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Public Health Awareness Status of Zoonotic Diseases in Mogadishu-Somalia

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ABSTRACT

Zoonotic diseases cause mild-to-severe illnesses in humans that transmitted from vertebrate animals. The majority of the human diseases originate from animals (61%), and 70% of them are emerging diseases. This study was conducted with the main objective of public health awareness of Zoonotic diseases in Benadir region. Questionnaire was structured into 4 sections namely, socio- demographic characteristics of residents, awareness on domestic animals, wild animals transmission of zoonotic diseases and Zoonotic diseases you heard. Simple random sampling with a total of 80 questionnaires were administered and descriptive statistics was used to analyzed data. The 56 respondents (70%) had domestic animals at home while 27 (33.75%) caged their domestic animals and 36 (45%) respondents vaccinated their domestic animals. The 59 respondents (73.75%) were aware of that the domestic animals (dog, cat, bird, rabbit, goat and cattle) can transmit disease to human. Resident awareness on wild animals' Zoonosis, showed that 36 (45%) respondents were known of wild animals, while 11 respondents (13.75%) caged their wild animals (Monkey). The 49 respondents (61.25%) were conscious about the transmission of disease to human. Result revealed that the study areas were well aware of zoonotic diseases from both domestic and wild animals. List of Zoonotic diseases that respondents heard were tuberculosis (25%), brucellosis (22.54%), anthrax (17.5%), rabies (20%) and toxoplasmosis (15%). Therefore, we recommend that the people should try the best way to avoid diseases acquired from contact with animals is to thoroughly wash hands with soap and water after close contact with animals can be supervised among adult and young to avoid zoonosis diseases in human. Animal owners must carefully practice biosecurity measures to keep away from diseases contamination both in the animals and human.

INTRODUCTION

Zoonotic diseases develop mild-to-severe illnesses in humans transmitted from vertebrate animals (Slingenbergh *et al.*, 2004). The majority of the human diseases originate from animals (61%), and 70% of them are emerging diseases (Jones *et al.*, 2008; Slingenbergh *et al.*, 2004; Wang & Cramer, 2014). Most of the emerging zoonotic diseases, including highly pathogenic avian influenza, nipah virus, MERS-CoV, SARS, COVID-19 and pH1N1 (pandemic H1N1) caused severe infections in humans globally. Domestic and wild animals act as a reservoir for zoonotic diseases. Domestic animals such as livestock, pet and poultry transmit pathogens frequently to humans because of close interaction (Han *et al.*, 2016). Rodents are very abundant, peri-domestic in nature and contributed more than 80 zoonotic pathogens to humans (Han *et al.*, 2016). Bats were identified as a reservoir host for many emerging diseases in humans such as Nipah, MERS-CoV, SARS, Rabies and Ebola (Wang & Cramer, 2014). The zoonotic disease can be categorised into emerging, reemerging and neglected. Many zoonotic diseases were detected worldwide, and some were regional. Most zoonotic animal host species such as domestic livestock, pets, poultry, bats and rodents are abundant in Southeast Asia, Central and South America, Eastern Europe and Central East Africa (Han *et al.*, 2016).

Many anthropogenic factors include changes in human habitat and behaviour, animal-human interaction, urbanisation, modernisation of agriculture and livestock farming, wild animal trade, wildlife hunting, climate change, destruction of wild animal habitat and mixing wild and domestic animals contributed the emergence of zoonotic diseases to human. Along with these anthropogenic factors, intrinsic factors such as hosts, pathogens and vectors also contributed to zoonotic pathogens' spillover to humans (Han *et al.*, 2016). Trans-disciplinary efforts can be more useful to detect, prevent and control zoonotic diseases globally. Recently, national, international (the Food and Agriculture Organization of the United Nations, the World Organization for Animal Health, and the World Health Organization) and professional agencies recognised a new multi-sectoral one-health approach to address the public health threat of animal origin. This one-health approach emphasises the interconnectedness of human, animal, environment and eco-health (Kahn, 2011; Karesh *et al.*, 2012; Rabinowitz *et al.*, 2013). We found many pieces of evidence for the effectiveness of this collaborative approach between human and animal health services to address not only disease threats but also predict certain diseases (Cleaveland *et al.*, 2003; Guan *et al.*, 2007; Kwan *et al.*, 2012; Mazet *et al.*, 2009; Schelling *et al.*, 2007).

