



St. Paul's Hospital Millennium Medical College

Student of the Year: 2019

Mortality pattern in adult emergency department of Addis Ababa Burn, Emergency & Trauma (AaBET) Hospital

Department of Emergency and Critical Care Nursing Research Proposal

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Abbreviation

AaBET: Addis Ababa Burn, Emergency & Trauma Hospital

BID: Brought in dead

DOA: Dead on arrival

ED: Emergency Department

LMICs: Low- and middle-income countries, the value is significantly higher

ROPD: Regular outpatient department

SPHMMC: St. Paul's Hospital Millennium Medical College

SPSS: Statistical Package for Social Science

TBI: Traumatic Brain Injury

Acknowledgment

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In closing, we would like to extend our gratitude to our coworkers who helped this proposal work together get done successfully through direct or indirect contributions.

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Summary

Background: Patients can attend the emergency room at any level of a healthcare facility with any life-threatening ailment. By offering the initial line of care as soon as a patient arrives, the department serves as the foundation for healthcare facilities and the general public. The purpose of this study will determine the magnitude, cause, and factors associated with very early mortality in patients presenting to the emergency department of Addis Ababa Burn, Emergency & Trauma Hospital.

Methods: In order to perform this study, a cross-sectional facility-based retrospective chart review will be used. From 2019 to 2021, records of all patients who passed away within 72 hours of their emergency department presentation will be compiled to create a two-year retrospective analysis. This study will be conducted at (AaBET). Addis Ababa Burn, Emergency & Trauma Hospital is an affiliate of St. Paul's Hospital Millennium Medical College^{24/7} Open! Found in Addis Ababa.

Study data include patients who came to ED of AaBET Hospital during the study period and dead within 72 h of presentation. Medical specialists, casualty officers, and triage officers made their determinations, which were recorded in the case notes and entered into the book keeping track of medical fatalities.

In order to analyze the data, it will first be manually checked in Microsoft Excel, transferred, coded, and entered into Epidata and then transferred to Statistical Package for Social Science (SPSS). All variables' descriptive statistics, frequency, means, and proportions will be calculated.

The estimated budget for this research is approximately about 6950.00 ETB.

Keywords: Mortality, Pattern, AaBET Hospital, Emergency department, Addis Ababa

1. Introduction

1.1. Background

Any hospital's emergency department (ED) serves as the "face" of the facility and offers information on the level of patient care offered. Emergency rooms serve 24/7 and offers a variety of medical services both for traumatic and non-traumatic patients. In addition, patients can attend the emergency room at any level of a healthcare facility with any life-threatening ailment. By offering the initial line of care as soon as a patient arrives, the department serves as the foundation for healthcare facilities and the general public. (1)

In order to handle emergencies, EDs have highly qualified medical personnel on site. They assess, treat, stabilize and start the health management of people who have come to the ED with a serious illness or injury. People often go to EDs with conditions that include: injuries from accidents, physical assaults or falls, heart attack and stroke, severe pain problems with breathing or bleeding, broken bones, loss of consciousness, worsening of a serious illness, drug overdoses or poisoning, allergic reactions, pregnancy complications, mental illness, burns.

The Ethiopian Hospital Services Transformation Guideline specifies that a patient may stay in the emergency department for a maximum of 24 hours; however, patients may stay longer owing to a lack of beds, a hold-up in an investigation, and other factors. However, all emergency department (ED) care is anticipated to conclude after a stay of no more than 72 hours. (2) Early mortality is a proxy for disease severity, hence the description of **ED mortality** is important because it reveals a subgroup of patients who will benefit more from ED therapies. This study defines ED mortality as occurring within 72 hours of ED presentation. Patients who are very sick and more likely to benefit from prompt ED therapies are classified as being in the very early mortality group. (3) (4)

Department of emergency on the individual, society, and the entire health system, mortality has a significant impact. It is quickly rising to the top of the list of fatalities in hospitals. It accounts for 15–16% of all hospital deaths worldwide. In low- and middle-income countries, the value is significantly higher (LMICs). It is 5.1% greater in Sub-Saharan Africa than in better-income nations, notably in the central, east, and west regions of the continent. (5) (6)

1.2. Statement of the problem

The burden of disease and patient death has increased in ED in recent years by a sizable part. (7) (8) Heart disease, car accidents, and trauma are the main causes of this mortality. Even though the etiologies vary depending on the area, it has been stated that these reasons account for 15% to 60% of all fatalities. (9) (10) In higher-income countries, decades of progress in clinical science and healthcare delivery have significantly improved patient outcomes for a variety of acute diseases. Prior research has demonstrated that clinical interventions, such as standardized ED trauma protocols, reduce mortality in high- and few middle-income nations. (10)

