

RESEARCH ARTICLE

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# Morbidity and mortality patterns among patients in a tertiary hospital, South-west, Nigeria: a five-year retrospective study

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## Abstract

**Objectives:** Morbidity and mortality statistics are essential tools for assessing population health status as well as effective elements to adapt to the changing epidemiological trends. This study aimed at assessing the morbidity and mortality pattern in the facility while also looking into the patterns of presentation at the facility.

**Methods:** A hospital-based descriptive cross-sectional study was employed, involving the review of patients' medical records from January 2016 to December 2020. The data were analyzed using SPSS version 24.0. Descriptive statistics such as frequency distribution, percentages and central tendencies were used. The level of significance was set at 0.05.

**Results:** A total of 2,809 patient records were scrutinized from January 2016 to December 2020. The mean age of the respondents was 27±20.5 years, the majority were urban dwellers (91.4%) and males were predominant (55.7%). Infectious and parasitic diseases were found to have the highest prevalence among the respondents (44.1%). Diseases of the respiratory system and the circulatory system had a prevalence of 14.9% and 4.2% respectively. The mortality rate among the respondents was 3.6%.

**Conclusion:** The morbidity pattern in this facility was largely dominated by infectious and parasitic diseases thus showing that communicable diseases such as Malaria, HIV/AIDS, and tuberculosis are still prevalent in Nigeria with a high burden on the health system. There is an urgent need to strengthen disease prevention measures across all levels of Health care to stem this tide.

**Keywords:** Morbidity, Mortality, Patterns, Hospital, Nigeria

## Plain English Summary

Morbidity is the state of being symptomatic or unhealthy for a disease or condition while mortality is related to the number of deaths caused by the health event under investigation. Both statistics allow epidemiologists to study the burdens a health event may place on a population or health system. This study is aimed at assessing the morbidity and mortality patterns of patients attending the Emergency unit of Federal Medical Center, Abeokuta, Ogun State during a five-year period, while also looking at the disease presentation of patients at the facility.

All the medical records of the patients seen in the emergency unit of the hospital from the period of January 2016 to December 2020 were retrieved and reviewed. A total of 2,809 patient records were scrutinized from January 2016 to December 2020. Infectious and parasitic diseases were found to have the highest burden

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among the respondents (44.1%). Diseases of the respiratory system and the circulatory system had a proportion of 14.9% and 4.2% respectively. The mortality rate among the respondents was 3.6%. In conclusion, the disease pattern in the facility was largely dominated by infectious and parasitic diseases thus showing that communicable diseases such as Malaria, HIV/AIDS, and tuberculosis are still prevalent in Nigeria placing a high burden on the health system. Thus, we recommend strengthening disease prevention measures across all levels of Health care to stem the tide.

## Background

According to the United Nations report, Nigeria's health system is an inconsolable 187th out of 191 nations. Despite the various reforms to increase the provision of health to the Nigerian people, health access is only 43.3% (1). The inadequacy of the healthcare delivery system in Nigeria could be attributed to the peculiar demographics of the Nigerian populace; about 55% of the population lives in rural areas and only 45% live in urban areas (1, 2). Nigeria's health outcome indicators are still unacceptably high, despite modest improvements. The maternal mortality ratio is 814 per 100, 000 (2). The mortality rate for infants and children under five years is 70 and 104 per 1,000 live births respectively (2). A significant disparity in health status exists across States & geopolitical zones as well as across rural/urban divides, education & social status (2).

The emergence of the COVID-19 pandemic added to the already precarious nature of the disease burden in Nigeria. The country reported its index case of COVID-19 on the 27th of February 2020 in an Italian national. By 21<sup>st</sup> February 2021, the Federal Ministry of Health (FMOH) through the Nigerian Centre for Disease Control (NCDC) had confirmed 154,476 Coronavirus cases in the country with 1,891 deaths (3, 4). Communicable diseases still constitute a major public health problem: Malaria accounts for 27% of the global burden; TB prevalence is at 323 per 100, 000; HIV/AIDS prevalence is estimated at 1.4%. Malnutrition is common with a stunting rate at 43.6% (2). Guinea worm transmission was interrupted in 2013, and the last Wild Polio Virus was reported in September 2016 (2).

The global burden of disease study in 2017 reported ischemic heart disease, neonatal disorders and stroke as leading causes of early death (5). A greater proportion of developing countries have mortality patterns that show a larger proportion of infectious diseases and the risk of death during pregnancy and childbirth whereas cardiovascular diseases, chronic respiratory diseases and cancers account for most deaths in the developed world (2). Population-based data on the pattern of morbidity and mortality are often lacking in developing countries,

hospital-based patterns of morbidity and mortality often offer the best alternative (6).

