



Original Research Article

A Qualitative Study of Knowledge and Viewpoints of Professionals Regarding Public Readiness to Prevent and Control Avian Influenza Outbreak in Tanzania

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ABSTRACT

PURPOSE: We evaluated knowledge and perceptions of district and regional level officers regarding Avian Influenza (AI) and in Tanzania and the recommended measures for its control.

METHODS: We used in-depth interviews, supplemented by researchers' field observations in mainland Tanzania and Zanzibar and analysed data using a qualitative content data approach.

RESULTS: Knowledge about AI varied among respondents who had different opportunities to access AI-related information mainly through mass media and attendance to health seminars; AI was perceived as being uncommon if has ever existed in Africa; perception that people could contract AI by sharing breathing air, utensils, meals and houses with infected animals or people and eating meat of infected birds. Some respondents were less informed about AI symptoms and signs, although all respondents perceived AI as fatal. The reported common community behavior of involving young-children in poultry businesses, not washing hands before meal preparations, eating food and after disposing bird carcasses, were perceived as risk factors for AI transmission. Scientifically recommended methods for preventing and controlling AI were known by few respondents.

CONCLUSION: The inadequate knowledge on AI symptoms and signs and modalities for AI control calls for concerted health education and sensitization programmes targeting even the professionals.

Keywords: avian influenza, infectious diseases, health behavior, health education, communicable diseases, Tanzania

INTRODUCTION

Avian influenza (AI) is one of the listed diseases of the World Health Organization (WHO) for animal health (OIE) and its increased importance in the field of animal and human health has drawn attention to need for scientific evidence on several aspects of the disease that has hampered the adequate management of recent management in a number of European and Asian countries. ^(1, 2) Commonly known as 'Bird Flu', AI is the type of influenza caused by the viruses adopted from birds, and is highly pathogenic. ^(3, 4) The *type 'A'* virus can affect several species of food producing birds such as chicken, turkeys, quails, guinea fowls, etc. as well as petty birds and wild birds with some strains resulting in high mortality rates. But, so far, there is vast evidence throughout available literature on the historical outbreaks of AI in domestic poultry. ⁽⁵⁾

The highly pathogenic avian influenza (HPAI) 'A' subtype H5N1 virus is an emerging AI virus causing global concern as a potential pandemic threat. This H5N1 virus has killed millions of poultry in a growing number of countries especially all over Asia and Europe and health experts are concerned that the co-existence of human flu viruses and avian flu viruses (especially H5N1) will provide a room for genetic material to be exchanged between species-specific viruses, hence possibly creating a new virulent influenza strain that is easily transmissible and lethal to humans. ^(6, 7)

The H5N1 strain of AI virus continues attracting much attention because of its significant outbreaks globally in domestic and wild birds. It has a high degree of virulence in poultry, ⁽⁵⁾ wild birds and its ability to infect mammalian species including humans is alarming. ^(8, 9) Since the first H5N1 outbreak occurred in 1997, scientific debates have prevailed regarding

transmission of AI in humans. Evidently, there is increasing number of HPAI H5N1 bird-to-human transmissions leading to clinically severe and fatal human infections. ^(9, 10)

According to WHO, it is evident that there is a significant species barrier that exists between birds and humans and because of this the virus does not easily cross over to humans. However, some cases of infection are being researched to ascertain whether or not transmission from human to human is possible. ⁽¹¹⁾ Records indicate that although millions of birds have become infected with the virus since its discovery, at least 200 people have died from the H5N1 in twelve countries ⁽⁶⁾ and the mostly reported countries severely affected so far are Indonesia, Laos PDR, Vietnam, Romania, China, Turkey and Russia. ⁽⁷⁾ As the scientific community continues worrying about the possibility of AI virus mutation and the virus to pass from one human being to another, wherefore, leading to another pandemic occurring, the disease-control centers around the world are making AI their top priority. ⁽⁹⁾

Tanzania received alert messages from OIE, FAO and WHO on existence of AI H5N1 killing both domestic and wild birds. In response, the government took measures towards ensuring that this disease is prevented from entering the country or to contain it and eliminated it before it gets a chance to spread and become entrenched. ⁽¹¹⁾ According to Msoffe and others ⁽³⁾, flocks of chickens, ducks, guinea fowl, turkeys and pigeons are common in Tanzanian rural villages and are normally cared for by women, children and vulnerable individuals (aged, chronically ill or physically challenged). Also, there is free-ranging poultry from different households that form a series of contiguous flocks that may become one large flock during feeding and breeding times.

