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MORTALITY PATTERN AT THE NATIONAL HOSPITAL: A HOSPITAL-BASED STUDY IN ABUJA, NIGERIA

Osunkwo D. A.*[1], Nwokeukwu H. I.[2], Balogun M. S.[2], Nguku P.[2], Ajumobi O.[2] and Sabitu K.[3]

[1]National Hospital Abuja, Nigeria.
[2]Nigeria Field Epidemiology and Laboratory Training Program, Abuja, Nigeria.
[3]Ahmadu Bello University, Zaria, Nigeria.

*Corresponding Author: Osunkwo D. A.

National Hospital Abuja, Nigeria.

ABSTRACT

Background: Mortality is one of the indicators of disease burden of a population. The rates and numbers of people who die, where, at what age, and from what, is a vital input into policy making, planning interventions, and prioritizing research for new health technologies. The aim of this study was to determine the frequency and causes of mortality at the National Hospital Abuja, Nigeria. **Methods:** Retrospective analysis of all deaths recorded at National Hospital, Abuja from 2009 to 2013, was conducted. Information obtained from the records included demography, ward and duration of hospital admission, and certified cause of death. Cause of death was coded according to the International Statistical Classification of Diseases and Related Health Problems. **Results:** There were 42,444 admissions and 2,149 (5.06%) deaths. Overall, 719(33.0%) were children under five years, 1179 (55%) were aged 15 – 64years while 181 (8%) were ≥65years. Males accounted for 58% (n = 1,241) deaths. The overall leading cause of death was the infections group which accounted for 22.2% (n = 476) deaths. HIV was the leading cause of death in both sexes (males: 15.9%, females: 16.9%). Other major causes were perinatal: 19.9% (n = 472), cancers: 13.1% (n = 281), trauma: 11.1% (n = 239) and cardiovascular diseases: 8.8% (n = 190). **Conclusion:** Most of the leading causes of mortality in this study are preventable. Strategies for improving prevention of diseases should be defined and implemented.

KEYWORDS: Mortality, Pattern, Hospital, Nigeria.

BACKGROUND

Mortality data are important information necessary for assessing population health status and disease burden.[1] The rates and numbers of people who die, where, at what age, and from what, is a vital input into policy making, planning interventions, and prioritizing research for new health technologies.[2] Information on mortality rates and causes of death is clearly important to inform regional and national health policies, and to monitor the impact of interventions and progress towards health goals.[2]

Data from complete civil registration systems are the "gold standard" for mortality statistics, but death registration remains inadequate in several developing countries.[3] Generally, there is scarcity of information on disease prevalence, mortality rates and patterns in developing countries including Nigeria and our geo-ethnical locality. However, the few reports available are hospital-based[6-19] and may not adequately form a comprehensive national data of disease patterns as recommended by the World Health Organization (WHO), which could be very useful in assessing the mortality and morbidity patterns of diseases, when monitored over a prolonged period.[4,5]

A retrospective study of hospital deaths over a period of time could be conducted if the hospital records were adequate to allow an accurate medical diagnosis to be extracted. The present study was conducted to determine cause-specific mortality pattern at the National hospital Abuja, Nigeria.

METHODS

A retrospective study was conducted at National Hospital Abuja (NHA) situated in Federal Capital Territory, Nigeria. NHA is an apex tertiary health institution, a referral centre and 420 bed hospital. Abuja is the Federal capital of Nigeria and a metropolitan city. We reviewed mortality records in National hospital Abuja for 1st January 2009 to 31st December 2013.

Data processing and analysis

Data on demographic characteristics, duration of hospital admission, and certified cause of death were obtained from hospital records. Cause of death was coded according to the international classifications of Diseases, Tenth Revision. We adapted the 2006 Global Burden of Diseases and Risk Factors to classify causes of death as follows: Group I (communicable diseases, maternal

conditions, and nutritional deficiencies), Group II (noncommunicable causes), and Group III (injuries).[3] Data was entered using Microsoft excel. SPSS 20.0 was used for data analysis. Mean±SD, and median values are reported for quantitative variables, while frequency percentage were reported for qualitative variables. Results were considered statistically significant at *p<* 0.05.

