Republic of  **The Gambia**

Rapid Mortality Assessment in the Gambia: A retrospective cross-sectional study, 2018 – 2020

Directorate of Health Research
Ministry of Health
The Gambia

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This report summarizes the findings of the 2018 – 2020 Rapid Mortality Survey carried out by The Directorate of Health Research (DHR). The survey was funded by the World Health Organization (WHO).

Additional information about The Gambia Rapid Mortality Survey, 2021 may be obtained from the Directorate of Health Research (DHR), FIB Building, Kairaba Avenue; Phone: 2122669/ 3247910; Email: sainey_sanneh@ymail.com

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Abbreviations & Acronyms

AIDS – Acquired Immuno-Deficiency Syndrome

ASMR – Age-specific Mortality Rate

BID – Brought in Dead

CDD – Chronic Debilitating Disease

CHN – Community Health Nurse

CMR – Crude Mortality Rate

COVID-19 – Coronavirus Disease 2019

CRR – Central River Region

CRVS– Civil Registration and Vital Statistics

CVD – Cerebrovascular Disease

DHIS2 – District Health Information System 2

FSB – Fresh Still Birth

IMR – Infant Mortality Rate

IUFD – Intra-uterine Fetal Death

KM – Kanifing Municipal

LBW – Low Birth Weight

LRR – Lower River Region

MSB – Macerated Still Birth

NBER – North Bank East Region

NBWR – North Bank West Region

NMR – Neonatal Mortality Rate

NPC – National Population Census

PHC – Primary Health Care

RHD – Regional Health Directorate

RTA – Road Traffic Accident

SAR-CoV2 – Severe Acute Respiratory Coronavirus2

SSMR – Sex-specific Mortality Rate

TB – Tuberculosis

URR – Upper River Region

WHO – World Health Organization

WR1 – Western Region 1

WR2 - Western Region 2

Executive Summary

Introduction

The world became aware of the COVID-19 pandemic in December, 2019 as it spreads rapidly across the globe. In the Gambia, the first laboratory confirmed case of COVID-19 was identified and reported on 16th March, 2020. The initial sets of reported cases were mostly imported that had resulted in the appearance of many secondary cases. From mid-July to mid-September 2020, an unprecedented increase in the number of cases was observed with local transmission and a corresponding increase in COVID-19-related deaths. The COVID-19 disease burden in low and middle-income countries including The Gambia remains unclear. Disruption to provision of essential healthcare services and change in the health-seeking behaviour of people may have resulted in increasing the number of people dying from preventable diseases. Most countries in the Sub-Saharan Africa including The Gambia lack Civil Registration and Vital Statistics (CRVS) system to monitor the effects of the COVID-19 on mortality. Therefore, such a rapid mortality assessment has the potential to provide useful information that could inform interventions, programs and policies of the government in the fight against the pandemic.

The scale of impact of the COVID-19 pandemic in The Gambia is unknown. The Covid-19 testing capacity and access to testing are been limited, meaning a large number of undiagnosed cases and deaths are likely to occur in the country. Monitoring and registration of deaths in the country are very weak or absent in many facilities and communities. Use of routine data to assess excess mortality is therefore unlikely to estimate the impacts of the Covid-19 pandemic. Evidence suggests that infection increases mortality risk from a number of other conditions due to diversion of vital health care resources and interventions. All-cause mortality assessment provides a more complete and comprehensive measure of the impact of the Covid-19, as it captures the net effect of all factors that may increase or decrease mortality. Therefore, the overall objective of this survey is to produce accurate and credible baseline information on mortality as well as estimate the impact of the Coronavirus pandemic on The Gambia.

Methods

A retrospective cross-sectional study design was used to conduct this nation-wide mortality survey. It was a secondary data collection study, involving all deaths recorded by public health facilities and Village Health Services (VHS) between 2018 and 2020. Private health facilities and Non-

Primary Health Care villages were excluded. The data was collected using an electronic-based template, programmed into the District Health Information System version 2 (DHIS2). The collected data were synchronized into the DHIS2 on a daily basis by the data collectors, and kept protected in the DHIS2. All data entry personnel were given a user account and password to access the database for data entry which was monitored by the database administrator. Participants were given unique identification numbers for the purpose of anonymity. The complete dataset was generated in an Excel file, followed by importation into Statistical Package for Social Sciences (SPSS) for the purposes of sorting, coding, and analysis.

Results

The assessment reveals that a total of 14,640 deaths were reported over the study period; with male deaths accounted for 53% of total deaths. It shows a relatively high mortality rate in The Gambia, particularly among the age group of 65 or above, aged 55 – 64 and 35 – 49. The Crude Mortality Rate (CRM) has increased slightly from 207 to 209 deaths per 100,000 populations in 2019 and 2020, respectively. There was a decline in Neonatal and Infant Mortality Rates (NIMR) in 2020. Deaths among males have declined as opposed to females in 2020, with a vice-versa trend in 2019. Overall excess of 4.3% deaths was noticed in 2020 indicating a negative impact of Covid-19 on the country. A decreased risk of mortality was observed, with circumstances surrounding it remains unknown. An excess of 30% community deaths significantly suggested a negative effect of Covid-19 pandemic. Among the principal causes of deaths in The Gambia between 2018 and 2020 were IUFD, Sepsis, Cardiac Failure, Stroke, and Hypertension. A vast majority of deaths occurred in Western Region 1 and North Bank West Region, with the lowest proportion of deaths observed in North Bank East Region. Kanifing Municipal and Banjul city combined had one-third of the mortalities. Almost all the Covid-19 related deaths (%) occurred in the West Coast Regions (WCR) and those at the aged 45 or above have the highest proportion of deaths, with male deaths accounting for the majority. The majority of the deaths in the Gambia occurred in health facilities, with an upward trend observed in 2020.

Conclusion & Recommendation

With the aim of reducing crude mortality in the country, the Ministry of Health (MoH) strives to implement effective measures that are aligned with the country's capacities and health delivery system. Thus, the Directorate of Health Research aimed at understanding the different determinants that currently impact mortality in the country. Through the World Health

Organization (WHO) country office, The Gambia, our research team worked alongside with other stakeholders within the MoH to assess and estimate the impact of Covid-19 pandemic to inform programmes and policies in The Gambia.

The study findings were achieved through a secondary data collection in the seven health regions of the country. The results suggest that the Covid-19 pandemic has relatively impacted on mortality with more males dying than females, particularly among the age group of 55 or above in the Gambia. An excess death of 4.3% was attributable to the pandemic, especially in the West Coast Regions. A positive mortality trend was observed among neonates and infants during the Covid-19 pandemic, with circumstances surrounding this still remained unknown. There was a rise in community deaths during the pandemic. Intra-Uterine Fetal Death (IUFD), Sepsis, Cardiac Failure, Stroke, and Hypertension remained as major causes of deaths during the three-year period (2018 - 2020). About 65% of total deaths occurred in Western 1 and North Bank West Health Regions. The least proportion of deaths occurred in North Bank East Health Region. Kanifing Municipal and Banjul city recorded one-third of the mortalities. The impact of the Covid-19 related deaths was observed in the West Coast Region, particularly among the age category of 45 or above. Health facilities recorded the highest burden of mortalities compared with communities.

Therefore we strongly recommend the establishment of Civil Registration and Vital Statistics (CRVS) system in the country to ensure a reliable and complete mortality database for subsequent similar studies. There is a need to conduct further studies that will include private health facilities and Non-PHC communities. Programs for Non-communicable Diseases (NCDs) should be strengthened to reduce high mortalities. Sensitization of the general public to the COVID-19 disease and its consequences should be intensified across the country in order to reduce its attendant morbidities and mortalities. Health care services should be decentralized to reduce the mortality burden in the West Coast Region.

Chapter One: Introduction

Background

Coronavirus disease 2019 (COVID-19) is a respiratory tract infection caused by a newly emergent coronavirus, that was first recognized in Wuhan, China, in December 2019.[1] The disease is highly infectious and common symptoms among symptomatic cases include fever, cough, difficulty in breathing, sore throat, malaise, and myalgia. Severe cases progress to acute respiratory distress syndrome, septic shock, end-organ failure and eventually death.

In response to the rapid spread of the virus, the World Health Organization (WHO) declared COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30th January 2020, and called for collaborative efforts of all countries to prevent the rapid spread of COVID-19.[2] The World Health Organization declared the outbreak as a pandemic 11 March 2020.[3]

The Gambia, with an estimated population of 2.4 million people[4], is surrounded by Senegal apart from its narrow Atlantic coast. It is the smallest country in continental mainland Africa. The first imported case of Coronavirus was identified and reported in The Gambia on March 16, 2020. This was promptly followed by adaption of several measures to interrupt the transmission nationwide, upon declaration by the president of the Gambia. These include the closing of schools, suspension of public gathering, closure of all non-essential public places, spatial distancing, respiratory etiquette, restriction on number of passengers allowed on public transport, mandatory quarantine of travelers, isolation and care for infected and suspected cases.[5,6] A toll-free helpline was created by the Ministry of Health to enable citizens make inquiries on COVID-19, seek support and advice if they notice any signs and symptoms or report possible suspects or complaints regarding people defying control measures.

According to the 334th outbreak situational report (SitRep) of the Gambia, the national statistic confirmed a total of 6,069 Covid-19 cases, 181 Covid-19 related deaths and a crude case-fatality ratio of 3% as of 24th June, 2021.[7] The neighboring country, Senegal, which has a population of about seven times that of The Gambia, experienced a different trajectory of the pandemic. Their first case of community transmission was reported in April, and by the end of June, almost 7, 000 cases had been reported.[8] From the beginning of the pandemic in the Gambia, numerous efforts have been put in place to estimate the impact of the Covid-19 pandemic, which is believed to be greater than indicated by the ministry of health official data.

The Covid-19 pandemic is developing differently in Africa compared with other regions with lower transmission rates and mild clinical presentations. The reasons for this are not fully known. Recent data from other regions in (Eastern and Southern) Africa indicate that transmissions may be higher than officially recorded. Thus, suggesting a detailed epidemiological data in different African settings is urgently needed.[9]The burden of COVID-19 in low and middle-income countries including conflict-affected countries remains unclear.[10]

Aim

The study aims to determine excess mortalities from all causes before and during the Covid-19 era as well as trends in mortalities 2018 – 2020 in the Gambia.

Specific Objectives

1. To determine prevalence and distribution of mortality from all causes
2. To identify trends in mortality over the three-year period with regards to excess mortality.
3. To determine the demographic characteristics of Covid-19-related deaths.

Justification

The rapid mortality surveys during the COVID-19 pandemic are critical to monitor mortality from all causes due to the interruption of essential health care services attributed to the diversion of vital resources and interventions. In The Gambia, it is anticipated that the disruption of routine services and the reduced ability to seek health care could potentially trigger an increase in the number of deaths from preventable diseases. However, identifying COVID-19-specific mortality started when the first case of the infection was confirmed in March 2020. This goes along with challenges due to some capacity issues in identifying COVID-19 patients, contacts tracing and diagnosing causes of deaths. Given these challenges, the WHO called on all governments to put in place a mechanism for rapid reporting of deaths during the COVID-19 Pandemic.

Recently, Sero-prevalence studies conducted in Kenya, Malawi and South Africa have revealed higher community transmissions of 1gG SAR-CoV-2 antibodies.[11-13] This highlighted the need to

conduct a similar study in the Gambia to assess the extent of Covid-19 community transmissions and their impact on mortality.

Moreover, monitoring mortality is an essential component of an effective response to the COVID-19 pandemic worldwide. Pooling data from multiple cross-sectional surveys could enhance the statistical power available to detect differences in excess mortality between population groups, geographical areas, etc.[14]Most countries in Sub-Saharan Africa, including The Gambia, lack Civil Registration and Vital Statistics (CRVS) system, thus resulting in inadequate information to monitor the effects of COVID-19 on mortality. Therefore, such a rapid mortality assessment has the potential to provide such information and thus inform interventions and programs.[10]Imperatively, information on excess deaths can inform the ongoing Covid-19 response, policy decisions and provide evidence for additional resource mobilization.[15]

Hence, the present mortality assessment is expected to adequately inform decision-makers about the scale and direction of the epidemic with a straightforward focus on excess mortality, it will provide a comprehensive understanding of the health consequences of the epidemic (beyond case counts and mortality counts based on lab diagnosis) as well as give disparities in disease burden across geographical and demographic groups. Despite mortality being a lagging indicator of infections, its assessment can provide insight into ongoing population transmission patterns.

Chapter Two: Methodology

This section describes and justifies the methods and processes that were used to collect data to achieve the study objectives.

Study design

The study used a retrospective and quantitative cross-sectional method which involved deaths recorded over a period of three years, 2018 – 2020.

Study Site and Population

This population-based study was conducted in the Gambia, which has an estimated total population of 2.4 million people based on a 3.1% annual growth rate of National Population Census (NPC, 2013), with a median age of 17.8 . Forty-two percent (42%) of the populations are between 20 and 64 years. About 95% of the population is Muslim. The illiteracy rate is high across the country. An estimated59% of the population lives in urban and peri-urban settings, mainly at the coast. The

climate is typical of the Sub-Sahel Region, with a long dry season from November to May and a short rainy season between June and October. The maximum temperature is high throughout the year (between 30°C and 34°C; lowest during the rainy season). While minimum temperature increases during the rainy season (16°C – 20°C). During the dry season, the temperature increases from 22°C – 24°C.[16] Humidity can surpass 80% during the rainy months.[17]

The government of The Gambia is the main healthcare provider, and the delivery care has three tiers based on the primary health care strategy. There are 4 tertiary hospitals, 38 health centers at the secondary level and 492 health posts at the primary level. The system is complemented by 34 private and non-governmental organization (NGO) clinics.

Sample Size & Sampling

A census of all deaths recorded by health facilities and community death registers at primary health care key villages for the period 2018 to 2020 was carried out. However, deaths recorded by private clinics or hospitals were excluded. Hence, only deaths that were recorded by government health facilities and Community Health Nurses in the communities were included.

Development of the data collection tools

A prototype document was obtained from the World Health Organization (WHO) country office, The Gambia, which was contextualized and adapted. A two-day validation session was organized involving different units/directorates within the Ministry of Health (MoH) in collaboration with the WHO. The draft tool was shared prior to the review sessions to give the reviewers enough time to appraise the tool critically. The instrument was pre-tested to ensure validity and reliability. The harmonized version of the tool was finally programmed into the District Health Information System version 2 (DHIS2), the national database for the Ministry of Health, before using it in the field to collect the data. The tool captured key mortality variables such as age, sex, location, date of death, cause of death, etc.

Data Collection Procedure

The assessment process involved secondary data collection through record review. On a daily basis, the identified data sources were visited by the data collection teams. The team supervisor introduces the team upon arrival at the source of data collection, explained the aim of the study and seeks permission for access to death records. Upon approval, the team reviewed the death

records and completed the electronic-based data collection template programmed on a tablet. The collected data were synchronized into the DHIS2 on a daily basis by the data collectors upon verification by their assigned supervisors.