Global projections of mortality and burden of disease up to 2030 have indicated a significant shift from infectious/communicable to non-communicable diseases worldwide and this transition is expected to affect developing countries like Nigeria (7, 8). Improving health around the world today is an important social objective, which has obvious direct pay-offs in terms of longer and better lives for millions. There is also a growing consensus that improving health can have equally large indirect payoffs through accelerating economic growth (9). Data on morbidity and mortality are vital inputs for assessing population health status and disease burden. While the medically certified cause of death from a complete civil registration system is the 'gold standard' for such statistics, these are generally not available in over two-thirds of all countries (11).

Causes of morbidity and mortality are relevant parameters for documentation of the geographical burden of disease and for public health planning, involving programmatic needs, assessing intervention programmes, and re-evaluation of health policies. They are also relevant tools for keeping track of the health of populations as well as for effective responses to changing epidemiological trends (11, 12). Morbidity, of physical and mental illness, is increasingly being recognized as a measurable indicator of well-being. Studies on reporting morbidity patterns reveal important facts that inform not only about the health status of various groups but also help in identifying about type and extent of prevailing morbidities, which provides vital feedback in setting up priorities in health service reforms (13). The Federal Medical Centre, Idi-Aba, Abeokuta (FMCA) is a public institution funded solely by the government, it is perceived to be a cheap and convenient place to secure health care. This has led to overcrowding of patients in this hospital and in recent times the flight of medical professionals out of the country has added to the burden of care leading to the exhaustion of the few professionals on the ground. This situation at most tertiary hospitals in Nigeria and FMCA, in particular, has led to the provision of primary, secondary and

tertiary/research care services in a Centre that ought to devote time and resources to tertiary health care services and research-based care (14). There is also a paucity of data on morbidity and mortality patterns in the facility and its service catchment areas. Hence, this study is aimed at bridging this gap by reviewing 5-year morbidity data from the Emergency Care Centre of the Hospital and by so doing take a look at the distribution of patients attending Federal Medical Centre, Idi-Aba, Abeokuta, Ogun State, Southwestern, Nigeria within five years.

## Methodology

### Study Area

This study was carried out at the Federal Medical Centre, Idi-Aba, Abeokuta, a 500-bed tertiary hospital, located in Abeokuta-South, Ogun state, Southwest, Nigeria, the facility was established in 1993.

The hospital provides medical services to the people of Ogun and the neighbouring states. It is generally stratified into the health care service department and administrative department, mortuary services and laundry and works department. The health care services are composed of a laboratory department, Nursing services, Surgery, Internal Medicine, Family Medicine, Paediatrics, obstetrics and gynaecology, Ophthalmology, physiotherapy, Community Medicine and Primary care, Orthopaedics, Accident and Emergency, Dental department and Blood bank units.

### Study design

The study was a five-year retrospective descriptive cross-sectional study in design. This involved using the medical records of the patients in the emergency unit of the hospital.

### Study population

All available patient charts from the period of January 2016 to December 2020 were retrieved and studied. There was a review of files to ensure correct data records for both the males and the females. Patients who were admitted or died (while in admission) in the Accident and Emergency unit of the hospital were included in the study. More so, it is pertinent to note that female subjects admitted for labour and delivery were also part of the study population (7).

### Inclusion criteria

All patients' charts who attended the emergency unit, with correctly filled information within the

specified period were retrieved from the records for the study.

### Exclusion criteria

All the records of patients not admitted through the Emergency unit. Patients brought in dead before arrival were also excluded.

### Sample size determination

All the case notes identified and retrieved within this specific period of five years were included in the study.

### Sampling Technique

The International Classification of Disease-11 (ICD-11) (15, 16), an adapted retrospective form was used to collect information on patients from the medical records using a convenience sampling method of suitable cases over the specified period.

### Data Collection Instruments and Analysis

Data were abstracted from electronic medical records in the dataset with the use of the adapted questionnaire by trained research assistants. Three (3) research assistants (Resident doctors) were trained for two days on methods of data collection. Preliminary data were also collected through a review of case files with the secondary data.

Data abstracted using data extraction format was analyzed using SPSS version 24.0, descriptive statistics were used to determine patterns and distribution of clinical presentations. Chi-square tests were used for the association between categorical independent variables and the response variables. Statistical significance was set at  $p$ -value  $< 0.05$ .

