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A FOREWORD FROM THE EDITOR

ML Mazaba

Zambia National Public Health Institute, Lusaka, Zambia.

Welcome to The Health Press Zambia (THP-Z) September 2018 issue. September 2018 saw 36 health awareness occasions celebrated globally. THP-Z has given special attention to World Rabies Day that was recognised on 28th September with the theme, Rabies: Share the message. Save a life. The editorial entitled 'Ending dog-mediated human rabies by 2013: a Zambian perspective' is dedicated to the awareness of rabies, a disease that can be prevented given adequate attention to mitigation measures such as vaccination. Did you know that nearly 50% of deaths caused by human rabies occur in Africa. Read more about Zambia's strategies to ending dog-mediated human rabies among its population

On a personal note, I also wish to increase awareness on mental health as a global problem. Mental health disorders include depression, bipolar affective disorder, schizophrenia and other psychoses, dementia, intellectual disabilities and developmental disorders including autism, with depression being in the lead. According to the WHO in 2017, more than 300 million people, 4.4% of the world's population, suffer from depression. Let's embrace this fact and support strategies to treat and prevent mental health.

We have lined for you 3 other articles relating to different aspects of health.

Zambia reported an increase in the number of Tungiasis cases in some parts of it country in 2017. The neglected tropical disease caused by infestation of the female sand flea Tunga penetrans which burrows into the skin causing localised itching and irritation. The disease is associated in most parts of the world with poor housing and low soci-economic status. Read about the outbreak that occurred in a peri-urban set up of Njelemani area, Masaiti district of Copperbelt province in October 2017 in this issue.

Readers of THP-Z, allow me to introduce the Civil Registration & Vital Statistics program run by the Department of National Registration Passport and Citizenship (DNRPC) in the Ministry of Home Affairs. The program envisages improved registration of births, death and cause of death in Zambia. The THP-Z team had an opportunity to acquaint to a pilot a birth and death registration system using local leaders in the rural set up to capture birth and death data using registers. We are happy to note that the team has decided to give an update to our readers on causes of death in our community as they increase their coverage of registration. In this issue are two inaugural articles; Rapid Population Growth and Health and Mortality and Causes of Death: 2017 Facts and Figures both based on data collected through their program.

To authors, reviewers and editors, THP-Z has increased its readership as it continues to promote its publication on twitter @ Healthpress and facebook @PressZambia. We invite you to visit our website for the monthly issues and more on http://znphi.co.zm/thehealthpress/.

Mazyanga Lucy Mazaba

ENDING DOG-MEDIATED HUMAN RABIES BY 2030: A ZAMBIAN PERSPECTIVE

EDITORIAL

R Hamoonga

Zambia National Public Health Institute, Lusaka, Zambia.

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On 28th September 2018 each year, Zambia joins the world in commemorating World Rabies Day. The theme for this year is "Rabies: Share the message. Save a life". This year was no exception as veterinarians all across the country, with the coordination of the Veterinary Association of Zambia (VAZ) and in collaboration with the Ministry of Fisheries and Livestock came out in numbers throughout the week leading up to 28th September to conduct rabies vaccination campaigns and sensitising communities on responsible dog ownership.

Dog-transmitted rabies is a zoonotic disease that causes the completely preventable death of an estimated 59,000 people every year [1]. Of those deaths, 24,000 occur in Africa where rabies has the highest per capita death rate [1]. In Zambia specifically, approximately 15,000 dog bite cases are recorded annually. Additionally, 50 humans die of rabies annually in Zambia. The per capita death rates (per 100,000 persons) is estimated to be 0.19 in Zambia [1].

As public health practitioners, we are collectively responsible for human deaths due to rabies given the preventability of rabies from the human side through post exposure vaccine and from the animal side through dog vaccinations. Studies have shown that an annual 70% vaccination coverage in dog populations is an effective way to eliminate the disease from the dog and human population.

Zambia has demonstrated strong impetus to end dog-mediated human rabies by 2030. Under the able leadership of His Excellency Mr Edgar Chagwa Lungu, the ministries responsible for animal health and human health; Ministry of Fisheries and Livestock and Ministry of Health respectively, in 2018 came together in a rare One-Health approach to form the National Rabies Taskforce. The taskforce in Zambia has drawn all key ministries and players to the table such as, the Ministry of Local Government, the University of Zambia etc. to ensure a well-coordinated approach to rabies control. Foremost, the taskforce seeks to draft the National Rabies Control Strategy, a document that will provide guidance on how rabies control will be achieved in the country.

Focal points for the ministries responsible for animal health and human health attended the 2nd full Pan-African Rabies Control Network (PARACON) in Johannesburg in early September this year.

PARACON-WHO meeting
Johannesburg, South Africa
12-14 September 2018

The 2nd PARACON meeting was a joint meeting with the World Health Organization (WHO), with participation from both Anglophone and Francophone countries of sub-Saharan Africa as well as several international experts from around the world [2]. The meeting brought to the fore new World Health Organization (WHO) guidelines regarding human rabies immunization [3]. The meeting also provided an opportunity for member states to share ideas on rabies control. The meeting provided an opportunity for countries to self-exam where they are with regard to globally accepted steps in eradicating canine (dog)-mediated rabies.

Zambia is on course to eradicating rabies, and the key lies in responsible dog ownership. Rabies-prone dogs have been portrayed to be vicious looking dogs, however even puppies can transmit rabies, and because of the playful nature of puppies, children can get bitten and be put at risk of infection without guardians suspecting it. If we all do our part, by ensuring our pets have received all necessary vaccinations, including rabies, and if we ensure our health facilities stock adequate pre and post exposure rabies vaccines for humans, we all together can end rabies in our communities even before 2030. Share the message. Save a life.

DR Raymond Hamoonga (Rabies Focal Point, MoH-ZNPHI)

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RAPID POPULATION GROWTH AND HEALTH

PERSPECTIVE

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Citation style for this article: Banda J. Rapid Population Growth and Health. 2018;2(9); pp 5-7.

One of the important developmental goals of government is to provide adequate health care for the population through expanded primary health care. However, high population growth rate is likely to make the achievement of this goal difficult if not impossible. In general high fertility, which impacts on rapid population growth rate tends to be related to high rates of morbidity and mortality especially in a poorer economic setting[1].

The scope of public health programmes are necessarily influenced by the changing characteristics of the population because different age groups may require specialized health attention and services. Rapid population growth with its dynamic changing characteristics therefore necessitates consented and articulate long range planning of health care services [2].
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Rapid population growth is commonly associated with high fertility which impacts on quality of the population's health conditions and attendant health services. For example, African countries have the highest fertility rates in the world [3] and are prone to higher mortality rates. They also are affected by more diseases and chronic conditions than any other region [3]. This phenomenon, therefore, constrains improvements in health and the delivery of health services. For instance, owing to high birth rates many African countries have high proportions of young children in the population. This aspect has a negative bearing on the health situation and services in countries. A typical example, is the relatively large number of children in the age group 0-4 years which usually constitute the highest proportion. This age group experiences the highest illness and mortality rates, resulting in a greater need for health services. Additionally, high fertility and closely spaced children are associated with high rates of infant, child and maternal mortality [4]. In such situations the efficiency of health services are bound to be compromised because of rapid increase of population [5].

Zambia is not an exception to relatively high population growth rates and its apparent impact on constrained public health and resources. The population of Zambia in 2010 was about 13, 092,666 while it was 9,885, 591 in 2000 and projected to 17,067,592 in 2016 [6, 7]. The growth rate was estimated at 2.8 during the inter-censal period between 2000 and 2010. The rate remained almost at the same level by 2016. The Total Fertility Rates (TFRs) were estimated at 6.7, 6.0, 5.9 and 5.3 in 1990, 2000, 2010 and 2016 respectively. Although the TFR progressively declined from 2000 to 2016 it was still relatively high compared to most developed countries such as Spain and Taiwan, with TFRs of 1.3 and 1.2 respectively [7]. Owing to the high population growth rate the Zambian young population provides an in-built potential for continued population growth into the future (6). In this regard the number of health care facilities and resources may not grow at the pace of the ever-growing population [8].