Data Management and Analysis

The data collected were digitally transmitted and kept protected in the central database (DHIS2). All data entry personnel were given a user account and password to access the database for data entry which was monitored by the database administrator. Participants were given unique identification numbers for the purpose of anonymity. The confidentiality of the data was not compromised.

The complete dataset was generated in an Excel file to ensure that the data is cleaned to produce a complete and consistent dataset for analysis. This was followed by importation into Statistical Package for Social Sciences (SPSS) for the purpose of sorting, coding, and analysis. Descriptive variables were analyzed and presented using tables and charts.

Potential Risk Management

The emergence of the COVID-19 pandemic has led to strict adherence to MoH and WHO guidelines to prevent the spread of the virus to both data collectors and providers. In that regard, social distancing, hand washing, and wearing of face masks were maintained during the process of collecting the data. With regard to data analysis and report writing, a minimal number (10) of participants were invited to avoid overcrowding and a distance of at least 2 meters between analysts and report writers was observed. A well ventilated and spacious venue was used for both activities to ensure compliance with COVID 19 preventive measures.

Ethical Consideration

No ethical approval was obtained to conduct this study because secondary data was used. Yet, an Ethics waiver was obtained to conduct the study. Therefore, data collection, analysis and report writing have ensured standard practices of confidentiality and respect for the rights of individuals (i.e. to ensure that individual's biodata are not shared with third parties).

Chapter Three: Results

3.0 Introduction

Excess mortality is a count of deaths from all causes relative to what would normally have been expected. In a pandemic, deaths rise sharply, but causes are often inaccurately recorded, particularly when reliable tests are not widely and readily available. The death count attributed to Covid-19 may thus be significantly undercounted. Excess mortality data overcome two problems in reporting Covid-19-related deaths: misdiagnosis and miscounting. Excess mortality data include collateral damage from other health conditions left untreated. This could be because the health system was overwhelmed by Covid-19 cases or deliberately prioritizing patients with Covid-19 over those with other symptoms.

In this chapter, results from the rapid mortality survey are presented, focusing on key variables such as age, sex, cause of death, year of death, place of death, etc.

3.1 Leading Causes of Deaths

3.1.1 Cumulative distribution by causes of deaths, 2018 - 2020

Out of 14,640 deaths reported from 2018 to 2020, the death distribution in The Gambia according to causes, exposed that IUFD was the leading cause of death, representing approximately 11% of total deaths (n=1,583). The second leading cause of death was Sepsis, accounting for 6% (n=822) of deaths. Cardiac failure, Stroke and Hypertension constituted 5.2% (n=754), 4.5% (n=663) and 3.8% (n=555) of the total deaths, respectively. Furthermore, fresh (n=457) and macerated (n=420) stillbirths constitute relatively a large proportion of the IUFD (55%). Cumulatively, stillbirths account for 6% of the total deaths. Acquired Immune-deficiency Syndrome (AIDS) constitutes 2% (n= 237) of deaths. (**See Fig. 1 & 2**).

The causes of 2,194 deaths were reported as unknown, which accounted for about 15% of the total deaths. About 11% of the total deaths were registered as brought in deaths (BID) as a cause of death.

Figure 1: Proportionate distribution of 20 leading causes of death, 2018 - 2020

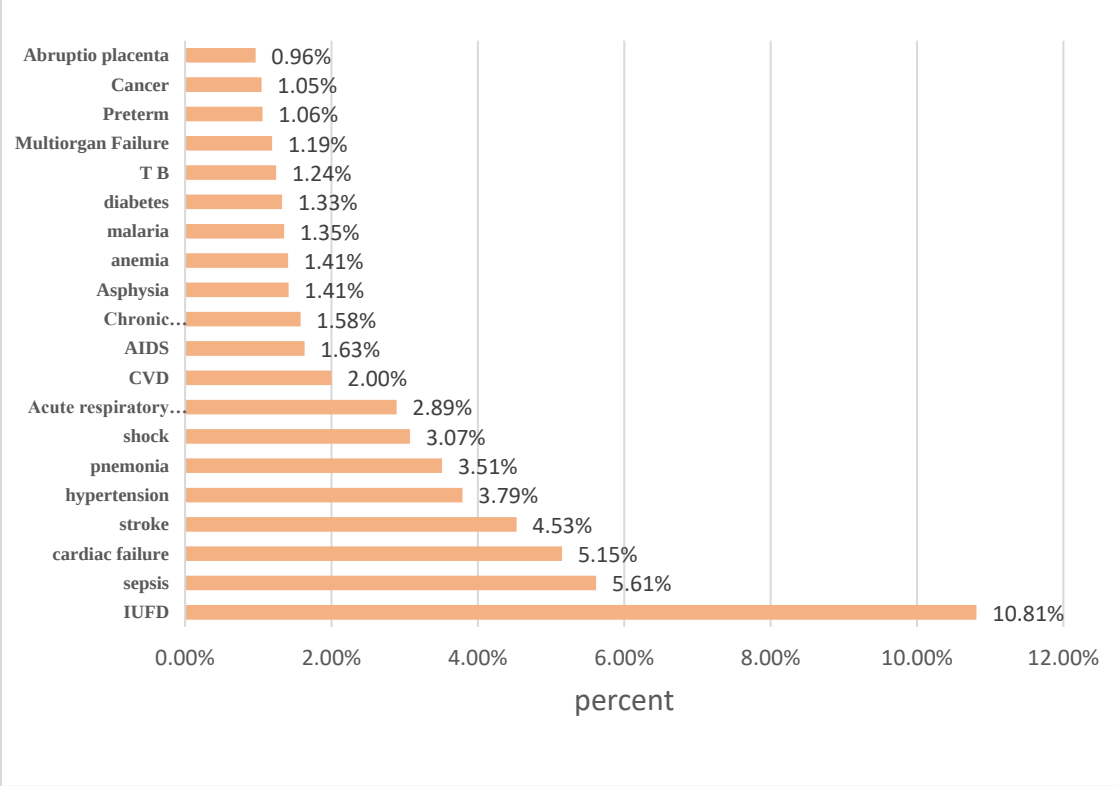
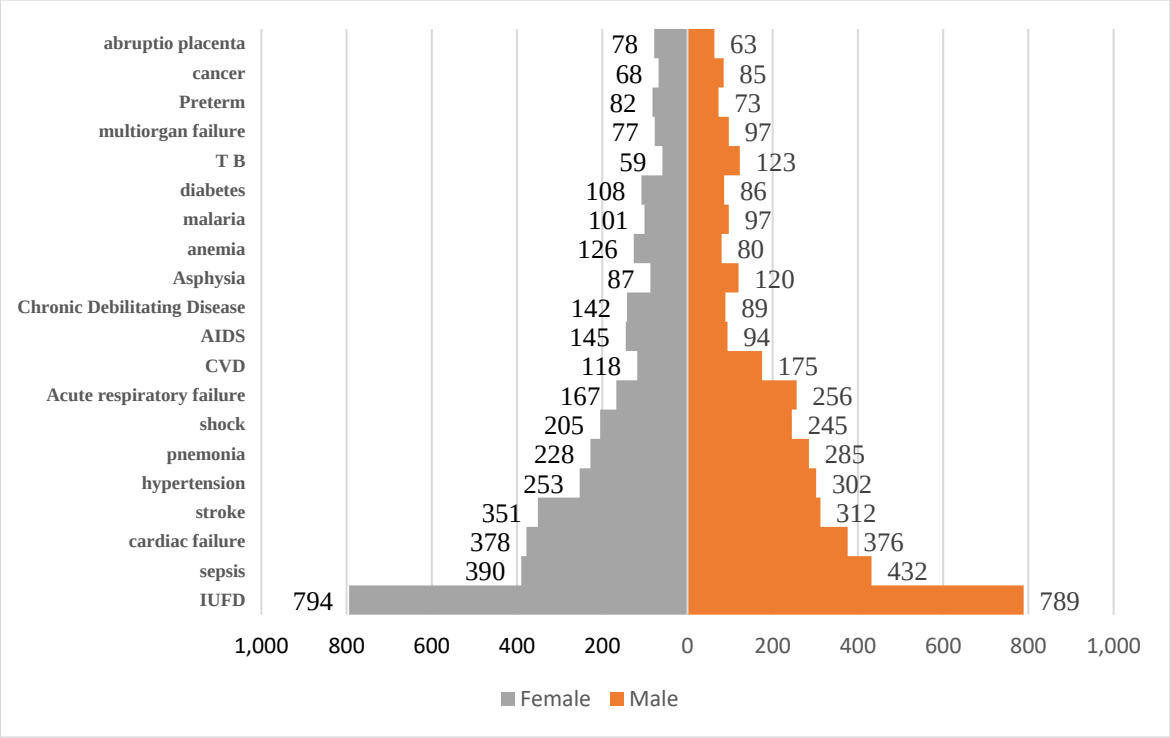


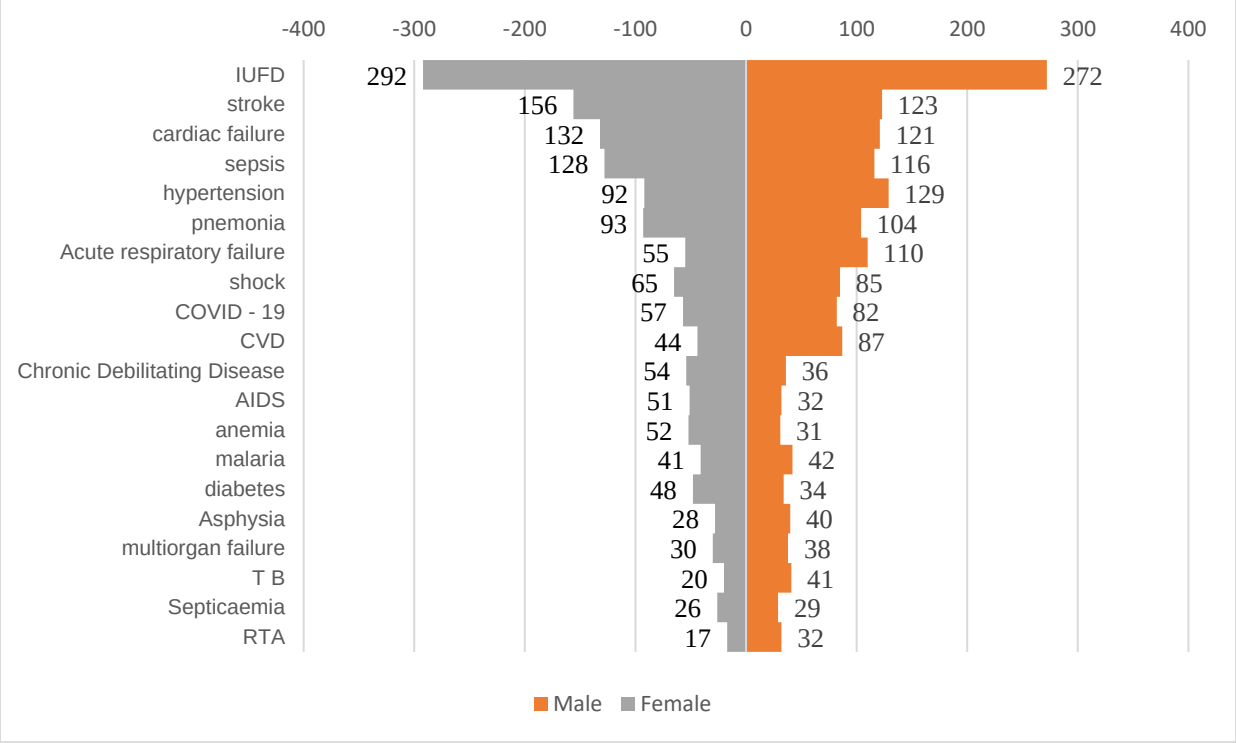
Figure 2: The distribution of 20 leading causes of deaths by sex, 2018-2020



3.1.2 Distribution of 20 leading causes of deaths, 2020

The findings show that IUFD was the leading cause of death, representing 11% (n=564). Stroke is the second most common cause of death, accounting 6% (n=279) of deaths, out of which female deaths accounted for 56% (n=156). The causes of more than 600 (12%) deaths that occurred in 2020 were unknown. There were 322 (7%) BID cases out of which 187 were males. There was a rise in the number of deaths among those with hypertension (n=221), stroke (n=279), cardiac failure (n=253) and other cardiovascular diseases (CVD) n=131. Sepsis which had been the second leading cause of death in the preceding years (2018 and 2019) dropped to 4th in 2020, registering 244 deaths. Out of this, 128 were females.

Figure 3: The distribution of 20 leading causes of deaths by sex, 2020

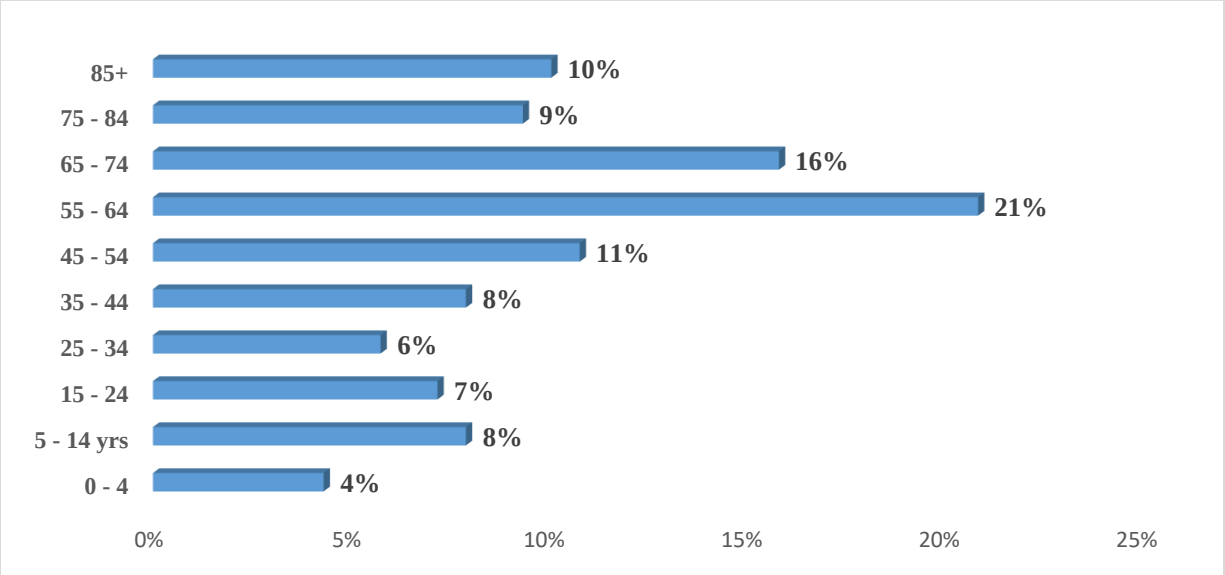


Coronavirus disease (COVID-19) claimed 139 lives from March to December, 2020. It constituted about 3% of the total deaths in 2020 (n=4,911). Hence, it was found to be the 9th leading cause of death in 2020 (**See Fig. 3**). Out of 4,911 deaths, male accounted for about 59% (n=82) (**See Tab. 1**). The highest proportion of deaths was observed between 55 and 64 age-category, constituting 21% (n=29) of deaths. This is followed by 65 -74 age category, 16% (n=21) and 45 – 54, 11% (n=15). The least proportion (4%) of deaths was recorded among children less than 5 years. The youthful age group 15 – 24 comprised 7% (n=10) of the deaths, with most of the deaths 70%, (n=7) was observed among females (**See Fig. 4**). The Covid-19 mortality was remarkably high among those who were 45 years or above, constituting about 67% (n=93) of the total Covid-19-related deaths. Out of these deaths (n=93), male deaths account for 62% (n=58) **(See Tab. 1).**