## Results

### Socio-demographic characteristics

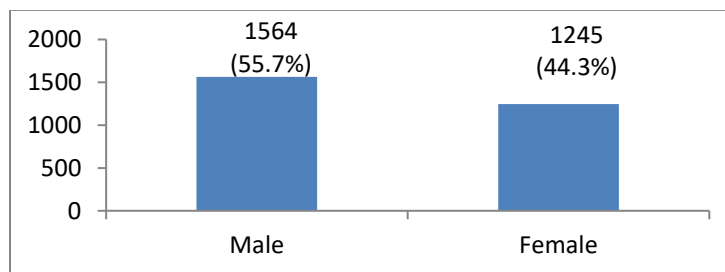
Table 1 shows a total of 2,809 patients' records were scrutinized between January 2016 and December 2020. About 1,357 (48.3%) of the data were from patients seen in 2016, 716 (25.5%) were those from 2019, 514(18.3%) were data from 2017 records, 219(7.8%) were records of 2018 data and 3 (0.1%) were data of 2020 records. The mean age of respondents was  $27 \pm 20.5$  years. Most of the respondents 980 (39.9%) had no form of formal education and 838 (29.8%) had tertiary education. Most respondents 1,104(39.3%) were unemployed, while 745(26.5%) were artisans. The majority 2,521 (89.7%) were Yoruba, while 195(6.9%) were Igbo and 70 (2.5%) were Hausa. The majority of patients seen 2,568 (91.4%)

between these periods were drawn from urban settings while 241(8.6%) were from the rural setting. Christians were 2015 (71.7%) and

Muslims 779 (27.7%). There is a male preponderance of 1,564 (55.7%). There were 1,245 (44.3%) females. (See Figure 1).

**Table 1: Socio-demographic characteristics of respondents. N= 2809**

Variables	Frequency (2809)	Percentage (%)
<b>Age group</b>		
<1	193	6.9
1 – 4	387	13.8
5 – 14	304	10.8
15 – 45	1423	50.7
46 – 64	356	12.7
>64	146	5.2
<b>Mean ± SD</b>	<b>27 ± 20.5</b>	
<b>Educational level</b>		
None	980	34.9
Primary	337	12.0
Secondary	651	23.2
Tertiary	838	29.8
<b>Occupation</b>		
Unemployed	1104	39.3
Housewife	117	4.2
Student	467	16.6
Artisan	745	26.5
Civil servant	376	13.4
<b>Religion</b>		
Christian	2015	71.7
Islam	779	27.7
Others	15	0.6
<b>Ethnic group</b>		
Yoruba	2521	89.7
Hausa	70	2.5
Igbo	195	6.9
Others	23	0.8
<b>Year of Presentation</b>		
2016	1357	48.3
2017	514	18.3
2018	219	7.8
2019	716	25.5
2020	3	0.1
<b>Residence</b>		
Rural	241	8.6
Urban	2568	91.4



**Figure 1: Gender distribution of respondents**

**Morbidity and mortality**

The International Classification Diseases (ICD-11) (17) has been categorized into different tables to allow ease of table presentation. Table 2 shows the prevalence of morbidity and mortality by broad ICD-11 classification and specific disease types. Very low percentage of these variables Infectious and parasitic disease- Malaria has the highest presentation with 514 (18.3%), Diarrhoea and Gastroenteritis 238 (8.5%), Tuberculosis 218

(7.8%) and COVID-19 156 (5.5%) respectively. In the category of Neoplasms Malignant neoplasm of the Cervix and Uteri – 12 (0.4%), malignant neoplasm of the breast- 7 (0.2%), and malignant neoplasm of the liver- 3 (0.1%) respectively. Under disease of the blood and blood-forming organs, anaemia was 17 (0.6%) and others- 3 (0.1%). Diabetes mellitus constituted 28 (1.0%) and malnutrition recorded 5 (0.2%).

**Table 2: Morbidity and mortality by broad ICD-11 classification and specific disease types**

Variables	Yes (%)	No (%)
<b>Infectious and parasitic diseases</b>		
Diarrhoea & Gastroenteritis	238 (8.5)	2571 (91.5)
Septicaemia	71 (2.5)	2738 (97.5)
HIV	5 (0.2)	2804 (99.8)
other viral diseases	18 (0.6)	2791 (99.4)
COVID-19	156 (5.5)	2655 (94.5)
Malaria	514 (18.3)	2295 (81.7)
Tuberculosis	218 (7.8)	2591 (92.2)
Others (cystitis, enteric fever, tetanus, UTI)	19 (0.7)	2790 (99.3)
<b>Neoplasms</b>		
Malignant neoplasm of lip, oral cavity	2 (0.1)	2807 (99.9)
Malignant neoplasm of liver	3 (0.1)	2806 (99.9)
Malignant neoplasm of breast	7 (0.2)	2802 (99.8)
Malignant neoplasm of cervix & uteri	12 (0.4)	2797 (99.6)
Benign neoplasm of breast	2 (0.1)	2807 (99.9)
Leiomyoma of uteri	0 (0.0)	2809 (100.0)
Others (cancer of the caecum, gastric cancer, laryngeal)	6 (0.2)	2803 (99.8)
<b>Diseases of blood and blood-forming organs</b>		
Anaemia	17 (0.6)	2792 (99.4)
Others	3 (0.1)	2806 (99.9)
<b>Diseases of the immune system</b>		
Autoimmune disease	1 (0.0)	2808 (100.0)
Organ-specific autoimmune Disease	0 (0.0)	2808(100.0)
<b>Endocrine, nutritional and metabolic diseases</b>		
Diabetes mellitus	28 (1.0)	2781 (99.0)
Malnutrition	5 (0.2)	2804 (99.8)
Volume depletion	4 (0.1)	2805 (99.9)
Others	3 (0.1)	2806 (99.9)

