

## ORIGINAL ARTICLE

**PATTERNS OF MORTALITY IN JIMMA UNIVERSITY SPECIALIZED HOSPITAL DURING SEPTEMBER 2001 TO AUGUST 2002: RETROSPECTIVE STUDY.****Berhanu Andarge, (B.Sc) Mesele Bezabih (MD), Abraham H/Amlak, (MD)****ABSTRACT**

**BACKGROUND:** *Mortality studies provide fundamental information that can serve as a corner stone for monitoring health progress. So the aim of this study was to assess the patterns of mortalities to patients admitted to Jimma University Specialized Hospital.*

**METHODS:** *This retrospective study was conducted on patients admitted to Jimma University Specialized hospital from September 2001 to August 2002. Relevant hospital data were retrieved from the registration books and patient cards from different wards and central archives of the hospital retrospectively. and also from central archive of the hospital. The study included in-patient deaths in medical, surgical, pediatrics and obstetrics-gynaecology Departments; whereas deaths in the out patient Departments were excluded. The relevant data variables were documented onto specialized formats and subsequently grouping and analysis were made with appropriate statistical package.*

**RESULTS:** *Out of 5960 in-patients admissions 399 (6.7%) died within the study period with a crude death rate of 66.9 per 1000 patients. The overall male to female sex ratio was 1:4:1. From all wards, tuberculosis 59 (18.6%), maternal causes 44 (13.8%), cardiac diseases 41 (12.6%), accidental injuries 38 (11.9%) and pneumonias 37 (11.6%) were among the top ten causes of deaths. Most deaths occurred in medical wards 211 (51.9%) with tuberculosis 54 (26.5%) and cardiac diseases 36 (17.1%) as the most common causes of death. On the other hand, chronic liver disease and cardiac diseases contributed to high mortality rate by scoring the highest case-fatality rates 41.5% and 29.2%, respectively.*

*Accidental injuries such as physical violence 24 (34.8%) and road traffic accidents 14 (20.3%) in surgical wards; pneumonias 18 (24.3%), and malnutrition 12 (16.2%) in pediatrics wards were the most frequently documented causes of deaths. Ruptured uterus 13 (28.9%) and abortions 9 (20.0%) were the most common causes of mortalities in obstetrics-gynaecologic wards during this study period.*

**CONCLUSION:** *This study tried to surface out the patterns of deaths in south western part of Ethiopia where it hinted local health implementers for strong preventive precautions in order to lower deaths from easily manageable health problems such as obstetric conditions and physical injuries. The study could as well serve as a baseline for subsequent studies.*

**KEYWORDS:** *Mortality, Hospital death, Jimma*

**Correspondence to :** Dr. Mesele Bezabih, P.O.Box 196 Jimma, Ethiopia, Email: meselebezabih@yahoo.com

## INTRODUCTION

Mortality levels provide most fundamental and widely used measure of the health status of populations (1). Information about the causes of mortality has for many years served as a corner stone for monitoring health progress. Over the years, routine causes of death information systems have been established in many countries, particularly in the developed world. A handful of developing countries, primarily in Latin America and East Asia have established comparable standards for the reliability of their causes of death statistics (2). Developing countries are known to carry a heavy burden of diseases

and deaths, many folds higher than the developed countries. Generally hospital based data tend to overestimate mortality because of selection factor of over representation of the severely sick patients. Mortality data are useful for formulating policies in health sector development. In the absence of other reliable and complete data, mortality data with all their current weaknesses are used largely by health planners (3,4). In the absence of national mortality data, regional estimates are of value in pinpointing disadvantaged areas that may require specific measures and

responses. Mortality in Sub-Saharan Africa is high by world standard and life expectancy is commensurately low (1).

Of the 50 million deaths, which occur throughout the world each year, 39 million (78.0%) occurring in the developing countries and infectious and parasitic diseases account for almost one-half of all deaths (4). Life expectancy in Sub-Saharan Africa in general and in Ethiopia has decreased after the advent of HIV/AIDS, which has complicated the natural causes of deaths (5). Study done in Gondar showed a crude death rate of about 8%; tuberculosis being the commonest cause of death (35%) while in a report from Armed Force General hospital, liver diseases and physical injuries were commonest causes of death (6,7).