Furthermore, the severity of the illness or damage may be fatal on its own. Lack of, or inadequacy of, medical facilities and staff, as well as accessibility of transportation due to the topography of patients' residence and an unsuitable (or unavailable) road network, cause delays in patients' arrival at the hospital and slow down the transfer of patients to other departments (for definitive treatment), aggravating illnesses or injuries. The management and care given to patients while they are in the hospital also determine whether they will live or die. These and other pre-hospital elements, such as having enough trained staff, are directly related to the morbidity and mortality trends in ED. (11) (12)

1.3. Significant of the study

The importance of an ED mortality audit is increased by the way it reveals the range of emergency cases in a given area, the burden of illness, and the distribution of the population.

This study will help decision-makers understand the emergency department's mortality patterns and contribute to the reduction of mortality in the emergency department of AaBET hospital. Additionally, it provides worthwhile work for the Ministry of Health and other health stakeholders to reduce emergency department mortality. The results of this study can potentially provide important information as baseline data for other researchers looking at emergency department mortality.

2. Literature review

In the worldwide world, as well as from region to region, there are differences in emergency room mortality. In the United States, there were about 2.8 million TBI-related emergency department visits, hospitalizations, and fatalities in 2013. This is an increase since 2007 that is primarily attributable to an increase in the volume and frequency of TBI-related ED visits. The same cannot be said for TBIs linked to falls in older adults, even while the slight increases in ED visits that may be linked to youth sports concussion may not extend to increases in TBI-related hospitalizations and mortality. Increases in TBI-related hospitalizations and mortality linked to falls among older adults between 2007 and 2013 point to the necessity of paying more attention to preventing older adult falls. Fall incidents among older adults can be decreased with the aid of empirically supported preventive strategies. (13)

It is possible that efforts to reduce motor vehicle crashes are to blame for the decline in TBI-related mortality from motor vehicle crashes between 2007 and 2013. However, more can be done to further lower automobile collisions. In terms of the number of fatal motor vehicle crashes, the United States falls behind other high-income nations; in 2013, it had a rate that was more than twice as high as that of other comparable high-income nations. For the sustained decrease in motor vehicle collisions and TBIs caused by motor vehicle crashes, it is crucial to step up efforts to promote the usage of restraints and decrease drinking and driving. (13)

Additionally, arriving at the emergency room, risk variables linked to short-term mortality also evolve over time. Has demonstrated an overall 30-day mortality of 4% among adult patients who were reported as alive at arrival in the ED. A third of patients pass away within two days of arriving at the emergency room. A high level of acuity upon presentation at the ED and aberrant vital signs are significant risk factors for imminent mortality. When the period between arrival and death increased, these risk variables significantly decreased. Contrarily, growing old, being a man, and developing comorbidity were all risk factors for mortality, but their odds ratios did not change with the passing of time. (14)

Moreover, the fatality rate in a tertiary medical facility's emergency room at Abakaliki in eastern Nigeria was also quite low, with a larger male involvement. Most of the occurrences occurred within a person's productive year of life. The two leading causes of death were heart failure and stroke. The bulk of deaths resulted from non-communicable diseases. Given that the majority of mortality causes are avoidable, a comprehensive and ongoing health campaign is required. In order to deal with the dual illness burden of communicable and non-communicable diseases, the health sector must also be strengthened. Additionally, it is advised that tertiary healthcare centers designate distinct emergency rooms for certain medical specializations. This will

facilitate patient sorting and promote quick evaluation by the primary expert physician. (15)

Besides that, Ethiopia is affected by ED mortality. In western Ethiopia demonstrated that the chosen hospitals saw a variety of emergency cases that resulted in a sizable percentage of adult fatalities. We discovered that seasonal differences affected the admission rate. According to research, the clinical and demographic characteristics of patients who are admitted to adult EDs influence their prognosis. Higher arriving dead In the ED, a patient passed away Better and released from ED discharged from the general ward after being admitted, improved, and ICU admission, recovery, and eventual release Death upon entrance to the ward or ICU referenced to other hospitals or locations had some issues after being released Negated medical advice and released 2.5% 6.4% 23.3% 46.8% 10.3% 1.6% 5.8 2 1.2 In Nekemte, western Ethiopia, in 2017, the distribution of responders was based on the effects of their visits to the emergency room. Emergency Medicine 8 percentage of the global. With some issues, discharged released despite medical advice 2.5% 6.4% 23.3% 46.8% 10.3% 1.6% 5.8 2 1.2 Figure 4: Respondent distribution by the effects of emergency room visits in Nekemte, western Ethiopia, 2017. Acute Care Medicine The percentage of instances that required admission to wards or intensive care units worldwide indicates the seriousness of the situations that were experienced. There is a need to take action to increase the emergency room's readiness and to continue funding community-level prehospital care standardization and organization. (16)