Table 1: Age distribution of Covid-19-related deaths, 2020

Age Categories	Male	Female	Total	%
0 - 4	5	1	6	**4.3%**
5 - 14	8	3	11	**7.9%**
15 - 24	3	7	10	**7.2%**
25 - 34	3	5	8	**5.8%**
35 - 44	5	6	11	**7.9%**
45 - 54	10	5	15	**10.8%**
55 - 64	21	8	29	**20.9%**
65 - 74	16	6	22	**15.8%**
75 - 84	6	7	13	**9.4%**
85+	5	9	14	**10.1%**
Total	**82**	**57**	**139**	**100.0%**

Figure 4: Percentage age distribution of Covid-19-related deaths, 2020

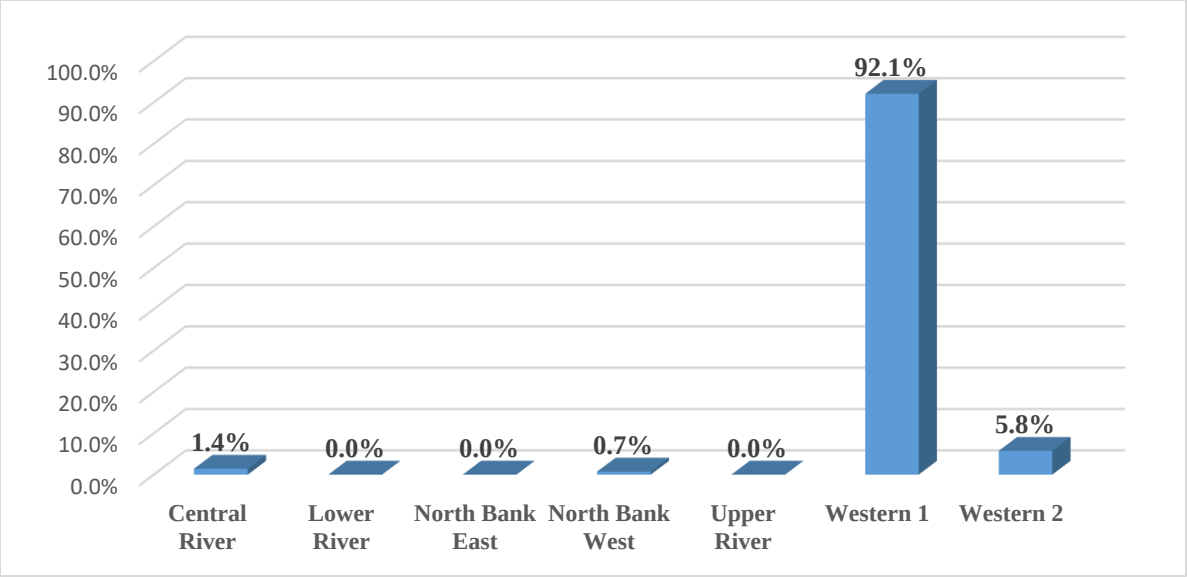


Geographically, the region with the highest burden of Covid-19 related deaths was Western 1, constituting 92.1% (n=128) of the deaths, followed by Western Region 2, with 5.8% (n=8). Imperatively, 98% of the Covid-19 related deaths were recorded in the two western regions,

Table 2: Regional distribution of Covid-19-related deaths across the country, 2020

Regions	Male	Female	Total
Central River	2	0	**2**
Lower River	0	0	**0**
North Bank East	0	0	**0**
North Bank West	0	1	**1**
Upper River	0	0	**0**
Western 1	76	52	**128**
Western 2	4	4	**8**
Total	**82**	**57**	**139**

Figure 5: Percentage distribution of Covid-19 related deaths by region, 2020



3.1.3 Distribution of 20 leading causes of deaths, 2019

Figure 7 & 8 below illustrate that IUFD was the leading cause of death, constituting about 13% (n=608) of 4,708 deaths. Sepsis was noted as the second leading common cause of death, accounting for about 6% (n=262) of deaths. Out of this, male deaths constituted 56% (n=148). This is followed by cardiac failure, which accounted for 5% (n=252) of deaths. Out of this deaths, male deaths accounted for 52% (n=132). Stroke which had been the second leading cause of death in 2020 dropped to 4th in 2019 with 4% (n=195) deaths, of which about 54% (n=105) were males.

Figure 6: Proportionate distribution of 20 leading causes of deaths, 2019

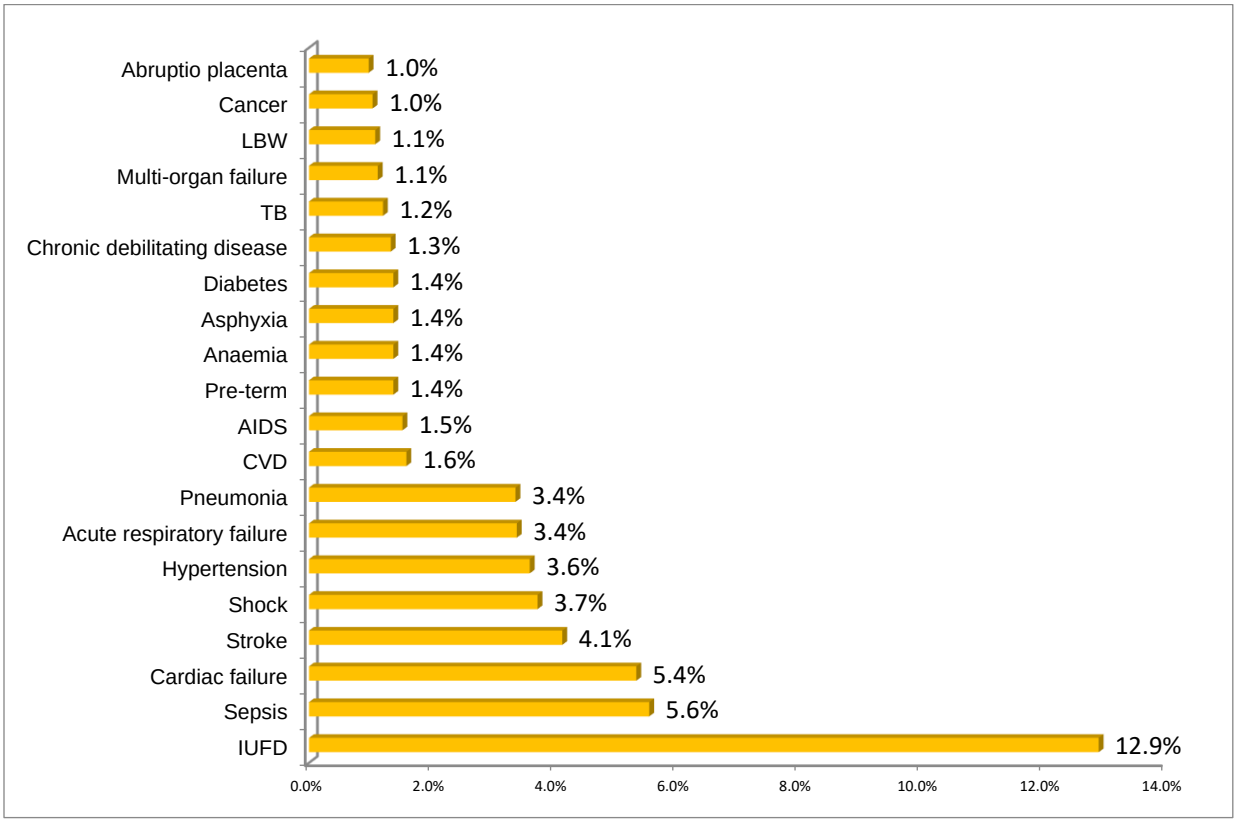
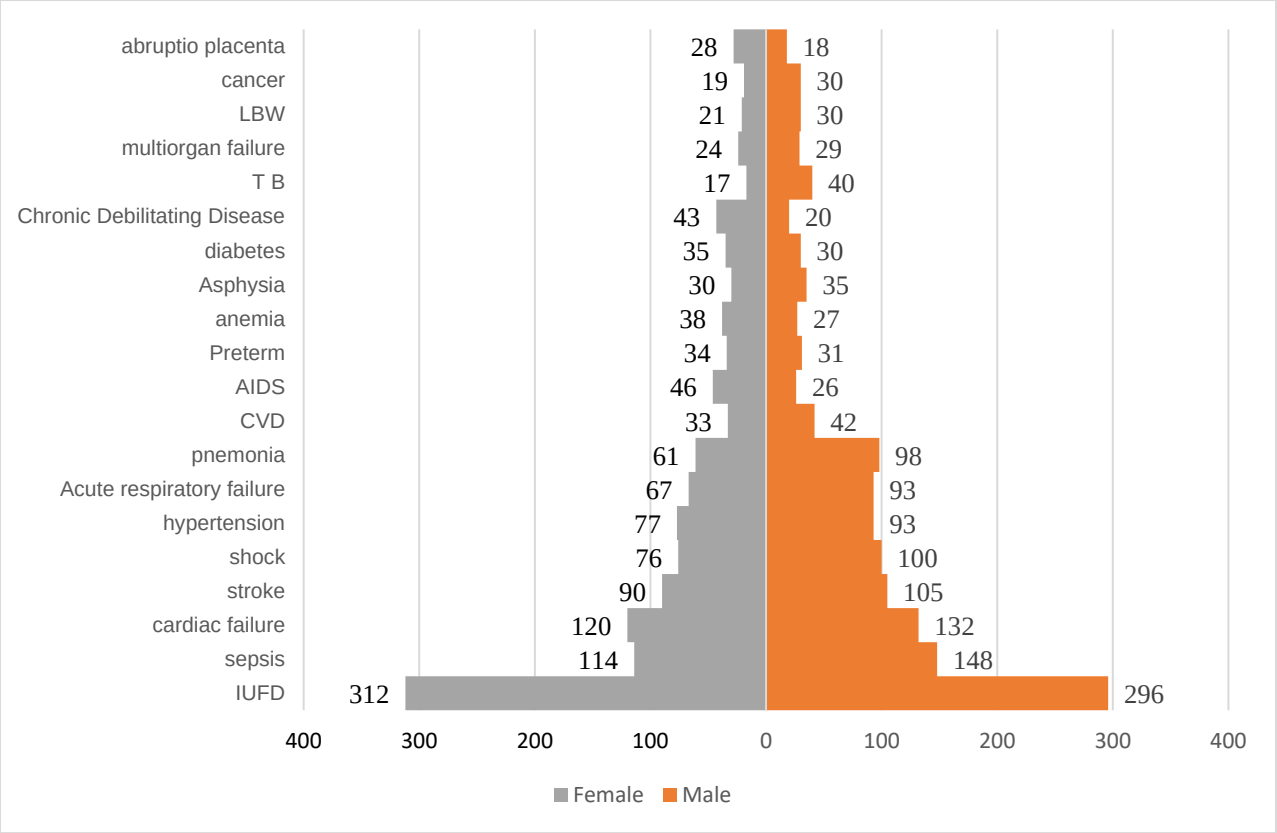


Figure 7: The distribution of 20 leading causes of deaths by sex, 2019



3.1.4 Distribution of 20 leading causes of deaths, 2018

The analysis shows that IUFD was the highest cause of death, representing 8% (n=389) of total deaths, out of which 51% (n=200) were males. Sepsis was the second leading cause of death, accounting for 6% (n= 311) of total deaths. Out of 311 deaths due to Sepsis, 164 were males. As shown in **Fig. 9**, more males died from asphyxia than females, with males accounting for 45 deaths out of 69. The figure also illustrates that more females (n=28) died as preterm neonates than males (n=22); and more females (56%, n=105) suffered from stroke than males (44%, n=84).

