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Assessment of risk communication strategy adopted by ministry of health and population in avian influenza

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Abstract

Risk communication is a dynamic and interactive process involving exchanges between different groups of key players and audiences. It allows people at risk to understand and adopt protective behaviors and allows authorities to listen and address people's concerns in a relevant, trusted and acceptable manner. This is a qualitative study aiming to provide recommendations that might help national decision makers to enhance and promote the currently adopted risk communication measures, especially in communicable diseases. The study examined the already adopted risk communication measures in communicable diseases taking avian influenza epidemic (Influenza season 2014-2015) as an example, also the public perception regarding these measures was evaluated through 12 focus groups in 3 Egyptian Governorates.

Results suggested that the adopted risk communication measures are proper. However, further strengthening of certain aspects is needed. The suggested recommendations were building trust and feedback channels with the community in alignment with better health care services, capacity building of officials dealing with risk information and communicating with the Public.

Keywords: Qualitative, communicable diseases, novel influenza

Introduction

Risk communication is one body of health communication theory, research and practice focused specifically on communicating the health risks caused by industrial technologies, environmental and natural hazards (including diseases) and human activities, amongst individuals, groups and institutions [1, 2]. Effective risk communication is increasingly seen as crucial to the prevention and cooperative management of health risks. It is an integral part of any public health emergency response; in epidemics and pandemics, in humanitarian crises and natural disasters [3].

The overall aim of risk communication is 'to provide the public with meaningful, relevant, accurate and timely information in relation to health risks in order to influence choice' [4].

Communicable diseases in themselves are complex, dynamic and uncertain phenomena, with new viruses emerging; diseases previously considered eradicated re-emerging; and influenced by geography, diet, occupation, population growth, global travel, and countless other social and cultural behaviors and practices [5]. In addition, risk communication frequently operates in emotionally-charged environments as 'fear, anxiety, distrust, anger, outrage, helplessness, and frustration' are common reactions to the health risks associated with communicable diseases [6, 7].

Despite the availability of planning tools and pre-crisis event and readiness efforts, many countries still need to concentrate on advanced risk communication planning efforts at all levels of public health, such as needs assessments and public engagement plans [19].

Methods

This is a qualitative research study, took place in three Egyptian Governorates; Cairo (as a cosmopolitan city), Menia (representing Upper Egypt and Ismailia (representing Lower Egypt).

The participants are classified into three categories: Officials at the Ministry of Health and Population, Media personnel, and Participants of Focus Groups from the selected Governorates (Cairo - Ismailia - Menia).

They were recruited in cooperation with the Health Directorates and some of the Nile Media Centers at these Governorates.

Purpose of this research study and aspired benefits were explained to all the participants and a verbal consent for participation was obtained.

Twelve focus groups were arranged in the three selected Governorates; 4 focus groups per Governorate as follows: two focus groups for females (high education – elementary /no education), and two focus groups for males (high education – elementary /no education).

The focus groups' participants of this research study were 82 individuals; 38 females and 44 males with different level of education. All the interviews were fully transcribed verbatim, Once the data was transcribed, it was then coded, analyzed, interpreted and verified.

This research study was executed in accordance with the ethical code of Suez Canal University Faculty of Medicine, Ismailia, Egypt.

Results

Participants of this study were classified into three categories; themes were generated accordingly. The themes of each category were as follows:

Category One: Ministry of Health and Population (MoHP): in this category, semi-structured interviews were conducted with chief of Preventive Sector and the official Spokesperson of the Ministry of Health and Population. The themes generated from these interviews were as follows:

Comprehension of Risk Communication Measures and Concepts: both officials stated that risk communication and communication of health messages are integral parts of their work. Although they might operate risk communication from relatively different aspects, they both communicate and cooperate with each other in delivering the proper health messages to the public.

