

Trends and Causes of Hospital-Based Mortality in Southwest Nigeria: An 11-Year Retrospective Statistical Analysis

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Abstract: Understanding the causes of death is essential for effective health policy planning and intervention, this study investigates mortality patterns in Ekiti State University Teaching Hospital (EKSUTH), Ado-Ekiti, Southwest, Nigeria, to identify the leading causes of death and provide evidence-based recommendations for their prevention. Secondary data were collected from the Information Management and Medical Records Department of EKSUTH, which covers all recorded deaths, including stillbirths, over eleven years (2004–2014). The dataset included primary causes of death, age, sex, and time of death. Descriptive statistics, graphical analyses, and inferential tests, including t-test, Chi-square test, Kruskal-Wallis test, and Jonckheere's trend test, were performed using IBM SPSS Statistics Version 20. A total of 1,954 death records were analyzed. Infections were the leading cause of death, accounting for 397 (20.3%) of all cases, followed closely by cardiovascular diseases, 382 (19.5%) deaths. Males accounted for 1,090 (55.8%) deaths while females accounted for 864 (44.2%) deaths. The age group 0–10 years recorded the highest number of death cases, accounting for 483 (24.7%) deaths, indicating a need for urgent public health attention. To further reduce the mortality rate, the study recommends targeted interventions for high-risk groups, enhanced public health campaigns focusing on disease prevention, nutrition, and road safety, and increased allocation for pediatric and emergency care units.

Keywords: Mortality, Infectious Diseases, Cardiovascular Disease, EKSUTH, Nigeria.

I. Introduction

Mortality data are critical for evaluating healthcare delivery and setting health priorities, especially in resource-limited settings [7], [11], [13]. In Nigeria, since comprehensive mortality statistics are often limited due to challenges in data collection and reporting, Hospital-based mortality reviews offer an alternative for analysing trends and informing healthcare planning [6], [2]. This study focuses on EKSUTH, aiming to identify major causes of death and demographic patterns over 11 years.

II. Literature Review

Mortality patterns in developing countries often reflect a dual burden of disease—communicable and non-communicable—exacerbated by poverty, limited healthcare infrastructure, and evolving lifestyles. According to [6], the absence of vital registration systems in many developing countries means that hospital-based data is the most reliable source of mortality statistics. In Nigeria, studies such as [10] and [3] have consistently identified infections and cardiovascular diseases as leading causes of death.

Cardiovascular diseases (CVDs) are on the rise in sub-Saharan Africa due to urbanization and dietary transitions [5] and [8]. Similarly, trauma, particularly road traffic accidents, remains a prominent cause of death, especially among younger adults [2] and [7]. The high mortality rate among children under five years is often attributed to preventable infectious diseases such as malaria and pneumonia [11] and [2].

Globally, Report by [13] notes a declining trend in under-five mortality but warns that Africa still shoulders a disproportionate burden. The lack of comprehensive national mortality surveillance systems has made longitudinal hospital-based studies indispensable for informing health policy and practice.

III. Methods

Study Area

Ekiti State University Teaching Hospital (EKSUTH), formerly State Specialist Hospital, located in Ado-Ekiti, Nigeria. It was upgraded on April 1, 2008, and serves rural and semi-urban communities.

Data Collection

Secondary data were retrieved from the Information Management and Medical Records Department. The dataset includes all recorded hospital deaths from January 2004 to December 2014, including stillbirths. Variables includes: Primary causes of death, age, gender and year of death.

Causes of death were categorized into infectious and non-infectious groups. Non-infectious causes included cardiovascular, trauma, malaria, neonatal, obstetric and gynaecological, hepatobiliary, endocrine, neoplastic, digestive, and respiratory diseases. Rare conditions were grouped as "Others."

Data Analysis

Data were analysed using IBM SPSS Statistics 20. Statistical methods included descriptive analysis, chi-square tests, t-tests, Kruskal-Wallis test, and Jonckheere's trend test.

IV. Results

A total of 1,954 deaths were recorded. Males accounted for 1,090 (55.8%) while females accounted for 864 (44.2%) deaths. Deaths were highest in the 0–10 years age group (24.7%).