Therefore, this retrospective study aimed to determine the patterns of in-patients mortalities in Jimma Specialized Hospital in southwestern part of Ethiopia.

## MATERIALS AND METHODS

This retrospective study was conducted in Jimma University Specialized Hospital located in Jimma Town, 335km away from the capital Addis Ababa in Southwestern part of Ethiopia. The hospital serves for 10

million peoples within a very wide catchment area of about 250Km radius. Currently the hospital has 271 beds in the four major wards; medical (74), surgical (65), pediatrics (65), obstetrics gynaecology wards (58) beds. The study was conducted on hospital deaths during Sept. 2001 to Aug. 2002.

Using prepared questionnaire, data such as age, sex, residence areas (urban, rural) parity, and working diagnosis were retrieved from medical, surgical, pediatrics and obstetrics-gynecology wards' registration books as well as from the patients' cards at the archive center of the hospital. Deaths at the OPDs were excluded from the study. Ophthalmology and psychiatry wards were also excluded since no death was reported during the study period.

Health personnel that had a half-day briefing on how to retrieve the relevant data undertook data collection. Disease categories that were coded according to WHO criteria were decoded appropriately (8). Urban is defined when the town has more than 2000 inhabitants such as Jimma and others whereas Rural are those localities with allegedly less than 2000 inhabitants according to 1994 population censuses (4). The maternal death is defined

as death of women while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of pregnancy, from any cause related to or aggravated by the pregnancy or by its management but not from accidental or incidental causes (1). Abortion is defined according to the practice and teaching in Ethiopia, as an expulsion of conceptus material before 28<sup>th</sup> week of gestation while the number of births after the 28<sup>th</sup> week of gestation is named as parity (7).

Data were traced from hospital files and were written on data sheet that were then grouped, and analyzed by use of SPSS 11.0 version statistical package. Descriptive statistics were utilized for frequency distribution and chi-square test to study association between groups. P-value was considered significant when its value was less than 0.05.

Before commencing the data collection written request were delivered to the hospital Director and other appropriate bodies. Data retrieval system was secured from the wards registration books and central hospital archive. Names and card numbers were deleted and the WHO coding lists were decoded accordingly. Confidentiality of information as well as accuracy of data was maintained. The

cards of the deceases served as checklist for checking the accuracy of the registration books records.

## RESULTS

Out of 5940 patients admitted to Jimma specialized hospital during the study

period, 399 (6.7%) were registered dead while being treated in the hospital. Male to female death ratio was 1:4:1. Most frequent deaths were recorded between 25-34 year age group, accounting for 105 (26.3%)(Table1).

**Table-1.** Patterns of mortalities by age in Jimma Specialized Hospital, Jimma, Sep.2001-August 2002.

Age in years	Male	Female	Total (%)
< 1	20	11	31 (7.8)
1-4	14	11	25 (6.3)
5-14	17	13	30 (7.5)
15-24	37	29	66 (16.5)
25-34	48	57	105 (26.3)
35-44	36	27	63 (15.8)
45-54	33	10	43 (10.8)
55-64	17	5	22 (5.5)
65-74	6	3	9 (2.3)
> 74	4	1	5 (1.3)
Total	232	167	399 (100)

Among the ten top causes of deaths in all wards, tuberculosis 59 (18.6%) had the highest proportionate mortality ratio followed by maternal causes, cardiac diseases and accidental injuries accounting for 44 (13.8%), 41 (12.2%), 38 (11.9%), respectively. The highest case fatality rates were recorded in chronic liver diseases (41.5%) and cardiac diseases (29.2%) followed by tuberculosis (22.4%) and malaria (20.5%). There were 248 (62.6%)

urban and 167 (37.8%) rural deaths (Table 2). Over all mortality, as well mortality due to the ten top causes was high among males compared to females, ofcourse except the maternal cause. All (100%) malaria 24 out of 27 (88.9%) chronic liver disease, 29 out of 38 (76.3%) accidental injuries and 10 out of 14 (71.4%) intestinal obstruction deaths occurred in males (Table 3).