The Tanzanian national policy for HPAI is to stamp out the affected birds (3). As one of the measures, the government has formed a Multi-sectoral Task Force to assess constantly the situation and give advice on actions to be taken as the problem continues to unfold. Members constituting this Task Force come from the Ministry of Livestock Development and Fisheries (MLDF), Ministry of Health and Social Welfare (MoHSW) and Ministry of Natural Resources and Tourism (MNRT) under Prime Ministers (PMO)'s Office. The government has also formulated an Emergency Preparedness and Response Plan, ⁽¹²⁾ which has five key intervention areas, namely: Strengthening early warning through surveillance and reporting; Reducing opportunities for virus introduction; Containment of the problem at source; Reducing opportunities for human infection; and Commissioning Research to improve understanding of the pandemic. In attempt to create public awareness to prevent the introduction or spread of AI, UNICEF-Tanzania supported the MLDF in 2006 to implement a mass communication strategy. ⁽¹³⁾ The activity for mass awareness campaign for behavioral change in Tanzania mainland had the following sub-activities: Production of technical leaflets and posters; Production of TV episodes and promospots; Production of radio programs and promospots; Training of mass media personnel; Training of medical staff from border districts of lake zone; Training of veterinary staff from districts of border regions; Training of Wildlife Staff; Management and Coordination; and Distribution of the awareness materials to Veterinary Investigating Centers.

To contribute to the evaluation to understand its community impact of the awareness campaign, the present study was commissioned by UNICEF-Tanzania under the auspices of the MLDF to establish

baseline data with respect to knowledge, perceptions/attitudes, and practices/behaviors of the people at risk regarding AI; and identifying the effective sources of information among the communication methods/tools. It is the purpose of the present paper to disseminate the findings obtained from this study to a wider international community.

MATERIALS AND METHODS

Study Design

The study was cross-sectional and exploratory in nature, and adopted a mixture of different qualitative ethnographic techniques in data collection, targeting among other stakeholders, the district and regional level officers and was conducted between February and July 2008.

In assessing knowledge about public health issues, most studies tend to over-focus on lay persons in particular areas of interest and forget that even the professionals may not be fully knowledgeable if not completely ignorant as might be for the lay individuals, and this might be one of the reasons why some public health problems fail to be properly managed.

Study Areas and Sampling techniques

The study was carried out in Dar es Salaam, Mwanza, and Dodoma Regions in the mainland part of the United Republic of Tanzania (URT) and Mjini Magharibi and South (Kusini) Regions in the Unguja Island that is one of the two islands of Zanzibar and part of the URT. The study covered different categories/groups of members of the general public including household members, teachers and their pupils, but a separate paper for these groups is still under preparation and this is due to the vast nature of the information collected using different methodological techniques. In such paper,

detailed description of the demographic characteristics and other background information of the study participants will be shown as they are related to the kinds of the responses obtained.

This paper, therefore, focuses on district and regional level officers who participated in the in-depth interviews (IDI) as part of the key informants for the study. These were adult individuals (over 18 years old) and they include medical officers, school health program coordinators with

public health experience/background, veterinary medicine officers, livestock development officers, engineers, and district educational officers belonging to other disciplines in the humanity field. Personal communication with district commissioners was also done in Zanzibar. The IDI participants were traced from the MoHSW, MLDF, Ministry of Education and Vocational Training (MoEVT), and Ministry of Natural Resources and Tourism (MNRT) at regional level (Table 1).

Table 1: Officers interviewed at Regional and District levels about AI disease in Tanzania

<i>Region</i>	<i>Regional Officers</i>	<i>District level officers</i>
Dar es Salaam	Regional Veterinary Medicine Officer (RVMO), Regional Agricultural Engineer (RAE), Regional Forestry Officer (RFO), Regional Planning Officer (RPLO)	No Municipal Council level Officers were involved
Dodoma	RVMO, RFO, Regional Medical Officer (RMO), Regional Hospital Superintendent (RHMS)	<u>Kongwa District Council:</u> 1 District Natural Resources Officer (CNRO), 1 District Traditional and Cultural Development Officer (DTCDO) <u>Dodoma Municipal Council:</u> 1 Medical Officer (CMO), 1 Academic and Education Development Officer (CAEDO), and 1 Veterinary Medical Officer (CVMO)
Mwanza	RVMO, Regional Education Officer (REO)'s representative (one of the academic and educational development officers)	<u>Magu District Council:</u> 1 DVMO, 1 DAEO, 2 Livestock Officers (DLOs), 1 Agricultural Extension Officer <u>Nyamagana District Council:</u> CVMO, Council Fisheries Officer (CFO), Council Agricultural Officer

The evaluation team involved an epidemiologist, a health economist and sociologists. The research instruments were reviewed by committee of UNICEF Country

Office officials before their approval for use in the field. Since not every participant/respondent had a medical or veterinary background, some questions

followed the recommended clinical guidelines for diagnosis and treatment of AI related infections, the majority of others followed a public health guidelines. As recommended, the study team met each day to discuss the progress and validate the information where necessary and make the necessary arrangement for improving data collection in the next days. ⁽¹⁴⁾

DATA ANALYSIS

Handwritten notes and record tapes were transcribed immediately after data collection each day. Coding of the important text was done by arranging the themes systematically to allow the interpreters select the appropriate texts based on the way the data were presented. IDI normally do not involve quantification of data in numeral form, but allow investigators to have a general impression of the proportion of the responses pertaining to a particular topic of discussion. This is exactly what was done. The study team used an opportunity during their debriefing stage to discuss the contents and quality of the information collected in relation to the study main and sub- themes and final interpretation was done after the data collection process was finished. ^(14, 15, 16)