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Bangladesh is considered as one of the critical global hotspots for zoonotic spillover to humans (Allen *et al.*, 2017). Human behaviour, high abundance of animal and human population, greater extent of the animal–human interface, many live animal markets, wildlife diversity, urbanisation, deforestation and fragile ecosystem may increase the risk of zoonotic disease emergence. The Government of Bangladesh selected six diseases, including anthrax, brucellosis, nipah virus, rabies, zoonotic influenza and zoonotic tuberculosis, as priority zoonotic diseases through a one-health zoonotic disease prioritisation workshop (CDC, 2017). HPAI viruses caused repeated outbreaks in chicken and more than 550 outbreaks were reported since 2007 (OIE, 2020). More than 300 human cases with Nipah virus were reported since 2001 (IEDCR, 2020). Human anthrax cases were identified every year (IEDCR, 2015). As a low resource country, limited studies and surveillance were conducted to understand zoonotic diseases’ burden.

The overall risk of zoonotic diseases on public health and disease emergence factors is not well summarized. People of Bangladesh live very close to their domestic livestock and poultry. Slaughtering and selling sick animals are not uncommon. Agriculture farmers, farm workers, butchers and live animal market workers are at high risk of frequent exposure to animals. People are not well aware of the risk of zoonotic disease transmission. A better understanding of the public health impact of zoonotic diseases and associated factors is needed to identify the knowledge gap and assist in developing interventions. This narrative review attempted to explore the past zoonotic events, distribution of zoonotic pathogens, potential risk factors and future risk for the emergence of potential zoonotic diseases. This review paper provided a detailed overview of reported zoonotic diseases of public health significance in Bangladesh that will assist in public health decision-making.

Zoonotic diseases tend to be most prevalent in places where awareness about the disease, prevention and control are low. Lack of awareness, frequently in combination with conditions of poverty, means that risky behaviours persist and populations remain vulnerable. Risky behaviours related to public management and food consumption can put communities at risk for zoonoses. Public awareness and education efforts can help in tackling zoonoses.

The main objective of this study was as follow-

> To asses public health awareness of Zoonotic diseases in Mogadishu-Somalia.

Therefore, in this article as the authors we need to increase the awareness of community health towards Zoonotic diseases. We wanted to have baseline information about

the level of Zoonotic diseases in public health based on it is awareness.

METHODOLOGY

Study Area

Benadir region consists of 18 districts. It borders with middle Shebelle in the north and the east, lower Shebelle in the west and Indian ocean in the south. The study was carried out in three districts of Benadir region of Somalia namely Wadajir, Yaqshid, and Dayniile districts. The region lies between latitude 2°2'59"N and longitude 45°15'44"E. Although by far the smallest administrative region in Somalia, it has the largest population estimated to be about 2.3 million and covers an area approximately 96,878 km [Wikipedia, 2018]. There is no information of public health awareness of zoonotic disease in Benaadir population particular. Therefore, these three districts were selected purposively due to their population. Observation was collected randomly from the population by questionnaire.

Population of the study

The target group of this study was the people live in the region specially the mentioned districts. Dairy farmers were the second target group for interview about knowledge of awareness of public health of zoonotic diseases in benadir region.

Study Design

A cross-sectional study was conducted from 1st may 2022 to 1st August 2022, to determine the public awareness of zoonotic diseases in benadir region.

Sample Size

Sample size required for the study was determined using the formula given by Sloven’s formula (Pogosso *et al.*, 1992) to calculate sample size, we took population size 100 and margin of error (e) 5% and the formula was given below and Simple random sampling was used to select sample locations in which a total of 80 questionnaires were administered, descriptive statistics was used to analyzed data.

$$n = N / (1 + (N * e^2))$$

$$n = 100 / (1 + 100 * 0.05^2)$$

$$n = 100 / (1 + 100 * 0.0025)$$

$$n = 80.$$

So, the number of required populations to observe the awareness of public health of zoonosis diseases was calculated to be 80. All collected raw data of the study by letters were entered to a Microsoft Excel database system and imported to be analyzed using SPSS Version 20.

RESULTS

Table1: Socio- demographic characteristics of residents in the study area.

Item	Responses	Frequency	Percentage (%)
Gender	Male	44	55
	Female	36	45
Age	15-19	10	12.5

	20-24	14	17.5
	25-30	12	15
	31-34	10	12.5
	35-39	11	13.8
	40-45	12	15
	46-49	11	13.8
Marital Status	Single	36	45
	Married	44	55
Level of Education	Informal	17	21.3
	Primary	19	23.8
	Secondary	19	23.8
	Tertiary/college	25	31.3
Number of people in Household	1-5	17	21.3
	6-10	19	23.8
	11-15	20	25
	16 and above	24	30
Major Occupation	House wife	19	23.8
	Self-employed	17	21.3
	Employed	20	25
	Non-employees	24	30

