# MOTHERS' PERCEIVED CAUSE OF DEATH :a survey of infant mortality in Butajira, Ethiopia

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**ABSTRACT:** In an attempt to explore mother's perceptions about the causes of infant deaths, 156 mothers whose infants died before attaining their first birthday were interviewed immediately after the death of their infants. Although the causes of death were ill defined and vague in the majority of the cases, 19% attribute "evil spirits" as the main cause of death. However, they claimed that the common (42%) symptoms prior to death were vomiting/diarrhoea and cough/fever. More than half of the mothers never sought any form of health care, while only 30% visited modern health care unit. Mother's perception of the cause of death significantly (p<0.001) interfered with her decision to seek treatment. As long as causes of deaths are associated with supernatural beliefs, mothers will be reluctant to use modern medical services. The importance of IEC to raise the level of health awareness of the community and modify their attitude and behavior accordingly so as to enable them make informed decisions for timely and appropriate action is also discussed.

## INTRODUCTION

Health for All by the year 2000 poses greater challenge for the infants than for other segments of the population. Several attempts are being made to obtain information on infant morbidity and mortality by all health workers, especially at the primary health care level (1-6). Mortality data are useful for formulating policies in health and development sector in general. The purpose of collecting health information is for health care planning, programming and evaluating. In the absence of more reliable and complete data, mortality data are, with all their current weaknesses being used to a large extent by health care planners (7-9).

Studies conducted on infant and child mortality indicate that diarrhoea and acute respiratory tract infections are still the leading causes of morbidity and mortality in developing countries (1-5,10,11). The factors commonly identified as determinants are maternal education and occupation, duration of breast-feeding, number of children, household income, birth-weight of the infant, birth order and interval.

At present, commonly used data-bases for planning in developing countries are documentary sources. The limitations of such sources are clear to health care planners and epidemiologists. Population-based surveys are needed to provide a more complete picture.

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Because the basic idea of community health services, among other functions, is to enable the community to diagnose its own problems and to find out how it views disease causation and causes of death. Assessment of symptoms and causes of deaths as perceived by the community through interview surveys would therefore be of importance.

## OBJECTIVES

The objectives of this study were:
1. to find our what mothers understand about causes of infant deaths;
2. to obtain information on actions taken regarding the infants prior to their deaths.

## STUDY POPULATION AND METHODS

The study was carried out in southern Shoa Administrative Region in a sub-district (Woreda), 130 km south of Addis Ababa, where a base-population of 29,000 was enumerated in 9 Peasants' Associations (12). The basic demographic data were collected during February and March 1986. The two Peasants' Associations were excluded because they were under the process of villagization during study, which was conducted between January and July 1987.

Information on infant mortality was collected from mothers using questionnaires. Enumerators who were previously trained and had worked for a census and demographic surveillance were given additional training on the procedure for collecting information on infant deaths from mothers. A procedure known as 'verbal autopsy", which is a method of assessing the most probable causes of death by constructing a standard questionnaire from algorithms of symptoms of common killing diseases, was used (1,10). The nurse in charge of Butajira Health Center went with the team to the field as a supervisor.

The variables for which data were collected were:

*For the infant:* date of birth, date of death, age at death, sex, weight at birth (assessed as small, normal or big by the mother), shape at birth (assessed as well-shaped or grossly malformed by the mother), symptoms prior to death, duration of the symptoms, assistance obtained, treatment given, admission to health care unit, attendance at Maternal and Child Health clinics immunization status.

*For the mother:* age in years, age at first marriage, number of marriages, religion, ethnicity, parity, duration of work during pregnancy, number of children ever born alive by sex, number of children alive at present by sex, gestational age, place of delivery, mode of delivery, attendant at delivery, mother's perception of the causes of death.

The study was both retrospective and prospective, in the sense that infants who died before attaining their first birthday and those who were alive but who died at subsequent visits to individual houses, were registered in eight of the ten Peasants' Associations. The occurrence of the deaths was further ascertained by the chairmen or other officials of the Peasants' Associations, as the relatives had to be accompanied to the graveyard or church by elder members of the "Edir" (association of members for death ceremonies). However, there would be a possibility that few of the dead infants might be excluded as they may not be buried in officially designated burial places. Thus, information was obtained on 143 infant deaths and 16 still-births from 159 mothers.