Table 1: Zambian Population and Total Fertility Rates

Year	Number	Total Fertility Rate
1990	7,860,000	6.7
2000	9,885,591	6.0
2010	13,092666	5.9
2016	17,885,422	5.3 (projected)

Table. 2: Life expectancy at birth for selected countries

Country	Male	Female
Country	Male	Female
Benin	59	62
Niger	59	61
Nigeria	53	54
Zambia	51	56
Canada	80	84
Italy	81	85
Switzerland	82	85
USA	76	81

Source: i) Central Statistical office, Zambian Population and Demographic projections (2011-2035) ii) Population Reference Bureau, World Population Data Sheet 2018

In the urban areas high population growth, without matching special development efforts, for instance, would constitute a barrier to socio-economic development that includes the health sector where the expansion of health facilities would not match the available resources [10]. Siwale, as early as 1984 observed that the National Primary Health Programme which had been implemented for quite a long time was expected to achieve a goal for health for all by the year 2000 [8] This was not attained among other reasons, because of the persistent high birth rates in the country. In conclusion we reiterate that rapid population growth, has a depressing effect on health services.

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TUNGIASIS OUTBREAK INVESTIGATION IN MASAITI DISTRICT, ZAMBIA

OUTBREAK REPORT

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Tungiasis is a neglected tropical disease caused by infestation by the female sand flea Tunga penetrans. Primary reservoirs include livestock such as pigs, goats and cattle. Infection occurs when skin comes into with fleas in soil of floor. The flea burrows in the epidermis of the skin causing local itching and irritation. An outbreak of tungiasis was reported in Njelemani area, Masaiti district of Copperbelt province in October 2017. We investigated to determine the magnitude and geographic spread of the outbreak, and conducted epidemiologic and clinical assessment of cases in the affected communities.

Key words: Tunga penetrans, tungiasis, jiggers, Zambia

METHODS:

We defined a case of tungiasis as any person from Njelemani area with T.penetrans associated lesions (i.e. white patch or black dot with pain and or itching) on any part of the body from 1st August to 13th October 2017. We reviewed records and conducted active case search. We calculated attack rates by using population estimates from central statistical office 2010 census. We interviewed a convenient sample of case-patients using a structured questionnaire and collected data on demographics, tungiasis symptoms, location of lesions and hygiene practices. In addition, eggs and fleas were collected from patients and the environment for microscopic examination. Descriptive analyses were performed using Epi info 7.

RESULTS:

We identified 192 tungiasis case-patients during the 1st August to 13th October of which 120 (63%) were male, constituting an attack rate of 16%. Of the 66 cases interviewed, majority (40%) were children aged 0-9 years of which 66% were males. Almost all (91%) lesions were located on the feet. Predominant symptoms were itching 66 (100%) and pain 49 (75%). Although 85% of cases reported having footwear, only 16% wore them regularly. More than half (56%) of case patients had dirty feet and half of the houses in the area were temporary structures with bare earthen floors. Laboratory investigations revealed the presence of T.penetrans eggs from the lesions of eight cases-patients.

CONCLUSION:

An outbreak of tungiasis occurred in Njelemani area of Masaiti district. Interventions aimed at raising awareness, promoting regular use of footwear, hygiene and maintenance of housing floors remains essential in controlling and preventing tungiasis. Furthermore, we recommend strengthening collaboration between the Ministries of Health and Livestock and Veterinary services since tungiasis affects both humans and animals.

INTRODUCTION

Tungiasis is a neglected tropical disease caused by infestation by the female sand flea Tunga penetrans also commonly known as jigger or chigoe [1]. The flea burrows in the epidermis of the skin. While in the epidermis, the flea increases in body volume causing local itching and irritation. Tungiasis is a zoonosis affecting both humans and animals. Reservoirs for human infection are predominantly pigs and bovines; but may include dogs, cats and rats in resource-poor urban communities [1] [15]. Studies conducted in Brazil have shown high risk of human tungiasis in communities were animal tungiasis is high. [3]. T. penetrans fleas penetrate the skin when it comes into contact with soil or floors which have developed sand fleas [2]. Tungiasis is common in villages and shanty neighborhoods of cities with low economic conditions [3]. A study conducted

Most (99%) of the lesions occur on the feet although any part of the body can be affected [1]. Tungiasis is a debilitating disease that can lead to restricted mobility especially if one has multiple lesions. Complications of chronic tungiasis may include bacteria superinfection of the lesions resulting in abscesses and lymphangitis [4]. Deformity and mutilation of the feet due to reoccurring infections may lead to impaired mobility and contribute to stigma and absenteeism

among school going children [5, 6]. Studies conducted in Africa, Asia and South America have shown that tungiasis is associated with poor housing and low socio-economic status. In Zambia the overall prevalence of human tungiasis is unknown serve for the study conducted in Chipata and Vubwi eastern province in 2015 showed an overall prevalence of 13.5%.

The Ministry of Health through the Copperbelt Provincial health office was alerted to an outbreak of tungiasis in Njelemani village in Masaiti District on 21st September 2017. Masaiti is one of the three rural districts on the Copperbelt province. It is located 343 kilometers north of Lusaka. The district has an estimated total population of 118,548 [7]. Njelemani has a population of 6117 [7] and ten (10) neighborhood health committees. The health facility has reported sporadic cases of tungiasis since 2003. However, in August 2017 there was a spike in the number of cases and affected households. To determine the magnitude and the geographic spread of the outbreak, we conducted a descriptive epidemiologic and clinical assessment of the cases in the affected communities.

METHODS

We defined a case of tungiasis as any person from Njelemani area with T. penetrans associated lesions (i.e. white patch, black dot with pain and itching) on any part of the body from 1st August to 13th October 2017. We reviewed facility records which showed the number of tungiasis cases per year and the villages which were affected. We also conducted active case search for tungiasis cases in affected villages. We interviewed a convenient sample of case-patients using a structured questionnaire and collected geographic coordinates of the area. We collected data on demographics, clinical symptoms, location of lesions, hygiene practices, treatment, housing characteristics, number and type of animals, access to veterinary services and observed animals for lesions. We calculated the attack rate based on the total population in affected villages Clinical assessment and staging was conducted using the Fortaleza classification criteria. The criteria was described by Eisele et al (2003) consisting of five (5) stages. Stage 1 characterized by penetration of skin by flea, stage 2 complete penetration and burrowing of most of the fleas body leaving only hind quarters, stage 3 the flea achieves maximum hypertrophy, the skin layer thins out resulting in the appearance of a white halo around a black dot. Egg release is common at this stage. Stage 4, the flea dies, the lesion shrinks in size, turns brown and appears wrinkled. Stage 4b is characterized by flea elimination through skin repair. Stage 5, the dead flea has been expelled leaving characteristic circular skin residues of infection and brown black appearance. In addition, eggs and fleas were collected from cases and the environment for laboratory confirmation of T.penetrans. GPS coordinates were also collected to map out the spatial distribution of cases. We also observed the feet of respondents for cleanness using agreed upon rating. We used Epi info 7 to obtain descriptive statistics.

ETHICAL CONSIDERATION

Since the study was conducted as part of an outbreak response, ethical clearance waiver was obtained from the Tropical Disease Research Centre (TDRC) ethics committee. Consent was obtained from participants aged 18 years and older. We obtained assent from children younger than 18years and consent from their parents and guardians.

RESULTS

As seen in Figure 1, there has been a cumulative 944 of tungiasis cases in Njelemani since 2003. After a peak in 2003, a reduction in the prevalence of tungiasis was noted. However, in 2017, an increase in the number of cases was observed. Following interventions, the number of cases reduced drastically as noted in (fig. 2).