**Table 2.** Distribution of ten top causes of mortalities (n=318) by areas of residences, proportionate mortality ratio and case fatality rate, Jimma Specialized Hospital, Sep.2001-August 2002.

Causes of death	Total Admissions	Deaths		Total (†PMR)	Case fatality rate (%)
		Urban	Rural		
Tuberculosis	323	43	16	59 (18.6%)	18.3
Maternal causes	2212	17	27	44 (13.8%)	2.0
Cardiac diseases	177	18	22	40 (12.6%)	22.6
Accidents	241	21	17	38(11.9%)	15.8
Pneumonias	396	26	11	37 (11.6%)	9.3
Meningitis	185	20	7	27 (8.5%)	14.6
Chronic liver diseases	85	15	12	27 (8.5%)	31.8
Malaria	106	11	7	18 (5.7)	17.0
Malnutrition	89	6	8	14 (4.4%)	15.7
Intestinal Obstruction	108	6	8	14 (4.4%)	13.0
<b>Total (%)</b>	<b>3922</b>	<b>183(57.5%)</b>	<b>135 (42.5%)</b>	<b>318 (100%)</b>	<b>-----</b>

† Proportionate Mortality Ratio

**Table 3.** Distribution of ten top causes of mortalities (n=318) by sex, Jimma Specialized Hospital, Sept. 2001- Aug. 2002.

Causes of Death	Male	Female	Total
	No (%)	No (%)	No (%)
Tuberculosis	31 (52.5)	28 (47.5)	59 (100)
Maternal Causes	-	44 (100.0)	44 (100)
Cardiac Diseases	25 (62.%)	15 (37.5)	40 (100)
Accidents	29 (76.3)	9 (23.7)	38 (100)
Pneumonias	22 (59.5)	15 (40.5)	37 (100)
Meningitis	14 (52.0)	13 (48.0)	27 (100)
Chronic Liver Diseases	24 (88.9)	3 (11.1)	27 (100)
Malaria	18 (100)	-	18 (100)
Malnutrition	8 (57.1)	6 (42.9)	14 (100)
Intestinal Obstruction	10 (71.4)	4 (28.6)	14 (100)
Total (%)	181 (56.9)	137 (43.1)	318 (100)

Most deaths were recorded in the medical wards 211 (51.9%) where the most common causes of deaths were tuberculosis 54 (25.6%) and cardiac diseases 36 (17.1%). Accidental injuries (including physical violence and traffic injuries) 38 (55.1%) and intestinal obstruction 12 (17.4%) were the most common surgical causes of deaths in surgical wards and similarly pneumonias 18 (24.3%),

malnutrition 12 (16.2%), and meningitis 11 (14.9%) were dominant causes of deaths in pediatric wards. In Obstetrics-gynaecology wards the most frequent causes of deaths were ruptured uterus 13 (29.8%) followed by abortions 9(20.0%), and puerperal sepsis 7 (15.6%) (Table 3). During the study period, there were 1771 deliveries and 41 maternal deaths due to obstetric causes.

**Table 4.** Frequency Distribution of causes of mortalities in the four major wards, Jimma Specialized Hospital, September 2001- August 2002 in the four major Wards.

Causes of death	Frequency	Percent
Medical Wards		
Tuberculosis	54	25.6
Cardiac	36	17.1
Chronic Liver Disease	27	12.8
Pneumonias	19	9.0
Meningitis	16	7.6
Malaria	14	6.6
† Others	45	21.3
Total	211	100.0
Surgical Wards		
Physical violence	24	34.8
Motor accidents	14	20.3
Intestinal Obstruction	12	17.4
‡ Others	19	27.5
Total	69	100.0
Pediatrics Wards		
Pneumonias	18	24.3
Malnutrition	12	16.2
Meningitis	11	14.9
Gastroenteritis	5	6.8
Tuberculosis	5	6.8
Malaria	4	5.4
□ Others	19	25.7
Total	74	100.00



Table – 4 .....continued.