Figure 8: Percentage distribution of 20 leading causes of deaths, 2018

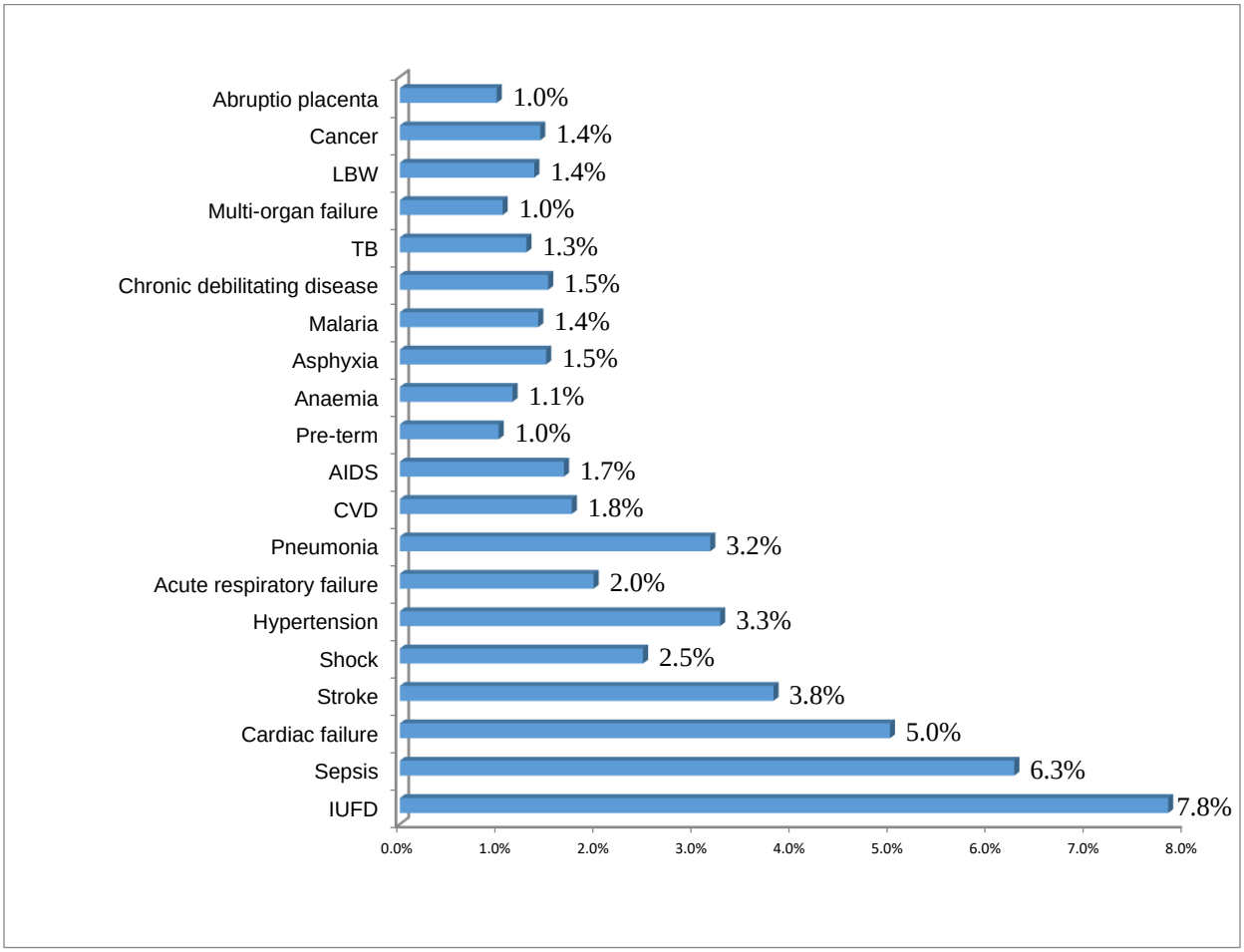
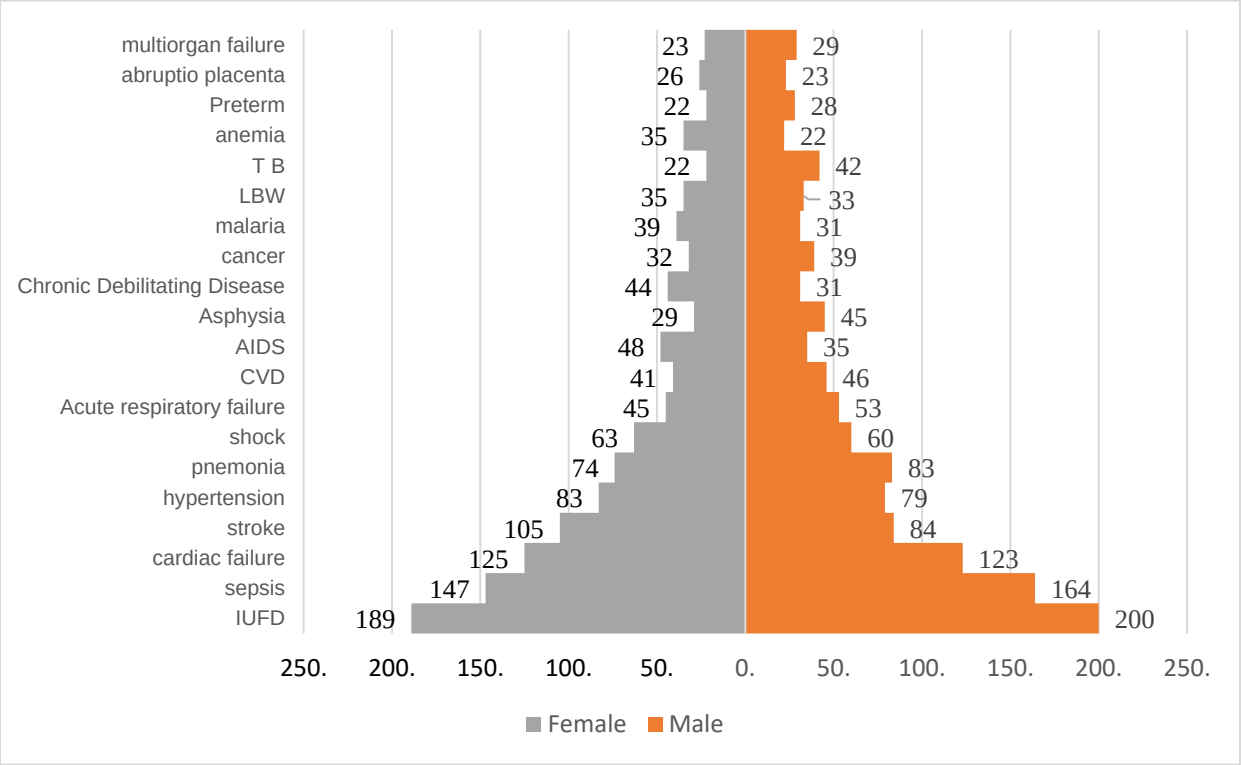


Figure 9: The distribution of 20 leading causes of deaths by sex, 2018



3.2 Geographical Distribution of Mortality

3.2.1 Regional distribution, 2018 - 2020

The table and figure below show the distribution of deaths by year in the different regions of The Gambia. Over the past three years, Western Region 1 (WR1) had the highest number of deaths with 7,580 deaths, representing 51.8%. North Bank West Region (NBWR) had the second highest proportion (13.3%) of the total deaths; followed by Western Region 2 (WR2), 10.6%; Lower River Region (LRR), 7.6%; Central River Region (CRR), 6.9%; Upper River Region (URR), 5.9%; and North Bank East Region (NBER), 3.9% (**See Fig. 10**). In WR1, there was a sharp decline in deaths in 2019, accounting for 1,622 deaths. This is half the previous year's death toll. However, in 2020, the number of deaths in WR1 rose by 52% (n=850).

Out of the total 867 deaths in the Upper River Region (URR) over the three-year period, 2018, 2019,and 2020accounted for 29% (n= 251); 35% (n=306) and 34% (n= 299), respectively. The region with the lowest number of deaths over the period was NBER, accounting for about 4% (n=566) of the total deaths (**See Tab. 3**).

Table 3: Annual distribution of mortalities by region, 2018- 2020

Regions	2018	2019	2020	Unknown(Years)	Total
WR1	3451	1622	2472	35	**7580**
WR2	451	251	839	4	**1545**
LRR	222	684	205	0	**1111**
CRR	397	170	448	8	**1023**
URR	251	306	299	11	**867**
NBWR	53	1298	597	0	**1948**
NBER	107	377	81	1	**566**
Total	**4962**	**4708**	**4911**	**59**	**14640**

Figure 10: Proportionate distribution of mortalities by region, 2018 – 2020

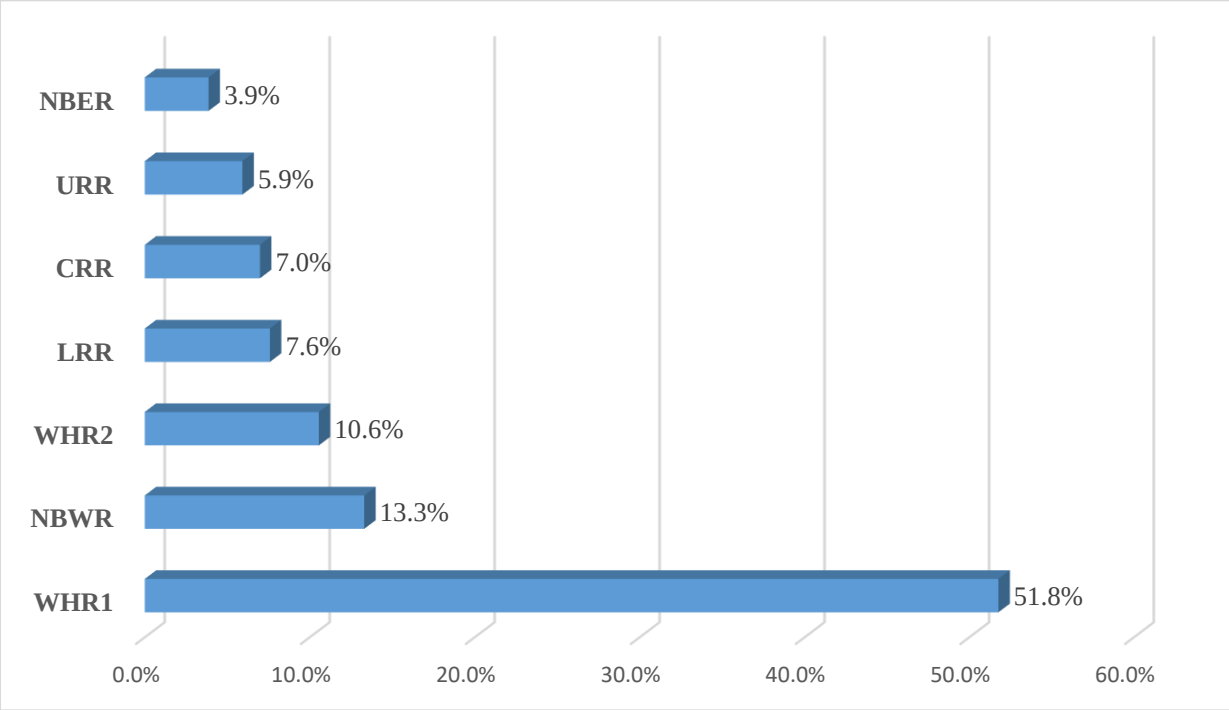
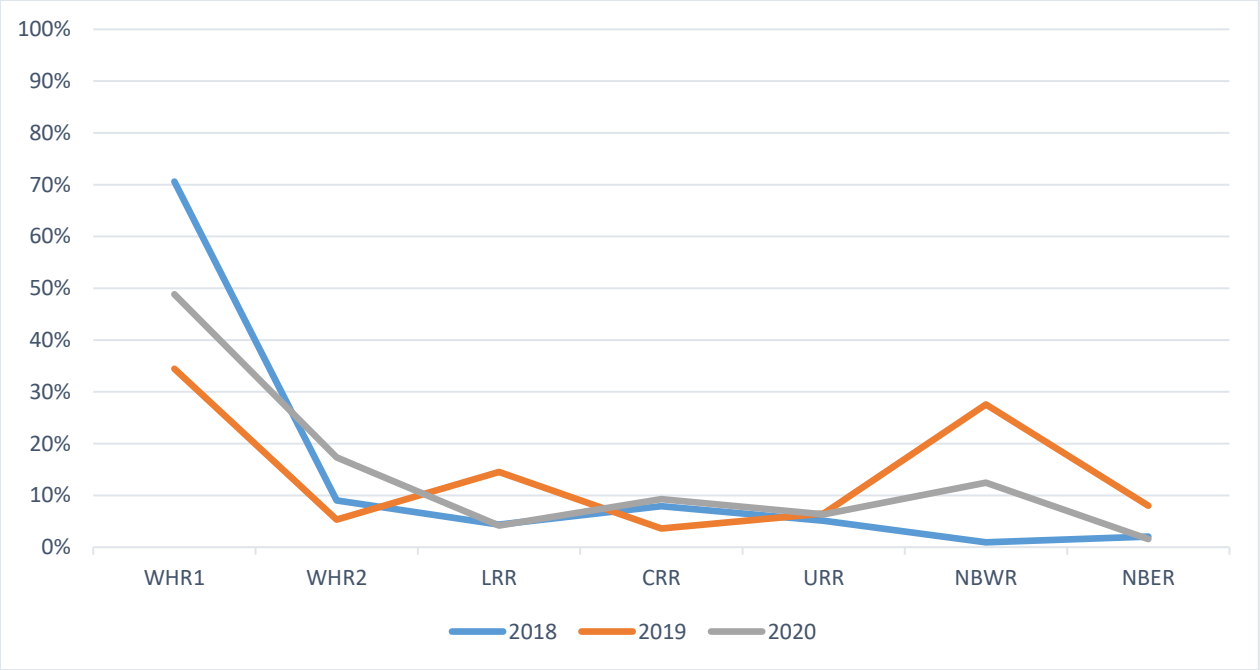


Figure 11: Annual percentage distribution of mortalities by region, 2018 – 2020



3.2.2 Distribution of mortalities among 15 leading districts, 2018 - 2020

The figures below illustrate the distribution of deaths across the different districts. The analysis reveals that most deaths occurred in Kanifing Municipality (KM) and Banjul city, representing 29.1% (n= 4,264) and 29.0% (n=4,259) deaths, respectively. Among the 15 leading districts, the urban districts had the highest death toll. Kombo Central was the third leading district with 8% (n=1170) deaths, followed by Upper Fulladou West, 7.6%; Upper Baddibou, 3.6%, etc. In contrast, districts with the lowest number of deaths were Kiang West (0.9%); Tumana (0.8%); Lower Niumi (0.8%); and Niamina East (0.7%) (**See Fig. 12**).

Apparently, male deaths were predominantly higher than female deaths in almost all the districts. On the other hand, Basse district had more female deaths than males (**See Fig. 13**).