During the outbreak period, a total of 192 cases of tungiasis were identified of which 63% (120) were males and 38% (72) were females, constituting an attack rate of 16%. A total of 66 cases were interviewed, of these, majority (41%) were children aged 0-9 years. In this age group, 33% were females and 67% were males. More than 50% of the cases lived in temporary houses while only 10% lived in permanent houses (Table 1). Almost all (91%) lesions were located on the feet and 7% on the fingers. Predominant symptoms were itching 66 (100%), and pain 49(75%). The number of lesions per person ranged from 1 to 20 with a median of 3. About 7% of the cases had severe tungiasis with lesions ranging from 11-20. Fortaleza classification revealed multiple staging with 53% of cases in stage II, 43% stage III (Eisele M et al. 2003) (Table 2). In relation to foot wear, 85% (56) of the respondents reported having footwear while 15% (10) had no footwear. Although 85% of cases had foot wear, more than half 66% wore them occasionally and only 5% reported wearing them all the time. Hygiene was assessed by observing the feet of the respondents for cleanness, and more than half (57%) of the cases had feet that were classified as dirty. The most common type of animals kept in the community were goats (43%) and pigs (39%). Some of the pigs examined had lesions associated with T. penetrans infestation.

Table 1: Socio-demographic characteristics of respondents of Njelemani area Masaiti District Zambia August – October,2017

Characteristic	Frequencies (Percent)
Age	(n=66) (%)
0 – 9	27 (41)
10 - 19	19 (29)
20 - 29	8 (12)
30 - 39	5(8)
>40	7(11)
Median age	13.5 (6,23)
Sex	
Male	42 (64)
Female	24 (36)
Education level	
None	32(48)
Primary	29 (44)
Secondary	5 (8)
Source of income (n=63)	
Farming	51 (73)
None	11 (16)
Casual Work	7 (8)
None	2 (3)
Housing Type (n=66)	
Temporary	33 (50)
Semi-permanent	23 (35)
Permanent	10 (15)
Type of wall	
Mud plastered	56(85)
Not plastered	7(10)
Cement plastered	3(7)
Type of floor	
Bare ground	51(75)
Concrete	13(19)
Other	4(6
Source of water	
Communal borehole	40 (59)
Shallow well	19 (29)
Shallow well	8 (12)

Table 2: Clinical assessment of tungiasis cases in Njelemani area Masaiti District, Zambia August – October 2017

Location of lesions	Frequency (%)
Feet	60 (91)
Finger and feet	5 (7)
Forearm	1 (2)
Number of lesions	
1-5	50 (76)
6-10	11 (17)
11-20	5 (7)
Fortaleza classification	
Stage 1	28 (24)
Stage II	37 (32)
Stage III	24 (21)
Stage IV	14 (12)
Stage V	12 (10)

Table 3 Factors associated with tungiasis in Njelemani area of Masaiti district, Zambia August – October, 2017

Variable	Frequency (%) =66
Foot wear	
Do not wear	10 (15)
Wear footwear	56 (85)
Type of foot wear	
Open	25 (45)
Closed	31 (55)
Use of foot wear	
Sometimes	37 (66)
Most of the times	16 (29)
All of the times	3 (5)
Heard of tungiasis	
No	50 (75)
Yes	17 (25)
Hygiene	
Dirty feet	38 (57)
Clean feet	29 (43)
Livestock	
Goats	33 (43)
Pigs	26 (39)
None	21 (31)
Cattle	1 (2)*

**Percentages >100 due to multiple responses*

LABORATORY FINDINGS

Although the diagnosis of tungiasis is clinical, samples were collected from 8 patients who had various stages of lesions and were examined microscopically for the presence of T. penetrans eggs. In addition, the characteristic adult T. penetrans flea was identified on microscopic examination.

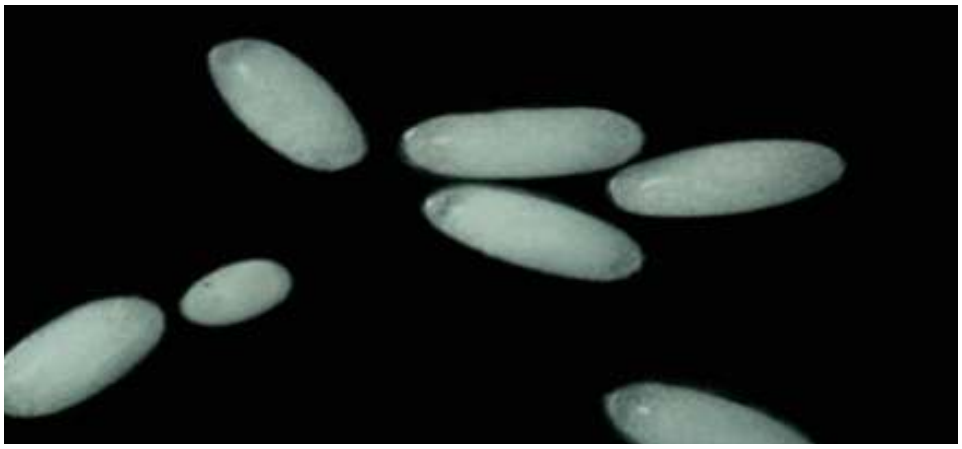

Fig 4: Sand flea eggs, x40 magnification

Fig 5: Adult T. penetrans collected from the environment of one of the affected communities in Njelemani area of Masaiti

DISCUSSION

In our study, majority of case-patients were males. Similar findings were observed in Haiti, where more males were affected than females [8]. Males are more likely to be involved in activities that are more likely to expose them to sand fleas such as playing football barefoot. The findings of this study are consistent with the findings of a study conducted by Kampamba et al 2015 which showed high prevalence among persons aged under 15years. Most of the respondents were children aged 0-9years, a finding consistent with the study carried out in southern Ethiopia, were most cases were children ages 5-14 years [8-10]. Similar findings were observed in Tanzania and Nigeria, were children were more affected than adults [11] [12]. The finding could be due to the fact that children are more likely to be exposed to the sand fleas as they play barefoot. It is also possible that affected adults may remove the fleas on their own. The finding may also be related to selection bias were children are likely to complain about T.penetrans symptoms while adults may shy away.

With regard to education, only a small percentage of respondents had attained secondary level education, a finding which is in tandem with that of a Ugandan study which showed that secondary level education was protective against tungiasis. People with secondary or higher education are more informed and practice high levels of hygiene as compared to those with primary or no education [13]. This finding may also be attributed to the general low number of people with secondary education in the community.

A study conducted in Uganda showed an association among poor housing, cracked walls, earthen and dusty floors and tungiasis [13]. Similarly our study showed poor housing in the affected area with half of the structures being temporally (Table 1). Furthermore, two thirds of the houses had bare ground or earthen floors a finding which is consistent with studies conducted in Nigeria and Uganda [14], [13]. The high number of houses with earthen dusty floors could be attributed to lack of knowledge on T.penetrans prevention among the community members. Dusty earthen floors are very conducive for the fleas.

Although our study findings show that two thirds of the case-patients lacked knowledge on the cause of tungiasis, they were aware of the signs and symptoms, contrary to the findings of Mutebi and others in Uganda[15]. Almost all affected persons preferred self-treatment by extracting embedded fleas using non-sterile sharp instruments such as pins, needles and thorns instead of visiting the health facility similar to the findings in other tungiasis studies [2], [12], [10].

Despite more than three quarters of the case-patients in our study reporting having shoes, only less than a quarter wore them regularly. Regular usage of shoes has been shown to have a protective effect against tungiasis. In a study in Madagascar, the protective effect of shoes from sand fleas was related to the regularity of footwear use [16]. However, it appears that only closed shoes offer some protection.[17] A report from an outbreak investigation in Ethiopia showed that most tourists who had tungiasis wore open shoes [18]. A similar

observation was noted in our study were almost half of the case-patients had open shoes. In our study it was noted that close to half of the case-patients who reported having footwear had open shoes. This finding could be due to lack of knowledge on the type of shoes and exposure to fleas. On removal of T.penetrans fleas, nearly all respondents preferred using thorns, razors, pins, chemical pesticides and needles, a finding consistent with studies conducted in Tanzania, Uganda, Kenya and Nigeria [11, 13-15]. However, these are unsafe practices that could lead to transmission of blood-borne pathogens such as hepatitis B and C virus, possibly also HIV [1].

Personal hygiene practices such as having dirty feet, and putting on dirty clothes are associated with tungiasis. Dirty feet and clothes provide a conducive environment for T. penetrans to survive and hide [11]. This is consistent with our study findings where 55% of the respondents had dirty feet. Several studies have highlighted personal hygiene as an important factor in the control and prevention of T. penetrans [13], [11]. Poor hygiene among our case-patients could also be attributed to distance to water sources in the area. Some villages had unsafe water sources which they shared with animals. Lack of knowledge on hygiene practices therefore remains key in the prevention of tungiasis.