RESULTS

Knowledge about Avian Influenza AI

Knowledge about the nature of the disease (AI)

As expected, this was described well and with confidence by some of the officers at regional and district council levels, especially the officers with backgrounds in veterinary medicine, livestock and agricultural development. The rest of the respondents at these levels were still unclear about the essence of AI, despite indicating to know some of the symptoms and signs. Several of these respondents questioned

whether or not the disease could be transmitted from one person to another directly. Contacting the infected birds or their products (such as eggs or meat) when processing their selling or eating them, for instance eating the meat or eggs that are inadequately cooked/fried, was well perceived to be the risky since this would lead to disease transmission from birds to humans. People involved in poultry keeping, poultry commercial activities and the hunters of wild birds were reportedly being the most at risk of contracting AI and being among the key carrier agents. It was argued that such people can expose the virus from wild birds to tamed birds at household levels; hence, eventually exposing other people with whom they live in the same households or those visiting their households to come into contact with such tamed birds get infected. More than half of the respondents knew that AI could be transmitted by people sharing the breathing air with the infected birds. Also, almost all of the respondents claimed that AI is uncommon in Africa region, especially in East Africa, unlike in its being reported from some Asian and European countries. Also, the majority reported to have heard through the mass media about this disease for the first time in the last 2-3 years period, otherwise they had never heard about it in the period before. Generally, their explanation was similar to that presented by their counterparts in Zanzibar.

Knowledge about the symptoms and Signs of AI

While the knowledge about symptoms and signs of AI was high among veterinary, agricultural and livestock officers, some of the rest of the respondents were in dilemma about the difference between AI and other diseases such as the New-Castle disease that attack birds including chicken or the normal flu that

periodically affects people. The following statements justify:

“To be frank, this disease is still new in the ears of many people. It doesn't easily enter people's minds to hear birds facing serious flu and to most people including myself distinguishing between normal flu and serious flu that attack birds then transmittable to humans is not easy” (A regional level respondent in Dodoma).

“I know it is a zoonotic disease caused by a certain virus as we have heard in the news....., mmh...it is an airborne disease that can cause 100% mortality in birds and about 60% mortality in humans....., but I am uncertain of effective measures for its prevention” (A district level respondent, Kongwa, Dodoma).

According to the Dodoma RHMS, even some medical and paramedical personnel were not fully knowledgeable of AI, and he believed this was partly due to the fact that the syllabus at medical schools did not cover the topic for this disease. At least all the respondents identified the following conditions in birds and people as related to AI: high body temperature (fever), serious headache, flu associated with cough, and sudden death, and they appreciated that AI was incurable because it is caused by virus.

Knowledge about measures or strategies recommended for prevention of AI

The degree of awareness about the recommended measures/strategies for preventing AI was high among the majority of the participants. While from the mainland side the participants seemed to doubt about the awareness in the general public in the study regions, their counterparts in Zanzibar were very confident in public's awareness of the interventions undertaken by the

government so far. Generally, the respondents in both sides of the country identified the following measures: need for people to prepare their meat well including cooking it thoroughly well, avoiding to eat bird's meat in the suspected unhygienic local restaurants/cafes, adhering to instructions given by the veterinary health officers about early detection of and reporting on any ill conditions facing the tamed birds as they do for other kinds of animals, using protection gears such as gloves and masks when working in poultry farms, washing hands with clean or boiled water with soap or any other kind of detergents after performing any activity involving birds, avoiding to live in the same houses or rooms with birds, ensuring cleanliness in the environment in which the poultry activities take place.

Expressing their lack of knowledge about AI treatment measures, several officers at district and regional levels asked the interviewers to confirm whether or not a vaccine for AI for tamed animals such as birds and people was already available in Tanzania or abroad and when they heard a 'Not yet' answer they seemed to get much worried about how the situation would be if the AI disease outbreaked in the country.

Knowledge about the actions or strategies made by the government and partner authorities in the campaigns for preventing and controlling AI

Banning of importation of any suspected or tested birds/poultry products

Interestingly, most of the methods officially recommended were known to the majority of the respondents who identified the: official banning of illegal importation of birds, public warned about transportation of birds and people in the same vehicles, and announcements sensitizing the public on reporting and avoiding to touch any kind of bird seemingly ill or dead.

While in Zanzibar these strategies were appreciated to have been actually taken on the ground, the reaction was somehow from the mainland side where some opinion givers perceived that there was any serious official banning of importation of birds and poultry products rather than remaining announced as a strategy in the pipeline had the disease been reported in countries of East Africa.

Destruction of the suspected chicken and other poultry products

Testimony was given by all the officers acknowledging to have seen in the national and international TVs some European and Asian countries destroying chicken and poultry products that have been suspected to contribute to people contracting AI and could be the source of transmission. It was reported that in Tanzania the government authorities have so far not taken a similar stain action because this disease has not entered the country.