## DATA ANALYSIS

Data were processed using the IBM PC. Simple descriptive statistics and contingency tables are used in the analysis. Chi-square test is used to test significance.

## RESULTS

A total of 143 infant deaths and 16 still-births were registered during the study period. Three of the deaths that occurred in children over the age of one year, were excluded from the analysis. Thus, a total of

140 infant deaths were analyzed; however, the 16 still-births were included only for the analysis on the causes of death.

### Characteristics of mothers

*Age:* 30% of the mothers were in the age-group 25-29 years, the median being 28.8 years. Eighty-eight percent of the mothers were married between the ages of 15-19 years, 85% of which was their first marriage.
*Parity:* Fifty percent of the mothers were below parity five.
*Literacy, ethnicity and religion:* Eighty-nine percent of the mothers were illiterate. Forty-nine percent were Meskan ethnically, and 83% were Muslims.

Eighty-six percent of the mothers had never attended antenatal clinics. Ninety-five percent of them were engaged in heavy work (carrying water from river, cultivating, cutting enset, going to a market carrying goods on the back and the like) till delivery of the infant.
*Place of delivery and birth attendant*: Ninety-seven percent had delivered at home assisted by untrained traditional birth attendant (88.3%) and self/neighbor (8.7%). An insignificant proportion (3.1%) had delivered at health care units.

Average number of children born alive was 4.7% per woman, while the average number of surviving children was 2.9 per woman, the number surviving being higher for females than males.

### Characteristics of infant deaths

*Sex, gestational age, birth-weight and shape:* Fifty-seven percent of the infants who died were males; most were born at term. Thirty-one percent were considered as small, 55% as normal and 14% as big babies. Thirteen percent of the small babies were pre-term. Overall, 96.5% were well-shaped (normal) compared to 3.5% who were grossly-malformed. Of the well-shaped babies, 15.5% were born pre-term. Infants classified as small were more likely to be grossly malformed than others (Table 1). There is a slight preponderance of grossly malformed babies born to mothers in the age group 15-19 years. Big babies were also born more to mothers of parity 4 and below, compared to those para-5 and above.

Table 1. Percent distribution of infant deaths by weight and shape

| Weight | Well Shaped | Grossly malformed | Total |
|--------|-------------|-------------------|-------|
| Small | 28.0 | 2.8 | 30.8 |
| Normal | 55.2 | 0.0 | 55.2 |
| Big | 13.3 | 0.7 | 14.0 |
| Total | 96.5 | 3.5 | 100.0 |

*Mode of delivery:* Ninety-two percent of the deliveries were vaginal vertex.
*Age at death, symptoms and duration:* Fifty-nine percent of the deaths occurred under the age of one month. Median age at death was 15 days. Major symptoms prior to death are as indicated in table 2 with a preponderance of cough and fever (21.4%) and vomiting/diarrhoea (20.7%). A significant number (25%) were also classified as others, which includes neonatal tetanus, prematurity, malaria, accidents, sudden death of infant, and the like.

Table 2. Number and percent distribution of symptoms prior to death

| Symptoms | Number | Percent |
|---|---|---|
| Vomiting/diarrhoea | 29 | 20.7 |
| Cough/fever | 30 | 21.4 |
| Swelling of body | 11 | 7.9 |
| Loss of weight | 6 | 4.3 |
| Others | 35 | 25.0 |
| Do not know | 29 | 20.7 |
| Total | 140 | 100.0 |

For the majority (77.3%) of the cases the symptoms lasted less than 15 days, 80.3% of these occurring in those less than two months of age at death (Table 3). Of the deaths which occurred below the age of two months, the highest rate (23.4%) occurred for mothers in the age group of 25-29 years and for parity below five (36.6%). 80% of the deaths of the grossly-malformed also occurred under the age of two months.

Table 3. Percent distribution of duration of symptoms by age at death

| Age at death in months | Duration of symptoms in days | | | | Total |
|---|---|---|---|---|---|
| | 0-14 | 15-29 | 30-44 | 45+ | |
| 0-2 | 62.1 | 4.1 | 0.7 | 1.4 | 68.3 |
| 3-5 | 7.6 | 4.1 | 0.0 | 1.4 | 13.1 |
| 6-8 | 4.8 | 2.1 | 2.1 | 0.7 | 9.7 |
| 9-11 | 2.8 | 3.4 | 0.7 | 2.1 | 9.0 |
| Total | 77.3 | 13.7 | 3.5 | 5.6 | 100.1 |

*Assistance sought:* Attempts were made by mothers to get assistance from health personnel in 30% of the cases. However, in the majority (51.4%) of the cases, nothing was done. No significant association was observed between mother's perception of symptoms and treatment sought.