Although, the mortality load of shock and car accidents is high at the Black Lion Specialized Tertiary Hospital, and the extent of ED mortality varies between these categories. Males had a greater early ED mortality rate than females, and the majority of patients with shock and respiratory illness pass away within 24 hours of presenting to the ED. The potential benefit of treatments meant to reduce mortality among clients with co-morbid illnesses, customers who live in Addis Ababa and the Oromia area, should be encouraged as emergency mortality increases in Ethiopia. Additionally, the duration of the ailment and the triage category should be stressed. (17)

The, ED mortality in Ethiopian hospitals from traumatic and medical causes is still mostly uncharacterized. The root causes, which are thought to be multifaceted, include a heavy weight of diseases and trauma, as well as a lack of access to good resources, such as qualified medical personnel. (3) (18) (19) Despite the fact that the issue places a significant burden on the community, the health system, and the nation as a whole, there is a lack of adequate data in Ethiopia and other low-income countries, which has made it challenging for policy-makers to make significant new investments in emergency care. In order to characterize all causes of early mortality and identify associated factors of very early ED mortality among patients presenting to the emergency departments of Addis Ababa Burn, Emergency & Trauma (AaBET) Hospital, Ethiopia, from 2019 to 2021, this study set out to measure the early emergency department mortality rate.

3. Objectives

3.1. General objectives

- To determine mortality pattern in adult emergency department of Addis Ababa Burn, Emergency & Trauma Hospital, 2022.

3.2. Specific objectives

- To assess the mortality trends and magnitude in the Addis Ababa Burn, Emergency & Trauma Hospital's public adult emergency department, 2022.
- To identify factors related to mortality in patients presented to the emergency department.

4. Methodology

4.1. Study setting

This study was conducted at (AaBET). Addis Ababa Burn, Emergency & Trauma Hospital is an affiliate of St. Paul's Hospital Millennium Medical College^{24/7} Open! Found in Addis Ababa. It includes four important departments: orthopedics & traumatology, neurosurgery, plastic reconstructive and hand surgery, emergency medicine & critical care. AaBET Hospital is a forward-thinking, expertly run upper level teaching hospital with 190 and 190 bed ward departments as well as a center for traumatology, physiotherapy, and spinal problems. Approximately the hospital serves annually 20–30,000 patients at ED. The Hospital is recognized as one of the largest government-based trauma & emergency center in the country. (20)

4.2. Study design and period

In order to perform this study, a cross-sectional facility-based retrospective chart medical record review was used. From Oct/2020 to Sep/2022, records of all patients who passed away within 72 hours of their emergency department presentation was compiled to create a two-year retrospective analysis.

4.3. Population

4.3.1. Study population

Patients who died within 72 hours of visiting the emergency room at the AaBET Hospital within the study's time frame.

4.3.2. Source population

All patient who dies in ED of AaBET hospital within the time frame.

4.3.3. Eligible criteria

Inclusion criteria

- Death with 72 hours of ED presentation.
- Completed medical chart.

Exclusion criteria

- Dead on arrival (DOA).
- Incomplete chart record.
- Pediatrics death (age less than 13 is excluded)

4.4. Sample size determination

In this a retrospective study, the appropriate sample size would be determined using the straightforward formula below. (21)

$$n = \frac{(Z\alpha/2)^2 P(1 - P)}{d^2}$$

Where:

- n is sample size
- Z is level of confidence = 95% = 1.96
- P is prevalence
- d is precision = 5%

For a total source of population (<10,000) finite population correction is needed to calculate a true sample size.

N=312

$$n = \frac{(Z\alpha/2)^2 P(1 - P)}{d^2}$$

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4.5. Sampling technique

Simple random sampling technique will be used in individual chart.

4.6. Data collection instrument

According to the registration book of deaths, a structured check list was employed to determine the death prevalence in the AaBET emergency room. The checklist was created in English. The lead investigator was regularly monitor the data collectors to ensure adequate data collecting. Prior to data collection, they receive instructions on how to gather the data and should be ethically monitored.