Ethical consideration
The study was a secondary data analysis and was approved by the NHA institutional review committee.

RESULTS
Overall 2,149 deaths (5.1%) from 42,444 admissions were reported over the 5-year period. Of the 2149 deaths, 719(33.0%) were children under five years and 1241 (58.0%) were males (Table 1).

More than half of the deceased (55.0%, n = 1179) were aged 15 – 64years while 181 (8.0%) of the deceased were 65years and above (Figure 1). Among both men and women, most deaths were due to communicable conditions (Group 1), and they account for 47.0% of deaths. Non- Communicable diseases, reproductive and nutritional conditions are responsible for 40% of deaths in both males and females. The largest difference between the sexes occurs for Group III, with injuries accounting for almost 1 in 6 male deaths and 1 in 19 female deaths (Figure 2).

In children younger than five years, communicable diseases were the leading causes of death. Among those 45years and above, the main causes of deaths were non-communicable followed by communicable diseases and then Injury causes. There were differences in rank for causes of death between age groups (Figure3). Among adults aged 15 - 44years, 24% (n=159) of deaths were caused by injury.

Infectious and parasitic diseases (A00–B99), was the leading cause of death accounting for 22.2% (n = 476). Perinatal diseases (P00-P96) accounted for 19.9% (n = 472), Cancers (C00-D48): 13.1% (n = 239). Of the 2149 deaths recorded, Other main causes of death were Trauma 11.1% (n = 239) and cardiovascular -related deaths: 8.8% (n = 190), see Table 2. In under 5years the leading cause of death was low birth weight and prematurity accounting for 153 deaths (21.3%) of all under 5 deaths. Sepsis was the leading cause of death for above five years. (Figure 4).

Overall, the deaths of males exceeded the deaths of females by 15.5%.(Table 1) The leading cause of death was HIV in both sexes but slightly higher in female (16.9%) while male was 15.9%. The other leading causes of death differ. In male HIV is followed by RTA, Chronic liver disease, Stroke, Hypertension and Renal disease (Figure 4). While in females, HIV is followed by cancer of the breast, Stroke, Septicemia, Hypertension, maternal causes and cancer of the cervix (Figure 5).

Table 1: Hospital admission, mortality and mortality distribution according to gender and Age, NHA, Nigeria; 2009-2013.