Demographic Characteristics of Patients

Table 1: Percentage Distribution of Deaths by Causes

Causes	Gender		Total	Percentage
	Male	Female		
Infection	227	170	397	20.3%
Cardiovascular	193	189	382	19.5%
Trauma	121	42	163	8.3%
Malaria	46	50	96	7.7%
Neonatal	53	27	80	6.3%
Obstetric & Gynecology	0	9	9	4.9%
Anaemia	85	65	150	4.1%
Endocrine disease	42	37	79	4.0%
Respiratory disease	35	25	60	3.8%
Urinary disease	21	15	36	3.1%
Digestive disease	80	44	124	3.0%
Neoplasia	23	24	47	2.4%
Tissue disease	21	18	39	2.0%
Hepatobiliary disease	20	12	32	1.8%
Haemorrhage	7	13	20	1.6%
Sickle cell disease	12	7	19	1.4%
Hernia	5	0	5	1.0%
Immunosuppression	4	12	16	1.0%
Others	49	26	75	.8%
Retroviral disease	13	46	59	.5%
NYD	17	10	27	.4%
Pleural Effusion	1	4	5	.3%
Poisoning	3	3	6	.3%
Pulmonary Oedema	3	4	7	.3%
Suicidal attempt	3	1	4	.2%
Seizure disorder	2	1	3	.2%
Malnutrition	1	3	4	.2%

Ectopic Preg.	0	3	3	.2%
Foreign substance ingestion	3	0	3	.2%
Rabies	0	3	3	.2%
Cholera	0	1	1	.1%
Total	1090	864	1954	100%

Table 1 shows all the causes of death and their percentage, considered between the year 2004 and 2014. According to the table, there are One thousand nine hundred and fifty-four (1,954) deaths. Infection has 20.3% of the population, cardiovascular disease accounted for 19.5% of the population.

Table 2 Percentage Distribution of Deaths by Age

Age		Gender		Total
		Male	Female	
0-10 Yrs	Count	271	212	483
	% of Total	13.9%	10.8%	24.7%
11-20 Yrs	Count	58	40	98
	% of Total	3.0%	2.0%	5.0%
21-30 Yrs	Count	117	102	219
	% of Total	6.0%	5.2%	11.2%
31-40Yrs	Count	109	102	211
	% of Total	5.6%	5.2%	10.8%
41-50 Yrs	Count	124	86	210
	% of Total	6.3%	4.4%	10.7%
51-60 Yrs	Count	128	92	220
	% of Total	6.6%	4.7%	11.3%
61-70 Yrs	Count	121	107	228
	% of Total	6.2%	5.5%	11.7%
71-80Yrs	Count	100	83	183
	% of Total	5.1%	4.2%	9.4%
81-90Yrs	Count	43	34	77
	% of Total	2.2%	1.7%	3.9%
above 90 Yrs	Count	19	6	25
	% of Total	1.0%	0.3%	1.3%
Total	Count	1090	864	1954
	% of Total	55.8%	44.2%	100.0%

Table 2 shows the percentage distribution of patients by age. Age group 0-10 years (24.7%) took the highest percentage, followed by 11.7% which represent ages between 61-70 years, 11.3% are between ages 51-60 years, 11.2% are between ages 21-30 years, 10.8%, 10.7%, 9.4%, 5.0%, 3.9% and 1.3% are between ages 31-40 years, 41-50 years, 71-80 years, 11-20 years, 81-90 years and 90 years above respectively. It also reveals that 55.8% of the total number of deaths is males while 44.2% are females.

Table 3 Percentage Distribution of Deaths by Year

Year	Frequency	Percent
2004	264	13.5
2005	312	16.0
2006	285	14.6
2007	226	11.6
2008	137	7.0
2009	167	8.5
2010	111	5.7
2011	109	5.6
2012	115	5.9
2013	121	6.2
2014	107	5.5
Total	1954	100.0

Table 3 reveals year 2005 to have the highest percentage of death with 16.0% while year 2014 had the lowest percentage of death with 5.5%.