Opinions were given by some of the respondents that even if the disease was reported in Tanzania, it would not be possible for the government to launch destruction of all the suspected birds and other poultry products because of two main reasons: Firstly, the financial shortages facing the government would not enable it to compensate the poultry farmers, households and vendors, as most of such business in Tanzania are not insured. Secondly, dishonesty of some poultry farmers or household keepers and vendors/businessmen to cooperate with the authorities in making this process a success. As generally viewed, the process could be cumbersome due to people who for some reasons would be reluctant to disclose their birds/products to be examined that would lead to their eventual destruction if necessary, besides existence of some dishonesty livestock officers and other departmental officers who

might corruptly authorize and protect the unlawful poultry vendors/traders.

Sensitization through Seminars

It was acknowledged by all the participants that several seminars have been conducted with support of the government and UNICEF authorities in relation to AI and this was perceived as a strength of the authorities concerned to arrange such seminars that involved stakeholders from different sectors at zonal, regional and district levels in attempt to enlighten the participants and equipping them with knowledge about the strategies for sensitizing communities on AI prevention. The perceived weakness is that due to financial shortages, such seminars have been few and involved few participants including the primary and secondary school teachers who are an engine for trickling down the information to the communities through their pupils/students and their direct contact with local people in areas where they live. The education officers were greatly concerned about the seminar organizers rarely inviting teachers in disease prevention seminars.

Participants added the low teachers' involvement is contributed by the seminar organizers from the government side not setting appointment with the district level education or school management authorities in time, therefore, making the training period occasionally coincide with the teaching sessions at the already understaffed schools.

Sensitization through written documents

Some of the respondents in Mwanza and Dodoma regions testified to have read about AI on posters, newspapers, pamphlets and leaflets and acknowledged the ministerial authorities concerned for the distribution of these materials to regional and district council health authorities. Sadly,

such materials have so far been found in a few departments, including some schools, health facilities, and local government offices. In one district in Dodoma region, the respondents revealed that some ward councilors and district officers attended sensitization seminars where they received dozens of posters to distribute to community members in their areas, but until the time of they were interviewed under the present study such materials were still kept in such officers' offices.

In Dodoma Municipality, the Municipal Officers admitted that distribution of posters, leaflets and pamphlets to vendors through their representatives who attended sensitization seminars has so far been low because of the shortage of the materials received by the Council, therefore, limiting coverage of a larger target audience/population. It was added that the information education and communication (IEC) materials were brought during the same period the government was campaigning against the rift valley relapsing fever (RVF). This situation made the two campaigns i.e. on RVF and AI coincide, hence confusing the public and limiting stakeholders' participation in the campaign, especially for the AI. It was lamented that the campaigners paid much attention to RVF outbreak that was reported to have occurred in the country, Dodoma region being among the regions greatly affected.

Sensitization through Mass Media Announcements/Advertisements

The explanation obtained on this issue was similar to that of Zanzibar regarding a large proportion of the Tanzanians at least possessing radios through which they could get the news related to AI disease. However, it was argued by some of the respondents that this depends on which kind of radio station and programs in which the news was being

aired. As detailed further below, arguments were made regarding the chances that a considerable proportion of the public members might not be fully utilizing the mass media news opportunities aired.

Perceived effectiveness of the measures/strategies available against AI epidemic

General perceptions

Controversial views emerged about the effectiveness of the strategies in place to sensitizing the public on AI and these views were based on the experiences the respondents so far have had in their areas. In Zanzibar, the widespread of TV and radio networks was acknowledged to have widened the opportunity for the residents to receive the necessary announcements. The reporters commended the government's recent action of banning importation of birds and poultry products and this response was commended by the residents. Furthermore, it was claimed that more than half of the residents in the Islands had access to TVs and radios and are accustomed to listening/watching them. Participants from Zanzibar also testified the distribution of posters, leaflets and pamphlets done by government authorities throughout the islands under UNICEF support.

In contrast, the regional and district officers in the mainland side of the country did not acknowledge the news aired through the mass media about AI outbreak in Asia and several African countries and the preventive measures to have spread to many people. They warned against the authorities concerned to not take for granted that all the people correctly accessed news announced through radio or TVs because a considerable proportion of the residents either do have either no access to or interest in the radio/TV news related to health. Similarly views were expressed by the rest of the officers. It was also reported from the

mainland side that many people believed that it will take a long time for AI to enter the country, and for this reason such people might neglect the news announced. The Mwanza REO's representative and district level education officers viewed that inaccessibility to radio news is likely to be faced by the people who are too poor to afford buying radio cells/batteries regularly while electricity is also a problem for TV users and those who would like to connect with their radios since it is not always stable and some people avoid paying high amounts of the bills by reducing the frequency of use of power. In this respondent's view, radios and TVs are not a much reliable means of communicating sensitive health information, hence complementary methods such as posters and leaflets are necessary. Meanwhile, several regional and district level respondents confidently and strongly believed that since posters aimed at sensitizing the community about AI have been distributed widely in their regions, communities got an opportunity to receive the appropriate information. This point was criticized by the rest majority of the officers despite their testimony of having seen the posters in some offices at district or regional capital levels and at several schools and other departments.