In the present study, most of the pigs in Njelemani area had lesions a finding consistent with other studies which have shown pigs to be the most common animal reservoir of sand fleas [12]. It should be noted that goats were the most common animals in the community but they had no lesions. This could be due to natural resistance to diseases and infection. However, a study conducted in Uganda showed that goats can also be infected by T.penetrans [19]. Limited access to veterinary services in the area could have contributed to the sudden increase in the number of tungiasis cases.

CONCLUSION

Tungiasis is a common health problem in Njelemani area of Masaiti district. The control of tungiasis requires a one health approach combining efforts and strengthening collaboration between the Ministries of Health and Livestock and Veterinary services since it affects both humans and animals. Interventions aimed at raising awareness and promoting regular use of footwear, hygiene practices and regular maintenance of housing floors remains essential in controlling and preventing tungiasis.

LIMITATIONS

The sample size for this study was small and hence cannot be generalized to a larger population. Furthermore, there was no comparison group which prohibited looking at risk factors. We therefore recommend that other more analytical studies be conducted in order to gain more understanding of risk factors, animal reservoirs and disease related behavior in the study community.

Figure 1

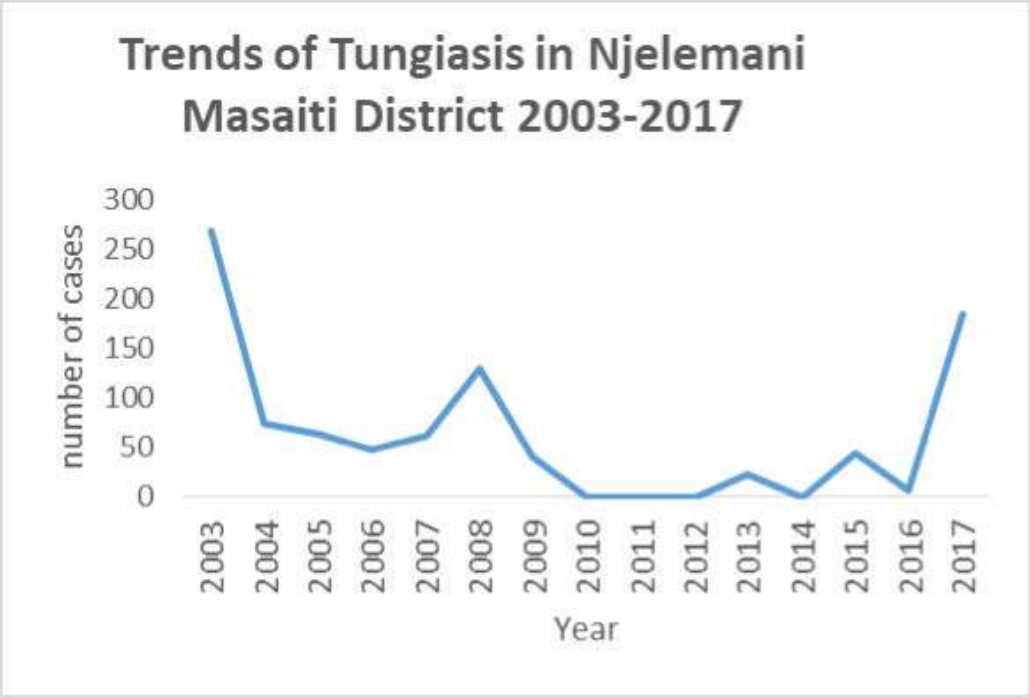

Fig 2 shows the epi-curve of the tungiasis outbreak in Njelemani area of Masaiti district

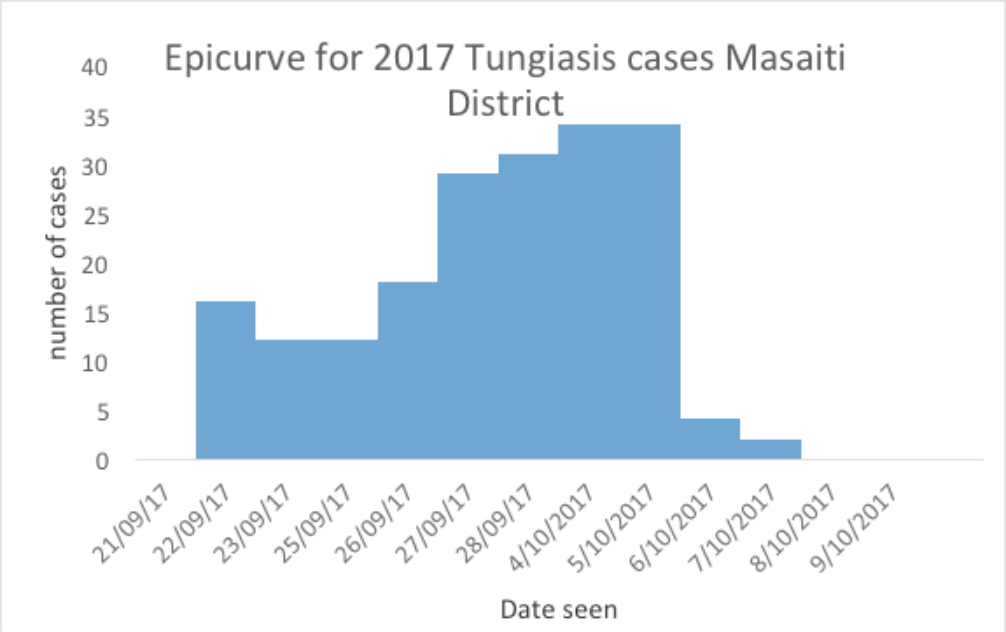

Fig 3: Map of Copperbelt province showing Masaiti district

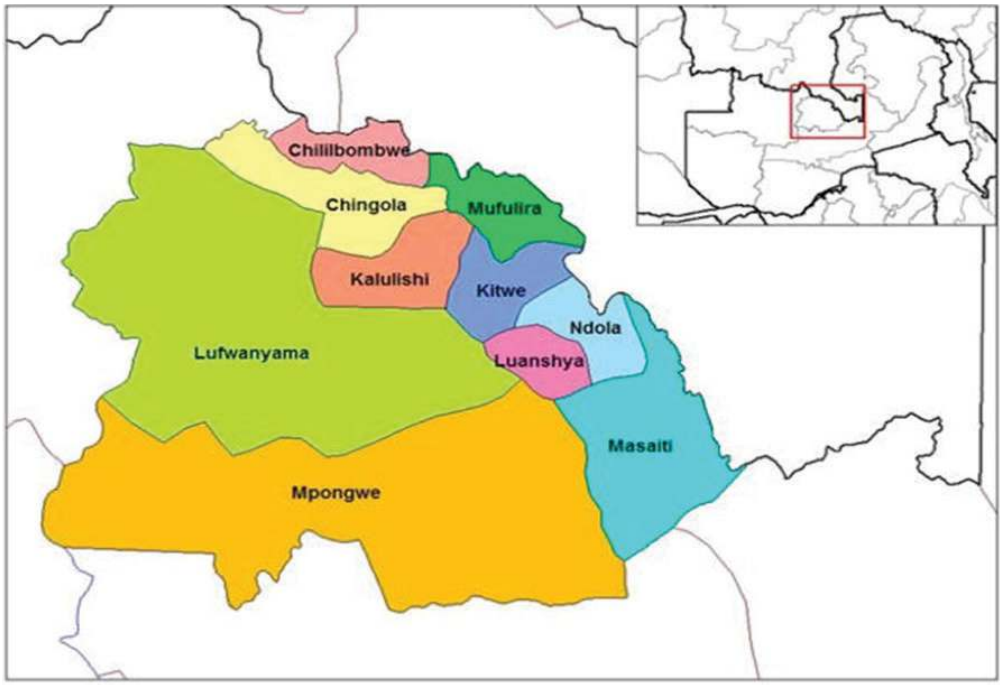

Fig 4: Map of Njelemani health centre and surrounding villages showing cases of tungiasis (n=66

COMPETING INTERESTS:

The authors declare no competing interests

Author's contributions

Nelia Langa, Patrick Sakubita, Osbert Namafente, Raymond Hamoonga, Mable M. Mutengo Ellen Yard contributed to writing and review the draft and final article

Mable Mutengo and Osbert Namafente participated in data and specimen collection for microscopy

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MORTALITY AND CAUSE OF DEATH PROFILE FOR DEATHS FROM THE CIVIL REGISTRATION SYSTEM: 2017 FACTS AND FIGURES

RESEARCH ARTICLE

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The Department of National Registration Passport and Citizenship is mandated to register vital events including deaths and causes of deaths. However, death registration is still low at less than 20 percent nationwide. About 65 percent of the deaths occur in health facilities while 35 percent take place outside health facilities. HIV was the leading cause of death, accounting for about 24 percent of all health facility deaths in 2017. Gestation and fetal growth disorders were the most common among children in the age group 0-4 years. With respect to non-communicable diseases, 29 percent of the deaths were caused by cardiovascular diseases. Road traffic accidents accounted for about 29 percent of the external causes of death.