The data gathering method will be supported by qualified nurse experts. A pretested, standardized form for gathering data that was used to evaluate the study. A secondary data source that contains a Health Management Information System registration book, patient chart, ED triage record, clinical care note, and hospital death certificate was used to get raw data on adult emergency mortality.

4.6.1. Data processing and analysis

In order to analyze the data, it will first be manually checked in Microsoft Excel, transferred, coded, and entered into Epidata and then transferred to Statistical Package for Social Science (SPSS V.20). All variables' descriptive statistics, frequency, means, and proportions will be calculated.

In order to identify the group of patients who might have benefited from early ED care, those patients who were already deceased when they arrived at the emergency department will be disregarded from the remainder of the research. The amount of time from ED presentation to death; then divided into two categories: 24 hours or less and > 24–72 hours. This group, known as the very early ED mortalities, going to choose for analysis because the majority of them represented seriously ill and injured patients who would have benefited from prompt and effective ED therapies.

4.6.2. Data quality control

By carefully designing the checklist that adopted from previous research and doing a pretest on 5% of death charts before to the real data collection, data quality was ensured. Then, necessary correction was made at the finding pretest checklist.

4.6.3. Study Variables

- Dependent Variables
 - ED mortality
- Independent variables
 - Socio-Demographic
 - Mode of Transportation
 - Source of Referral
 - Diagnostic aspect
 - Triage categories
 - Cause of death

5. Ethical consideration

The St. Paul's Hospital Millennium Medical College Ethical Approval Board was issued letters of ethical clearance before the research is conducted. After clearance approved from the clinical director of AaBETH, and we received a letter of support from the Department of Emergency and Critical Care. Before beginning data collection, verbal ethical approval must be obtained from the emergency department of AaBETH, Hospital Management Information System and Card Room employees. Every step will be confidential. Addis Ababa Burn, Emergency & Trauma Hospital, and Ethical Approval Board were disregard the participants' agreement due to the retrospective and secondary nature of the data. Every procedure was carried out in conformity with the applicable laws and regulations.

6. Dissemination of result

After the data collected, analyzed and conclusions and recommendations drawn, copy of the result is submitted to the SPHMMC department of research and Nursing school. A copy of the finding was also be given to the Emergency Nursing Department of AaBETH to effect changes based on the conclusions and recommendations of the study.

7. Result

A total of 17,384 patients visited the ED over the two-year study period, and 312 (1.8%) deaths were reported there, per the hospital's Health Management Information System (HIMS). Despite the fact that we discovered 242 (1.4%) fatalities between the time of ED entrance and the patient due to a lost death registration book. And out of the charts, 222 (1.3%) met the requirements for analysis, while the remaining 20 were disqualified due to age groups of fewer than 13 and also, some of them are DOA. However we did not discover any incomplete charts when we were doing our investigation.

In addition, it displays the socio-demographic characteristics of the study participants at the beginning of first (table 1). With a male to female ratio of 2:1, more men (67.1%) than women (32.9%) died. The group's ages ranged from 13 to ≥ 65 . More than half (62.2%) of the participants were referred by public hospitals, with the majority of participants hailing from the Addis Ababa region (55.4%). Also, more than half of them (72.1%) transported by ambulance service. (98.2%) of them had no previous ED visits within the last 30 days. With this study (88.7%) deaths was analyzed due to traumatic causes and (68.0%) had 4h-24h duration of symptom. In addition, (95.9%) of the patients were admitted to the red triage categories, and (83.8%) of them underwent imaging and lab investigations. Additionally, the majority of them (76.6%) died at nighttime.

Causes of death

Traumatic emergency cases were the main factor in deaths (88.7%). The two main top primary causes are RTA 141 (63.5%) and assault/fighting 21 (9.5%), followed by fall injuries 15 (6.8%) gunshots 15 (6.8%), suicidal attempts 3 (1.4%), and burns 2 (0.9%). The most important damage at the location of death among traumatic causes is a head injury, which accounts for 162 (73%) of all fatalities, more than chest injuries 15 (68%), spinal injuries 3 (1.4%), and polytrauma 17 (9.7%) combined (table 2).

When we move on to non-traumatic, or what we might say, medical conditions, the leading causes of mortality are: cardiovascular disease 10 (4.5%), respiratory disease 7 (3.2%), neurology disease 5 (2.3%), sepsis (0.5%), and cardiogenic shock (0.5%) were looked into throughout our time period (table 3).