Newspapers were reported from almost all the regions as having been regularly read by urban residents and rarely by the rural ones due to low demand in rural areas. Also all the respondents were concerned about a considerable proportion of population in the communities more likely to be confused about the outbreak and conditions of AI after they have recently been sensitized about the outbreak and dangers of the RVF. As argued, the public was sensitized that RVF is transmittable through eating meat of the infected cows or other animal of the cattle family and that means many people might think that they

could be only infected by eating birds' meat. The following statements represent some of the experiences and opinions shared by several other respondents:

"I don't think people are sensitive enough on AI because recently as you know there has been a mass campaign against RVF throughout the country. The government did a big job to sensitize the public on this disease and many people responded by fearing to buy or eat beef because they were informed that doing so would be fatal. While this is till in their mind, they should be confused about AI and as it seems they have not been adequately sensitized about the risks of AI, they continue with their business of keeping and eating chicken and other product as usual" (A regional level respondent in Mwanza)

"People to believe that birds can acquire flu and transmit them to people?.....It is not simple to educate people about this disease within a short time and in a simple language as the intervention programs seem to be doing and believing that people get the message well. It is not a surprise that even the highly learned people can be found ignorant since this disease is new to us. And apart from mass sensitization through radio and TV announcements, I don't think that there is any other deliberate actions are in place here in Tanzania" (A regional level respondent in Dodoma).

"It is not possible for lay (non-professional) people to understand what AI means in simple terms, and the issue of serious bird flu is not that easy to be borne in mind by a common person" (A regional level respondents in Dar Es Salaam).

"How can lay people differentiate bird flu from human flu?" By the way...people must be asking themselves about what 'mafua

makali (bird flu) means as distinct from the normal bird flu they used to see? (A regional level respondent in Dar Es Salaam).

In Magu District, it was reported that there was a monitoring and evaluation (M&E) committee (MEC) tasked to work toward ensuring that none of the vendors/traders violated the directives of the veterinary officers and other authorities in the campaign against AI. The MEC is also responsible for liaising with stakeholders from various sectors in the district to distribute posters, leaflets and other kinds of information aimed at sensitizing the community about AI, and this includes AI conditions and methods for its prevention. Nevertheless, the immediate constraint is the limited amount of financial resources. These points were shared by the respondents in other districts within and outside Mwanza region. In Dodoma region, for instance, the Municipal Council was reported of being in a process of forming a MEC for enforcing the target populations to take action for preventing AI in a similar way they have been sensitized about the RVF.

Behaviour or Practices

Changing behaviors was reported to be a process usually taking a long time especially when people are accustomed to certain life styles e.g. eating certain foods or keeping animals in particular ways. It was commonly argued that people are likely to maintain their traditional eating behaviors unless they are adequately sensitized to believe that doing so may lead them to death. The following are expressions of some of the respondents concerning people who due to cultural behaviors are reluctant to change by adopting the recommended intervention measures even when clear sensitization messages from health experts are disseminated:

“You can take a horse to the river but you can’t force it to drink water” (A regional level respondent in Mwanza).

“If people continued eating the banned dead meat of cattle that were buried following health experts’ instructions here in Dodoma, what do you expect if it happens that their chicken dies” (A regional level respondent in Dodoma)

“Using protective gears when dealing with birds e.g. those working in poultry farms is not easy for some people who may find it too expensive to buy such materials even if they know the risks” (A regional level respondent in Mwanza).

Furthermore, several respondents (mainly the education officers) argued that although normally children follow the living styles of their parents, guardians and adult members in the society, it is surprising that children seem being more sensitive to adopt the health messages by avoiding the risky behaviors than adult people. In all the study regions, respondents at regional and district levels gave an example of HIV/AIDS prevention programs by noting that school children are more receptive and flexible than adult people. As reported by the DEOs of Kongwa district in Dodoma and Magu district in Mwanza, the receptiveness and adaptability of health sensitization messages also has been noted among the school children who were found in the streets shouting by joking while warning their fellow children with a tendency of playing with or hunting the wild birds.

The majority of the respondents considered that eating the meat of the dead birds which is a common behavior of the communities studied is one of the major ways of transmitting AI. This practice was reported as being common in Dodoma Region and to a small extent in Mwanza

Region, but not in Dar Es Salaam Region and Zanzibar. As revealed, there are people in the community who find it a loss to bury the dead body (carcasses) of chicken or any other kind of the tamed birds despite the regular warnings they have been receiving from health officers. Mixed views were given regarding the reasons for people to behave so, most of the views indicating that due to poverty, some families cannot afford buying chicken for meat and therefore whenever it happens for a chicken or related birds found dead they think God has given them an opportunity for eating meat free of charge. In contrast, the rest majority of the respondents associated such a practice with the traditionally and culturally rooted norms rather than poverty as the following statements implies:

“Even the people who own large flocks of chicken and related animals find it impossible to slaughter at least one healthy chicken for meal once in a while unless the chicken is seriously ill or dead. Even the people who died during the RVF campaign period are those who reside in rural areas not necessarily due to lack of information, but their traditional eating behavior based on their belief that a dead cow is never buried” (Dodoma RFO).