I. Background

The Department of National Registration Passport and Citizenship (DNRPC) is the Civil Registration authority in Zambia, whose mandate is to register all vital events occurring in Zambia as established in the Births and Deaths Registration Act (Cap 51) of the laws of Zambia (1). Despite the legal basis of the system and 40 years of implementation, less than 20 percent of all deaths are registered (2). The Sample Vital Registration with Verbal Autopsy (SAVVY) reports that approximately 53 percent of deaths occur in health facilities and 47 percent outside of health facilities (3). Statistics on mortality and causes of death assist in the formulation of evidence-based health policies and decision-making as well as implementation of cost-effective health interventions (4).

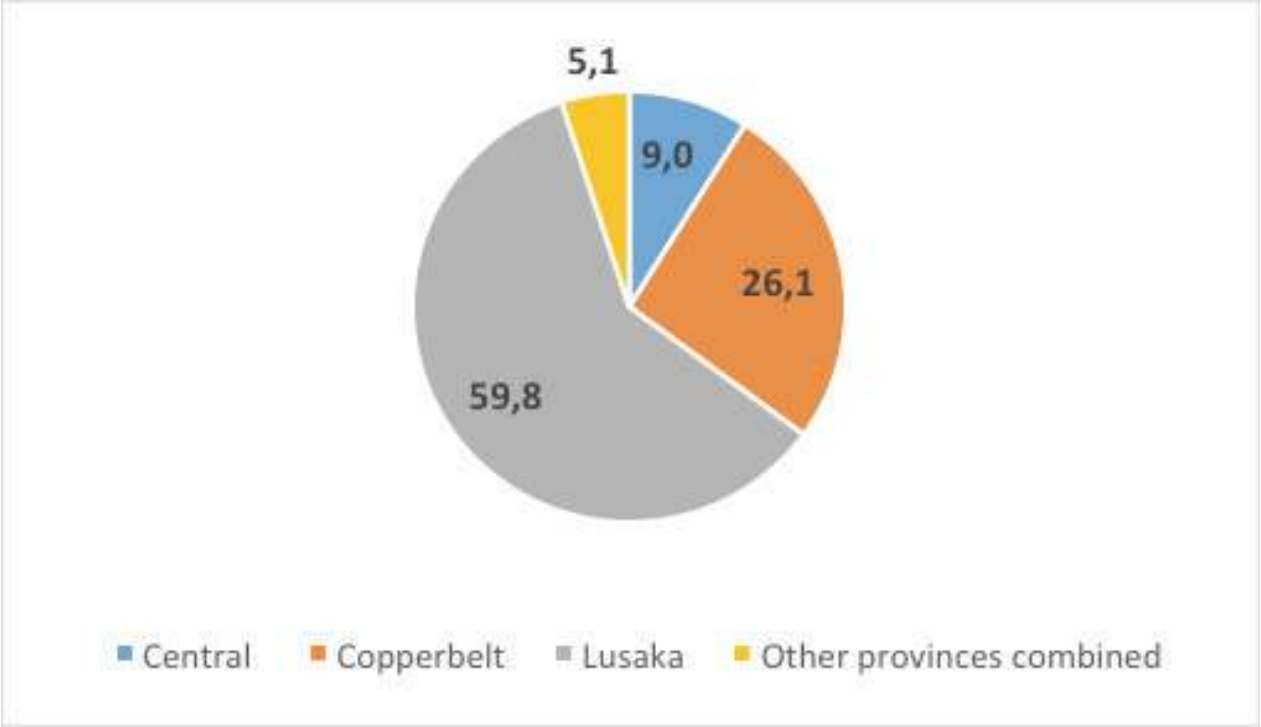
II. Importance of Information on Cause of Death

Efforts are being made to increase death registration coverage in Zambia. Various interventions are being implemented with the support of cooperating partners, including the Bloomberg Data for Health Initiative (BD4HI). Training of medical doctors and ICD-10 Coders are among the interventions aimed at improving the quality of Cause of Death (COD) certification and coding, respectively. Currently, a pilot study on verbal autopsy which involves the collection of probable causes of death is taking place outside some selected health facilities in Lusaka. Such deaths are unlikely to be certified; hence, no health information is recorded. Other interventions on improving coverage include the improvement in health facility reporting of all deaths, use of village administrative systems to facilitate the registration of community deaths, reviewing of laws pertaining to death registration and the use of Enterprise Architecture (EA) to strengthen the processes in death registration. This paper presents findings on deaths occurring in health facilities. The deaths were routinely registered in 2017 and had Medical Certificates of Cause of Death (MCCDs).

III. Distribution of Deaths

Out of 29,164 routinely registered deaths in 2017 the majority, of deaths, occurred in health facilities accounting for 64.7 percent, 32.2 percent occurred outside health facilities and 0.3 percent occurred in others places such as hospices/ retirement homes.

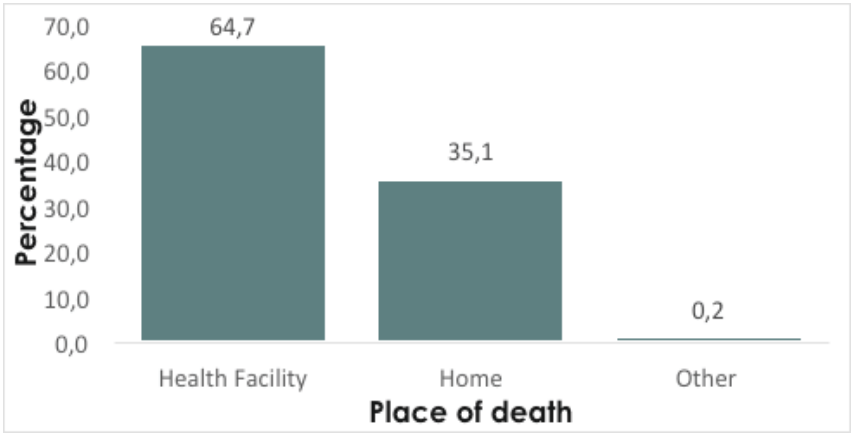
Fig 1: Distribution of deaths registered in 2017



n = 29,164

Figure 1 above shows percentage distribution of the 29,164 deaths registered in 2017 at DNRPC. The majority of deaths (59.8 percent) were from Lusaka, followed by Copperbelt (26.1 percent) and Central (9 percent). The remaining provinces had a combined total of 5.1 percent.