| Year	2009	2010	2011	2012	2013	OVERALL
Total admission(n)	8197	7780	8864	7795	9808	42444
Mortality (%)	475 (5.8%)	441 (5.7%)	440 (5.0%)	440 (5.6%)	353 (3.6%)	2149 (5.1%)
Sex						
Male	269 (56.6%)	260 (59.0%)	273 (62.1%)	253 (57.5%)	186 (52.7%)	1241(57.8%)
Female	206 (43.4%)	181 (41.0%)	167(38.0%)	187 (42.5%)	167 (47.3%)	908 (42.3%)
Age group(years)						
<1	134 (28.2%)	112(25.4%)	94 (21.4%)	122(27.7%)	85 (24.1%)	547 (25.5%)
1—4	45 (26.3%)	21 (4.8%)	34 (7.7%)	43 (9.8%)	28 (7.9%)	171 (8.0%)
5—14	10 (2.1%)	12 (2.7%)	14 (3.2%)	18 (4.1%)	16 (4.5%)	70 (3.3%)
15—24	24 (5.1%)	20 (4.5%)	14 (3.3%)	9 (2.1%)	9 (2.6%)	76 (3.5%)
25—34	52 (11.0%)	58 (13.2%)	62 (14.1%)	55 (12.5%)	38 (10.8%)	265 (12.3%)
35—44	68 (14.3%)	78 (17.7%)	67 (15.2%)	66 (15.0%)	69 (19.6%)	348 (16.2%)
45—54	64 (13.5%)	57 (12.9%)	57 (13.0%)	55 (12.5%)	50 (14.2%)	283 (13.2%)
55—64	41 (8.6%)	38 (8.6%)	56 (12.7%)	37 (8.4%)	36 (10.2%)	208 (9.7%)
=>65	37 (7.8%)	45 (10.2%)	42 (9.6%)	35 (8.0%)	22 (6.2%)	181 (8.4%)
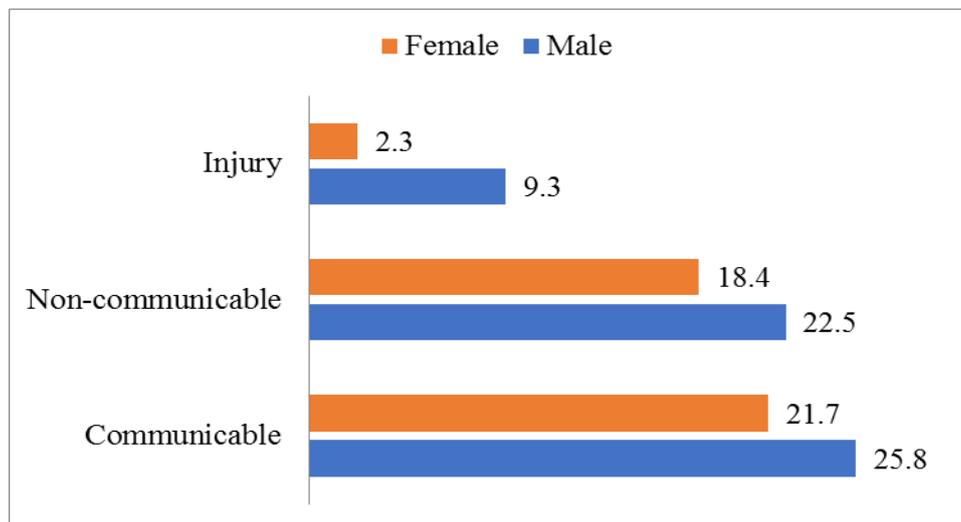
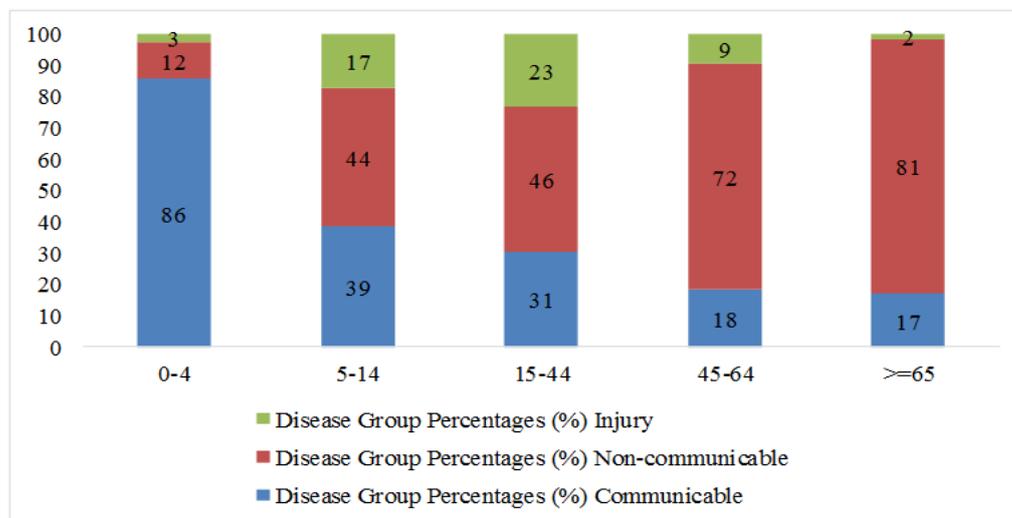**Figure 1: Sex distribution of causes of death, NHA, Nigeria; 2009-2013.**

Figure 2: Age distribution of causes of death, NHA, Nigeria, 2009-2013.