Of those who visited health personnel, 69% were given treatment of one kind or another. In addition to treatment given by health workers, some 9.3% had also given roots/leaves of trees. The overall application of such treatment was 20%. Only 9.4% of the cases were admitted to a health care unit and 3.8% were partially immunized.

*Cause of death:* Evil spirits accounted for 18.6% of the causes according to them. The "bird of the sky", which the mothers believed was different from evil spirits, accounted for 13.5% of the causes (Table 4). The causes of

Table 4. Distribution of causes of death - Mothers' view

| Causes of death | Number | Percent |
|---|---|---|
| Allah's willing | 4 | 2.6 |
| Labor difficulty | 14 | 9.0 |
| Evil spirit | 29 | 18.6 |
| Diarrhoea/vomiting | 3 | 1.9 |
| Cough/fever | 10 | 6.4 |
| Refusal to suck | 6 | 3.8 |
| ARI | 3 | 1.9 |
| Bird of the sky | 21 | 13.5 |
| Others | 48 | 30.8 |
| No idea | 18 | 11.5 |
| Total | 156 | 100.0 |

death as perceived by mothers were very diverse and ill-defined and therefore coded as 'others' (30.8%). A significant association (p<0.01) was observed between mother's perception of the causes of death and treatment sought. Most mothers did not seek treatment for causes of death they attribute as supernatural ("evil spirit" or "bird of the sky").

Causes of deaths as assessed from the verbal autopsy showed that 21.1% were due to ARI, followed by neonatal tetanus (15.4%) and diarrhoea (13.5%). Still-births accounted for 10.3% of the cases (Table 5).

Table 5.  Causes of death as assessed from verbal autopsy

| Causes of death | Number | Percent |
|---|---|---|
| Still-birth | 16 | 10.3 |
| Prematurity | 15 | 9.6 |
| Neonatal tetanus | 24 | 15.4 |
| Malaria | 5 | 3.2 |
| ARI | 33 | 21.1 |
| Measles | 8 | 5.1 |
| Diarrhoea | 21 | 13.5 |
| Malnutrition | 7 | 4.5 |
| Accidents | 11 | 7.0 |
| Others | 16 | 10.3 |
| Total | 156 | 100.0 |

The major causes of deaths, ARI, neonatal tetanus and diarrhoea mainly occurred below the age of two months at death (Table 6).

Table 6.  Percent distribution of causes of death by age at death in months

| Cause of death | Age at death in months | | | | Total |
|---|---|---|---|---|---|
|  | 0-2 | 3-5 | 6-8 | 9-11 |  |
| Still-birth | 10.3 | 0.0 | 0.0 | 0.0 | 10.3 |
| Pre-maturity | 9.6 | 0.0 | 0.0 | 0.0 | 9.6 |
| Neonatal tetanus | 15.4 | 0.0 | 0.0 | 0.0 | 15.4 |
| Malaria | 0.6 | 1.3 | 0.6 | 0.7 | 3.2 |
| ARI | 14.5 | 3.8 | 1.3 | 1.5 | 21.1 |
| Measles | 0.0 | 0.0 | 1.3 | 3.8 | 5.1 |
| Diarrhoea | 6.6 | 3.0 | 2.9 | 1.0 | 13.5 |
| Mal- nutrition | 0.6 | 1.3 | 1.3 | 1.3 | 4.5 |
| Accidents | 1.9 | 2.7 | 1. 7 | 0.7 | 7.0 |
| Others | 8.8 | 0.9 | 0.6 | 0.0 | 10.3 |
| Total | 68.3 | 13.0 | 9.7 | 9.0 | 100.0 |

## DISCUSSION

Identifying health problems is one of the most important steps in the planning of health care interventions.  As there are serious limitations of the use of routine statistics for health care planning (13), a shift to information gathering through community-based surveys becomes not only mandatory but a necessity, especially when supported by local community participation.

Routine reporting systems even in established health care units are often inaccurate and incomplete. While 100% accuracy can not be guaranteed in such studies, at least completeness could be.