Additionally, during the course of our analysis, we identified individuals who co-morbidly suffered from a primary illness and secondary causes of death. The mainly of cases include hypertension 10 (4.5%), heart disease 11 (5%), diabetes mellitus 3 (1.4%), and cancer 1 (0.5%) (Table 4). Cardiorespiratory arrest, respiratory failure, cardiac failure, and multi-organ failure are the top immediate causes of death among all patients who passed away in the emergency room (222), accounting for 100 (45%), 63 (28.4%), 48 (21.6%), and 11 (5%) of all deaths. (Table 5) Road traffic accidents account for the majority of causes (63.5%) (Table 2).

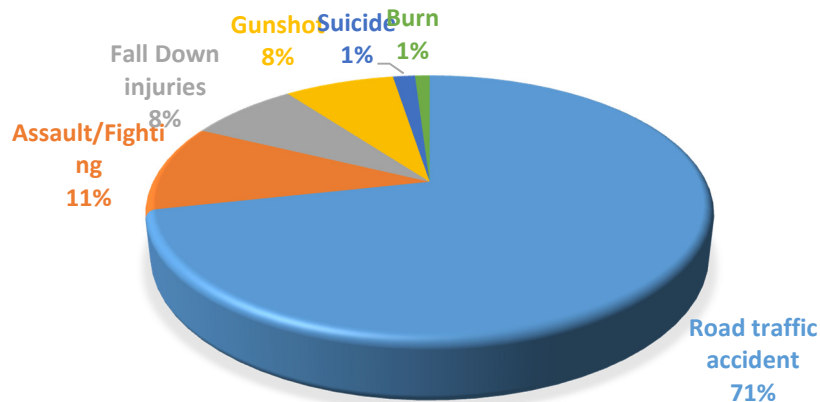
Table 1: Socio-demographic and clinical traits of patients who passed away within 72 hours of ED presentation from October 2020 to September 2022 at the AaBET Hospital in Addis Ababa, Ethiopia

Variables		Length of stay in ED within 72 hours before death with total sample (N=222)	
		N	%
Sex	Male	149	67.1
	Female	73	32.9
Age	13 - 24	17	7.7
	25 - 54	109	49.1
	55 - 64	64	28.8
	≥65	32	14.4
Residence	Addis Ababa	123	55.4
	Oromia	92	41.4
	Amhara	7	3.2
Source of referral	Public hospital	138	62.2
	Health center	41	18.5
	Self	43	19.4
Mode of transportation	Ambulance	160	72.1
	Taxi	25	11.3
	Private car	14	6.3
	Walking/Carried	23	10.4
Previous ED visit within last 30 days	No ED Visit	218	98.2
	1	3	1.4
	2	1	0.5
Major cause of death	Traumatic	197	88.7
	Non-Traumatic	25	11.3
Triage category	Red	213	95.9
	Orange	9	4.1
Investigations	Laboratory	33	14.9
	Imaging	3	1.4
	Laboratory and Imaging	186	83.8
Duration of the symptoms	<4h	41	18.5
	4 - 24h	151	68.0
	>24h	30	13.5
Time of death	Day	52	23.4
	Night	170	76.6

Table 2: Distribution of traumatic mortality causes by frequency of patients who passed away within 72 hours of ED presentation from Oct 2020 to September 2022 at the AaBET Hospital in Addis Ababa, Ethiopia

Causes of death		Length of stay in ED within 72 hours before death with total sample (N=222)	
		N	%
Traumatic Cause of death	Road traffic accident	141	63.5
	Assault/Fighting	21	9.5
	Fall Down injuries	15	6.8
	Gunshot	15	6.8
	Suicide	3	1.4
	Burn	2	0.9
Site of injury	Head injury	162	73.0
	Chest	15	6.8
	Spinal injury	3	1.4
	Polytrauma	17	7.7

TRAUMATIC CAUSE OF DEATH



Site of injury

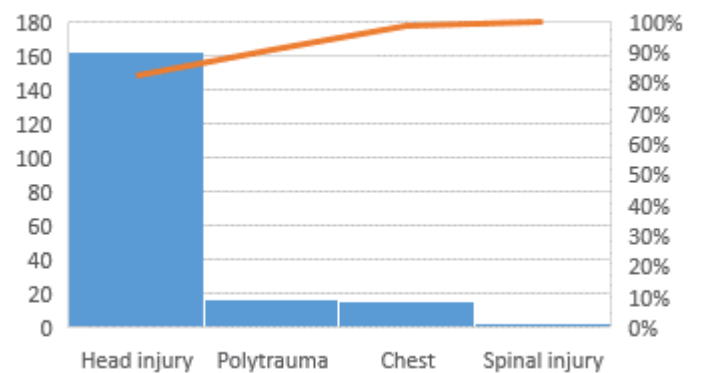


Table 3: Distribution of non-traumatic mortality causes by frequency of patients who passed away within 72 hours of ED presentation from Oct 2020 to Sep 2022 at the AaBET Hospital in Addis Ababa, Ethiopia