Figure 2: Place of Death



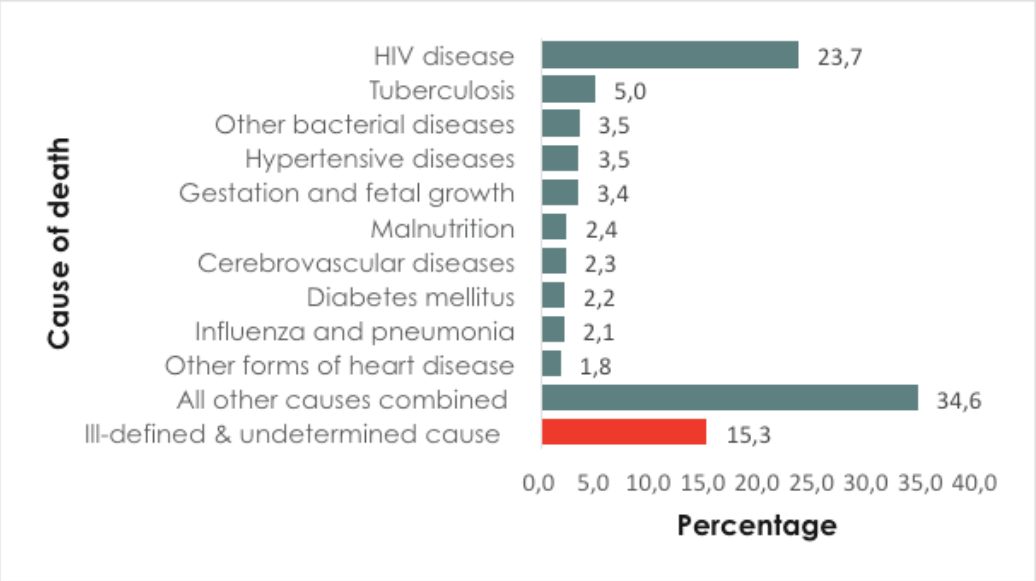
n=29,164

Figure 2 displays a total of 29,164 deaths registered in 2017 by place of death. About 18,869 deaths representing 67.5 percent of deaths occurred in health facilities, 10,237 deaths (35.1 percent) at home and 58 deaths (0.2 percent) in other places, including hospices and retirement homes.

IV. Causes of Death in Health Facilities

The extent and pattern of distribution of causes of death can inform policy and stimulate programme planning and implementation.

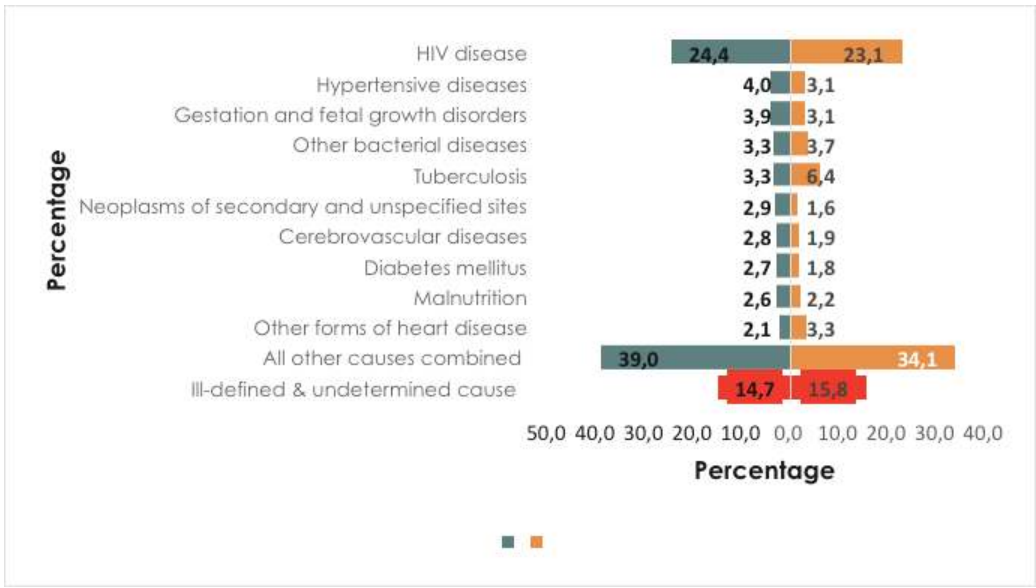
Fig 3: Causes of Death Distribution among Males and Females Combined (All Ages)



n = 18,875

Figure 3 gives the leading causes of death for both sexes and all ages. Among the ten leading causes of death, HIV disease was the most prominent, representing 23.7 percent, followed by tuberculosis, representing 5 percent. Other bacterial and hypertensive diseases accounted for about 3.5 percent each.

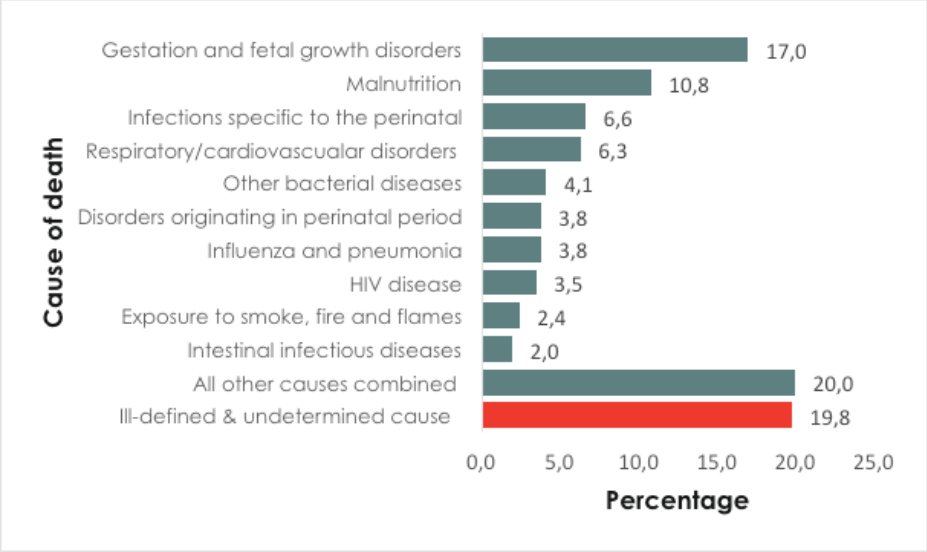
Figure 4: Leading Cause of Death Distribution by Sex (all ages)



Female = 8,398
Male = 10,477

Figure 4 shows that HIV disease was the leading cause of death in 2017 for both females and males, thus, 24.4 and 23.1 percent, respectively. For females, the next leading causes of death were hypertensive diseases, causing 4 percent of the deaths, gestation and fetal growth disorders, accounting for 3.9 percent, and tuberculosis and other bacterial diseases, each accounting for 3.3 percent. The distributions of causes of death are similar for males and females, with minor variations. However, percentages of all other causes of death were about 5 percent higher among women compared with men.

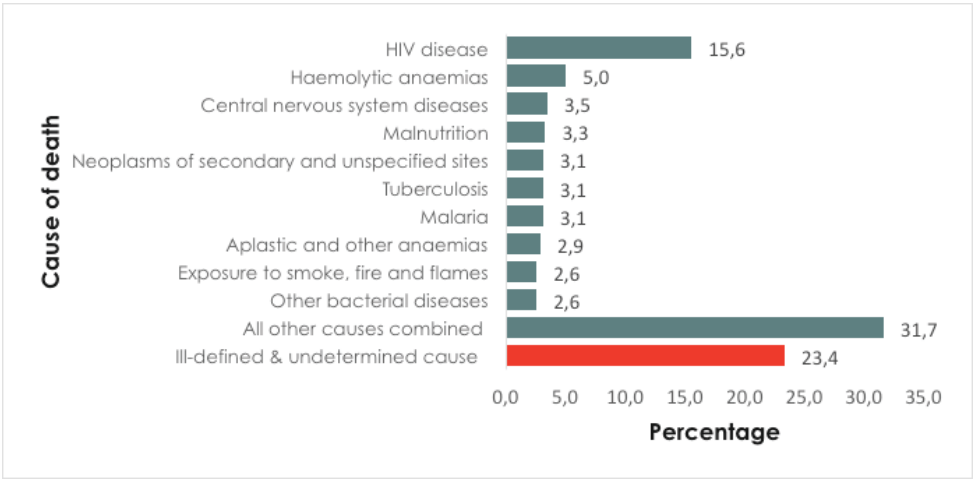
Figure 5: Leading Causes of Death among Children Aged 0-4 Years



n = 3,577

Among the leading causes of death for children aged 0-4 years, out of 3,577 deaths, 17 percent were related to gestation and fetal growth disorders, followed by malnutrition, which accounted for 10.8 percent, infections specific to the perinatal period, accounting for about 6.6 percent, respiratory and cardiovascular disorders, accounting for 6.3 percent, and other bacterial diseases, accounting for 4.1 percent. Other disorders originating in the perinatal period and Influenza including Pneumonia accounted for 3.8 percent each. HIV disease accounted for 3.5 percent of deaths. Deaths due to fires were 2.4 percent and intestinal infectious diseases amounted to 2.0 percent. Undetermined causes of deaths were 19.8 percent of the total number of deaths in this age group.