Risk Communication Experiences: although the Spokesperson of the Ministry is the person entitled to communicate risk and health events information to the Public, he and his office are dealing with one aspect of risk communication, which is the final delivery of the information or the (Media Release) by the Spokesperson. However, risk communication is way more of a comprehended process that covers several aspects including the full understanding of the health issue in hand, the risk audience and how they shall be addressed and what are the implications of such risk information, which are usually not covered by media release on its own.

Risk Communication Approaches Adopted by the Ministry of Health and Population in addressing Communicable Diseases: the Media office at MoHP prefers the risk communication messages to be light and not disturbing regardless of the gravity of the situation, as their main concern is usually not to cause a status of panic among citizens, which in their opinion, will aggravate the situation even more.

On the other hand, the Media office at MoHP is depending mostly on the information delivered.

The Preventive Sector leadership believes messages should be transparent and informative of the situation. However,

with transparency a feedback channel between the Ministry of Health and population at risk should be always maintained to answer their inquiries and reply to their concerns to avoid exaggerated rumors and public panic.

Risk Communication Measures Adopted by MoHP upon the Avian Influenza Epidemic (Influenza Season 2014 – 2015): the Media office at MoHP was taking the number of cases and fatalities from the Preventive Sector, and at the beginning there was some discrepancy between the numbers released by the Ministry of Health and the numbers released by the Media (either in newspapers and/or private TV channels) as their numbers were always higher and some of their numbers were even exaggerated and dramatic. At the Preventive Sector the epidemic was under close investigation, and they had to be careful with the information they are releasing to avoid producing panic in the society. Another issue was; the Preventive Sector is calculating the cases according to epidemiological weeks and because of the chaos engendered by the Media, they had to give constant statements, which was not applicable because cases had to be laboratory confirmed to be stated as actual cases. And the media doesn't differentiate between suspected and confirmed cases, and both numbers are widely different.

Therefore, both the Media office and the Preventive Sector worked on increasing the number of Media releases with regular update of the exact number of confirmed cases and hold frequent press conferences to update the Public and media with the current situation. In addition to the challenge imposed by the local media, there was another challenge regarding the Public and specifically population at risk (individuals with exposure to poultry) as they were very concerned that their poultry will be killed or they had to get rid of them as the situation in 2006. Therefore, keen risk communication measures and tactful approaches were required to address this delicate concern.

Risk Communication Challenges and Obstacles in Egypt: both Officials from the Ministry of Health and Population stated that Media is the greatest challenge that might face the implementation of proper risk communication measures, especially in the past 4 years, as new newspapers and private TV channels are emerging and they had a role in spreading rumors or release fake news which confuse the public and decrease the credibility of the national official health news. Another challenge by the Media is conflict of interest, as some newspapers (for instance) might release fake news if they are in conflict or disagreement with the current health authority. Also, the Media office expressed an internal challenge regarding delay of replies they need to get from the concerned health sectors, authorities, directorates and concerned personnel, which in turn delay their media/press release and make the local media a step ahead of them.

Category Two: The Media

In this category, semi-structured interviews were conducted with the Executive Editor in Chief of Al Ahram Electronic Gate Newspaper. The themes generated from these interviews were as follows:

Sources and Verifications of Health News: the Executive Editor in Chief of Al Ahram Electronic Gate stated that all

health news is referenced, and that their newspaper has a representative at the Media office of the Ministry of Health and Population, where they can verify the news and obtain updates.

Qualifications to Comprehend Health News: when the executive editor in chief was asked about if the journalist assigned to cover the health section in his newspaper had any sort of training to make him qualified to comprehend health news, he said that was never necessary and they already obtain the health news from health sources.

Cooperation with the Ministry of Health in the field of Communicable Diseases and Outbreaks: the newspaper has a representative at the media office of the Ministry of Health, and usually that's where they obtain their health news and verifications from.

However, the Executive Editor in Chief of Al Ahram Electronic Gate Newspaper mentioned that there are some obstacles in this cooperation, like the delay in obtaining health information or updates about some health events, which in turn pushes the newspaper to get such information from other sources (other newspaper, other medical source or health organization), and they can verify later from the Ministry of Health.