Table 4: Relationship Between Age Group and Causes of Death

Causes	Age (Yrs)										Total
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	above 90	
Cardiovascular	16	6	19	17	50	69	85	81	32	7	382
Infection	106	27	65	57	39	46	32	16	7	2	397
Trauma	7	15	40	30	29	15	11	7	2	7	163
Malaria	73	2	4	2	1	3	4	4	2	1	96
Neonatal	80	0	0	0	0	0	0	0	0	0	80
Obstetric & Gynecology	0	1	6	2	0	0	0	0	0	0	9
Anaemia	131	3	5	3	0	3	3	1	1	0	150
Endocrine disease	0	3	5	7	13	17	18	11	5	0	79
Respiratory disease	20	2	3	7	5	7	6	6	2	2	60
Urinary disease	1	1	3	2	9	4	7	5	3	1	36
Digestive disease	12	16	13	14	17	17	18	14	3	0	124
Neoplasia	0	0	3	2	9	8	10	11	3	1	47
Tissue disease	5	2	7	4	2	3	6	2	7	1	39
Hepatobiliary disease	0	3	2	3	4	2	10	4	2	2	32
Haemorrhage	4	1	2	4	2	1	2	2	2	0	20
Sickle cell disease	3	4	8	4	0	0	0	0	0	0	19

Hernia	1	0	0	1	0	0	2	1	0	0	5
Immunosuppression	1	1	2	7	2	2	1	0	0	0	16
Others	8	5	8	9	11	7	8	13	6	0	75
Retroviral disease	1	2	11	28	9	6	1	1	0	0	59
NYD	6	2	5	3	5	3	1	1	0	1	27
Pleural Effusion	0	0	1	0	1	0	1	2	0	0	5
Poisoning	2	1	2	0	0	0	0	1	0	0	6
Pulmonary Oedema	1	0	0	1	0	3	2	0	0	0	7
Suicidal attempt	0	0	2	1	1	0	0	0	0	0	4
Seizure disorder	0	0	1	1	0	1	0	0	0	0	3
Malnutrition	4	0	0	0	0	0	0	0	0	0	4
Ectopic Preg.	0	0	1	2	0	0	0	0	0	0	3
Foreign substance ingestion	0	0	1	0	1	1	0	0	0	0	3
Rabies	1	1	0	0	0	1	0	0	0	0	3
Cholera	0	0	0	0	0	1	0	0	0	0	1
Total	483	98	219	211	210	220	228	183	77	25	1954

Table 4 shows the relative distribution of the causes of death within different age groups. Infectious related death was rampant most in the first decade of life (i.e. age group 0 – 10 years) accounting for 106 deaths (26.7%) while cardiovascular related death was commonest during the seventh, eighth and sixth decades of life (age group 61-70, 71-80 and 51-60) accounting for 85 (22.3%), 81 (21.2%) and 69 (18.1%) deaths respectively. Death from trauma was high during the third, fourth, and fifth decades of life, accounting for 40 (24.5%), 30 (18.4%), and 29 (17.8%) deaths, respectively. Death from Anaemia was commonest in the first decade of life, accounting for 131 (87.3%) deaths. In general, death occurs most between the ages of 0 and 10 years, accounting for 483 deaths (24.7% of the total deaths).

Top Five Causes of Death includes: Infectious Diseases with 397 deaths (20.3%), Cardiovascular Diseases with 382 deaths (19.5%), Trauma with 163 deaths (8.3%), Anaemia accounted for 150 deaths (7.7%) and Digestive Diseases accounted for 124 deaths (6.3%).

Trends: Infectious disease deaths declined from 74 in 2004 to 14 in 2014, cardiovascular deaths remained relatively stable while Retroviral disease deaths began in 2011 and increased annually.