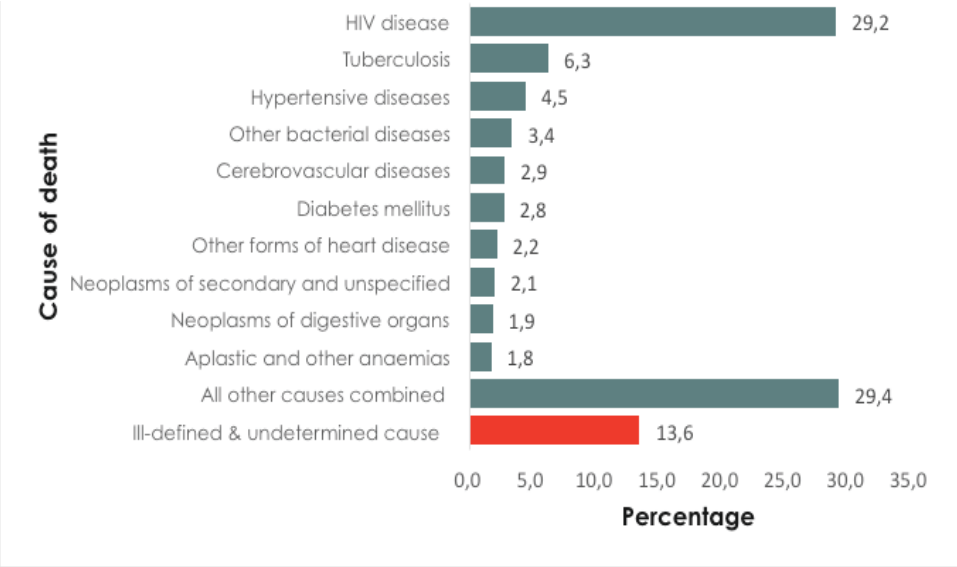
Figure 5: Leading Causes of Death Among Children Aged 5-14 Years



n = 577

Figure 5 shows that deaths caused by HIV disease among those aged 5-14 years had the highest occurrence at about 15.6 percent, followed by Haemolytic anaemia, accounting for 5 percent of deaths. Central nervous system diseases contributed 3.5 percent of deaths. Tuberculosis, malaria and neoplasms of secondary and unspecified sites each accounted for 3.1 percent. All other causes combined accounted for 31.7 percent.

Fig 6: Leading Causes of Death among Adults Aged 15+ Years

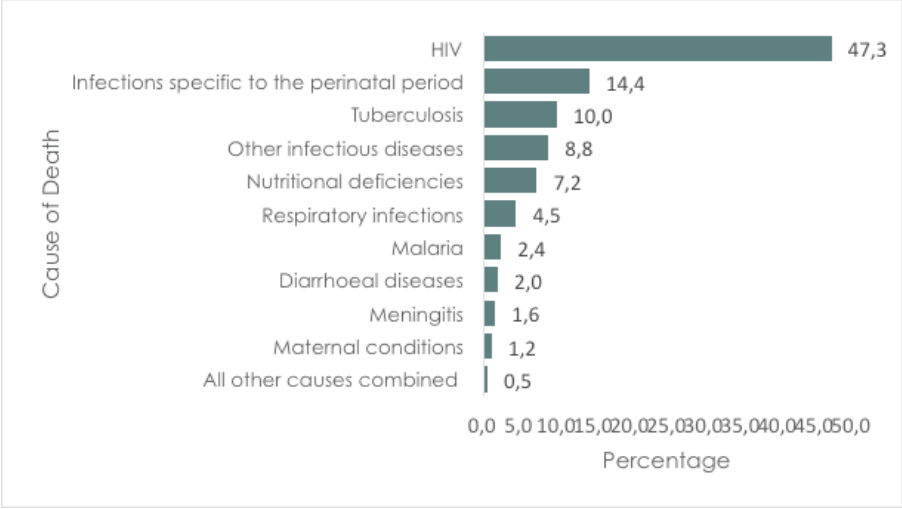


n = 14,439

In Figure 6 above, out of 14, 439 deaths, HIV disease was the highest leading cause of death in the 15 and older age group, as it was in those aged 5 to 14. However, the percentage of HIV deaths in those aged 15 and older is much higher at about 29.2 percent compared to 15.6 percent in those aged 5 to 14. Tuberculosis caused about 6.3 percent of deaths, followed by hypertensive diseases, which caused 4.5 percent. Other bacterial diseases were responsible for 3.4 percent of deaths. Cerebrovascular diseases and diabetes mellitus caused 2.9 and 2.8 percent of deaths, respectively. All other causes combined accounted for 29.4 percent, while ill-defined and undetermined causes accounted for about 13.6 percent.

Communicable Diseases

Fig 7: Leading Causes of Death Due to Communicable, Maternal, Perinatal and Nutritional Conditions

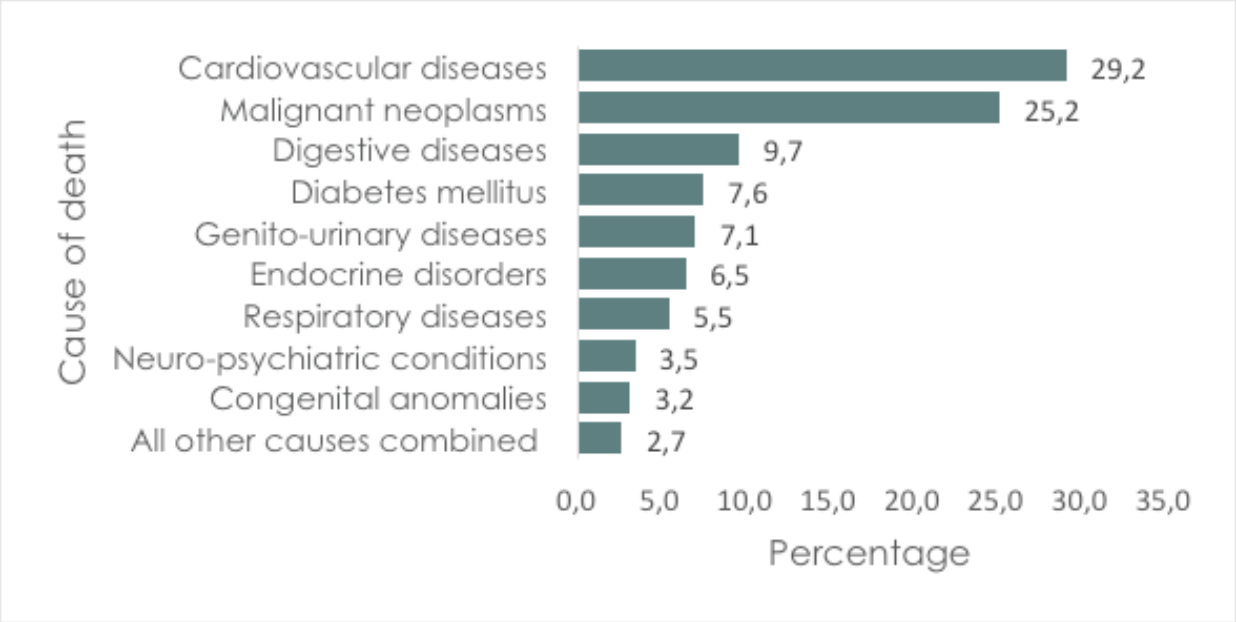


n= 11,543

Figure 7 gives the leading causes of death due to communicable diseases for both sexes and all ages. Among the ten leading causes of death was HIV, representing 47.3 percent of deaths, followed by infections during the perinatal period, accounting for about 14.4 percent. Tuberculosis represented 10 percent of deaths, followed by other infectious diseases and nutritional deficiencies, at 8.8 percent and 7.2 percent, respectively.