Media Coverage upon the Avian Influenza Epidemic (Influenza Season 2014 – 2015): he stated that this epidemic had a medium coverage, and it wasn't the main event the Public is following. And when he was asked about the news that the Public usually follow, he replied news about deaths, security and violence events.

Media and Rumors: despite the apparent linkage between spreading rumors and media, the Executive Editor in Chief of Al Ahram Electronic Gate Newspaper denied such linkage, even when fabricated news was subjected. He stated that Media has a great role in communicating the truth to the Public but not the rumors. When he was asked about the social media, he said it has a positive role in delivering the news, and regarding rumors he denied that social media might have a role.

Category Three: Focus Groups

There were 12 focus groups including 82 individuals (23 to 68 years old); 38 females and 44 males from both urban and/or rural settings (table 1). Half of the focus groups included participants of high education, while the other half included participants of low and/or no education. The themes generated from these 12 focus groups were as follows:

Sources of Health Information: most of the participants agreed that TV was the most watched and approached mean to obtain health information, some said through news forecast, others from TV programs and some TV spots produced by the Ministry of Health.

Population of old age preferred Radio, and they complained it doesn't communicate health news as the TV does (Figure 1). When they were asked about what TV channels they prefer; the national and channels like Ch. 1 and Ch. 2, or the private channels. Most of them agreed on following the private satellite channels confirming that there is no longer audience for these local channels, even in Upper Egypt.

Some participants, mostly females, stated that social media is replacing TV and newspaper in health news. And they think that the Ministry of Health should communicate through these social networks and the internet for better engagement with the Public. Other participants declared that newspapers are still their favorite source to get all information; health information included, and they varied in age and they were mostly from urban settings. Very few participants declared other sources than the aforementioned ones, such as talking to a health care provider or trusted friends and neighbors.

Credibility and Truthfulness of Health News shared by The Ministry of Health and Population:

most of the female participants believed that news posted by the Ministry of Health lacks credibility and truthfulness, and they preferred other sources of media to obtain health information, especially those information regarding communicable diseases and their related health phenomena, news about number of cases and/or deaths in a health event and food safety issues. When the participants were asked to give a score for MoHP in credibility and reliability most of the female participants gave a score below 60%, in both rural and urban settings, while the in rural settings the score was slightly higher than the urban, but collectively all scores were low for the MoHP's credibility. On the other hand, the male participants believed in the credibility and truthfulness of MoHP. Only few participants gave zero credibility to the news shared by the Ministry of Health, but generally the male population believed in the health news communicated through the Ministry of Health, and they pay good attention to the statements by health officials of the Ministry of Health. The male participants believed that the Government has no interest or benefit in communicating false or untrue news as eventually the media will uncover such fraud.

Most of the male participants stated that they usually don't trust everything posted by the private TV channels or newspapers, although they watch them. But they agreed that the Ministry should reply to the claims or health information of some of these TV channels as these news could impose danger or produce public panic. Despite the discrepancy in credibility scores given to the MoHP among females and males of this research study (figure 2), they agreed on the ability of the media to spread rumors, even some of them stated that some TV channels and newspaper or even some TV show presenters spread health rumors intentionally to engender a status of panic in the Egyptian society.

Risk Communication and Awareness Conducted by the Ministry of Health:

most of participants agreed that the Ministry of Health awareness measures are not exactly the optimum, but they are not always bad. All agreed that efforts need to be exerted to promote health awareness among citizens (Figure 3).