Lack of information sharing about illegal practices in eating birds' meat was reported as a challenge. For instance, it was revealed in all the three regions that some chicken and poultry meat traders including the formal ones operating in local markets and vendors have been colluding with some owners/operators of local restaurants, hotels, canteens, and bars to sell the meat of the dead or very seriously ill chicken underground and do so very cautiously against being caught by livestock health officers as long as they know that the

consumers cannot note such kind of meat very easily.

In Dodoma, some of the officers reported that around central Tanzania, people especially men are accustomed to hunting birds in the wild fields, therefore, being more exposed to risk of being infected with AI if it occurs and acting as carriers to their families and other people in the community. In all the regions, it was reported that children normally prefer playing with birds in attempt to capture them through hunting, and according to some of the livestock officers, this behavior is maintained by the children and respected by adult people as a way of demonstrating their talent in performing targets like solders.

In all the three study regions in Tanzania mainland, the risk facing of possible AI infections was perceived to face the people who live with birds inside or close to- their houses. Also, most of the people who keep chicken and ducks adopt a free range system in attempt to avoid feeding and maintaining such birds in special places. These practices were reportedly common in Dodoma and Mwanza regions. In Dar es Salaam, the proportion of people sharing accommodation with birds was reportedly small as modern ways of keeping birds are relatively more adopted. There were views that sharing accommodation with birds is associated with low/lack of knowledge about the risks of doing so. It was commonly lamented that in the cases where people keep birds in separate houses, such houses are still very close to the main house where people live, hence making it easy for them to contract infections through sharing the breathing air with birds. There were different schools of thought regarding why people lived in the same houses with the birds. While some of the respondents viewed that the people concerned do so by negligence while

knowing that it is risky, the rest pointed out the factors such as poverty, fear of thieves and lack of space for separate houses, as the main driving force, as was similarly reported from Zanzibar.

Another perceived risk especially in Tanzania mainland was the tendency of some people traveling with birds in congested vessels such as motor vehicles. This behavior was reportedly to be mainly common among the residents of rural district areas and not in large urban centers like Dar es Salaam where people are at least more sensitive to complain to the vehicle operators against the risk of contracting the disease(s) through sharing air with such animals.

Opinions on measures for awareness and prevention measures for AI

Best mass communication methods

The majority of the opinions gives favored the announcements through radios on ground that even the residents in rural areas are accustomed to listening radio news more than watching TVs and reading newspapers that are relatively more accessible to urban residents. The majority of the respondents also favored billboards and posters that were considered to be much better than radio and TV news because once the information is printed there it easy for people to remind themselves by reading the points again and again. Proposals were given by some of the respondents that for such materials to be effectively used to disseminate information, they should be posted at walls or other places where they can be read by a mass of people while not tempting other people who may remove them for some reasons. A few respondents argued that some people can get posters or leaflets or access billboards, but still neglect them if they have no reading culture or they do not consider AI as being important. For example, it was argued that:

“People have not given this (AI) disease a priority in the same way as they have done for RVF” (A municipal council level respondent in Dodoma).

With regard to the contents and timing of the news, the opinions obtained were quite similar to those obtained both in the mainland and Zanzibar were as follows: There is need for the authorities concerned to announce the news regularly through different mass media channels since people watch different news stations and listen to different radio channels/stations at different times. The news intended to be announced should be timed into programs that attract different groups of the populations e.g. music can be an entry point if the musicians were used to spread the messages. This is because at late night hours most of the young children of primary school age are already asleep and for this reason they may miss the messages. Experience was given that the announcement/adverts usually performed during day-time hours when school children are attending school are usually missed since at that times the children are in class concentrating with class lessons. The same applies at day-time hours when adult people are too busy occupied at work and their minds already tired to concentrate on the media news. Also, use of plays or drama through TV or organized cinema shows to demonstrate the news about the nature, mode of transmission, consequences and preventive measures of the disease would be complementary to the news announcements because in several cases involving health problems, people seem to learn more by watching pictures or illustrations than hearing the news only. Thus, people are likely to change from risky behavior if they are shown how AI affects birds and is transmitted to people, its consequent morbidity and mortalities. It was

added that the educationists or news promoters should not take for granted that the Swahili is the language adequately known by every Tanzanian resident (whether a citizen or foreigner). Thus, use of any locally known and acceptable language would be helpful to widen the chance for the message to penetrate the minds of target population where possible and necessary. Local languages are usually used in drama shows such as traditional dances to spread the messages to target audiences.

