Making*, 19, 102.

## Aknowledgments

- CHAMPS participants and their families
- CHAMPS teams in Bangladesh



**CHAMPS**