Obstetric gynecology wards		
	Frequency	Percent
Ruptured uterus	13	28.9
Abortions	9	20.0
Puerperal sepsis	7	15.5
Toxemia of Pregnancy	5	11.1
Ectopic pregnancy	2	4.4
@ Others	9	20.0
Total	45	100.0

† Includes AIDS, Relapsing fever, bronchial asthma, diabetes melitus, anemia & renal problems.

‡ Includes appendicitis, malignancy & infections.

□ Include Cardiac diseases, septicemia, tetanus & intestinal obstructions.

@ Include delivery without mention of complication and other problems associated with pregnancy.

## DISCUSSION

In this study, the crude death rate was 6.7% and similar frequency distribution reported by Habte-Gabir E et al (6). More deaths in males were documented in this investigation where, similar reports were surfaced in Lesotho and Swaziland but in Malawi more hospitals deaths were registered in females than in males (1). There were more deaths in males almost for most of the ten top causes of deaths but it was very high for malaria, liver disorders and accidental injuries, which could be ascribed to males' greater tendency to outdoors activities in day-to-day life in the

country. Similarly, liver diseases and physical injuries were more commonly reported in males in another literature (7). The most frequent causes of deaths among the ten top deaths in this study were tuberculosis, maternal causes, cardiac diseases, and pneumonia however, the national data showed tuberculosis, pneumonia, malaria, bacillary dysentery and accidents as the most common causes of death (10). Tuberculosis was found to be the most frequent cause of death and this disease has been reported in literature as the single most important infectious cause of death on earth accounting about three million deaths each year (11,12).

Tuberculosis as well was referred as the most common cause of death accounting for more than a third (35.0%) of all deaths in Northwestern Ethiopia (11). It was reported that tuberculosis as the first cause of hospital death in this country accounting for (27.0%) of all causes of deaths and one-fourth of all hospital admissions in the country (10).

Among the ten top causes of deaths from all wards, chronic liver diseases and cardiac diseases scored the highest case fatality rates and this could partly ascribe to the natural history (severity) of these diseases at time of clinical presentation (13). Liver diseases were reported to score two-third of all deaths in medical wards of Armed Forces Hospital in Addis Ababa depicting high level of case-fatality rate (9,11). A study conducted in North Gondar identified that pneumonia, diarrhea, and malnutrition as the main causes of deaths in children (14), which are virtually similar to our findings.

There is no vital registration system in Ethiopia nor has there been any national household survey carried out for the purpose of estimating maternal mortality (4). In this undertaking maternal cause of death were the second most common cause of all deaths and the most frequent causes of these maternal deaths were uterine

rupture, complications of induced abortion and puerperal sepsis. Similarly, studies in four Sub Sahara African countries indicated that hemorrhages, sepsis, toxemia, uterine rupture and complications of induced abortion accounting for about half to three quarters of maternal deaths in the hospitals studied (1). Maternal causes of deaths were relatively more common in rural settings as compared to urban ones in this study, which could be ascribed to limited transportation accesses to health services, little or no knowledge about antenatal clinic as well as family planning methods. However, maternal deaths in other studies were reported as more frequently in urban centers for more efficient and timely reports of induced abortions and other maternal causes of death in towns and cities (1). Maternal mortality rate in Ethiopia is one of the highest in Africa, and ruptured uterus was the most common cause of maternal death accounting for more than a quarter cases in this study and similar study in Adigrat Hospital documented similar figures (15). It was good if the confounding effect of AIDS was considered in this study how ever since, not all patients had serologic tests nor the study tried to investigate into this entity this couldn't happen. On the other hand the fact, the fact this study is

hospital based, overestimates mortality rates.

The study is concluded by recommending the need to scale up hospital services in order to sustain health needs of our community. Tuberculosis, maternal causes of deaths and cardiac diseases as well as traffic accidents and physical violence were registered as important causes of deaths. These events could herald the tip of the iceberg in this part of the country that can largely be preventable. Thus, in totality, this study is concluded by hinting to the appropriate local health implemented to reinforce the preventive health measures, including obstetric and physical accidents in order to decrease such causes of death.

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