Figure 12: Proportionate distribution of deaths by district, 2018 – 2020

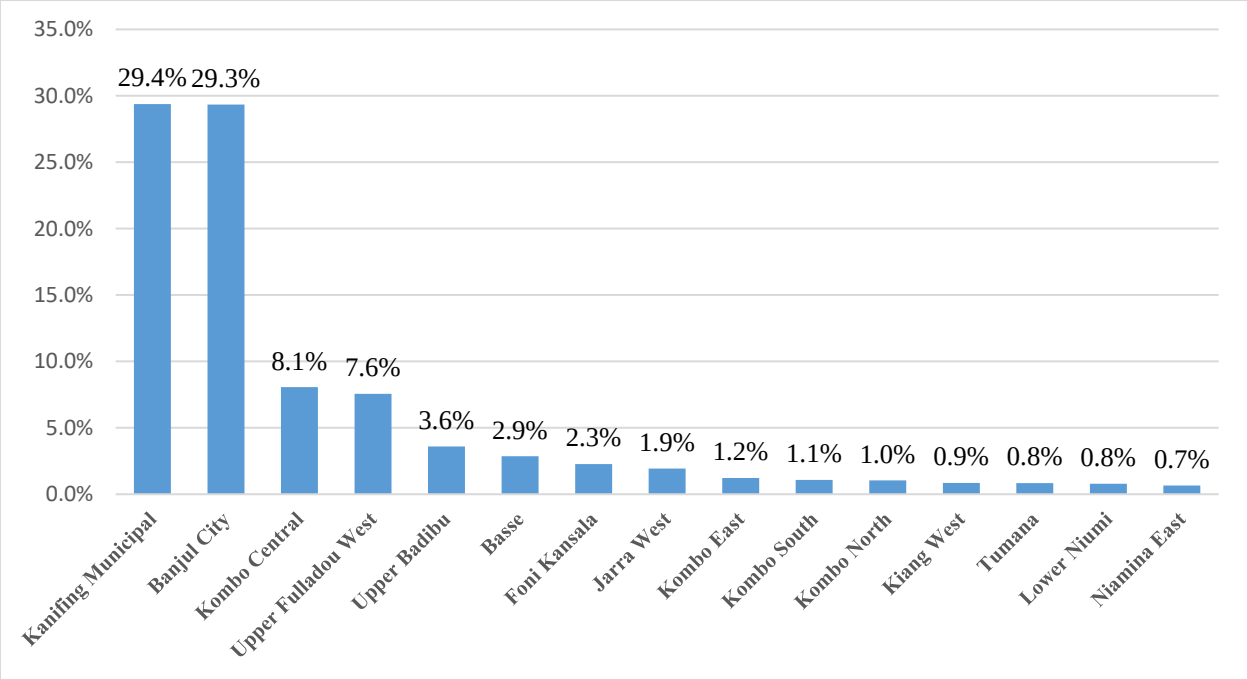
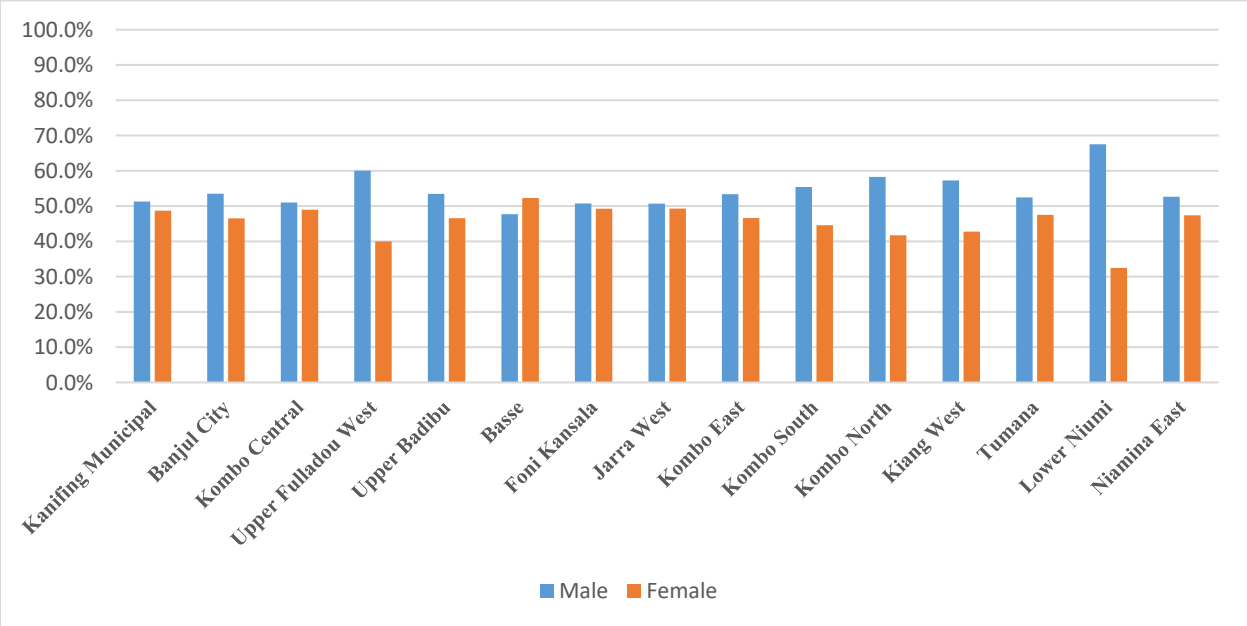


Figure 13: Sex distribution of patients who died by district, 2018 – 2020



3.3 Mortality Distribution by Sex

The table shows the distribution of deaths by sex. The results show that 53% (n=7,760) of those who died during the study period were males, while death among female represented 46% (n= 6,784). The sex of about 1% (n= 96) of those who died was unknown.

Table 4: Distribution of total deaths by sex, 2018 - 2020

Sex	Number	Percentage
Male	7760	**53.0**
Female	6784	**46.3**
Unknown	96	**0.7**
Total	**14640**	**100.0**

3.4 Annual Mortality Distribution by Place of Death

Overall, deaths reported by health facilities accounted for 84% (n= 12,310) compared with community deaths. Only 14% of total deaths were community deaths. The place of death of about 2% were recorded as unknown (**See Fig. 14**). Out the total community deaths, 2020 had the largest number of deaths, with 37%. There were more deaths in 2020 than in the preceeding years (2018 (35%); & 2019 (28%)). On the contrary, there were more health facilities deaths in the preceeding years (2018 (33.8%); & 2019 (33.3%)) than in 2020 (32.8%). Overall, 2018 had the highest number of deaths with 33.9%, followed by 2020 with 33.5%, which was a little more than 32.2% deaths in 2019 (**See Tab. 5 & Fig. 14**).

Table 5: Annual mortality distribution by place of death, 2018- 2020

Place of Death	2018	2019	2020	Unknown	Total
Community	735	592	771	9	**2107**
Health Facility	4151	4087	4022	50	**12310**
Unknown	76	29	118	0	**223**
Total	**4962** (33.9%)	**4708** (32.2%)	**4911** (33.5%)	**59** (0.4%)	**14640** (100%)

Figure 14: Percentage distribution of mortalities by place of death, 2018 - 2020

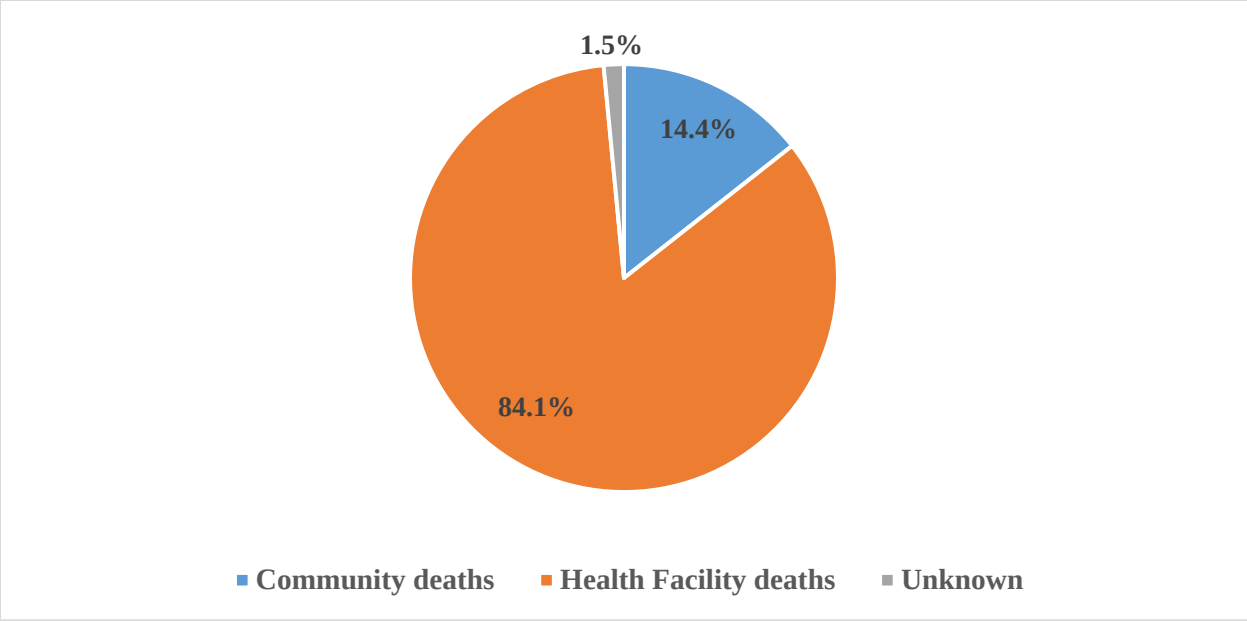
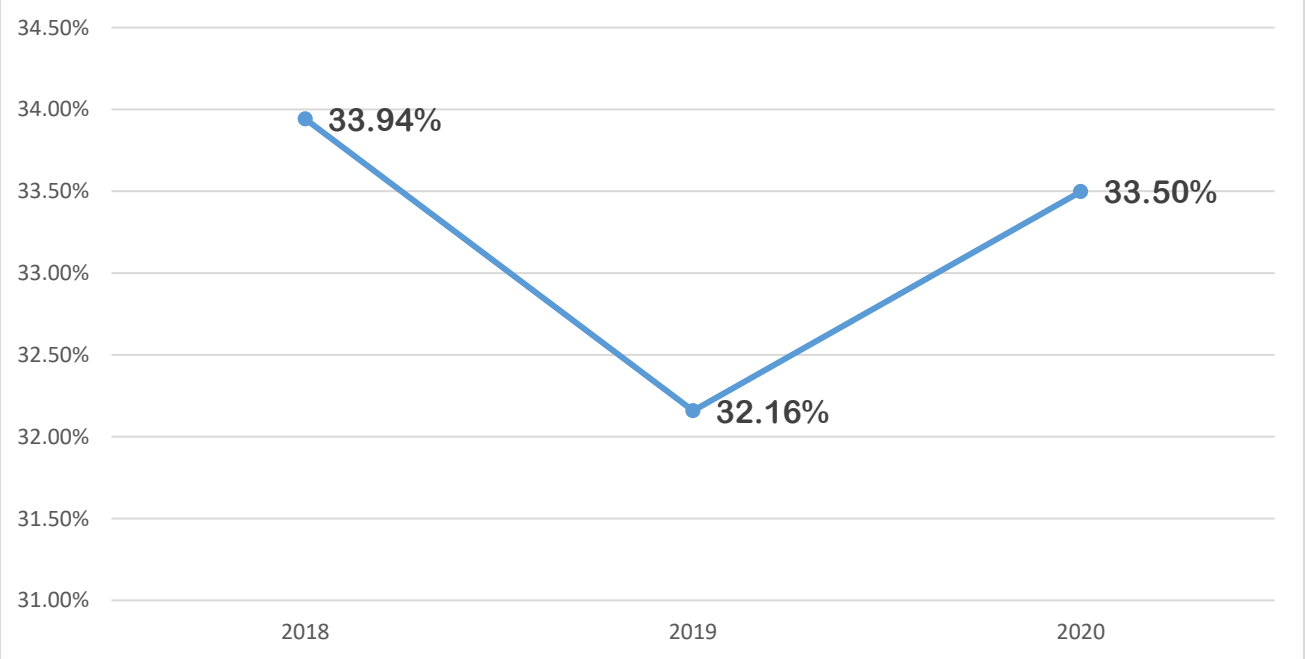
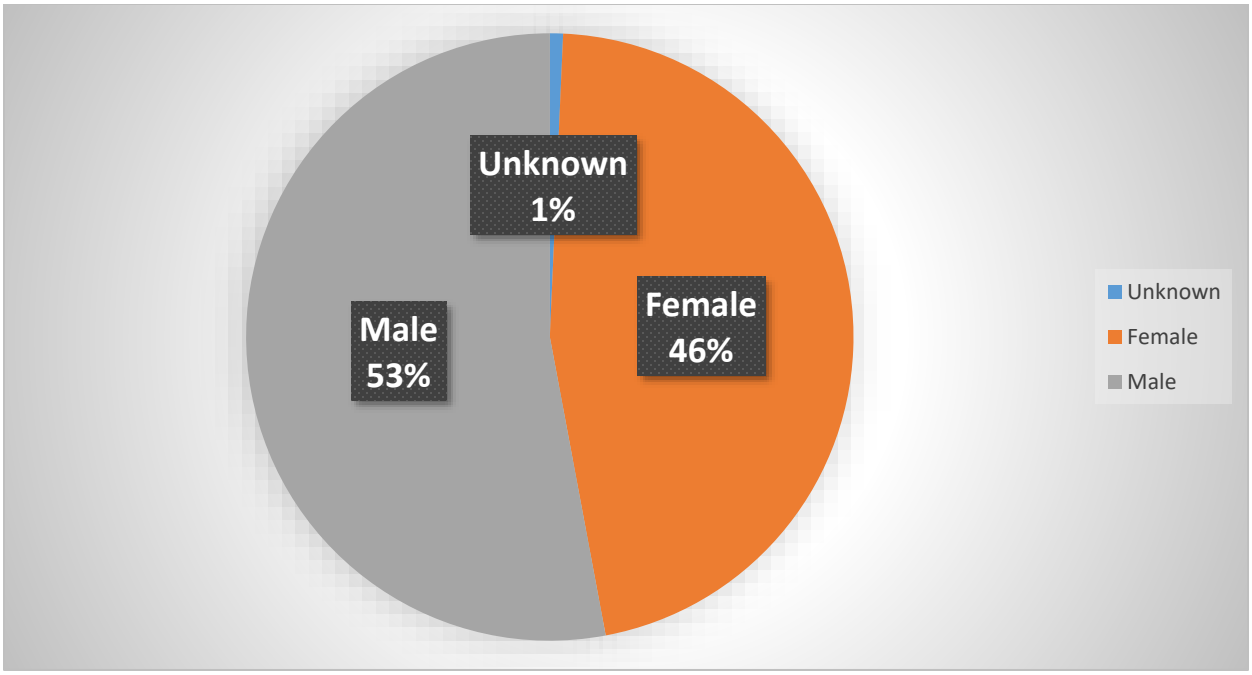


Figure 15: Percentage distribution of deaths by year, 2018 - 2020



Furthermore, the figure below represents the sex distribution of proportion of persons who died over the three-year period. The majority of those who died over the period were males (53%). The sex of 1% of the deaths was unknown.

Figure 16: Distribution of deaths by sex, 2018 - 2020



3.5 Age Distribution of Deaths by Sex

Figure 17 shows the sex and age distribution of people who died during the period between 2018 and 2020. Neonates constituted the highest number of deaths, accounting for 21% of the total deaths. Out of 3,098 total neonatal deaths, 51% (n=1586) were males. The 65 – 74 age group had the second-highest deaths, constituting about 11% (n=1,593). Out of this, males represented 60% (n=961).

The age category with the third-highest deaths was 35 – 49, representing 11% (n=1544). In this age-category, males constituted 53% (n=821). The analysis also reveals that the age-category with the lowest number of deaths was 5 – 14, accounting for only 0.04% (n=516), with 59% (n= 302) being male deaths.

The figure also illustrates that the youthful population age-range of 15 - 24 constituted about 5% of the total deaths. Out of this age category, male deaths accounted for 51%.

Figure 18 represents proportions of deaths by age group and sex. The proportion of female deaths among those within the age category of 35 - 49 represented 11%. Finally, the smallest proportion of female deaths occurred among those between the ages of 5 and 14, constituting 3%. According to this figure, the occurrence of deaths among males by age category is similar to that of females. For instance, twenty-one percent (21%) of all male deaths were under one month, whilst their female counterparts accounted for 22%. Males in the age category of 5 -14 accounted for 4% of total male deaths, whereas females constituted 3% in the same age-category. However, a difference can be seen in the age category of 64 – 74, with 13% being male deaths and 9% female deaths.

Males aged less than one year constituted 3% of the total male deaths, which was the smallest proportion of the different age categories.

Figure 17: Age distribution of deaths by sex, 2018 – 2020.