Non-Communicable Diseases

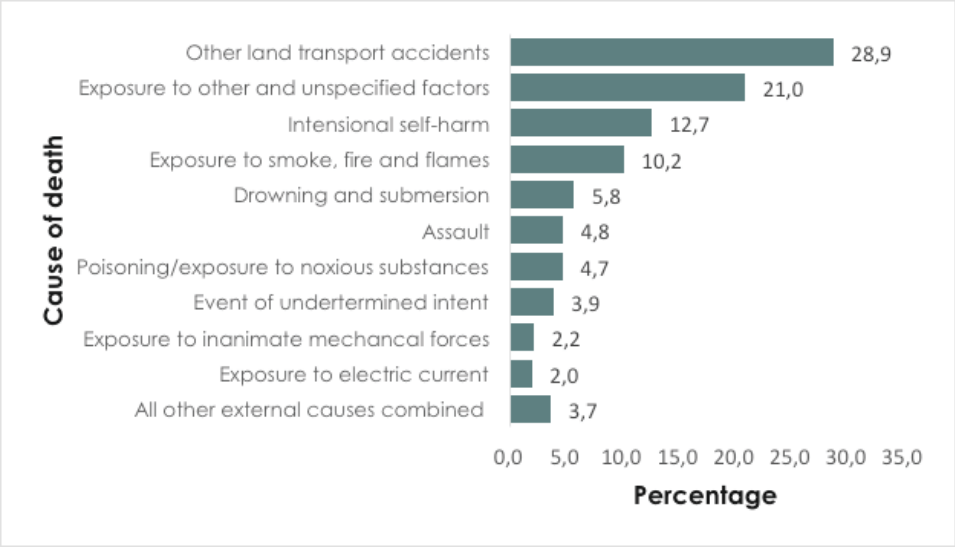
Fig 8: Percentage Distribution of Deaths Due to Non-Communicable Causes



n = 6,633

About 5,437 deaths were caused by non-communicable diseases. About 29.2 percent were due to cardiovascular diseases, followed by 25.2 percent due to malignant neoplasms. Digestive diseases caused 9.7 percent of deaths, followed by diabetes mellitus, with 7.6 percent of the deaths, genito-urinary diseases, with 7.1 percent, and endocrine disorders, with 6.5 percent. All other causes combined only caused 2.7 percent of the deaths. There were no ill-defined or undetermined causes of death in this category.

Fig 9: Percentage Distribution of Leading Deaths Due to External Causes



n = 699

In Figure 9, there were about 699 deaths due to external causes. The highest percentage of deaths, about 28.9 percent, were caused by other land transport accidents, followed by 21 percent of deaths caused by exposure to other and unspecified factors, 12.7 percent caused by intentional self-harm, 10.2 percent due to exposure to smoke, fire and flames, and 5.8 percent due to drowning and submersion.

Fig 10: Percentage Distribution of Deaths Due to HIV Disease by Sex and Age Groups

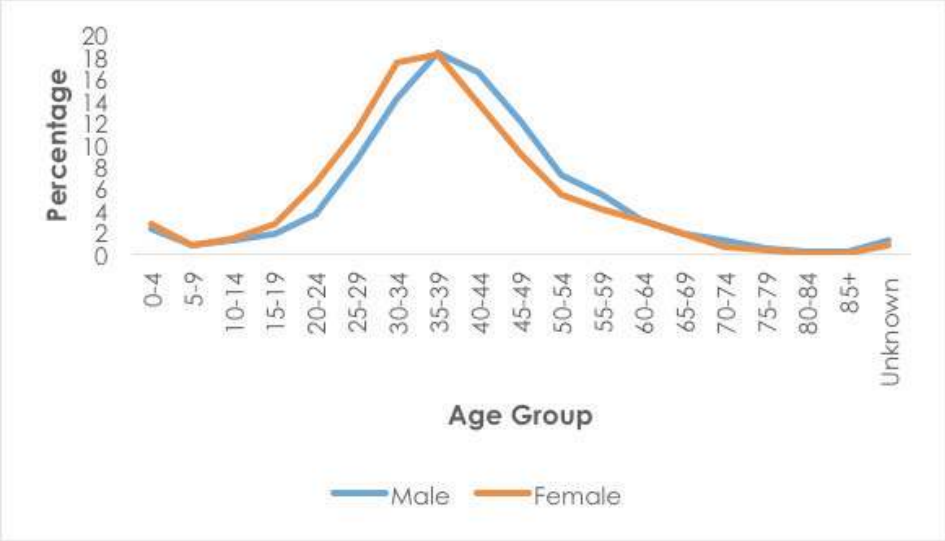


Figure 10 displays the distribution of deaths due to HIV disease. There was a decline of deaths due to HIV from ages 0-4 to ages 5-9. Thereafter, there was an increase in deaths for both males and females, peaking at age group 35-39. There were generally more deaths among females in age groups younger than 35-39 while deaths among males exceeded those of females for age group 64-69 and older.

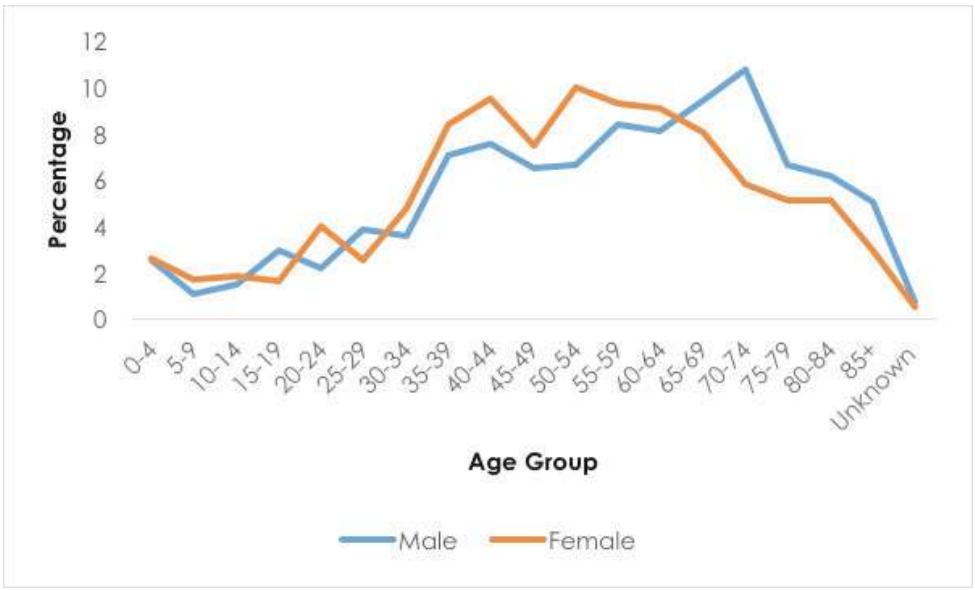


Figure 11 shows the distribution of deaths due to neoplasms. There were generally more deaths among females between age groups 30-34 and 65-69. Deaths among males were higher in age groups 65-69 to 85 and over.

V. Conclusion

A large proportion of deaths, 32 percent routinely registered in 2017, occurred outside health facilities. The leading cause of deaths occurring in health facilities among both males and females was HIV disease, accounting for about 23.7 percent. About 5 percent of deaths in all age groups were due to tuberculosis, which was the second highest cause of death for all ages. Gestation and fetal growth disorders caused about 17 percent of deaths among children under five, followed by Malnutrition, which was the second highest cause of death at about 10.8 percent of all child deaths. Road traffic accidents contributed about 28.9 percent of deaths and were the leading cause of all external deaths. The rate of deaths from non-communicable disease was about 29 percent.

Although the information on numbers of deaths is not complete for the whole country, the information was a basis for producing useful relative distributions of the leading causes of death by age groups. As recommended at the meeting of African Ministers responsible for civil registration, it is imperative for countries to analyse whatever data were available on vital events(5). It is against this background that we opted to analyse the available data, which revealed some useful distributions and patterns. There is, however, need for improvement of the reporting of deaths and their causes in all health facilities.

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