Table 2: Classification of the causes of death according to ICD-10, NHA, Nigeria; 2009-2013.

| ICD-10 BLOCKS	ICD-10 TITLE	No. of deaths N= 2149 (n)	Percent (%)
A00-B99	Infection	476	22.2
P00-P96	Perinatal	472	19.9
C00-D48	Cancers	281	13.1
S00-T88, V01-Y98	Trauma	239	11.1%
I00-I99	Cardiovascular	190	8.8
K00-K93	Gastrointestinal Liver Diseases	140	6.5
R00-R99	Symptoms and Signs	90	4.2
N00-N99	Renal Disease	70	3.3
Q00-Q99	Congenital	53	2.5
J00-J99	Respiratory	51	2.4
E00-E90	Endocrine and Metabolic	47	2.2
G00-G99	Neurological	34	1.6
D50-D89	Diseases of Blood	28	1.3
O00-O99	Pregnancy Related	21	1.0
F01-F09	Mental Disease	1	0.1
L00-L99	Skin Disease	1	0.1
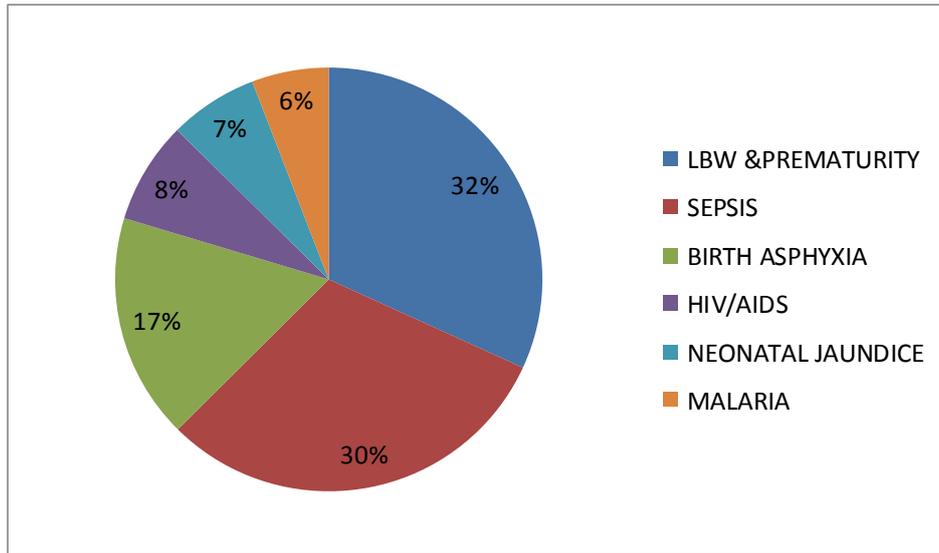
Figure 3: Leading causes of death in >5years, NHA, Nigeria, 2009-2013.
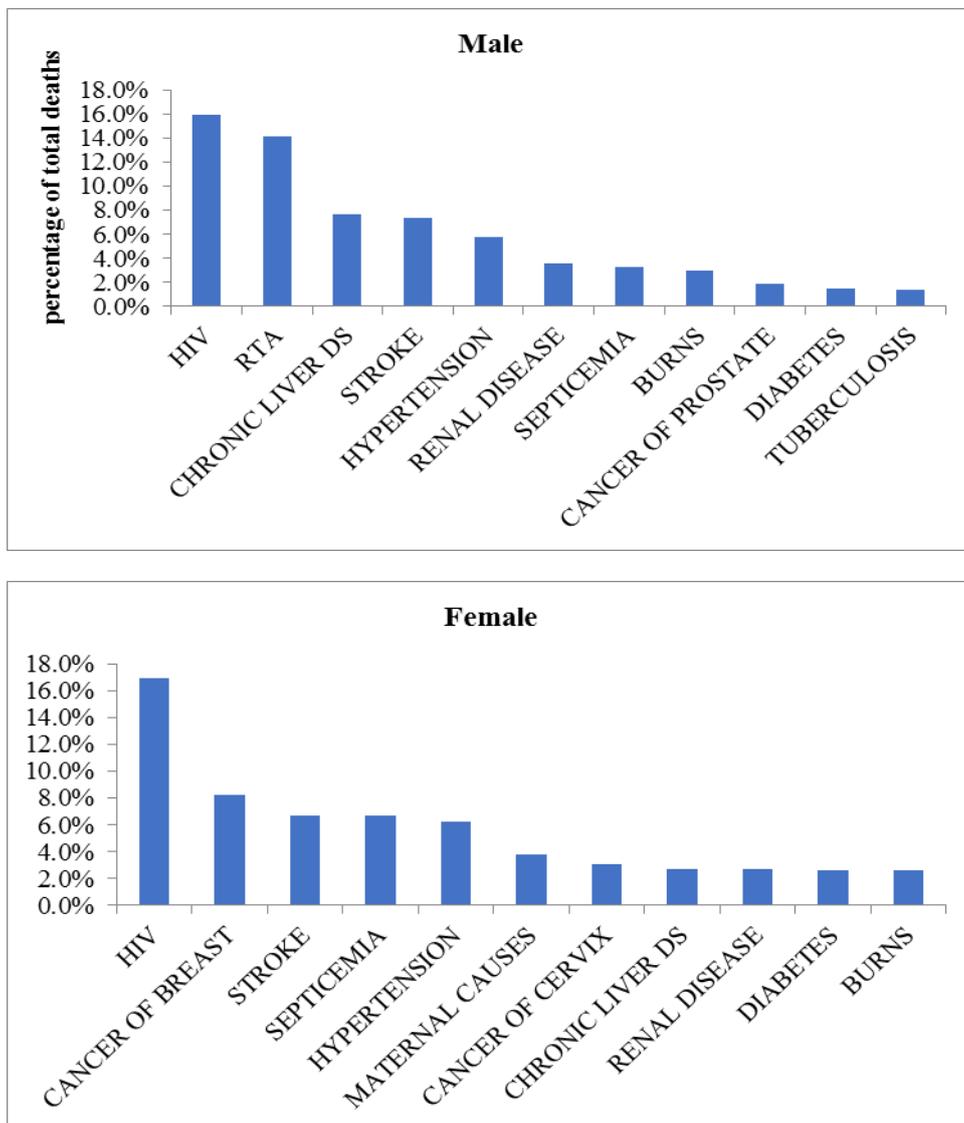