Some participants, especially those above 40 years of age, stated that the awareness measures of the Ministry of Health were very good in the past years and their quality declined dramatically after 2011. The female participants, especially those with children below 5 years emphasized the importance of the Primary Health Care Units in spreading awareness especially in reference to communicable diseases and children's health, and they believe the Ministry should promote health awareness inside these facilities by seminars and lectures. They agreed that they have seen posters, but

some of the uneducated female participants said that they couldn't grasp their meaning and they may benefit from seminars or face-to-face health education. Some female and few male participants stated that health awareness can be conducted through social centers and clubs, but such facilities had undergone severe neglect in the past 10 years. But if such facilities were revived or renovated, they could fit as great public health awareness facilities.

Some participants, mostly males, stated that MoHP should keep an eye on pharmacies, as they believed pharmacies have indirect role in health misconceptions and wrong health messages.

Avian Influenza Epidemic (Influenza Season 2014 – 2015): first, some general questions were asked at each focus group to assess the general knowledge of avian influenza. Almost 62% of participants gave correct answers (or at least gave one correct item) to the asked questions regarding avian influenza (causative organism, affected population, mode of transmission, linkage to birds, affected body system, signs and symptoms, treatment, prevention and control). The female participants were relatively better than the male participants regarding information of avian influenza (Figure 5). At Cairo and Ismailia, the knowledge of avian influenza was not bad, but they still depend on the information posted in 2006, and they were not very much into absorbing new information upon the 2014 epidemic. However, situation in Menia was different; knowledge about the disease was way better and no difference in knowledge between rural and urban areas (Figure 6).

The participants at Menia Governorate were acquainted with prevention and control measures, especially in Mattay (the rural setting in Menia), where almost all the participants had or used to have poultry at their households. When they were asked about the risk communication measures regarding avian influenza communicated to them through the Ministry of Health, they stated that this epidemic the situation was much better than what happened in 2006, and they maintained to keep their poultry. Only they were urged to get rid of the dead poultry with specific mechanisms that were explained to them. The community health care workers (who are all females) used to conduct home visits and educate the women on prevention and control measures through illustrated colored charts, simulations and sometimes on job training.

Discussion

The study questions were answered in the light of the results and the inputs of the study participants in their three categories.

Does the Ministry of Health and Population apply the internationally-recommended risk communication measures in general?

Actually yes, as in reference to the literature review of risk communication that was highlighted earlier, the Ministry of Health and Population implements several successful risk communication strategies and measures, especially in the field of communicable diseases and outbreaks.

For instance, the example of the risk communication approach taken by the Preventive Sector leadership and team upon the Measles outbreak in Siwa oasis was distinguished, as it didn't only emphasize the importance of field risk communication approaches but also, it proved that

keen understanding and comprehension of the population at risk needs and inquiries are fundamental keys to address the health situation at hand.

So, the importance of comprehension of the fine rules and regulations at this tribal community was undeniably crucial to implement risk communication and control measures and curb this outbreak. Respect of the cultural background and building the necessary measures around them were additional fundamental pillars to address this tricky situation in Siwa.

However, the Ministry of Health and Population still needs to promote risk communication measures and approaches both centrally at the ministerial sectors and peripherally at Health Directorates of the 27 Governorates. Also, official personnel at the Ministry who are may be required to deal with the Public or the media need to have the necessary communication and presentation competencies demanded for proper risk communication.

Did the Ministry of Health and Population apply the internationally-recommended risk communication measures in addressing avian influenza epidemic (Influenza season 2014-2015)?

Scholars in risk communication sometimes distinguish three paradigms: (1) when people are insufficiently alarmed about a serious hazard, the task is to increase their concern and motivate them to take appropriate actions, (2) when people are excessively alarmed about a small hazard, the task is to diminish their concern and deter them from unnecessary and potentially harmful actions, and (3) when people are justifiably alarmed about a serious hazard, the task is to harness their concern and guide their actions.

Egypt encountered two main outbreaks regarding avian influenza; the first was in 2006 when the disease was first recognized among Egyptian citizens, and a status of Panic was engendered in which the media had a great toll in creating this status. So the 2006 avian influenza situation might fit the second paradigm of risk communication that was mentioned earlier, and although the avian influenza risk was not small but it was not big either; as back in 2006, out of almost 2000 suspected cases of avian influenza only 18 cases were laboratory confirmed throughout all Egypt (the Ministry of Health Published data on avian influenza cases in 2006).