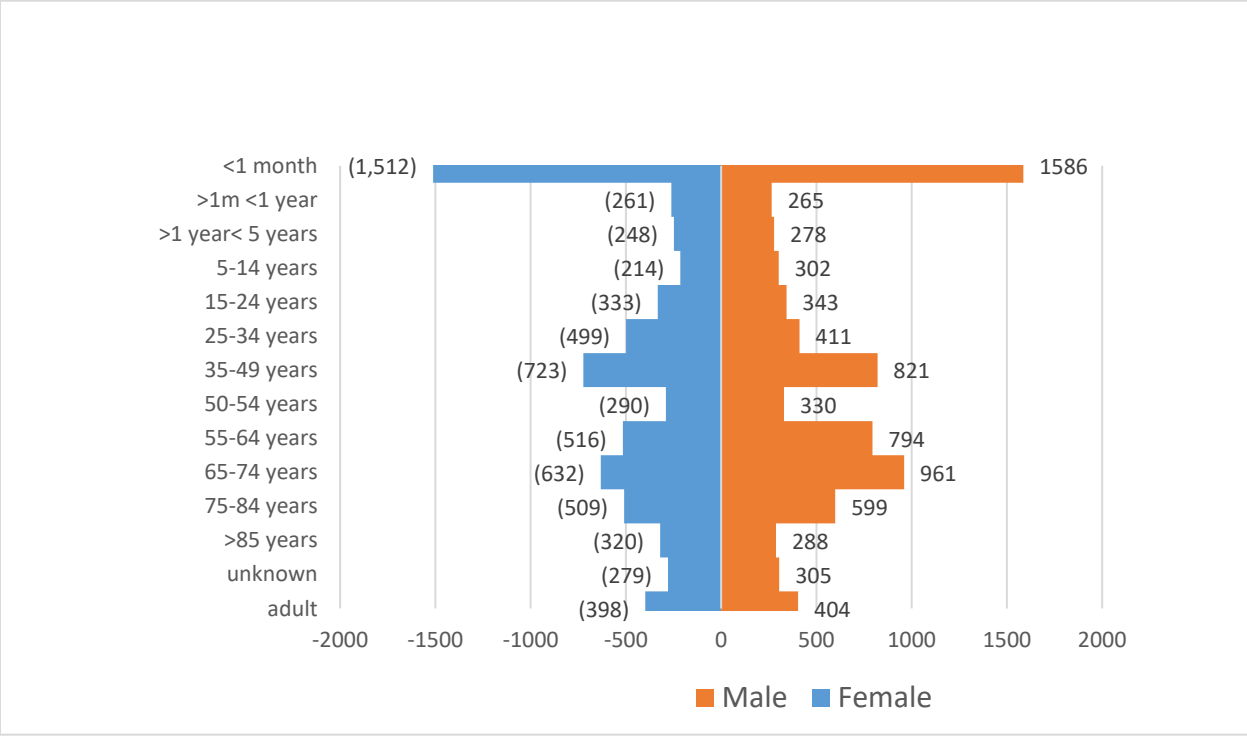
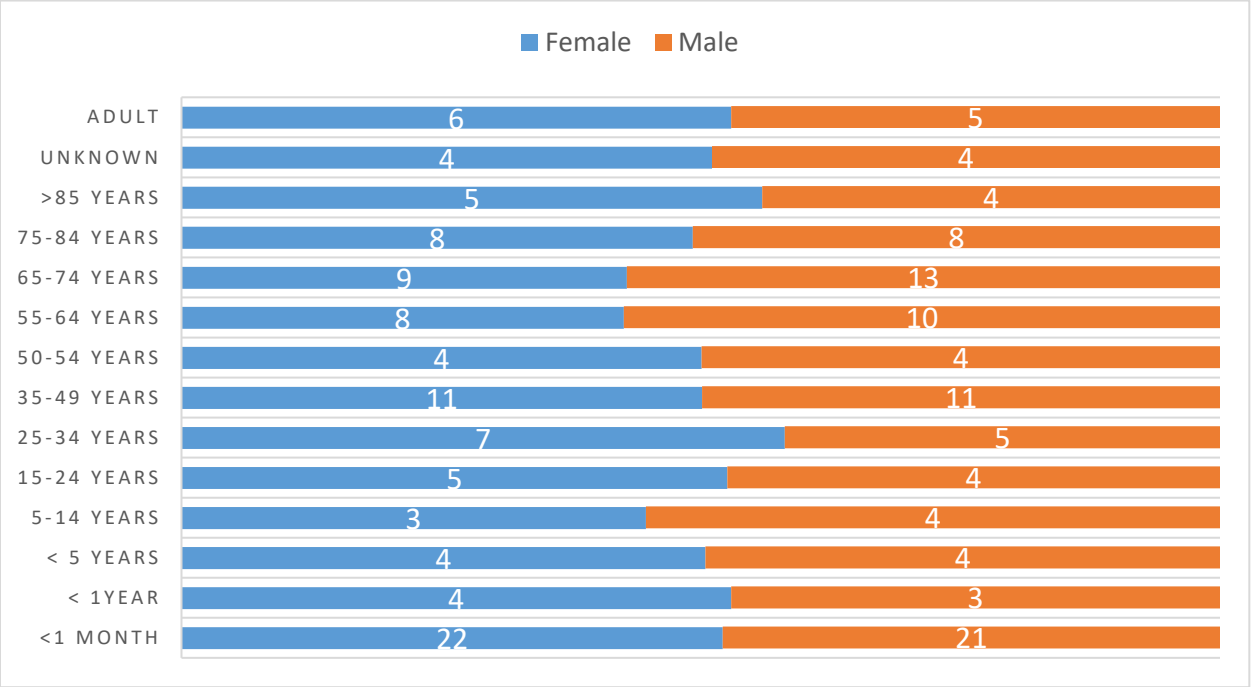


Figure 18: Proportionate sex distribution by age group, 2018 – 2020

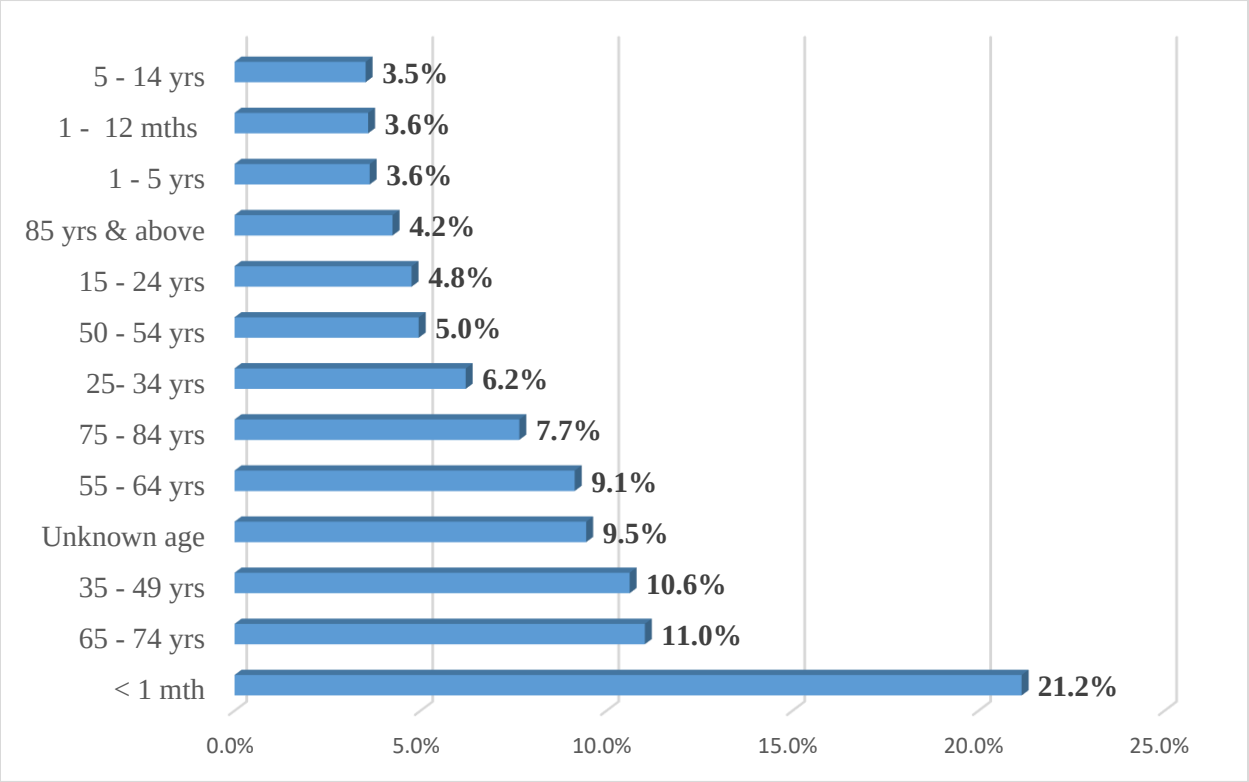


3.6 Annual Distribution of Mortalities by Sex and Age

3.6.1 Cumulative distribution of deaths by age, 2018 – 2020

The figure below shows the age distribution of deaths over the period. The distribution indicates that neonatal deaths constituted the highest proportion, accounting for 21% of the total deaths; followed by the age category of 65 – 74 constituting 11.0%; 35 – 49, 10.6% etc. The youthful age group (15 – 24 years) accounted for 5 % of the total deaths. The least proportions of deaths were observed among those within the age brackets of 1month – 14 years (1 – 12 months, 3.6%; 1 – 5 years, 3.6%; 5 – 14 years, 3.5%).

Figure 19: Proportionate distribution of deaths by age (n=14,640) [ref. year = 2018 - 2020]



3.6.2 Age distribution of deaths by sex, (n= 4911) [Ref. year = 2020]

The table below shows the sex and age distribution of deaths by proportion during the period. The distribution shows that neonates constituted the highest number of deaths, constituting 19%. The age category with the second highest deaths was 65 - 74 years, accounting for 11.7%, followed by those within the age category of 35 – 49 years, representing 11.2%. The least proportions of deaths were noted among the age categories of 1 – 12 months (3.4%), 1- 5 years (3.7%), and 5 – 14 years (3.9%), respectively. Out of the total annual deaths, men constituted 53%.

Table 6: Age distribution of mortalities by sex, 2020

Age Categories	Sex		Total	Percentage	Ranking
	Females	Males			
< 1 mth	486	449	935	**19.0%**	1
65 - 74 yrs	229	345	574	**11.7%**	2
35 - 49 yrs	259	291	550	**11.2%**	3
Unknown age	232	245	477	**9.7%**	4
55 - 64 yrs	179	271	450	**9.2%**	5
75 - 84 yrs	173	211	384	**7.8%**	6
25- 34 yrs	164	133	297	**6.0%**	7
85+	119	126	245	**5.0%**	8
15 - 24 yrs	126	111	237	**4.8%**	9
50 - 54 yrs	94	126	220	**4.5%**	10
5 - 14 yrs	84	106	190	**3.9%**	11
1 - 5 yrs	80	103	183	**3.7%**	12
1 - 12 mths	84	85	169	**3.4%**	13
Total	**2309**	**2602**	**4911**	**100.0%**	

3.6.3 Age distribution of deaths by sex, (n= 4708) [Ref. year = 2019]

The distribution below shows that neonates constituted the highest number of deaths, accounting for 24% of the total death toll in 2019. Out of this number, 53% were males. The second age category leading in deaths comprised people between the ages of 65 and 74 years representing 11%, with men constituting about 59%. Similarly, the fourth age group of 35 – 49 years also accounted for 11% of deaths, with male deaths being 55 %. Those with the lowest proportion of deaths belonged to the age categories of 1 – 12 months (4%); 5 – 14 years (3.4%); and 1-5 years (3.3%). The total annual deaths indicate that, men accounted for 54% of the deaths.

Table 7: Age distribution of mortalities by sex, 2019

Age Categories	Sex		Total	Percentage	Ranking
	Females	Males			
< 1 mth	539	604	1143	**24.28%**	1
65 - 74 yrs	205	301	506	**10.75%**	2
Unknown age	224	250	474	**10.07%**	3
35 - 49 yrs	206	253	459	**9.75%**	4
55 - 64 yrs	157	245	402	**8.54%**	5
75 - 84 yrs	155	197	352	**7.48%**	6
25- 34 yrs	147	137	284	**6.03%**	7
50 - 54 yrs	94	104	198	**4.21%**	8
15 - 24 yrs	89	108	197	**4.18%**	9
85+	99	89	188	**3.99%**	10
1 - 12 mths	99	89	188	**3.99%**	11
5 - 14 yrs	65	96	161	**3.42%**	12
1 - 5 yrs	74	82	156	**3.31%**	13
Total	**2153**	**2555**	**4708**	**100.00%**	

3.6.4 Age distribution of deaths by sex, (n= 4,962) [Ref. year = 2018]

The sex and age distribution shows that neonates still constituted the highest proportion of deaths (21%), with male deaths being 52%. The second affected age group was 35 – 49 years representing 10.8% of the deaths with men constituting almost 52%. This is followed by the age group of 65 – 74 (10.6%). Those with the lowest number of deaths were: 1 – 12 months, (3.3%); 5 – 14 years (3.6%); and 1-5 years (4.0%). Generally, men accounted for almost 53% of the deaths.