According to Table 3, in the category of mental and behavioural or neurodevelopmental disorders, Sleep-wake disorder had a prevalence of 58 (2.1%), Head Injury 43 (1.5%), seizure 19 (0.7%), and Spinal cord injury 6 (0.1%). Inflammation disease of CNS had 4 (0.1%), Cerebral palsy and other paralytic syndrome had 4 (0.1%). Diseases of the visual system (Cataract, conjunctivitis) had a prevalence of 6 (0.2%).

Diseases of the ear and mastoid process (foreign body in ear/nose, AOM, bleeding, wax impaction) 28 (1.0%). Diseases of circulatory system disease including Essential (primary) hypertension had 51 (1.8%), other hypertensive diseases had 18 (0.6%), ischemic heart disease- 7 (0.2%), stroke recorded 35 (1.2%). Other (Atrial myxoma, CCF, complete heart block, hypotension, and palpitation) was 10 (0.4%).

**Table 3: Morbidity and mortality by broad ICD-11 classification and specific disease types**

Variables	Yes (%)	No (%)
<b>Mental and behavioural or neurodevelopmental disorders</b>		
Sleep-wake disorder	58(2.1)	2751(97.9)
Sleep-related disorder	1(0.0)	2808(100.0)
Parasomnia disorder	1(0.0)	2808(100.0)
Others (Inflammation disease of CNS, Cerebral palsy and other paralytic syndrome)	8(0.3)	2801(99.7)
<b>Diseases of the nervous system</b>		
Inflammation disease of the CNS	4 (0.1)	2805 (99.9)
Cerebral palsy & other paralytic syndromes	4(0.1)	2805(99.9)
Head injury	43(1.5)	2766(98.5)
Seizure	19(0.7)	2790(99.3)
Spinal cord injury	6(0.2)	2803(99.8)
Others (TBI, haemorrhage)	0	0
<b>Diseases of the visual system (Cataract, conjunctivitis)</b>		
	24(0.9)	2785(99.1)
<b>Diseases of the ear and mastoid process (foreign body in ear/nose, AOM, bleeding, wax impaction)</b>		
	28(1.0)	2781(99.0)
<b>Diseases of the circulatory system disease</b>		
Essential (primary) hypertension.	51(1.8)	2758(98.2)
Other hypertensive diseases	18(0.6)	2791(99.4)
Ischemic heart disease	7(0.2)	2802(99.8)
Stroke	35(1.2)	2774(98.8)
Other (Atrial myxoma, CCF, complete heart block, hypotension, palpitation)	10(0.4)	2799(99.6)

According to Table 4, in the category of diseases of the respiratory system; acute pharyngitis had a prevalence of 141 (5.0%), other acute respiratory infections had 138 (4.9%), pneumonia had 38 (1.4%), acute bronchitis was 12 (0.4%) and Asthma had 60 (2.1%). Under the diseases of the digestive system, Gastric and duodenal ulcers had 108 (3.8%), diseases of the appendix 33 (1.2%), paralytic ileus and intestinal obstruction 12 (0.4%).

Diseases of the skin and subcutaneous tissue; dermatitis was 5 (0.2%), abrasion 21 (0.7%), and soft tissue injury 52 (1.9%). Diseases of the genitourinary system; acute nephritic syndrome 3(0.1%), other diseases of the urinary system 67 (2.4%). Pregnancy, childbirth & puerperium; No medical abortion was recorded 1(0.0%) while post-partum haemorrhage was 3 (0.1%).