Regarding the Ministry of Health there were several appropriate risk communication measures especially those regarding addressing the public with successful TV spots that were still remembered by the focus groups' participants of this research study. However, the risk communication measures can never work properly if the public are feeling threatened as poultry is not only source of food but also source of money and income for several citizens who are breeding poultry either in small bird shops or at their own households.

According to the negative dominance model which is based on a central theorem of modern psychology: when people are upset they put greater value on losses and other negative information or outcomes than on gains or positive information and outcomes [2, 9, 23]. That also explains why the risk communication measures that were adopted in 2006 might not have worked properly (even though some of them were quite on point) as the Public were deeply concerned that their poultry will be killed and they will lose this important source of money and food. In reference to the

avian influenza epidemic (2014 -2015) the situation was quite delicate, as it was progressive and eventually Egypt scored the highest number of confirmed avian influenza cases in the world upon the avian influenza epidemic (Influenza season 2014-2015).

Therefore, the Ministry of Health was in quite a hot spot to curb this outbreak especially with the legacy of economic consequences that resulted from the mass killing of poultry back in 2006 from one side, and to deal with Public panic and stigma against this disease from another side; as the virus A (H5N1) used to be believed to attack individuals living with sick poultry, who are usually from low socio-economic backgrounds, and were mostly in Upper Egypt.

The avian influenza epidemic (Influenza season 2014-2015) was definitely a concern to the Ministry of Health as cases weren't matching the case definition developed in 2006. As there were cases from urban settings with no clear history of exposure to dead or sick poultry, additionally urban Governorates such as Cairo and Alexandria reported several confirmed cases, which caused a status of confusion and panic among population were never listed at risk, and became within risk groups.

What is the public comprehension of the information communicated to them by the Ministry of Health and Population, in relation to infectious/communicable diseases in general and avian influenza specifically?

The findings of the focus groups revealed that most of the female participants believed that the Ministry of Health lacks credibility and truthfulness, and they preferred other sources of media to obtain health information, especially those information regarding communicable diseases and their related health phenomena, news about number of cases and/or deaths in a health event and food safety issues. On the other hand, most of the male participants of the focus groups stated that they believe in the credibility and integrity of the measures taken by the Ministry of Health and Population. And some of them believed that the Ministry of Health should make a stand against the untrue and fabricated news spread by the private TV channels and newspapers.

Most of participants agreed that the Ministry of Health awareness measures are not exactly the optimum, and they not always bad, but all agreed that efforts need to be exerted to promote health awareness among citizens. Some participants believed that health sector like other sectors in Egypt has been negatively affected after 2011, while other participants believe health awareness services have been much better more than 10 years ago.

In reference to avian influenza it's believed that this epidemic (2014 – 2015) the situation was much better than what happened in 2006, and the population at risk maintained to keep their poultry. Only they were urged to get rid of the dead poultry with specific mechanisms that were explained to them.

What are the tools of risk communication that the Ministry of Health and Population uses?

The Ministry of Health uses several tools including direct and indirect approaches, and the Ministry had produced several TV and Radio Spots to address communicable diseases such as spots about immunization campaigns against vaccine preventable diseases like poliomyelitis, measles and rubella, and campaigns direct to prevent

respiratory illnesses like influenza and avian influenza.

In addition to the TV spots directed to specific populations; such as those spots directed to pilgrims before Hajj and Omra seasons, which are giving simple direct instruction to prevent illnesses especially respiratory ones during the holy rituals. These spots were even intensified after the emergence of MERS-CoV infection in the Kingdom of Saudi Arabia.

Also, materials like fliers, booklets, posters and brochures are usually used by the Ministry of Health and population, which are directing more detailed health and risk messages than those in the TV and Radio spots, which are limited in duration.