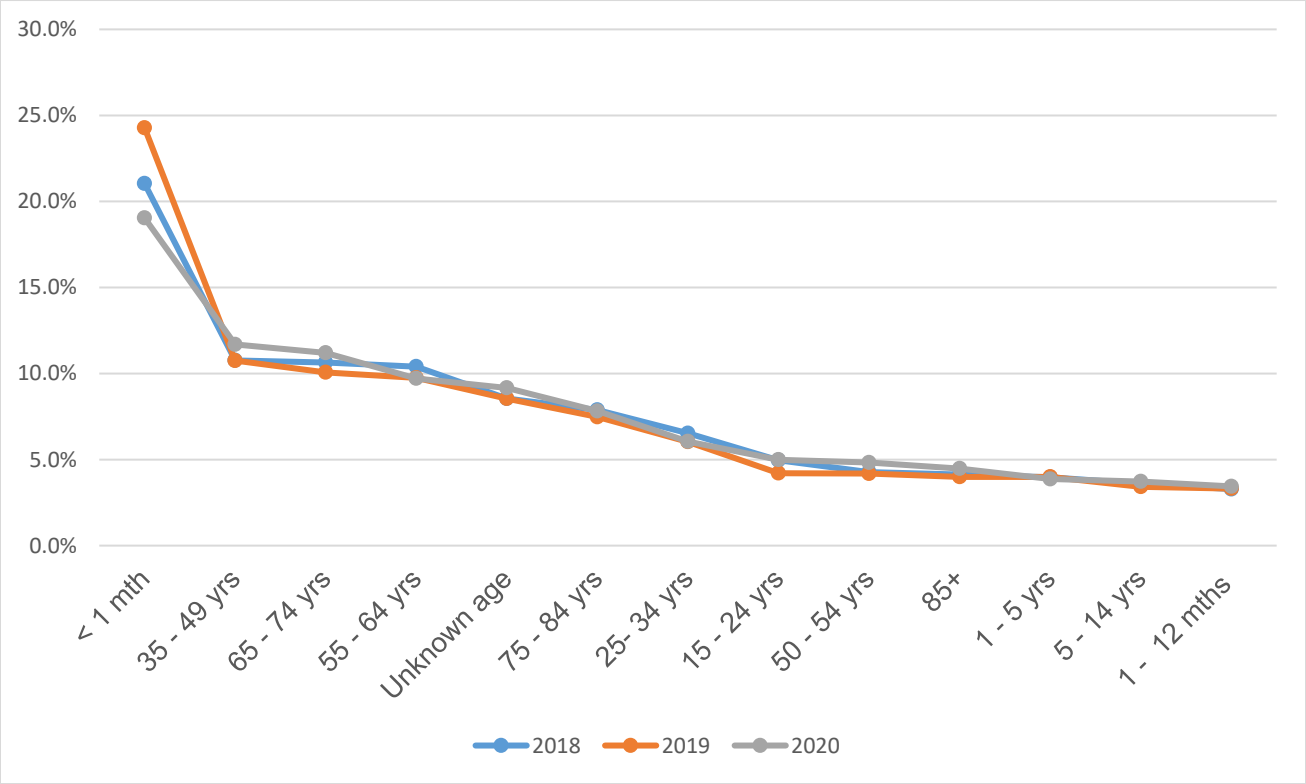
Table 8: Age distribution of mortality by sex, 2018

Age Categories	Sex		Total	Percentage	Ranking
	Females	Males			
< 1 mth	496	548	1044	**21.0%**	1
35 - 49 yrs	258	276	534	**10.8%**	2
65 - 74 yrs	202	326	528	**10.6%**	3
55 - 64 yrs	209	307	516	**10.4%**	4
Unknown age	217	207	424	**8.5%**	5
75 - 84 yrs	191	200	391	**7.9%**	6
25- 34 yrs	189	135	324	**6.5%**	7
15 - 24 yrs	123	123	246	**5.0%**	8
50 - 54 yrs	103	109	212	**4.3%**	9
85+	112	93	205	**4.1%**	10
1 - 5 yrs	93	104	197	**4.0%**	11
5 - 14 yrs	71	107	178	**3.6%**	12
1 - 12 mths	75	88	163	**3.3%**	13
Total	**2339**	**2623**	**4962**	**100.0%**	

3.6.5 Cumulative age distribution of deaths by year, 2018 - 2020

Overall, the cumulative age distribution strongly suggests that most of the deaths occurred in the age categories of < 1 month, 35 – 49, 65 – 74 and 55 – 64 years over the three-year period. The least affected age groups were those within the ages 1 – 12 months, 1 – 5 years, 5 – 14 years, and 85 years or above.

Figure 20: Cumulative age distribution of deaths by year, (n= 14,640)



3.7 Measures of Excess Mortality, 2020

As the pandemic progresses, there has been a growing focus on excess mortality as a more reliable metric for evaluating the impact of Covid-19 pandemic. It provides an estimate of the additional number of deaths within a given time period in a geographical area, compared to the number of deaths expected (often estimated using the same time period in the preceding year or averaged over several preceding years). Under the assumption that the incidence of other diseases remains steady over time, then excess deaths can be viewed as those caused both directly and indirectly by COVID-19 and give a summary measure of the whole system impact. Several studies have suggested that Covid-19 pandemic may potentially and inadvertently increase the risk of deaths from other factors, while decrease the risk of mortality from road traffic accidents and acute respiratory disease, with the net contribution of this yet to be understood.[18-20] From this perspective, the present study aimed to estimate excess mortality in order to identify both the negative and positive attributes of Covid-19 phenomenon in the country.

Thus, it was computed within the context of the following scenarios:

1. Overall estimated excess mortality (national)
2. Estimated excess mortality by region
3. Estimated excess mortality by place of occurrence
4. Age-specific excess mortality

Excess Mortality = Reported (estimated) deaths – Expected deaths; whereas:

Reported deaths = total number of deaths recorded in 2020

Expected deaths = total number of deaths from the preceding year (ref. year, 2019)

3.7.1 Estimated excess mortality (overall), 2019/2020

According to table 3 & 5 above, the total number of deaths reported in 2020 was 4911, whereas, the preceding/baseline year (2019) recorded 4708 deaths. Therefore:

Excess Mortality due to Covid-19 = 4911 – 4708 = **203** excess deaths

By proportion: 203/4708*100 = **4.3%** higher than expected

Nationally, the analysis reveals that an excess of 203 deaths (4.3%) could be attributed to Covid-19, both directly and indirectly.

3.7.2 Estimated excess mortality by region, 2019/2020

In reference to the illustration below, excess deaths (negative factor) attributed to the Covid-19 pandemic were only noticeable in three major regions of the country, namely WR1 accounting for 850 excess deaths; WR2 representing 588 excess deaths; and the least was observed in CRR, 278 excess deaths. Conversely, the Covid-19 pandemic has remarkably decreased the risk of mortality (positive factor) in most of the regions as indicated in the table. For instances, it has positively contributed to the reduction of 701 deaths in NBWR, 479 deaths LRR, 296 in NBER, as compared to the expected number of deaths (please provide here the expected figures for each region as you did with the positive factors) in 2020 in each of these regions.

Table 9: Comparing regional estimates of excess mortality, 2019/2020

Regions	2019 (Baseline)	2020 (Endline)	Excess deaths (n)	Proportion (%)
WR1	1622	2472	850	**52.4**
WR2	251	839	588	**234.3**
LRR	684	205	-479	**-70.0**
CRR	170	448	278	**163.5**
URR	306	299	-7	**-2.3**
NBWR	1298	597	-701	**-54.0**
NBER	377	81	-296	**-78.5**

3.7.3 Estimated excess mortality by place of occurrence, 2019/2020

As indicated in the table below, an excess in community deaths of 30% (n=179) was observed during the analysis. Unlike community deaths, records on health facility deaths have shown a decreased in mortality (positive factor), accounting for 65 reduction in deaths during the period.

Table 10: Comparative analysis of excess mortality by place of occurrence, 2019/2020

Place of Death	2019 (baseline)	2020 (Endline)	Excess deaths (n)	Proportion (%)
Community	592	771	179	**30.2**
Health Facility	4087	4022	-65	**-1.6**
Unknown	29	118	89	**306.9**

3.7.4 Age-specific excess mortality, 2019/2020

The table below illustrates the age-specific characteristics of excess mortality. It was discovered that the pandemic had a positive trend in mortality in the age groups of < 1month and 1 – 12 months. For instance, a reduction by 208 deaths was noted among neonates in 2020, as compared to the anticipated number (from 1,143 deaths in 2019 to 935 deaths in 2020). A similar trend existed among the age category of 1 – 12 months, with a mortality reduction of 19 deaths (from 188 deaths in 2019 to 169 deaths in 2020). Apparently, this shows that the pandemic has no negative effect on both neonates and those within the age-category of 1 – 12 months across the country.

However, a negative mortality trend has been observed among the other age-categories, for example, 1 year or above. . The most affected of these age-groups was 35 – 49 with almost 20% (n=91) of excess deaths. This is followed by the age bracket of 65 – 74 years, 13% (n=68); 85 & above, 30% (n=57); 55 – 64 years, 12% (n=48); 15 – 24, 20% (n=40); 75 – 84, 9% (n=32) of excess deaths. The age group with the least proportion of excess death was 25 – 34 about 5% (n=13).

Table 11: Age-specific estimate of excess mortality, 2019/2020

Age Categories	2019 (Baseline)	2020 (Endline)	Excess deaths (n)	Proportion (%)
< 1 mth	1143	935	-208	**-18.2**
1 - 12 mths	188	169	-19	**-10.1**
1 - 5 yrs	156	183	27	**17.3**
5 - 14 yrs	161	190	29	**18.0**
15 - 24 yrs	197	237	40	**20.3**
25- 34 yrs	284	297	13	**4.6**
35 - 49 yrs	459	550	91	**19.8**
50 - 54 yrs	198	220	22	**11.1**
55 - 64 yrs	402	450	48	**11.9**
65 - 74 yrs	506	574	68	**13.4**
75 - 84 yrs	352	384	32	**9.1**
85+	188	245	57	**30.3**
Unknown age	474	477	3	**0.6**

3.8 Crude Mortality Rate (CMR)

This metric measurement here refers to the death rates from all causes of deaths in the country from 2018 - 2020. Therefore, it was computed as the total number of deaths recorded in the country in a particular year divided by the total population of the Gambia for a specified time period (2018, 2019 & 2020) and multiplied by 100,000 populations.

Table 12: Annual distribution of crude mortality rates, 2018 - 2020

Years	Total deaths	Population size	Proportion (%)	CMR (deaths per 100,000 population)
2018	4,962	2,196,412	**0.23**	**226**
2019	4,708	2,273,665	**0.21**	**207**
2020	4,911	2,354,433	**0.21**	**209**

Population data source: *Final MoH Population Projection Database, 2020 – 2025*

3.9 Neonatal Mortality Rate (NMR)

The neonatal period covers from birth to 28 days. The numerator of neonatal mortality rate therefore was the number of deaths among children less than 28 days of age per 1,000 live births over a given period of time. The denominator is the number of live births reported during the same time period.

Table 13: Annual distribution of Neonatal Mortality Rates, 2018 - 2020

Years	Total deaths	Population size (live births)	Proportion (%)	NMR (deaths per 1,000 live births)
2018	1,043	75,557	**1.4**	**14**
2019	1,143	78,214	**1.5**	**15**
2020	935	80,993	**1.2**	**12**

Population data source: *Final MoH Population Projection Database, 2020 – 2025*

3.10 Infant Mortality Rate (IMR)

The IMR is perhaps the most commonly used measure for comparing health status among populations. It was the number of deaths among children < 1 year of age reported during a given time period divided by the number of live births reported during the same time period, multiply by 1,000. It is a widely used measure of health status, because it reflects the health of the mother and

infant. The health of the mother and infant, in turn, reflects a wide variety of factors, including prenatal care, prenatal maternal health behaviors, postnatal care and behaviors (including immunizations and nutrition), sanitation, and personal hygiene.

Table 14: Annual distribution of Infant Mortality Rates, 2018 - 2020

Years	Total deaths	Population size (live births)	Proportion (%)	IMR (deaths per 1,000 live births)
2018	1,207	75,557	**1.6**	**16**
2019	1,331	78,214	**1.7**	**17**
2020	1,104	80,993	**1.4**	**14**

Population data source: *Final MoH Population Projection Database, 2020 – 2025*

3.11 Sex-specific Mortality Rate (SSMR)

A sex-specific mortality rate is a mortality rate among either males or females. Both numerator and denominator were limited to each sex.

Table 15: Annual distribution of Sex-specific Mortality Rates, 2018 - 2020

Parameters	2018		2019		2020	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
Total deaths	2,625	2,337	2,538	2,170	2,604	2,307
Population size	1,082,372	1,114,040	1,120,599	1,153,066	1,160,575	1,193,858
Proportion (%)	**0.24**	**0.21**	**0.23**	**0.19**	**0.22**	**0.19**
SSMR (deaths per 100,000 population)	**243**	**210**	**226**	**188**	**224**	**193**

Population data source: *Final MoH Population Projection Database, 2020 – 2025*

3.12 Age-specific Mortality Rate (ASMR)

An age-specific mortality rate is a mortality rate limited to a particular age group. The numerator was the number of deaths in that age group, and the denominator was the number of persons in that age group in the population.

Table 16: Annual distribution of Age-specific Mortality Rates, 2018 - 2020

Age categories	2018		2019		2020	
	%	ASMR (deaths per 100,000 population)	%	ASMR (deaths per 100,000 population)	%	ASMR (deaths per 100,000 population)
1- 4 years	0.06	**57**	0.04	**41**	0.05	**48**
5-14 years	0.03	**30**	0.03	**26**	0.03	**28**
15-24 years	0.05	**52**	0.04	**40**	0.04	**44**
25-34 years	0.1	**97**	0.08	**83**	0.08	**82**
35-49 years	0.3	**273**	0.23	**227**	0.3	**257**
50-54 years	0.2	**179**	0.2	**162**	0.2	**162**
55-64 years	0.7	**736**	0.6	**570**	0.6	**605**
65 + years	1.6	**1,645**	1.5	**1,479**	1.5	**1,532**

Population data source: *Final MoH Population Projection Database, 2020 – 2025*

3.13 Summary of Findings

1. Out of 14,640 deaths reported over the study period, IUFD was the leading cause of death, 11%; followed by Sepsis, 6%; Cardiac failure, 5.2%; Stroke, 5%; and Hypertension, 4%. Stillbirths constituted a relatively large proportion of the IUFDs (55%).
2. In 2020 IUFD was the highest cause of death, 11% followed by Stroke, about 6%. The causes of more than 600 deaths (12%) in this period were unknown. There was a rise in the number of deaths among those with NCDs, such as hypertension (n=221), stroke (n=279), cardiac failure (n=253) and other CVDs, n=131.
3. Covid-19 was the 9th leading cause of death in 2020, with 3% of the total deaths. The mortality was high among those who were 45 years or above, constituting about 67% (n=93) of deaths. Out of which, male deaths account for 62%.
4. The region with the highest burden of Covid-19 related deaths was WR 1, with 92% of deaths; followed by WR 2, 6%. Almost 98% of the Covid-19 related deaths occurred in the two regions.
5. WR1 has the highest number of deaths across the three-year period, 52%; followed by NBWR, 13%; WR 2, 11%; LRR, 8%; CRR, 7%; URR, 6%; and NBER, 4%.
6. There was a sharp decline in deaths in WR 1 in 2019, with 1,622 deaths, almost equal to half of the previous year's deaths. However, in 2020 the number of deaths in the region rose by 52% (n=850).
7. Kanifing Municipality (KM) and Banjul City constituted the highest number of deaths, 29% and 29% respectively; with Kombo Central as the third leading district, 8%. In contrast, the lowest numbers of deaths were observed in Kiang West, Tumana, Lower Niumi and Niamina East each recording 1%
8. Apparently, males predominantly have higher deaths compared to females in almost all the districts, apart from Basse district which has more female deaths.
9. The results show that 53% of total deaths within the study period were males.
10. Deaths in health facilities accounted for 84% of deaths. On the other hands, the largest number of community deaths was observed in 2020, with 37% compared with 2018, 35%; & 2019, 28%.
11. The year 2018 slightly constituted the highest number of deaths, 33.9%; seconded by 2020, 34%; which is a little more than the 32% deaths in 2019.

