Original Article

Characteristics of people brought in dead at the Ndola Teaching Hospital in Zambia between 2012 and 2016

[1]Hachizovu S, [1]Chaponda M, [2]Makupe A, [1]Manyando C, [2]Mubikayi D, [1]Mulenga M,

[1]Department of Clinical Sciences, Tropical Diseases Research Centre,
6th Floor of Ndola Teaching Hospital P.O Box 71769, Ndola, Zambia.
[2]Ndola Teaching Hospital, Private Bag 1, Ndola, Zambia

ABSTRACT

Background: Death is the end spectrum of everyone's life. From a policy maker's point of view, the cause of death and the place of death are important variables as they have a bearing on the diagnostic capacity of a health system and the level of health services utilization by a population respectively. A study done in Zambia showed that 51 per cent of the adult deaths occurred in a health facility, 41.5% occurred at home and 7.7% happened elsewhere. This finding contrasted those of a systematic review of statistics on cause of deaths in hospitals: strengthening the evidence for policy makers by the WHO which reported that more than 50% of deaths in most developing countries occur outside hospitals. It is common to see people brought in dead (BID) in hospitals in Zambia. A literature review showed that no study has been done to characterize the people who are brought into health facilities already dead in Zambia. Our study proposes to collect the age and sex distribution of the people brought in dead, as well as their area of residence and cause of death as is captured in the registers.

Objectives

1. To describe the sex and age distribution of the people brought in dead in Ndola Teaching Hospital
2. To determine the areas of residence of these cases
3. To establish the causes of death for these cases of BID
4. To assess the completeness of the information recorded in the register

Methods*:* This study was done at the Ndola Teaching Hospital in the Copper-belt province of Zambia. It was a cross sectional, retrospective record review of the mortuary registers where all people brought in dead or dying within 24 hours of admission to Ndola Teaching Hospital are recorded. All cases of BIDs recorded in the Mortuary registers of Ndola Teaching Hospital between 2012 and 2016 were eligible. The age, sex, area of residence and the recorded cause of death were entered on a standardized form designed for the study. The data was entered on an excel sheet and double checked for completeness. It was then analyzed using excel

Results: There were 6931 cases of brought in dead at the Ndola Teaching Hospital between 2012 and 2016 with the average number of 1386 cases per year. The age group affected most was 24-55 years (60.34%), mainly comprised of males (61.81%) and coming from densely populated areas (81.50%). 96.75% of cases had undetermined mode of death while 2.35% of cases died of road traffic accidents

Conclusion: A big number of people are still dying outside health facilities or within 24 hours of admission to hospitals in Zambia today. The most affected group is males in their most productive period of their lives and mainly residing in densely populated areas. Additionally, our data capturing tools are not adequate and need revision.

Keywords: *Brought in Dead, BID, Ndola Teaching Hospital, Coroner's case*

INTRODUCTION

When people get sick, they will either do nothing about it, self-medicate or visit a health facility for health care. The decision made will depend on; cultural beliefs, level of education, social economic status, religion, self-stigma, distance to health facility, altitude of health workers, user fees and availability of drugs[1]. The Government of the Republic of Zambia has committed to provision of equitable access to cost effective and quality health services as close to the people as possible in a Caring, Competent and Clean environment (3 Cs). This is being achieved through improving service delivery, provision of human resource, medical commodities and infrastructure, leadership and governance, health information and health care financing[2]. According to the 2012 National Health Policy of Zambia, 46% of families in the rural areas live outside a radius of 5 km from a health facility compared to 1% in urban areas[2]. To mitigate this challenge, government developed a Capital Investment Plan (CIP) whose main objective was to improve the availability, distribution and state of essential infrastructure and medical equipment. Under this plan hospitals, health centers and health posts have been constructed national wide. The target is to have a health facility for every 5 kilometer of another and have trained health workers in these health facilities[2].

Death can occur anywhere. Most people prefer to die at home although the majority of the deaths still occur in health facilities[3]. In developed countries, a home death is considered a **'good death'** while in sub-Saharan African countries this may imply that the person failed to access and utilize health care services. A study done in Zambia showed that 51% of the adult deaths occurred in a health facility whereas 41.5% occurred at home. 7.7% of the adult deaths happened elsewhere[4]. This finding contrasted those of a systematic by the WHO which reported that more than 50% of deaths in most developing countries occur outside hospitals [5].

In Zambia today, a good number of people still die outside the health facilities. Banda S. et al found; TB, road traffic accidents, HIV/AIDS, malaria, poisoning, diarrhoea, meningitis, pneumonia, and cancers as top nine causes of death outside health facilities in Lusaka[6]. BID cases are to be dealt with under Chapter 36 of the Laws of Zambia (Inquest's Act).This law requires that an inquest is to be held as soon as is practicable "whenever a coroner is credibly informed that the body of a deceased person is lying within his jurisdiction, and that there is reasonable cause to suspect that such person has died either a violent or an unnatural death, or in prison or in police custody, or in any place or circumstances which, in the opinion of the coroner, makes the holding of an inquest necessary or desirable"[8]. It therefore means that a coroner will request for a post-mortem on all such cases to establish the cause of death. However, this law is not fully utilized in Zambia for one reason or another, a situation which has resulted in some people being buried without being fully investigated by the coroner.