Figure 4: Percentage of primary cause of death in adults aged 15 and above, NHA, Nigeria, 2009-2013.

DISCUSSION

Our study revealed majority of deaths occur in below one year and the leading cause of death was low birth weight and sepsis among the < 1yr age group. These findings are similar to other studies in Nigeria[17,18] and may be attributed to maternal health problems such as malaria, HIV/AIDS and poor nutrition. Deaths in under five years have decreased progressively over the years compared to baseline in 2009.

The statistics provided in this study is hospital-related death, but it can be reflection of the mortality pattern because of the referral nature and a wide catchment area the NHA is serving. The mortality rate of 5.1% in this study is lower than other studies in Nigeria[14,17,18] but higher than 1.6% observed in Karachi.[10] The low mortality may be the due to better health care facilities, health seeking behavior of the public, easy access to the hospital, good clinical services and clinical staff available 24 hours. Majority of the deceased were males, which is similar to other previous studies in Africa,[9,14,17] and could be related to the fact that men attend hospital more than female and most females do not attend the hospital until it is too late[14] and probably a larger proportion die at home.

In this study, Infection being the overall leading cause of death is not surprising. The finding is similar to other work done in the region.[9,14,17] Infectious diseases are the main health problems and consequently the leading causes of death. This was probably because of poverty[5], poor hygiene, and sanitary condition and lack of awareness and infection control., HIV/AIDS remained the major cause of mortality followed by septicemia, road traffic accidents, cardiovascular diseases, low birth weight and others probably due to late diagnosis, poor drug adherence, possible drug resistance and societal attitude to the disease.[10] These and other probable reasons need to be investigated and addressed.

Non-communicable diseases like malignant neoplasm and cardiovascular diseases were identified among the leading causes of death. This finding supports result of hospital-based studies done in Nigeria[9] and Addis Ababa.[19] Perinatal conditions were the second leading cause of death according to ICD-10. Perinatal mortality is a key indicator of the health status of a community. This study has shown that more than a quarter of the deaths (34%) were children under the age of five years and the vulnerability of this age group. Infant and child mortality however remains unacceptably high in Nigeria, despite the significant decline in most parts of the developing world.[19,20] There is a need to address low birth weight, prematurity and birth asphyxia, which were the major contributors to under-five mortality in this study.

An increasing trend of mortality due to neoplasms (cancers) throughout the period (third leading cause of death), could be due to well established Oncology department in the hospital that now identifies more cases. Malignant neoplasms of breast, cervix, prostate and liver were the dominant neoplasm in this study, 3% of all deaths. The finding of high rate of cervical and liver cancer corroborates the finding that most developing countries are affected by cancer related to infectious agent.[14] Despite the fact that approximately one-seventh of the total deaths of the study were cancer-related, there are no established screening programmes and Human Papilloma Virus and Hepatitis B immunisation for the asymptomatic population in the region.

Trauma was the fourth leading cause of death, 11%, mainly by road traffic accidents and burns among. males and in the age group 15 - 44years. This is similar to observations in previous studies.[14,27] The explanation for the high rate of burn cases may be due to petroleum product explosion and bomb blast by terrorist attacks in Abuja during this period.

Cardiovascular conditions like hypertension and cerebrovascular accident contributed a very significant part of the total mortality in our study (10.4%) Odia *et al* in their study reported that stroke was responsible for 15.9% of deaths on the medical wards while hypertensive conditions accounted for 16.1% of medical mortality in another report from Benin City, South-south Nigeria.[4]

This increase in non-communicable diseases supports the indication that an epidemiological transition is occurring especially in urban population because of the "westernization" of our diet and lifestyle in this part of the world.[25,26] There is a need for government to put in place public enlightenment strategies in addition to adequate diagnostic and management protocols to combat this menace. In our analysis infections, perinatal disease, neoplasms, trauma and cardiovascular diseases were the leading causes of death and accounted for three-fourths of all deaths. Similar studies conducted in Karachi[10] and Nigeria[8,18] showed comparable results with human immunodeficiency virus and acquired immunodeficiency syndrome (HIV/AIDS) as the topmost cause of hospital mortality. In addition, a study from Zimbabwe, and data from a central registry confirmed high prevalence of hypertension.[25]

CONCLUSION

The results of the present study suggest that to reduce mortality in the urban setting of Abuja, priority should be given to the prevention and management of conditions arising from infections such as HIV/AIDS, Perinatal conditions like low birth weight and birth asphyxia, malignant neoplasm, road traffic accidents and cardiovascular diseases. The planning of health resources and activities should take in to account the double burden in mortality due to communicable diseases, perinatal conditions and non-communicable diseases. Approaches towards the control and prevention of Injury such as road traffic accidents and non communicable diseases

conditions like cardiovascular and malignant neoplasm also deserve to be strengthened.

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