12. Neonatal deaths constitute the highest burden accounting for 21%; followed by the age category 65 – 74 about 11%; 35 - 49 , 10.6%;
13. The youthful age-range of 15 - 24 constituted about 5% of total deaths, with male deaths accounting for 50.7%. The age category with the lowest number of deaths was 5 - 14 years, 0.04%.
14. The analysis has revealed an excess of 203 deaths (4%) attributed to Covid-19, both directly and indirectly.
15. Excess deaths were only noticeable in three major regions of the country, namely: WR1, 850; WR 2, 588; and CRR, 278 deaths.
16. Conversely, the Covid-19 pandemic has contributed to the decreased risk of mortality in most of the regions. For instances, it has positively contributed to the reduction of 701 deaths in NBWR, 479 deaths LRR, 296 in NBER, as compared to the expected number of deaths in 2020. Circumstances surrounding this remained unknown.
17. An excess in community deaths of 30% (n=179) was apparently noted. In contrary, health facility death trend have shown a decreased risk of mortality, a reduction of 65 deaths.
18. A reduction of 208 and 19 deaths were noted among neonates and the age category of 1 – 12 months, respectively (positive mortality trend).
19. However, a negative mortality trend was observed among the age group 85 years or above, 30%; followed by 15 – 24 year, 20.3%; 35 – 49 years, 20.0% ; 65 – 74 years, 13%; 55 – 64 years, 12.0%, 75 – 84 years, 9%.
20. The Crude Mortality Rates were 226, 207 and 209 deaths per 100,000 populations in 2018, 2019 and 2020, respectively.
21. Neonatal Mortality Rate was 12 deaths per 1,000 live births in 2020; as opposed to 14 and 15 deaths per 1,000 live births in 2018 and 2019, respectively.
22. Infant Mortality Rate was 14 per 1,000 live births in 2020 as opposed to 16 and 17 per 1,000 live births in 2018 and 2019, respectively.
23. The Sex-specific Mortality Rates were 224 and 193 deaths per 100,000 populations among males and females in 2020, respectively. Though, 243 and 210; 226 and 188 per 100,000 populations among males and females were observed in 2018 and 2019, respectively.
24. According to the Age-specific Mortality Rate, the age group of 65 years and above has the greatest burden of mortality, with 1,532, 1479 and 1,645 deaths per 100,000 populations

in 2020, 2019 and 2018, respectively. This was followed by the 55 – 64 years age category, having 605, 570 and 736 deaths per 100,000 populations in 2020, 2019 and 2018, respectively.

25. The third most leading age bracket regarding age-specific mortality rate was 35 – 49 years, with 257, 227 and 273 deaths per 100,000 populations in 2020, 2019 and 2018, accordingly.
26. The age-specific mortality rate among the youthful population (15 – 24 years) was 44 deaths per 100,000 populations in 2020; compared to 40 and 52 per 100,000 populations in 2019 and 2018, respectively.

Chapter Four: Discussion of Findings

This chapter seeks to discuss the findings that have been generated from the analysis. It provides insight into other related study findings relevant to this study.

The Gambia, like any other country, has both urban and rural settlements. The country is divided into seven health regions with a total of 48 districts. Western 1& 2 health region has the highest number of deaths over the period under study. This could be because the area is densely populated. Most deaths occurred in Kanifing Municipality and Banjul city, which falls under the West Coast Region, with 29% and 29% respectively. The high death toll could be attributed to the large population size and most of the major referral hospitals are located in this region which could be a major factor in this finding. The study found that West Coast Health Region 1 and 2, and Central River Region has excess mortalities of 850, 588, and 278 respectively, hypothetically attributed to the Covid-19 pandemic. Conversely, the Covid-19 pandemic has remarkably decreased the risk of mortality in most of the regions. For instance, it has remarkably contributed to reducing 54% of deaths in NBWR, 70% deaths in LRR, 78.5% in NBER. These findings are supported by a statistics and research report which states that the pandemic may also result in fewer deaths from other causes. For example, the mobility restrictions during the pandemic might lead to fewer deaths from road accidents. Or there might be fewer deaths from the flu because of interventions to stop the spread of COVID-19.[21]

The country has health facilities in strategic locations and readily available for patient care. Health facilities reported 84% of total death cases. Nonetheless, in the year 2020, there has been an increase in the number of community deaths. An excess in community deaths of 30% (n=179) was apparently observed during the analysis. Unlike community deaths, records on health facility deaths have shown a decreased trend accounting for a reduction of 1.6% deaths during the period. This could be primarily attributed to the pandemic. An analysis conducted in England and Wales revealed that, as COVID-19 deaths rose, private homes become a much larger proportion of deaths; 59% of weekly deaths during the worst weeks of the pandemic. It also revealed that even though health services were fully functional, some of the additional capacity was created by people (some of whom may have subsequently died) not attending the hospital or being discharged early.[22] Some of the health care services in the Gambia were not fully functional at the beginning of the pandemic

because many health service activities were wined down as a measure to curb the spread of the covid-19 virus.

Death is an inevitable circumstance that occurs in human existence. It cuts across everyone regardless of age, gender and social status. This is influenced by various factors, which can either be a preventable or non-preventable cause. During the data collection, death from all causes was collected. The study revealed that IUFD had been the leading cause of death throughout the entire three years. This statistic covers both fresh stillbirth (FSB) and macerated stillbirth (MSB). The incidence of IUFD has shown to be 11.5%, 12.9% and 7.8% in 2018, 2019 and 2020 respectively. From 2018-2019, the study has shown a rise in the number of IUFD, but a sharp decline was noted in the year 2020. This finding is slightly in contrast with an analysis that saw a downward trend of IUFD from 3.1% in the period 2005–2008, to 2.8% in 2009–2012, to 2.3% in the period 2013–2015.[23] The causes of IUFD may be attributed to various factors which have not been captured by this study. Yet, a study conduct in Tertiary Referral Centre in Uttarakhand, India, indicated 4.8% (n=105) of IUFDs and stillbirths.[24]With appropriate and timely interventions, this could be averted, or otherwise, the trend could begin to decline steadily.

Sepsis was the second leading cause of death, although the prevalence was noted in both adults and children, with under 5 years' age group especially neonates having the greatest burden. In this study, neonates constitute the highest number of deaths of 21.3%. The country has few neonatal health facilities and minimal personnel with experience in neonatal care. This could significantly contribute to the high number of infant and neonatal mortality in the Gambia. At the time of the study, none of the health facilities have more than two specialized nurses or doctors in critical neonatal management. The global health observation on country cooperation at a glance reports that physician's density (per 1000 population) was 0.1 by 2015.[25]This is, of course, a much worse situation in The Gambia.

In the present study, the trends of mortality among neonates and infants have steadily declined in 2020 as compared to 2019 and 2018. Imperatively, Neonatal and Infant Mortality Rates were 12 and 14 deaths per 1,000 live births, respectively in 2020; as opposed to the UNICEF 2018 mortality report in the Gambia, which indicates an Infant Mortality Rate of 41 per 1000 live births, and Neonatal Mortality of 31 per 1,000 live births.[26] This indicates a sharp decline in mortality among these age groups.

In 2020, the trend changed from sepsis being the second leading to adult related conditions such as stroke and cardiac failure. Based on the 2021 Statistical Update, which furnished U.S. mortality data from 2018, cardiovascular disease remains the leading cause of death in the U.S.[27] The study conducted in China, Hubei province, revealed that 86.2% of deaths were attributed to chronic and non-communicable diseases in Hubei. Cerebrovascular diseases, ischemic heart disease and neoplasms were the main leading causes in urban and rural areas.[28] World heart foundation reported that the majority of deaths due to CVD are precipitated by risk factors such as high blood pressure, high cholesterol, obesity, or the presence of diabetes.[25] Similarly, in the Gambia, CVD or non-communicable diseases according to the present study are steadily rising at an alarming rate, which may end up wiping the adult population in the country if not properly addressed.

The study revealed that there has been more male death, (53%) throughout the three years. This may be due to risky behaviors of men that expose them to unfavorable circumstances, thereby contributing to the high number of deaths. Nonetheless, the study has found that women die more than men from chronic conditions such as stroke and cardiac failure, which are among the second and third leading cause of death. These findings are support by a study which revealed that, Women had greater mortality associated with stroke and other CVD, which was related to age and stroke severity rather than other factors. Excess mortality from other CVD was greater in women.[29] Similar finding was discovered in a study done in Africa, which found that there are more than 1.7 million excess female deaths each year in Africa. It shows that the younger age group has more deaths, and almost all of these excess deaths are from infectious and parasitic diseases, respiratory infections, perinatal conditions, and malnutrition.[30]

Covid-19 being the 9th leading cause of death in 2020, has constitutes 3% of the total deaths. The highest proportion of its deaths was remarkably observed among the age group of 45 years and above, constituting about 67% (n=93) of deaths. Out of this, male deaths account for 62%. This population is the most vulnerable group for COVID-19 infections, apart from people living with chronic conditions. A similar study finding in America indicated that 95% of Americans died of Covid-19 were 50 years or older.[31] Almost 98% of the Covid-19 related deaths were heavily burdened in the West Coast Regions. This could be linked to the high population density of this area, leading to an overcrowding environment as indwellers are closely living together, eventually promoting easy and rapid spread of covid-19 virus. In support of this finding, a study done in

America found out that places that have borne the brunt of the coronavirus outbreak are densely populated urban and suburban areas.[32]

An excess of 4.3% (n=203) deaths was hypothetically attributed to the Covid-19 pandemic, both directly and indirectly, as similarly noted in many other countries. The number of deaths from covid-19 is mostly associated with either old age or people living with other chronic conditions such as CVD, Diabetes, Hypertension, respiratory diseases, etc. The pandemic may result in increased deaths from other causes for several reasons, including weakened healthcare systems; fewer people seeking treatment for other health risks; or less available funding and treatment for other diseases (e.g. HIV/AIDS, malaria, tuberculosis).[27]

This study also revealed that many deaths were brought in deaths (BID) to the facilities, and the causes of deaths were unknown. Because of the debilitating effect of the pandemic, many feared coming to the health facility to seek medical attention. In another dimension, much attention was shifted from other conditions to covid-19. This has led to the disruption of normal services and limited available resources. Many individuals preferred to stay at home even though they need medical services. This led to high number of BIDs and unknown cases. These findings was supported by a study conducted in the Philippines which revealed that 4,000 deaths due to COVID-19 may not have been included in the government's official tally as many people severely ill with the disease have succumbed to it without actually getting tested.[33]

Limitations:

1. Data incompleteness in most cases had led to exclusion of some vital statistics during the analysis.
2. Limited knowledge of health care providers on how to certify and classify cause of deaths at both health facility and community levels led to so many misclassification and misdiagnosis
3. Inappropriate data recording and keeping in some data collection points led to under-reporting of deaths
4. Inadequate funding and time hindered the inclusion of private health facilities and Non-PHC communities into the study.

5. Lack of internet connectivity hindered the process of accessing relevant literatures and retrieving the dataset from the DHIS2 at the analysis stage.

Chapter Five: Conclusion

This study aimed to determine the prevalence and distribution of mortalities from all causes between 2018 and 2020 to estimate the impact of COVID-19 pandemic in the Gambia. Rapid excess mortality surveys are crucial during the COVID-19 pandemic to track mortality from all causes. Essential healthcare services being disrupted, people's ability to seek health care could be limited thereby increasing the number of people dying from preventable diseases. The Gambia, like most countries in Sub-Saharan Africa, lacks Civil Registration and Vital Statistics (CRVS) system, resulting in an incomplete and inconsistent mortality database. Subsequently, this led to inadequate information to monitor the effects of COVID-19 on mortality in the Gambia. Therefore, such a rapid mortality assessment has the potential to provide such information and thus inform interventions, programs and policies. The study used retrospective cross-sectional design wherein both health facility's and community's death records were reviewed to obtain data on key variables, such as age, sex, cause of death, year of death, place of death, etc.

The findings of this study showed a relatively high mortality rate in the Gambia. The Crude Mortality Rate has increased from 207 to 209 deaths per 100,000 populations in 2019 and 2020, respectively. Neonatal Mortality Rate was 12 deaths per 1,000 live births in 2020, a decreased from 15 deaths per 1,000 live births in 2019. Infant Mortality Rate has declined in 2020 with 14 deaths per 1,000 live births as opposed to 17 per 1,000 live births in 2019. The mortality rate ratio of 224:193 deaths per 100,000 populations among males and females in 2020, respectively slightly showed a different sex-specific mortality trend in 2019, with a ratio of 226:188 per 100,000 populations. The age group of 65 years and above has the greatest burden of mortality, with 1,532 deaths per 100,000 populations in 2020, an increased from 1,479 deaths per 100,000 populations in 2019. This was followed by the 55 – 64 years age category, which has 605 deaths per 100,000 populations in 2020, as opposed to 570 deaths per 100,000 populations in 2019. The third most leading age bracket was 35 – 49 years, with 257 and 227 deaths per 100,000 populations in 2020 and 2019, respectively.

The study found an overall excess of 4.3% deaths in 2020, prominently noted in three major regions of the country, namely: WR1, WR 2 and CRR. Conversely, a decreased risk of mortality was observed in the other regions. Circumstances surrounding this remained unknown. An excess of 30% in community deaths was discovered, contrarily to health facility death trend which has shown a decreased risk of mortality in 2020. A positive mortality trend was observed among neonates and the age category of 1 – 12 months in 2020. However, a negative mortality trend was noted among the age group 85 years & above, 15 – 24 years, 35 – 49 years, 65 – 74 years, 55 – 64 years and 75 – 84 years.

IUFD was the overall leading cause of death, followed by sepsis, cardiac failure, stroke, and hypertension over the three-year period. Moreover, after further disaggregation of mortalities by year, it was observed that IUFD was still the leading cause of death in all three years. With more than half of the fatalities over the period, WR1 had the highest mortality rate; seconded by WR 2. The region with the lowest mortality rate was NBER. Kanifing Municipal and Banjul city had one-third of the mortalities each. Males accounted for more than half of the deaths throughout the research period. In 2020, Covid-19 was the 9th leading cause of death, about 3% of total deaths. The mortality was remarkably observed among those who were 45 years and above, out of which, male deaths account for the majority.

The age group of 55 - 64 years had the highest proportion of Covid-19 related fatalities. WR 1 has the highest burden of Covid-19-related deaths. Almost 98% of the Covid-19 related deaths remarkably occurred in West Coast Regions.

The results show 53% of male deaths. Males predominantly have higher deaths compared to females in almost all the districts. Health facilities deaths accounted for majority of the mortalities, with the largest number of community deaths observed in 2020. The year 2018 slightly constitutes the highest number of deaths, seconded by 2020, which sightly has more deaths recorded compared to 2019.

Recommendations:

1. There is a need to train data entry clerks at all levels of data entry, storage, and filing system.
2. Health care workers at both health facility and community levels should be adequately trained on how to certify and classify deaths according to the W.H.O recommendation or outline.
3. There is a need to establish a Civil Registration and Vital Statistics (CRVS) system in the country to ensure a reliable and complete mortality database for subsequent similar studies.
4. Monitoring and supervision should be strengthened in the various departments/units at all health facilities and VHS/CHN.
5. Western Health Region 1 has more health facilities (major health centres & hospitals); therefore, it needs more than one team for subsequent studies.
6. With the essential role of rapid mortality surveys to inform policies and decision-makers, there is need for allocating adequate research funding to cover private health facilities and Non-PHC communities in subsequent similar studies in the country.
7. There is a need to address the sexual and reproductive health of women to address perinatal mortality.
8. Interventions towards NCDs should be strengthened to reduce the rising mortality from NCDs.
9. Sensitization on COVID-19 should be intensified in WCR to reduce Covid-19 related morbidities and mortalities.
10. Health care services should be decentralized to reduce the mortality burden in the WCR

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