Causes of death		Length of stay in ED within 72 hours before death with total sample (N=222)	
		N	%
Non-traumatic cause of death	Respiratory disease	7	3.2
	Cardiovascular disease	10	4.5
	Neurology disease	5	2.3
	Sepsis	1	0.5
	Septic Shock	1	0.5
	Cardiogenic shock	1	0.5

NON-TRAUMATIC CAUSES OF DEATH

■ Respiratory disease ■ Cardiovascular disease ■ Neurology disease
■ Sepsis ■ Septic Shock ■ Cardiogenic shock

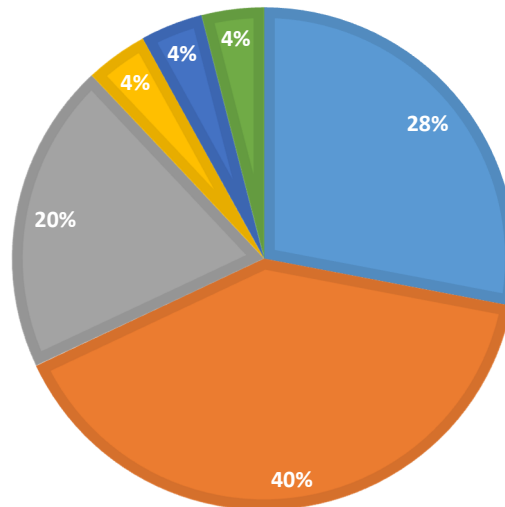


Table 4: Who had co-morbid disease and passed away within 72 hours of ED presentation from October 2020 to September 2022 at the AaBET Hospital in Addis Ababa, Ethiopia

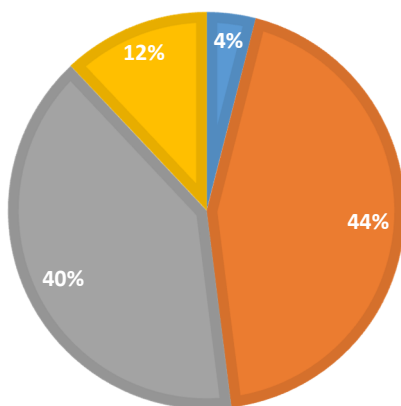
Causes of death		Length of stay in ED within 72 hours before death with total sample (N=222)	
		N	%
Co-morbid disease	Cancer	1	0.5
	Cardiac disease	11	5.0
	Hypertension	10	4.5
	Diabetic Mellitus	3	1.4

Table 5: Immediate causes of death of patients who passed away within 72 hours of ED presentation from October 2020 to September 2022 at the AaBET Hospital in Addis Ababa, Ethiopia

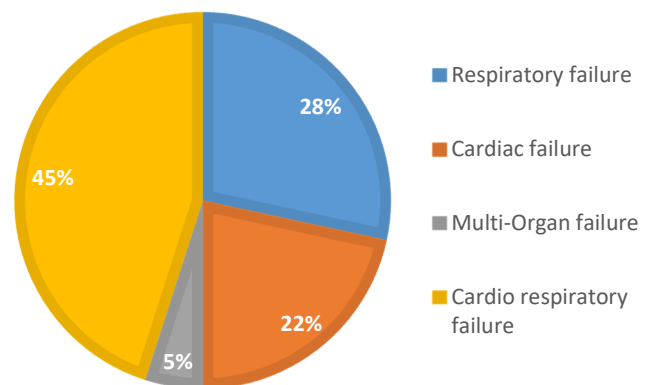
Causes of death		Length of stay in ED within 72 hours before death with total sample (N=222)	
		N	%
Immediate cause of death	Respiratory failure	63	28.4
	Cardiac failure	48	21.6
	Multi-Organ failure	11	5.0
	Cardio respiratory failure	100	45.0

CO-MORBID DISEASE

■ Cancer
 ■ Cardiac disease
 ■ Hypertension
 ■ Diabetic Mellitus



IMMEDIATE CAUSES OF DEATH



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