No study has been done to characterize the people who are brought into health facilities already dead in Zambia. An unpublished study by Banda S etal did not look at the demographic characteristics of the deceased, which information is crucial. Another study published by V.H Chisumpa etal[4] looked at place of death among adults in Zambia between the year 2010 and 2012. This study provided vital information on the place of death among adults but did not focus on the characteristics of the people who were dying outside health facilities. Our study was conducted in order to demographically characterize people brought in dead as well as those dying within 24 hours of admission to Ndola Teaching Hospital in terms of age, sex and area of residence as well as the cause of death as was captured in the registers.

Methods Study setting

This study was conducted at the Ndola Teaching Hospital on the Copperbelt province of Zambia. This hospital is one of the tertiary hospitals found in an urban setting and receives referrals from the northern part of Zambia. It houses the Copperbelt University School of medicine, Ndola School of Biomedical Sciences, Ndola Schools of Nursing and Midwifery

and the Ndola school of Community Health assistants. The Hospital, has a capacity of 851 beds and 97 baby cots, and is the second largest health institution in Zambia. It serves a population of about 552,000 people in Ndola district.

Study design

This was a cross sectional retrospective record review of the registers where BID cases between 2012 and 2016 were recorded in the Ndola Teaching Hospital.

Data collection

A data collection tool was designed and two research assistants were trained on how to abstract information from the BID registers from the hospital. The sampling frame included all cases brought in dead and all those dying within 24 hours of admission to hospital between 1st January 2012 and 31st December 2016. Information collected included; reference number, age, sex, date event recorded, area of residence and recorded cause of death.

Data analysis

Data analysis was done using excel. Means and frequencies were computed from the data set

Ethical considerations

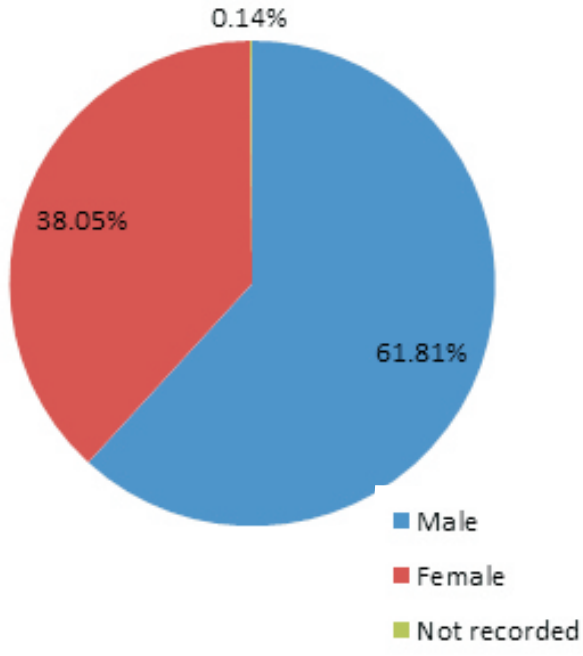
This study was approved by the Tropical Diseases Research Centre Ethics Review Committee. Data confidentiality was assured during data collection and publications as no personal identifiers were used

RESULTS

Sex distribution

The Ndola Teaching Hospital recorded a total of 6931 Brought in Dead cases between 2012 and 2016. The annual average for these cases over this five year period was 1386. Of these cases recorded, 4284 (61.81%) were males, 2637 (38.05%) were females and 10 (0.14%) had no gender recorded.

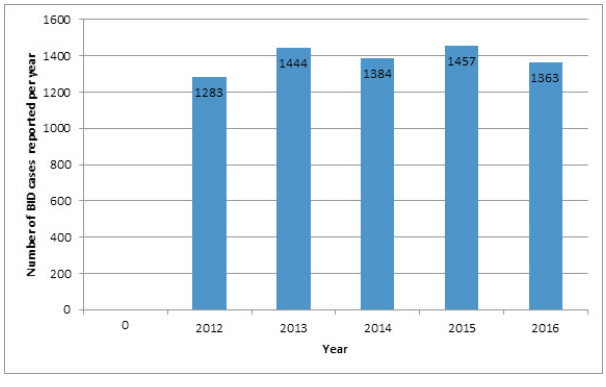
Figure 1. Pie chart showing the sex distribution of BID in Ndola Teaching Hospital



Five year trend

Over the five year period, the annual average cases of BID were 1386. The highest number of cases was recorded in 2015 (1457) while the year 2012 saw the lowest reported cases (1283). These results are shown in figure 2