**Table 4: Morbidity and mortality by broad ICD-11 classification and specific disease types**

Variables	Yes (%)	No (%)
<b>Diseases of the respiratory system</b>		
Acute pharyngitis and tonsillitis	141(5.0)	2668(95.0)
other acute respiratory infections	138(4.9)	2671(95.1)
Pneumonia	38(1.4)	2771(98.6)
Acute bronchitis	12(0.4)	2809(99.6)
Chronic disease of the tonsils & adenoids	0(0.0)	2809(100.0)
Asthma	60(2.1)	2749(97.9)
Others	32(1.1)	2777(98.9)
<b>Diseases of the digestive system</b>		
Gastric and duodenal ulcer	108(3.8)	2701(96.2)
Diseases of the appendix	33(1.2)	2776(98.8)
Inguinal hernia	11(0.4)	2798(99.6)
Paralytic ileus & intestinal obstruction	12(0.4)	2797(99.6)
Alcohol liver disease	1(0.0)	2808(100.0)
Other diseases of the liver	11(0.4)	2798(99.6)
Others (Abdominal pain, abrasion, cholecystitis, colic, soft tissue injury)	17(0.6)	2792(99.6)
<b>Diseases of the skin and subcutaneous tissue</b>		

Abrasion	21(0.7)	2788(99.3)
Dermatitis	5(0.2)	2804(99.8)
Fungal infection	7(0.2)	2802(99.8)
Soft tissue injury	52(1.9)	2757(98.1)
<b>Diseases of the genitourinary system</b>		
Acute nephritic syndrome	3(0.1)	2806(99.9)
Real tubule interstitial	1(0.0)	2808(100.0)
Other diseases of the urinary system	67(2.4)	2742(97.6)
Others (Laceration, MSS pain, pyelonephylia)	31(1.1)	2778(98.9)
<b>Conditions related to sexual health</b>		
1	22(0.8)	2787(99.2)
2	98(3.5)	2711(96.5)
Others (Gynecosmeytia, ovarian cyst, sexual assault, STI, PID, metromenorhagia)	10(0.4)	2799(99.6)
<b>Pregnancy, childbirth &amp; puerperium</b>		
Medical abortion	1(0.0)	2808(100.0)
Post-partum haemorrhage	3(0.1)	2806(99.9)
Single spontaneous delivery		
Others	1(0.0)	2808(100.0)

According to Table 5, the prevalence of diseases under conditions originating in the perinatal period; foetus affected by maternal factors and labour 2 (0.1%), congenital malformation 5 (0.2%). Symptoms, signs and abnormal clinical and laboratory findings; EUCr/ECHO/RVS constituted 51 (1.8%), X-ray was 50 (1.8%), ABD USS 18 (0.6%). Injury and poison & other external causes; laceration was 83 (3.0%), fracture of limb bone

141 (5.0%) and burns and corrosion 32 (1.1%). External causes of morbidity or mortality; Intentional accident was 14 (0.5%), unintentional 72 (2.6%) and interpersonal 53 (1.9%). Factors influencing health status & contact with health services; distance constituted 37 (1.3%), access to finance 19 (0.7%) and total lack of health facility 2 (0.1%).

**Table 5: Morbidity and mortality by broad ICD-11 classification and specific disease types**

Variables	Yes (%)	No (%)
<b>Condition originating in the perinatal period</b>		
Foetus affected by maternal factors and Labour	2(0.1)	2807(99.9)
Slow fetal growth, malnutrition & short gest	3(0.1)	2806(99.9)
Congenital infectious & parasitic diseases	0(0.0)	2809(100.0)
Others (AEFI, breast E., hypoglycaemia)	6(0.2)	2803(99.8)
Congenital malformations (ACHDx, Cystic hygroma, Omphalocele)	5(0.2)	2804(99.8)
<b>Symptoms, signs and abnormal clinical and laboratory findings</b>		
ABD/USS	18(0.6)	2791(99.4)
CT scan	7(0.2)	2802(99.8)
EUCr/ECHO/RVS	51(1.8)	2758(98.2)
FBC	49(1.7)	2760(98.3)
MP	74(2.6)	2735(97.4)
PCV	45(1.6)	2764(98.4)
RDT	35(1.2)	2774(98.8)
Urinalysis	38(1.4)	2771(98.6)
X-ray	50(1.8)	2759(98.2)
Others (PT, RBS, RVS, H.pylori, K+, PSA, HBSAg, LFT, ECG)	11(0.4)	2798(99.6)
<b>Injury and poison &amp; other external causes</b>		
Fracture of limb bone	141(5.0)	2668(95.0)
Burns and corrosion	32(1.1)	2777(98.9)
Laceration	83(3.0)	2726(97.0)
Others	36(1.3)	2773(98.7)
<b>External causes of morbidity or mortality</b>		
Intentional accident	14(0.5)	2795(99.5)

Unintentional	72(2.6)	2737(97.4)
self- harm	5(0.2)	2804(99.8)
Interpersonal	53(1.9)	2756(98.1)
Others	29(1.0)	2780(99.0)
<b>Factors influencing health status &amp; contact with health services</b>		
Distance	37(1.3)	2772(98.7)
Financial access	19(0.7)	2790(99.3)
Total lack of health facility	2(0.1)	2807(99.9)
Others	23(0.8)	2786(99.2)

Table 6: Shows the association between the socio-demographic characteristics of participants and disease/admission outcomes, however, the age of respondents-p-0.001 ( $X^2 = 101.101$ ), occupation-p-0.001 ( $X^2= 22.037$ ), and residence p-0.001 ( $X^2=11.732$ ) were found to be statistically significant as determinants of outcome. Others are religion-p-0.001 ( $X^2= 15.363$ ) and years of

presentation-p-0.001 ( $X^2= 79.872$ ) were other factors statistically significant as determinants of disease outcome. Lastly, the facility recorded a 3.6% (100) mortality rate among the patients seen through the Accident and Emergency unit, while 2,709 (96.4%) were discharged between January 2016 and December 2020. (See Figure 2).