Table 2: Residents awareness on domestic animal zoonosis

Item	Responses	Frequency	Percentage (%)
Do You Know What Domestic Animals are	Yes	36	45
	No	44	55
Do You Have Domestic Animals At Home	Yes	56	70
	No	24	30
Do You Cage Your Domestic Animals	Yes	27	33.75
	No	53	66.25
Vaccination	Yes	36	45
	No	44	55
Are You Aware This Animal Can Transmit Disease You	Yes	59	73.75
	No	21	26.25
Type of Domestic Animal	Dog	3	3.75
	Cat	11	13.75
	Bird	22	27.5
	Rabbit	2	2.5
	Goat	18	22.5
	Cattle	24	30
Number of Domestic Animals	1-5	20	25
	6-10	25	31.
	11-20	24	30
	20 and above	8	10
	None	3	3.75

Table 3: Residents awareness on wild animal zoonosis

Item	Responses	Frequency	Percentage (%)
Do you know what wild Animals are	Yes	36	45
	No	44	55
Do You Have Wild Animals At Home	Yes	11	13.75
	No	69	86.25
Do You Cage Your Wild Animals	Yes	11	13.75
	No	69	86.25
Are You Aware This Animal Can Transmit Disease to You	Yes	49	61.25
	No	31	38.75
Type of Wild Animal	Monkey	11	13.75
	None	69	86.25
Number of Wild Animal	1-5	9	11.25
	6-10	2	2.5
	None	69	86.25

Table 4: list of Zoonotic disease that you hear

Zoonotic Diseases	Frequency	Percentage (%)
Tuberculosis	20	25
Brucellosis	18	22.5
Anthrax	14	17.5
Rabies	16	20
Toxoplasmosis	12	15

DISCUSSION

A total of 80 questionnaires was administered in the three locations, data collected and analyzed indicated that 44 of the respondents were male while the proportion of female was 36, the slightly higher number of residents were in the age group 20-24years, this was different to the findings of Dawit *et al.*, (2013) in Southwestern Ethiopia who reported that male accounted for 123 while female were 52 and the highest numbers of residents were in the age group 35-49. Descriptively, there is a slightly higher male than female population, but statistical support is not established whether this assumption has statistical significance.

Resident awareness on domestic animals' Zoonosis, showed that 36(45%) respondents were know what domestic animals are while 44 (55%) did not know what domestic animals are. The respondents 56 (70%) had domestic animals at home while 24 (30%) did not have domestic animals at home. The respondents 27 (33.75%) caged their domestic animals while 53 (66.25%) did not cage their domestic animals. 36 (45%) respondents are vaccinated their domestic animals while 44 (55%) are not vaccinated their animals. The respondents 59 (73.75%) were aware the animals can transmit disease while 21 (26.25%) did not aware the animals can transmit disease to human. Types of domestic animals (dog, cat, bird, rabbit, goat and cattle) that the respondents had (3, 11, 22, 2, 18, 24) respectively. The number of domestic animals [1-5,6-10,11-20,20 and above and None] that the respondents had (25%, 31.25%, 30%,10% and 3.75%) respectively by percentage. this result corroborates the findings by Girma *et al.*, (2012) who also indicated a high level of awareness among residents of Addis Ababa on zoonotic diseases in domestic animal, however this findings do not corroborates the findings by Babu *et al.*, (2015) who reported a relatively low level of awareness

and knowledge on domestic animals zoonotic diseases among the public in and around Andhra District in India. This awareness among the residents of Mogdishu could be attributed to the recent Veterinary professional suspected that there is no awareness in the study area. Hence, we accept the null hypothesis which state that residents of mogdishu are aware of zoonotic disease in domestic animals.

Resident awareness on wild animals' Zoonosis, showed that 36(45%) respondents were know what wild animals are while 44 (55%) did not know what wild animals are. The respondents 11 (13.75%) had wild animals at home while 69 (86.25%) did not have wild animals at home. The respondents 11 (13.75%) caged their wild animals while 69 (86.25%) did not cage their wild animals. The respondents 49 (61.25%) were aware wild animals can transmit disease while 31 (38.75%) did not aware wild animals can transmit disease to human. Types of wild animals (Monkey and None) that the respondents had (11 and 69) respectively. The number of wild animals [1-5,6-10, and None] that the respondents had (11.25%,2.5% and 86.25%) respectively by percentage. the study areas were quite aware of zoonotic diseases in both domestic and wild animals. In this study is similar to the findings of Abosede *et al.*, (2017) who reported that residents of some high-risk zoonotic disease locations in Nigeria have a relatively high level of awareness on zoonotic disease in wildlife. This high level of awareness was also reported by Bukie *et al.*, (2018), by residents of communities surrounding Afi Mountain Wildlife Sanctuary, in Cross River State. Hence, we accept the null hypothesis that resident of Mogdishu are aware of zoonotic disease in wild animals.