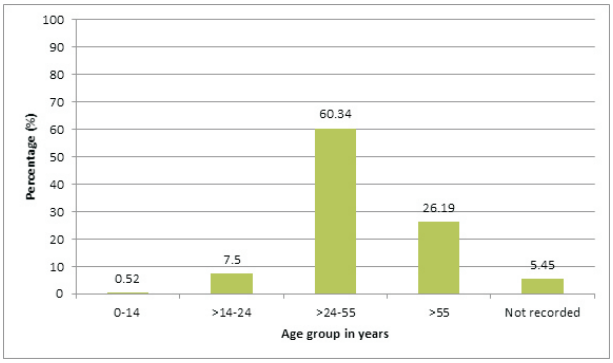
Figure 2. 5-year trend of BIDs at Ndola Teaching Hospital



Age distribution

The age distribution of the BID cases is as shown in **figure 3**. The youngest BID case reported was 2 days old while the oldest case was 131 years. The mean age for the group was 50.4 years. It is important to note here that although Ndola Teaching Hospital is a hospital for adults, the period under review recorded 0.52% BID cases aged 14 years and younger

Figure 3. Age distribution of the brought in dead at the Ndola Teaching Hospital from 2012 to 2016



Area of residence

The results showed that 5649/ 6931 (81.50%) of the people classified as BIDs were from high density population areas such as Chifubu, Kawama, Twapia and Masala while only 1258/6931(18.15%) were from low density population areas e.g. Kansenshi, Itawa and North-rise. The area of residence for the remaining 24 cases was not recorded.

Recorded manner of death

The recorded manners of death as extracted from the registers are shown in table 1 below.

Table 1. Manner of death

Manner of death	Frequency	Percentage
Undetermined	6706	96.75
Road Traffic Accident	163	2.35
Homicide	40	0.58
Suicide	19	0.28
Natural	3	0.04

DISCUSSION

This is the first study to describe the characteristics of people being brought in dead in a health facility in Zambia. The study revealed that a big number of people are still dying outside the health facilities and that our data capturing system as regards BIDs is still inadequate.

From the annual average number of BID cases reported for Ndola Teaching Hospital, it means that this hospital records 3.85 cases of people dying outside the hospital daily. This number is likely to be similar in other hospitals on the Copper-belt Province as they are all found in a similar environment. If this is the case and with an estimated 14 similar government hospitals in the province, it means that about 54 BIDs are recorded on the Copper-belt province on every given day

The people being brought in dead were 1.6 times more likely to be males than females and 4.5 times to be living in a densely populated area than in a low density populated area. The age group affected most is the >24-55 years. This is the group which has men and women in their most productive period of their lives and is expected to contribute greatly to the economic development of a nation. Losing them through death means reducing on the much needed

human resource that is required for economic development. This is also the age group which is mostly affected by HIV and the deaths could be HIV-related. Of note was that 5.45% of cases had no age assigned to them.

The possible explanation why the hospital was receiving more BID men than women could be that men delay to seek medical attention compared to women and are therefore more likely to die at home. Men are also more likely to engage in risk undertakings such as drunk-driving, robbery, fighting than women and therefore more likely to be killed. This could also require that specific health messages are designed for men in order to improve their health seeking behavior. The messages can be targeted at places where men are usually found like bars and football stadia.

The areas of residence were classified based on the density of population there. Low to medium cost areas tend to have more people per square kilometer and therefore called high density population areas while high cost areas have few people per square kilometer. The results showed that the proportion of BID in such areas as Chipulukusu, Chifubu, Kantolomba and Masala was higher than in such areas as Itawa, Kansenshi and Northrise. Highly densely populated areas tend to be of lower economic status compared to areas of low density populations. It can be argued that people in low densely populated areas are likely to have acquired some education and therefore they may have better health seeking behaviours.

We also noted that there was no recorded cause of death in the registers. What was recorded in the registers were details which are close to the manners of death for the cases. Categorization of these cases showed that 96.75% had undetermined manner of death while 2.35% died as a result of road traffic accidents. In some cases, only the name of the doctor who certified the body was captured without recording the manner of death or cause of death. Lack of information also applied to cases that were transferred from elsewhere. The registers did not give any details of whether a postmortem was done and what the results were as per requirement by the inquest's act. This has resulted in most of the BID cases being buried without a known diagnosis on the actual cause of death. This information is required by the Ministry of Home Affairs to issue the death certificate. This situation also results in underreporting of cases under the various mode of death categories. For instance, the 0.28% of cases reported as suicide may be less than the actual number of these cases, resulting in underreporting

CONCLUSION

Our study showed that the problem of BID is of public health importance and requires urgent attention. The majority of people dying are young and middle aged men, who are in their most productive years of their lives and mainly living in the high density populated areas. Additionally, the data capturing tool needs to be revised so that it captures vital information such as the cause of death or at least a clear-cut mode of death. Our results could be generalizable to other provinces which are mainly urban while they may not apply to mostly rural provinces. However, much bigger and robust studies need to be conducted national wide to generate more information to understand further the issues around BIDs which may be transformed into more specific interventions.

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