**Table 6: Association between sociodemographic characteristics of study participants and disease/admission outcomes**

Variable	Disease outcome		Total	X <sup>2</sup>	p-value
	Discharge (%)	Death (%)			
<b>Age group</b>				101.101	<b>0.001*</b>
<1	189 (97.9)	4 (2.1)	193		
1 – 4	384 (99.2)	3 (0.8)	387		
5 – 14	302 (99.3)	2 (0.7)	304		
15 – 45	1385 (97.3)	38 (2.7)	1423		
46 – 64	324 (91.0)	32 (9.0)	356		
>64	125 (85.6)	21 (14.4)	146		
<b>Sex</b>				0.019	0.889
Male	1509 (96.5)	55 (3.5)	1564		
Female	1200 (96.4)	45 (3.6)	1245		
<b>Educational level</b>				7.134	0.129
None	941 (96.0)	39 (4.0)	980		
Primary	330 (97.9)	7 (2.1)	337		
Secondary	620 (95.2)	31 (4.8)	651		
Tertiary	815 (97.3)	23 (2.7)	838		
<b>Occupation</b>				22.037	<b>0.001*</b>
Unemployed	1068 (96.7)	36 (3.3)	1104		
Housewife	110 (94.0)	7 (6.0)	117		
Student	463 (99.1)	4 (0.9)	467		
Artisan	703 (94.4)	42 (5.6)	745		
Civil servant	365 (97.1)	11 (2.9)	376		
<b>Religion</b>				15.363	<b>0.001*</b>
Christian	1959 (97.2)	56 (2.8)	2015		
Islam	737 (94.6)	42 (5.4)	779		
Others	13 (86.7)	2 (13.3)	15		
<b>Ethnic group</b>				2.371	0.499
Yoruba	2428 (96.3)	93 (3.7)	2521		
Hausa	67 (95.7)	3 (4.3)	70		
Igbo	191 (97.9)	4 (2.1)	195		
Others	23 (100.0)	0 (0.0)	23		
<b>Year of Presentation</b>				79.872	<b>0.001*</b>
2016	1324 (97.6)	33 (2.4)	1357		
2017	512 (99.6)	2 (0.4)	514		



2018	191 (87.2)	28 (12.8)	219		
2019	679 (94.8)	37 (5.2)	716		
2020	3 (100.0)	0 (0.0)	3		
<b>Residence</b>				11.732	<b>0.001*</b>
Rural	223 (92.5)	18 (7.5)	241		
Urban	2486 (96.8)	82 (3.2)	2568		