Seminars to train the frontline workers

Participants in both sides of the country identified the need for more seminars to be conducted by involving different stakeholders like school teachers, hoteliers, poultry vendors, livestock extension officers working at community level, community-based health officers e.g. village health workers, clinical and nursing personnel working at health facility levels and local leaders who represent communities in local PHC committees. Nevertheless, one officer was skeptical about local health committee members' ability to disseminate information to the public by remarking:

“During our supervisory visits, they normally tell us that they hold health related meetings each month to discuss health issues, but we are not sure if really they meet and do anything” (A regional hospital level respondent in Dodoma).

It was added that the ministerial level authorities should take more deliberate measures to increase and distribute the budgets to the district councils. Instead, such authorities seem to be proposing/recommending the strategies and requiring the district authorities to bear the burden of mobilizing additional resources

internally within the districts. This was pinpointed as a weakness since it is not always possible for each district to raise adequate funds to finance various activities related to health, education, infrastructure, and other social problems facing the district councils.

While these sensitization efforts were acknowledged, the education officers expressed reservations related to the way they were organized. Critics expressed their disappointments with the failure of the seminar organizers to involve all the appropriate official authorities when channeling their invitation of teachers from different schools:

“They decided to communicate directly with the region and ministerial education departments and received official letter permitting them to conduct seminars with stakeholders including teachers in our district. This was not proper since they did not inform us and that is why some of the teachers decided not to attend the seminars because they had not received permission from the district education department. Sadly, the teachers who failed to attend received a letter from higher authorities requiring them to explain themselves” (A district level respondent in Zanzibar)

The views supporting the reservations expressed above were confirmed from the primary school teachers from both the mainland Tanzania and Zanzibar.

Essay competition in schools

Essay competition on AI was viewed as a promotional strategy in school communities as it seems to have been successful in HIV/AIDS programs. By doing so, primary and secondary school children become encouraged to read and recall health messages related to HIV prevention and

AIDS treatment strategies and has even sensitized teachers to note HIV/AIDS as a priority disease in health teachings. Inclusion of AI in the school health education program was suggested as it has been the case for HIV/AIDS.

However, some of the district and regional officers in both sides of the country warned that it is very difficult for already burdened teachers to teach every health problem without prioritizing those that are so common in the Tanzanian settings.

Quarantine and Mass Killing of the Suspected or Tested Birds

Quarantining and mass destroying all the suspected birds or those tested and confirmed with the virus was proposed by the respondents who did not know if the government had already moved on this step on the mainland side or if it had a policy on that. On the isles (Zanzibar) side, it is interesting to find respondents who commended the 'TV Zanzibar' for having displayed the government's action to destroy the suspected animal products as a demonstration that people should do the same to show their commitment to prevention of this possible epidemic disease. As suggested by their mainland counterparts, contributors from Zanzibar testified that the latter government action has been done along with the banning of importation of all the suspected birds and their products from countries where AI has been reported. Adequate workforce to enforce the defaulters by regularly monitoring and giving punishment accordingly was also proposed.

DISCUSSION

The aim of the present study was to contribute to establish evidence regarding the knowledge and perceptions of different

groups of community members including the health professionals and non-professionals about the AI disease. The aspects explored include the nature, modes of transmission of AI infections and preventive measures against this AI. This was done so following the awareness campaign launched by government authorities to establish baseline data with respect to knowledge, perceptions/attitudes, and practices/behaviors of the people at risk of AI outbreaks as well as identifying the sources of information considered to be potentially effective among the communication methods/tools.

Although it is acknowledgeable that the majority of the respondents were aware that AI is a dangerous disease, the knowledge gaps noted between the participants from the two sides of the country regarding the symptoms and signs of this disease imply that if this epidemic happened for the time being, many people would be at risk of infections and possible deaths could happen. Simply, it may sound strange or unbelievable to note that even the professionals were less informed on particular issues of this disease even if such issues are related to topics that are usually taught at public health schools in particular fields of their specialization. The reality that people are not always perfect in thinking and actions even if they could be taught thoroughly well, and thus even if people are professionals in a particular field they may not know everything in their academic or professional areas of specialization. Also, in African settings, especially in East Africa, AI has never been a common public health problem to draw attention of the education curricula authorities pay priority attention when emphasizing the topics to be seriously covered in the biological syllabuses at schools and colleges. The present study confirms this based on the reports from district and regional level professionals

testifying that leave alone themselves, some of the medical and paramedical personnel had limited knowledge on AI. This implies that such professionals would be of limited help in event of outbreak of the disease unless they were immediately given refresher training about how to manage it and adequately sensitized from both clinical and public health perspectives to change their perception about the possible emergency of the disease in the region.

The low knowledge among the health, educational, veterinary science professionals about AI especially in mainland Tanzania reflects on one hand a similar or even more ignorance happening at community level whereby people might not be connected to communication channels disseminating the right and timely health information and the inadequacy of the campaigns launched by the government and other stakeholders about this disease. This means, the authorities concerned with IEC should not always place emphasis on promoting interventions by over-focusing on lay persons, as professionals may also be part of the group with limited knowledge of certain public health issues.