The Ministry of Health and Population are developing its own awareness materials either totally by its own or in cooperation with other partners like international organizations and agencies and civil societies. Also, the Ministry has shared some of its awareness and risk communication materials with some countries in the region like materials of Ebola Virus Disease (EVD) with several African Countries.

Despite the importance of the internet-based and electronic forms of communication issues, little research has been done on how newer forms of technology and communication, including social media or video-sharing sites, influence health decision-making, And there are basic questions about the effectiveness of traditional public health campaigns ^[20].

What are the sources from which the public are gaining their health information?

Most of the focus group participants agreed that TV was the most watched and approached mean to obtain health information, some said through news forecast, others from TV programs and some TV spots produced by the Ministry of Health, which matches findings from similar studies and literature. Research on traditional media such as newspapers and TV and radio broadcasts concludes that they can be reputable, trustworthy sources of information. However, communication and emergency officials should carefully consider which media outlets are used, taking into consideration what channels were utilized to reach out to publics in previous risk situations and what behaviors resulted from those messages. Effective social media usage involves understanding the potential impact of message and/or platform, and the security of the messages being distributed. Most publics have clear pre-established attitudes about social media usage and communication, and public leaders should be aware of them, and of the ability of social media to engage publics outside of a geographically-restrained community ^[21].

While television news is still one of the top two outlets for both routine and crisis communications (the other being physicians, or other trusted, knowledgeable individuals), the accuracy of information is the most important factor desired by publics ^[21]. Many public and private organizations have adapted to this focus on generalized media. For example, when faced with the SARS outbreak in 2003, the Singapore Ministry of Health created a dedicated SARS television channel, which exclusively played updates and recordings of daily press conferences. The channel allowed for press conferences to begin later in the day, so that Ministry officials could present information without the pressure of a reporter's deadline and without a time limit, which allowed

time for every question asked to be answered as best as possible (Menon & Goh, 2005). This adaptable solution to a national crisis proved successful and is lauded as exemplar [21].

Individuals who are older in age prefer Radio, and some of the Focus groups' participants complained that Radio doesn't broadcast enough health news and/or information. Other categories of society, especially males, still prefer newspapers, but mostly the Public obtains their information from the media. Some of the focus groups participants prefer newer and less traditional methods like social networks and internet-based approaches. But still no enough

data on the possible implication of using such methods in risk communication; especially as such methods are not properly monitored for flaws and malpractices.

Table 1: Number and distribution of focus groups' participants according to sex and Governorate of residence.

Sex	Governorate			Total
	Cairo	Menia	Ismailia	
Females	13	13	12	38
Males	15	15	14	44
Total	28	28	26	82

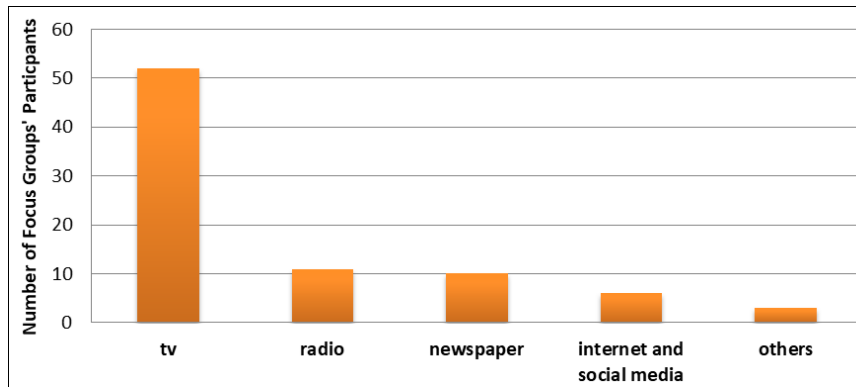


Fig 1: Preferred sources of health information among all participants of the focus groups of this research study.