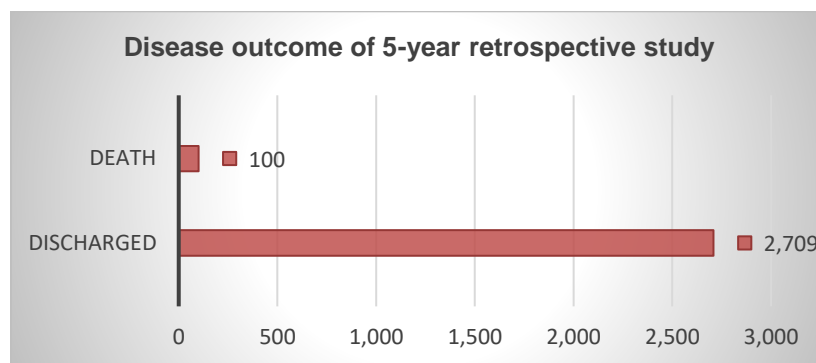


Figure 2: Disease outcome of 5-year Retrospective study

### Discussion

The Accident and Emergency unit of a hospital is the first place to which patients have recourse in case of urgent medical attention. There is a need, therefore, to constantly measure and assess the healthcare service provided to promote the quality of emergency medical services (17). This study measures the patterns of presentation among users of the Accident and Emergency unit of Federal Medical Centre, Abeokuta; the study found a mean age of  $27 \pm 20.5$  years) compared to  $34.98 \pm 15$  years reported by Ashenafi HW et al in Ethiopia (18). Most of the respondents in this study were 15-45 years constituting 50.7% compared with another related study in Ahmadu Bello University, Zaria, North West, Nigeria where ages 40 to 59 years constituted the largest proportion (39%), followed by 20–29 years (34%) (19). This pattern of age presented cannot be unconnected with the demographic pattern of the Nigerian population (20). This study found a male preponderance of 55.7% similar to Ogunmola OJ et al (21) in Ekiti, Chukwuemeka OE et al (22) in Abakaliki with a male preponderance of 57.0%, and Jamoh BY et al (19) in ABU, Zaria. But different from the findings of Ahmet TZ et al (17) in Turkey where the proportion of female patients outnumbered the male counterpart. However, the male preponderance has been argued to be multifactorial. Most men decline to go to the hospital until the illness becomes very severe. This is both cultural and also like men to deny illness as a mark of strength. This makes them usually present to the health facility in an advanced stage of their

illness with attendant higher mortality (19, 20, 21, 22).

This present study utilizes the International Classification of Disease-11 as a means of classifying the patterns of morbidity at the Accident and Emergency unit of the FMC, Abeokuta between January 2016 and December 2020. We found Infectious and parasitic diseases mostly Malaria (18.3%), Diarrhoea and Gastroenteritis (8.5%), Tuberculosis (7.8%), COVID-19 (5.5%) and HIV (0.2%) with an aggregate of 44.1% of the cases seen at the unit. Despite the Epidemiologic transition of diseases in developing and low-income countries, infectious and parasitic diseases still account for the greater majority of diseases seen in most health facilities in Nigeria. In their studies, Also U et al (23) and Wright JT et al (24) captured the significance of the double disease burden in Africa and other low-income countries, they stressed the problems posed by communicable diseases such as Malaria, HIV/AIDS, Viral hemorrhagic fever and tuberculosis as still prevalent in Africa. This puts much strain on the fragile health system of Nigeria and other developing countries (25, 26).

In the same vein, this study found Diseases of the Respiratory system constituting 14.9% of single Non-Communicable Diseases (NCD), Ahmet TZ (17) also reported that in the emergency department, the respiratory system with J code accounted for the highest rate of visits 16.6% and respiratory system diseases were the leading cause of visits 10.3%. The high rate of emergency visits in case of upper respiratory tract diseases they observed led them to consider that primary

healthcare services were not functioning properly in Turkey (17). Nigeria is not left behind in this trend as reported in Turkey where patients' expectations of receiving better services in tertiary healthcare institutions further put greater pressure on human and other resources. The lack of capacity of Primary Health Care (PHC) to meet the needs of the people in most situations led to more patronage of tertiary care services, Clara Ejembi (27) in her presentation posited that the root cause of the poor performance of PHC in Nigeria has been attributed to poor governance and inadequate funding leading to 29% service capacity performance in 2021 Global UHC ranking (27).

Injury and poison & other external causes due to trauma and fracture ranked third highest in this study with 10.4% ahead of Diseases of the Circulatory system which ranked 7<sup>th</sup> with a percentage of 4.2% respectively. A higher proportion was recorded among the working group in a study by Seok-In Hong et al (28) they reported 16.4% among patients with "Disease of the circulatory system", and 16.1% among patients with "injury, poisoning, and certain other consequences of external causes" (28). This study also recorded 6.2% in the category of External causes of morbidity or mortality with unintentional causes accounting for 2.6%. The increasing NCD prevalence in most Accident and Emergency units of tertiary hospitals in Nigeria has been attributed to the increasing adoption of a Westernized (29). This pattern was captured by other studies on Accident and Emergency admissions in Nigeria by Oyira EJ et al (30) and Ogunmola et al (21). The utilization of health care still differs greatly between urban and rural communities due to the availability of basic equipment and the presence of trained medical personnel in the urban area with a relatively low supply of the same in the rural community where more than 60% of the population resides (31, 32). The disproportionate utilization between rural and urban communities in Nigeria has resulted in varied morbidity and mortality rates (33). This study found similar correlates among our respondents, 91.4% of utilization was made by individuals who reside within the urban communities around the FMC, Abeokuta, and only 8.6% of our respondents were rural dwellers who defy the challenges of inadequate facilities, lack of equipment and low performance of PHCs still find usage of the Accident and Emergency unit for their immediate and urgent need. Assessing factors influencing health status & contact with health services the current study found distance to facility responsible

for 1.3%, financial access 0.7% and total lack of health facility 0.1% reasons for morbidity and mortality recorded in this study.

