

## Case Report

# Verbal autopsy: the vital tool to bridge the gaps between health care delivery system and maternal deaths

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### ABSTRACT

In settings where the majority of deaths still occur at home and where civil registration systems do not function, there is little chance that deaths occurring away from health facilities will be recorded at all, let alone certified as to the cause or cause of death. As a partial solution to this problem, verbal autopsy has become the primary source of information about causes of death in populations lacking vital registration and medical certification. As maternal deaths have still not reached the goal decided in MDG, we need to improve health services. Verbal Autopsy is an excellent tool to help finding the gaps between causes of maternal deaths, which can help greatly to find out the loop falls. Structured questionnaire was designed with the help of verbal autopsies for maternal deaths by WHO, to elicit information regarding the deceased and progress of her illness towards death. Prior consent was taken from the relatives of deceased. Cause of death according to verbal autopsy were puerperal sepsis and postpartum haemorrhage in case one and case two respectively. In areas where vital registration system is lacking or weak, verbal autopsies can provide a standard way to reach cause of maternal deaths.

**Keywords:** Verbal autopsy, CBMDR, Three delay model

## INTRODUCTION

### Maternal mortality

According to the tenth revision of the International Classification of Diseases (WHO, 1992), a maternal death is defined as the following: The death of a woman while pregnant or within 42 days of termination of the pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental causes. According to SRS 2007-2009 MMR in India was 212/1 lac livebirths.<sup>1</sup> While according to SRS 2010-2013 MMR decreased 34 points to 178/1lac livebirths.<sup>2</sup> According to a study by Hogan et al India's maternal

mortality per 1 lac live birth was 200-299/1 lac live births.<sup>3</sup>

Approaches for measuring maternal mortality:<sup>4</sup>

In the absence of complete and accurate Civil Registration System, MMR estimates are based upon variety of methods:

- Civil registration system
- Household survey
- Sisterhood methods
- Reproductive age mortality studies (RAMOS)
- Verbal autopsy
- Census

The determinants of maternal health and mortality interact to produce a complex set of circumstances that involve clients, communities, the health system, and the government.

These dynamics become urgent when a life-threatening obstetric emergency occurs. The Delay Model (Thaddeus and Maine, 1994) outlines the three delays in obtaining emergency obstetric care and provides an elegant example of these interactions:<sup>5</sup>

**Delay one**

Recognizing danger signs and deciding to seek care are influenced by a woman’s knowledge of pregnancy-related health risks and by her ability to access the resources of her family and community. Poor families in communities with limited information and resources tend to delay decision making or make inappropriate choices when complications arise.

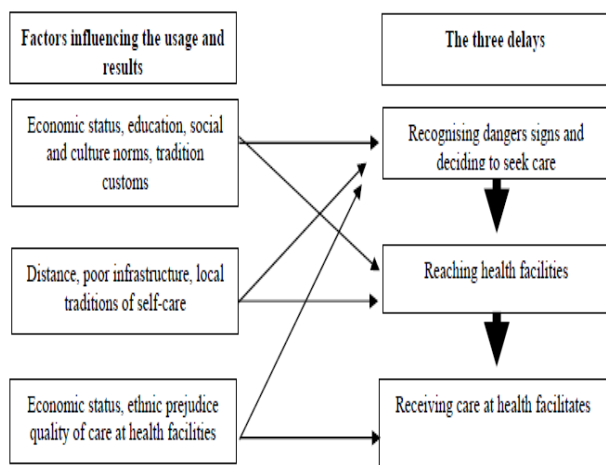
**Delay two**

Reaching appropriate care is exacerbated for poor rural women and their families, who tend to face higher and less predictable costs of emergency transportation because of distance and poor infrastructure.

**Delay three**

Receiving care at health facilities is influenced by economic status, discrimination based on gender or ethnic prejudice, and availability of providers. Poor families often have to borrow money to pay up front when complications arise.

Frequently, households do not have ready access to sufficient cash in time, and often, credit is withheld for needed supplies, medications, and services.



**Figure 1: The three delay model in obtaining emergency obstetrics care by Lule et al.<sup>6</sup>**

**Qualitative study**

Justification of qualitative study: In settings where the majority of deaths still occur at home and where civil registration systems do not function, there is little chance that deaths occurring away from health facilities will be recorded at all, let alone certified as to the cause or cause of death. As a partial solution to this problem, verbal autopsy has become the primary source of information about causes of death in populations lacking vital registration and medical certification.<sup>7</sup>

Community based maternal death review (CBMDR) with the use of verbal autopsy tool. Verbal autopsy is an interview carried out with family members and/or caregivers of the deceased using a structured questionnaire to elicit signs and symptoms and other pertinent information that can later be used to assign a probable underlying cause of death. Verbal autopsy is an essential public health tool for obtaining a reasonable direct estimation of the cause structure of mortality at a community or population level, although it may not be an accurate method of attributing causes of death at an individual level.<sup>8</sup>

Structured questionnaire was designed with the help of Verbal Autopsies for Maternal Deaths by WHO, to elicit information regarding the deceased and progress of her illness towards death.<sup>9</sup> In depth interview of the respondent (relative /caregiver) was taken using a structured questionnaire to elicit cause of death. The interviews were held in respondent’s home lasting 45- 60 minutes. Prior permission was taken to visit their home.

During the data collection if any house was found having any maternal death during last one year, was included in study for in depth interviews to trace the cause of maternal death. Verbal consent was taken from the respondent before the interview. Structured interviews are mentioned as individual cases.