Among the several zoonotic diseases transmitted to humans from several species of domestic animals like dog,cattle,cats,rabbit residents in the study area were more aware of rabies as a disease transmitted to humans from dog which is followed by ringworm from camel, this is in line with the findings of Babu *et al* (2015) who reported that the frequently known zoonotic disease among the public in and around Andhra District in India was rabies and most of them were unaware of other zoonotic diseases in domestic animals.

The residents embark on monthly vaccination of their animals while a higher proportion of the residents did not vaccinate their animals of which can lead to

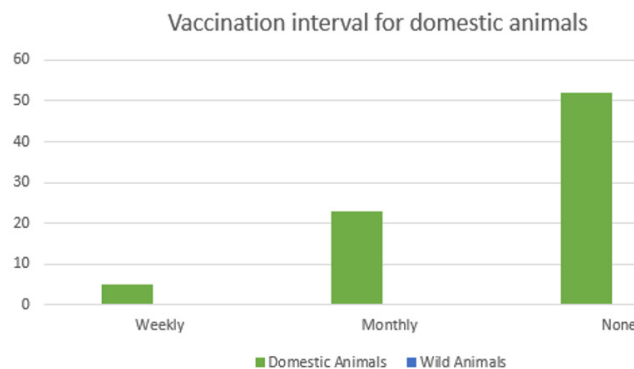


Figure 1: Vaccination interval for domestic animals.

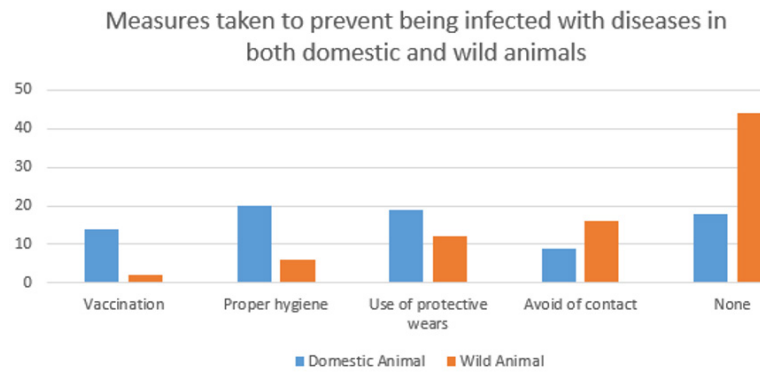


Figure 2: Measures taken to prevent being infected with diseases both domestic and wild animals

high risk in disease transmission in both domestic and wild animals. This is of public health concern because regular vaccination helps in preventing disease outbreaks and transmission. The commonly adopted measure by residents in the study area to prevent being infected with zoonotic diseases was by Avoid contact of the animals and use of proper hygiene, this however corroborates the report by Omudu *et al.*, (2010) who reported several reasons why dog owners in Makurdi visit veterinary clinic with dogs and one prominent reason was for routine check- up and avoid contact against tick infestation.

CONCLUSION

As conclusion, among the several zoonotic diseases that can be transmitted to humans from animal species, tuberculosis and rabies were the well-known aware zoonotic disease in domestic animal and wild animal by the respondents in the study area, this implies the awareness on other types of zoonotic disease that can be transmitted to humans which can be very dreadful to the human population. The absence of awareness about other zoonotic diseases in the present study area might be due to poor or absent of awareness creation activities that should have been done by medical and veterinary health care professionals of the state.

In conclusion the overall level of awareness on zoonotic disease with respect to the three locations were high which could be due to their educational level, experiences and information on zoonotic disease transmission but there is still need for awareness to be carried out about other types of disease can be contacted by humans from animals and a more effective measure to be taken by residents to prevent being infected.

RECOMMENDATION

1. Efforts towards educating the people to get good management practice and proper use of protective measures.

2. Further research investigation is needed to investigate more the effect of risk factors based on sessional time, the effect of Zoonotic diseases Among human Population and Strategic control and prevention of Zoonotic diseases.

3. We recommend that the people should try the best way to avoid diseases acquired from contact with animals is to thoroughly wash hands with soap and water after contact

with animals or their environments and Handwashing should be supervised in young children. Washing Hands with Soap and Water. Proper handwashing technique for the prevention of illness.

4. Animal owners must carefully practice biosecurity measures to keep diseases from entering animal and human populations.

- a. Fence in animal areas.

- b. Separate animal areas from your family's home.

- c. Separate animal areas from human food and water supplies

- d. Reduce visitor contact with animals.

- e. Keep new animals away from other animals for at least two weeks.

- f. Place disposable clothing and equipment into a lined trash container for proper disposal.

5. When caring for sick animals, wear personal protective equipment over your personal protective clothing. Examples of personal protective equipment are:

- a. mask

- b. goggles

- c. gloves

- d. gown or apron

6. Make sure all nondisposable equipment is cleaned and disinfected before entering and leaving animal areas.

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