A mortality rate of 3.6% was recorded over the 5 years, this outcome of admissions appears good concerning the number of patients that were successfully treated and discharged. Jamoh BY et al (19) in Zaria reported a 9.0% mortality rate, and Odenigbo et al (30) in Asaba reported a higher mortality rate of 12.9%. The low mortality rate in this study might be due to prompt attention by the multi-specialist human resources in the facility and the continual upgrade of infrastructure being experienced at the tertiary hospital. However, there is a need to further reduce the mortality rate to the barest minimum, by making the right diagnoses promptly and instituting an appropriate line of management (19). Bivariate analysis found age (p-0.001), occupation (p-0.001) and residence (p-0.001) as factors responsible for the morbidity and mortality patterns recorded in this study. These findings are comparable to the findings by other studies where the substantial proportion of patients belonged to the economically productive age group, the majority were unemployed and were from urban localities similar to what Angell B. et al (34) found in Nigeria; Arun A. et al (35) and Maharshi P. et al (36) reported in India.

Despite the low mortality rate recorded in this study, there is still room for improvement and the discharge of quality services at the Accident and Emergency unit through the increase in the number of personnel, and access to modernised equipment to enable quick diagnosis and accelerate care delivery, especially trauma cases, and arrange working hours in consideration of patient volume, and to employ qualified and experienced healthcare professional in these departments (17, 36).

#### *Study limitations*

Certain limitations were observed in this study, one of which is inadequate documentation of cases especially the lack of computerized Information management techniques of data saving. Most if not all information used in this study were hard copies of patients' records between 2016 and 2020 which created room for loss of data. Our study like other similar ones (17) is a single-centered and retrospective finding with limited application. Multi-centered prospective studies will bridge some of the limitations observed in this study.

## Conclusion

The International Classification of Diseases (ICD-11) provides a veritable tool for the constant evaluation and analysis of data for regular review and planning. There is a need to evaluate and review the services offered through the Accident and Emergency unit of tertiary centres to improve the future healthcare and patient service quality (17, 37). Regular monitoring, evaluation and review provide opportunities for storage and ease of retrieval of patient data quickly, practically, and accurately when there's a need for such. One of the major recommendations from this study is to ensure continuous improvement of record keeping and upgrading from paper storage to computer-based health information systems. Regular training of Emergency health professionals in detailed record keeping and documentation of all information provided by the patients.

## List of Abbreviation

ABD USS:	Abdominal Ultrasound;
AEFI:	Adverse Event Following Immunization;
ACHDx:	Adult Congenital Heart Disease;
AOM;	Acute Otitis Media;
CCF:	Congestive Cardiac Failure;
COVID-19:	Corona Virus Disease-19;
CT scan:	Computerized Tomography Scan;
CNS:	Central Nervous Systems;
ECG:	Electrocardiogram
EUCr/ECHO/RVS:	Electrolyte Urea and Creatinine/Echocardiography/ Retroviral Screening;
FMoH:	Federal Ministry of Health;
FMCA:	Federal Medical Centre Abeokuta;
HBsAg:	Hepatitis B Surface Antigen;
HIV/AIDS:	Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndromes;
ICD-11:	International Classification of Diseases-11;
LFT:	Liver Function Test;
MP:	Malaria Parasite;
MSS:	Musculoskeletal;
NCD:	Non-Communicable Disease;
NCDC:	Nigerian Centre for Disease Control;
PCV:	Packed Cell Volume;
PHCs:	Primary Healthcare Centres;
PT:	Pregnancy Test;
PSA:	Prostate Specific Antigen;
RBS:	Random Blood Sugar;
RDT:	Rapid Diagnostic Test;

RVS:	Retroviral Screening;
TB:	Tuberculosis;
UHC:	Universal Health Coverage

## Declarations

### *Ethical consideration*

Ethical approval with protocol number FMCA/470/HREC/01/2021/11 was obtained from the Health Research and Ethics Committee of The Federal Medical Centre, Abeokuta Ogun State. Confidentiality was guaranteed using numbers rather than names to identify the information abstracted from the records of clients. Since participants were not interviewed, there was an assurance that the data collected were used solely for research purposes and there shall be feedback of the findings to the management.

### *Consent for publication*

The authors consented to the publication of the work under the Creative Commons CC Attribution. Non-commercial 4.0 license.

### *Availability of data and materials*

The data are available in the manuscript. The data sets used and analyzed during the study are available from the corresponding author on demand.

### *Competing interests*

The authors have declared that no competing interests exist.

### *Funding*

There was no funding received for this study.

### *Authors' contributions*

AKA: Conceptualization, Methodology, Formal analysis, Writing - original draft, review and editing, Resources; OOO: Conceptualization, Methodology, Formal analysis, Writing - original draft, review and editing, Resources, SAR: Conceptualization, Methodology, Formal analysis, Writing - original draft, review and editing, Resources; OSA: Data collection, Resources; AGA: Data collection, Resources; QW: Data collection, Resources

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