**CASE REPORT**

**Case 1**

**Respondent: mother in law of the woman**

The 30 years old Hindu woman delivered on 29<sup>th</sup> November 2010 at home by the trained dai at the village Latipar. Delivery was normal and she delivered a 2.9 kg female child. Placenta was delivered. Baby is alive and of 3 months old at time of interview. According to her mother in law the cause of death was “akhaa sharir ma rasi thai gai hati”(infection in whole body).

On the 2<sup>nd</sup> day of labour 30<sup>th</sup> November 2010 she developed high grade fever. She took treatment of fever at a private practitioner at latipar. After the condition worsened she was shifted to another hospital on 5<sup>th</sup> December 2010. As the conditioned worsened more and

appropriate facilities were not available there, she was shifted in ICU of tertiary hospital of the area on 6<sup>th</sup> December 2010. At that time she had high grade fever, pallor of the body and breathlessness. She died in ICU of tertiary hospital on 7<sup>th</sup> December 2010. She did not have other complaints like bleeding p/v, convulsions etc.

**Case 2**

**Respondent: sister of the deceased**

A 40 years old Muslim woman had a full term normal delivery of a female child on 18<sup>th</sup> September 2010 at home by an untrained dai, and after giving birth to the child she died within 3 hours. Her baby is still alive and 6 months old at the time of interview. She delivered at home by an untrained die, and soon after the baby delivered, she started bleeding badly. The umbilical cord of the baby was not yet cut and also the placenta was not yet delivered. She was bleeding heavily and she wetted her cloths and whole floor also.

As her relatives came to know that, they brought her to the nearest PHC Aamrol in chhota haathi (vehicle), which was 12 kms away. Medical officer was available there, and he cut the umbilical cord. As he was not able to manage the vaginal bleeding he decided to take her to the health facility where emergency obstetric care was available. He called 108 ambulance and he brought her to the tertiary care hospital. But unfortunately she died on the way to health Facility. Placenta was not delivered when she died.

**DISCUSSION**

In study conducted by Sachdev PS et al pregnancy related sepsis accounts for 15% of deaths but it was leading cause of deaths in Hyderabad.<sup>10</sup>

Starrs A in his study shows that, on the basis of verbal autopsy data and hospital records it is estimated that approximately 25% of maternal deaths are caused by haemorrhage, 15% by infection, 12% by pregnancy-induced hypertension, and 8% by obstructed labour.<sup>11</sup> In a pilot study conducted by H and FW, the main cause of death was observed to be PPH (17%), post-partum septicaemia (13%) and anaemia (13%).

About 24% of the deaths were observed to be during antenatal period, about 70% deaths in postnatal period and 7 % were found to be during delivery. 45% of the deliveries were conducted by untrained dais.<sup>12</sup> 59.14% deaths were occurred in health institutes while 24.73% deaths occurred at home. 16.13% deaths occurred on the way to health facility.

14.89%, 24.47%, 18.09%, 14.09%, 14.89% and 27.66% deaths were occurred in women with 1, 2, 3, 4 and 5<sup>th</sup> parity respectively. In a study conducted by Zabin S et al. the major causes of Maternal Mortality found were

obstetric haemorrhage (44%), PPH (30.1%), PIH (21.8%) and pregnancy related sepsis (15%). Mortality amongst Primigravida, gravida 2-5, gravida 6-10 and gravida >10 was 21%, 41.4%, 24.1% and 13.5% respectively. From the women who died majority (51.1%) were from the distance of >50 kilometres from the health facility, while 37.6% and 11.3% were from the distance of 20-50 kilometres and <20 kilometres respectively.<sup>13</sup>

**Table 1: Variables of deceased case studies.**

Variables of deceased		Case 1	Case 2
Age		30	40
Education		4 <sup>th</sup> standard	Illiterate
Gravida		3	8
Para		2	8
Abortion		1	0
Last delivery	Type of delivery	Normal	Normal
	Place of delivery	Home	Home
	Person who conducted delivery	Trained dai	Untrained dai
Time of death		7th day of delivery	Within 3 hours of delivery
Place where she died		In hospital	On the way to hospital
Essential symptom <sup>9</sup>		High fever for > 24 hours after delivery Breathlessness	Sever Vaginal bleeding within 42 days of termination of pregnancy
Supportive symptom <sup>9</sup>		Pallor of whole body	Retained placenta-placenta delivered >1 hour after delivery
Cause of death <sup>9</sup>		Puerperal sepsis and severe Anaemia	Postpartum haemorrhage
Distance of health facility		60 km.	60 km
Delay	In seeking care		
	In arriving at appropriate level of care		✓
	In receiving care at institution	✓	

According to WHO fact sheet (November 2010) Maternal Mortality is higher in rural areas and among poorer and less educated communities.<sup>14</sup> The importance of MDR lies in the fact that it provides detailed information on various factors at facility, district, community, regional and national level that are needed to be addressed to reduce maternal deaths. Analysis of these deaths can identify the delays that contribute to maternal deaths at various levels and the information used to adopt measures to fill the gaps in service.<sup>15</sup>

The main purpose of CBMDR is to identify various delays and causes leading to maternal deaths, to enable the health system to take corrective measures at various levels. Identifying maternal deaths would be the first step in the process, the second step would be the investigation of the factors/causes which led to the maternal death – whether medical, socio-economic or systemic, and the third step would be to take appropriate and corrective measures on these, depending on their amenability to various demand side and communication interventions.<sup>15</sup>

## CONCLUSION

Verbal autopsy is a standard tool for analysing the maternal cause of death. In areas where vital registration system is lacking or weak, verbal autopsies can provide a standard way to reach cause of maternal deaths. According to which the health system can be strengthened to bridge the gap between three delays and the maternal deaths in the community.

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