Information is power as it is a source of knowledge. However, knowledge is one thing and behavior change in health is another issue in the sense that knowledge may not necessarily reinforce behavior change. ⁽¹⁷⁾ This has been evident and has raised controversial debates in various epidemiology and policy related research, including those related to HIV/AIDS ⁽¹⁸⁾ and malaria, ⁽¹⁹⁾ among other public health problems. It is interesting that as expected the present study respondents were greatly informed about the measures recommended for prevention of AI infections and transmission in the community. But, on one hand the worries shown about the inaccessibility of AI related information by poor families and the cultural values

perpetuating practices related to unhygienic feeding and animal keeping at household level and the hunting tradition in most of the rural communities, are critical to consider when designing an implementation plan for the interventions aimed to controlling important diseases of AI type. Even with the advance of information, people may not change their traditional behavior, as revealed from the present study based on the participants' report about and field observation of people not habitually washing their hands before eating anything or while preparing meals and eating bird carcasses. On the other hand, discussions emerging about the ability of public sensitization messages to reach all the target audience widely and conveniently through means other than mass media e.g. TVs and radios are important to the program planners and field interventionists instead of taking it for granted that such means are easily accessible. It is easy for a small country area such as Zanzibar islands to be fully covered with these information dissemination means, but it is difficult to cover a large country area like mainland Tanzania where the remoteness of some villages is challenge.

Sensitization of professionals including the frontline health-care workers and health service managers through seminars is useful as has always been the case in other areas of public health programs. However, the approach used for mobilizing the participants and the contents of the seminar materials need to be given adequate weight when planning the activities ahead, otherwise it is not strange and as reported by the present study respondents that the contribution of the seminar to public awareness raising remains minimal as compared to the overall cost of undertaking the sensitization program. Research involving neutral teams invited from independent (or private or public) organizations should go hand in hand with

training sessions or should be carried out immediately after the training sessions have been accomplished as part of monitoring the effectiveness of the teaching facilities and coming up with suggestions for the ways-forward. Moreover, sensitization through mass media targeting the audience in the right time and place, as recommended by the present study respondents, is very vital to the success of the behavioral change and communication program, in addition to adequate distribution of other IEC materials packed with the right and clearly understood message.

As reported from the present study, poultry keeping at household level is a common practice throughout Tanzanian communities both as a source of income whereby people sell the poultry products and as a source of animal proteins following the slaughtering of the poultry e.g. chicken or eating their eggs. Unfortunately, the poultry keeping practices involving mainly the free range system in villages is risky in that it exposes the poultry to possible acquisition of a range of animal infections including AI and as warned by other authors it presents serious challenges for the application of disease prevention and control interventions. (3)

As for AI control, the control policies for trade in poultry to restrict possible infections to enter the country and spread all over are one of the recommended interventions in countries exposed to HPAI (1, 2). As reported from the study regions, measures such as the banning of importation of any suspected or tested birds/poultry products and destruction of the suspected chicken and other poultry products may be difficult to enforce in the absence of strict laws or regulations for making people change their traditional behavior. The worse side of it is when some officers prove to be dishonest or corrupt through what was reported to be the intervention officers

colluding with the poultry traders to violate the law/regulations and it is not strange to find even the influential local politicians interfering with the appropriate public health interventions involving damaging the suspected poultry animals or products on grounds of defending the rights of poor residents who depend on poultry business as a source of their incomes.

CONCLUSION

In conclusion, studies of this kind mark important evidence that the government in collaboration with multilateral authorities such as UNICEF and WHO have taken some commendable steps in sensitizing the public on AI even if this disease has not occurred in the country. However, the present study reveals existence of knowledge gaps and controversial albeit constructive perspectives among regional and district level program officers regarding the nature of AI infections, symptoms, signs and modes of transmission and control in Tanzanian community settings and their worry about the general public knowledge and change behavior in relation to AI prevention. This in addition to reservation shown about the methods used for IEC to be effectively accessed by a larger public audience call for more concerted measures and deliberate actions toward making a difference, otherwise it will not be strange to experience a situation whereby any occurrence of HPAI in village settings of Tanzania, there will be regrettable loss of livelihoods both for the poultry and humans, as warned by previous observers (3). This study therefore suggests continuous health education and promotion in relation to AI among other infectious diseases as an integral part of emergency preparedness for effective and sustainable control of the AI in Tanzania, East Africa and elsewhere in Africa. Further research is imperative to

establish evidence on the environmental risk factors from both the ecological and human behavioral perspectives so that require immediate interventions can be instituted before the onset of the disease. These should be coupled by strengthen the existing health-care delivery systems and decision-making structures so that should the disease occur regrettable outcomes can be avoided.

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Authors Contributions

GMM lead the qualitative data collection process, and writing the technical report of this study and wrote the first draft and revised version of this manuscript (MS) under assistance by JJM who was the principal investigator in the overall study.