Given these shortcomings, the classification used for verbal autopsy, mothers' perception of the symptoms and causes of death, however crude, fairly accurately represents the nature of infant mortality that prevails in the community.  It also indicates the mothers' understanding of what constitutes an illness and her choice of actions to be taken regarding the infant.

Low birth-weight as an important indicator of the risk of survival of a baby and its healthy growth and development is an already established fact (14,15,16).  Low birth-weight rate for East Africa is reported as 12% (17).  From various hospital statistics in Ethiopia, this rate is between 9-11% (18).  When expected number of live-births and low birth-weight rates are calculated for the study area, the 31% of the babies described by mothers as small at birth yields a low birth-weight rate of 21% which is almost twice of those reported from institution-based systems.  Of course, the birth-weight in this study was as assessed by the mother and it may not be accurate; thus the difference could be due to the methodology.  However, we do know that the birth-weight measurements taken within health care units are also subject to many errors.  In a similar but larger survey (1), the low birth-weight rate was 12.2% and was the probable cause of death in 17.9% of the cases of infant mortality.

Illiteracy rate is high by any standards.  Several studies have shown an association between literacy of mothers and infant mortality (4,19-22).  The utilization of antenatal clinics is almost non-existent.  In

addition, almost all mothers (95%) were engaged in a heavy work till delivery of the infant. The deleterious effect on the foetus of heavy work during pregnancy is already documented (23,24).

Of the 140 infant deaths, 68.3% occurred under the age of two months. Median age at death was 15 days indicating high and early loss of life.

Major symptoms prior to death were cough and fever, vomiting and diarrhoea. Mothers also gave diverse, often unclassifiable symptoms on several (25%) occasions. Although this calls for further refinement of the questionnaire, the symptoms of the three diseases most commonly associated with mortality still predominate. It is an indication that the Peasants' Associations have not fully benefited from the several crucial programmes launched in the country to improve child survival. Accelerated Child Health Development (ACHD), the components of which are Expanded Programme of Immunization, Control of Diarrhoeal Diseases, Acute Respiratory Tract Infections, Maternal and Child health & Family Planning, and Health Information System, are examples of such programmes (25). The programmes have remained within the institutions.

The symptoms lasted less than 15 days for 77% of the cases, pointing to the acuteness of the conditions. This probably did not give the mothers enough time to look for alternative sources of health care as only 30% took their infants to health personnel. It could also be a reflection of what constitutes an illness for them, when and what action to take then. Mother's perception for causes of death seems to play a major role in deciding whether or not to take the infant for treatment.

The admission rate to a health care unit represented only 9.4% of the deaths, an extremely low rate of utilization even for a terminal case. The goal of "Immunization For All by the year 1990" is also at stake for children in this community as only 3.8% were partially immunized.

Mothers still believe that evil spirits prevail. This raises questions as to how far we have been and are penetrating into the community to raise health awareness. This is an indication that insufficient progress has been made in enabling people to take their own health into their own hands. Certain essential activities could be undertaken by people in the community in their own homes. There is sound evidence to suggest the need for intensive educational effort through appropriate means and methods in order to positively influence health behavior in such communities. This is an important intervention that will promote improved mother and child health care including increased utilization of available health services and programmes.

Neonatal tetanus as a cause of death accounted for 15.4% of deaths. Only five of the studied Peasants' Associations have Traditional Birth Attendants. As most (88.3%) of the deliveries are attended by these cadres of health workers, it casts doubt as to how the umbilicus has been handled. The possibility of infection after circumcision can not also be ruled out.

The age at death and causes seem to correlate very well. Causes of death at different ages are definitely of greater importance for age-specific health care intervention planning

The present survey has provided information, although crude, which would be useful for planning of programmes for the improvement of infant survival. Where diagnostic tests can not be carried out, where the majority can not make use of the available resources due to various reasons, and where available service records and information systems can not give a true picture of the non-users, such means of arriving at probable causes of death would serve to plan relatively appropriate health care interventions for infants in particular and children in general.

The census carried-out in 1986, covering a population of 29,000, would serve as an epidemiological study-base, the potentials of which would be great for related studies on infant and child mortality. With the introduction of continuous surveillance of vital events, it would be possible to do analytical studies on such issues in the near future and thus build firm foundation for intervention programmes.

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