Demographic Distribution: Males accounted for 55.8% of deaths; females 44.2%. Highest mortality occurred in the 0–10 year age group (24.7%), followed by the 61-70 age group (11.7%)

Age-Specific Findings: From this study, Infection is common among 0–10 years (26.7%), Cardiovascular is predominant in ages 51–80 group, Trauma is high in ages 21–50 group while Anaemia is Concentrated among 0–10 years (87.3% of anaemia deaths)

Fig. 1: Trend of Death among Age Groups

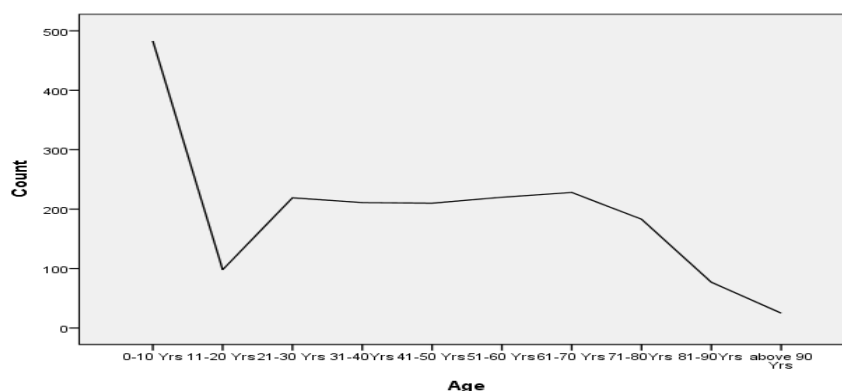


Fig. 1 shows the trend of death among age groups. It was observed that highest mortality occurred in the 0–10 year age group.

Fig. 2: Death Trend between 2004 and 2014

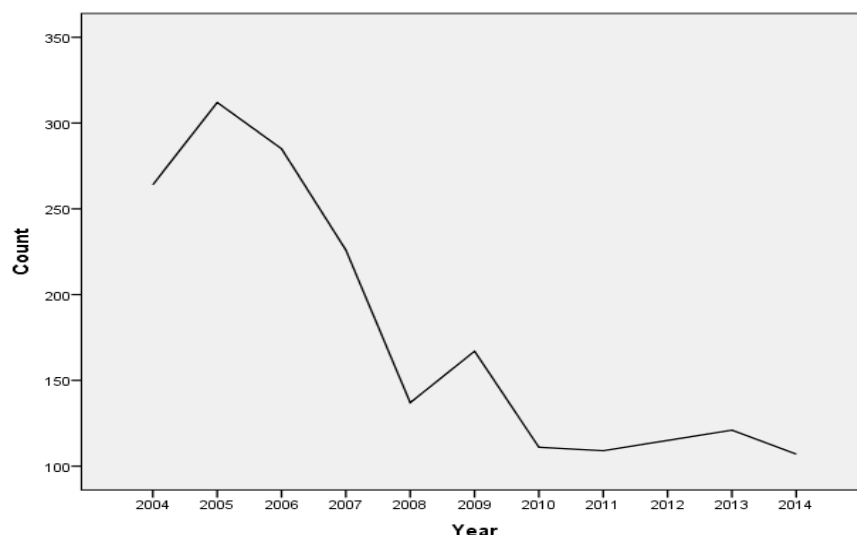


Fig. 2 shows a decrease in trend of death between year 2005 and 2014

V. Discussion

The study identifies infectious and cardiovascular diseases as the major mortality contributors to hospital mortality [3] and [5], consistent with global trends in developing nations [12]. The decline in infection-related deaths may reflect improved healthcare access and interventions post-2008. However, rising deaths from retroviral diseases and persistent trauma-related fatalities highlight emerging health challenges. Children under ten are particularly vulnerable, underlining the need for pediatric-focused health programs [1], [11] and [4]. Gender distribution shows a higher mortality rate among males, suggesting possible gender-related risk behaviors or access disparities [9], [10] and [8].

VI. Conclusion

The upgrade of the Hospital to a Teaching Hospital (EKSUTH) in 2008 has helped in reducing the rate of death, especially from infectious and trauma-related causes. Death from infectious disease, trauma, and anaemia in 2014 has greatly reduced compared to the deaths recorded in the year 2004, while the death rate due to retroviral disease is on the increase. Strategies aimed at preventing, early diagnosis, and management of these conditions are imperative.

VII. Recommendations

To further reduce the mortality rate, this study recommends targeted interventions for high-risk groups, public awareness campaigns on disease prevention, nutrition, and road safety, enhanced funding for pediatric and emergency care units and implementing reliable mortality tracking systems for continuous health evaluation.

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