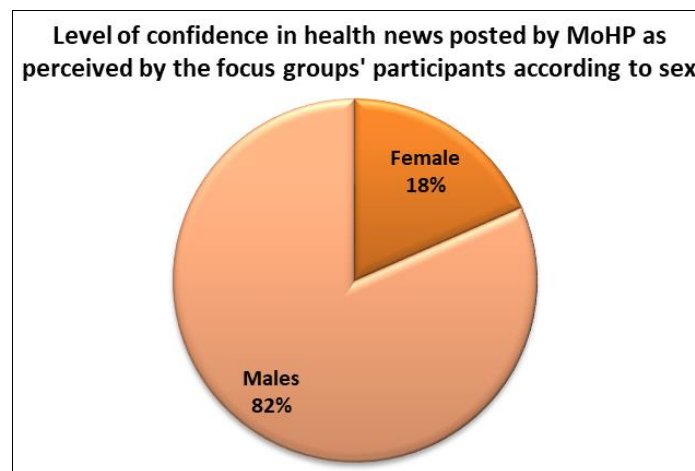


Fig 2: Percentages of males and females confident in the news posted by the Ministry of Health and Population (MoHP) among all the focus groups' participants.

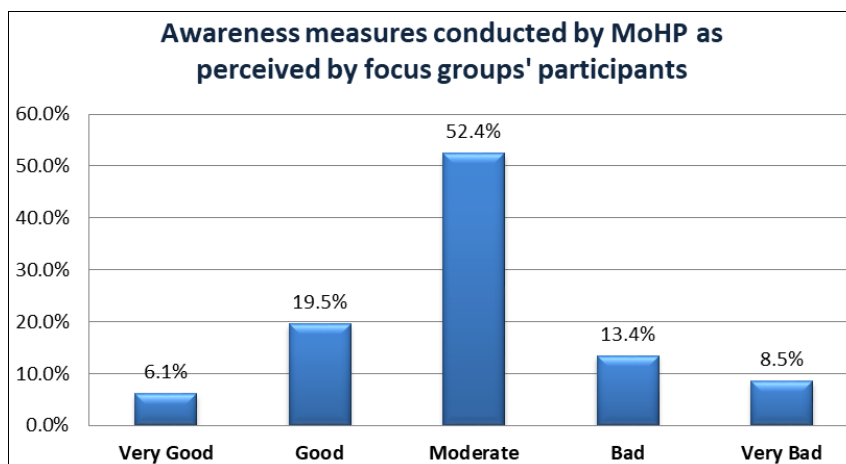


Fig 3: Percentages of focus groups' participants who graded level of awareness measures conducted by the MOH and Population from very good grade to very bad grade.

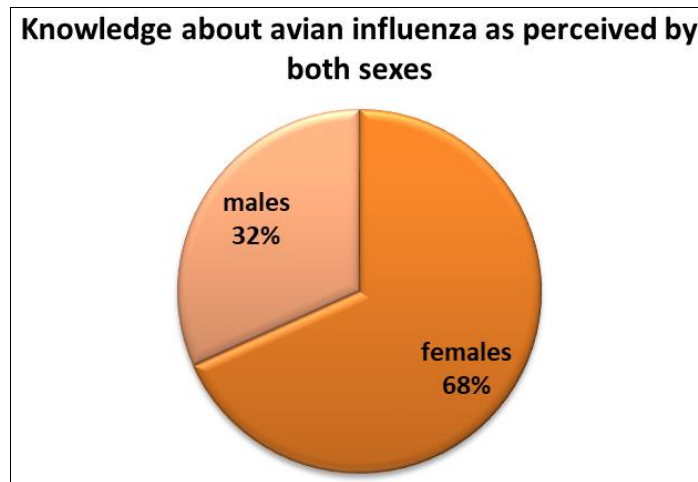


Fig 4: Percentages of males and females who answered correctly to questions assessing knowledge about avian influenza among focus groups' participants

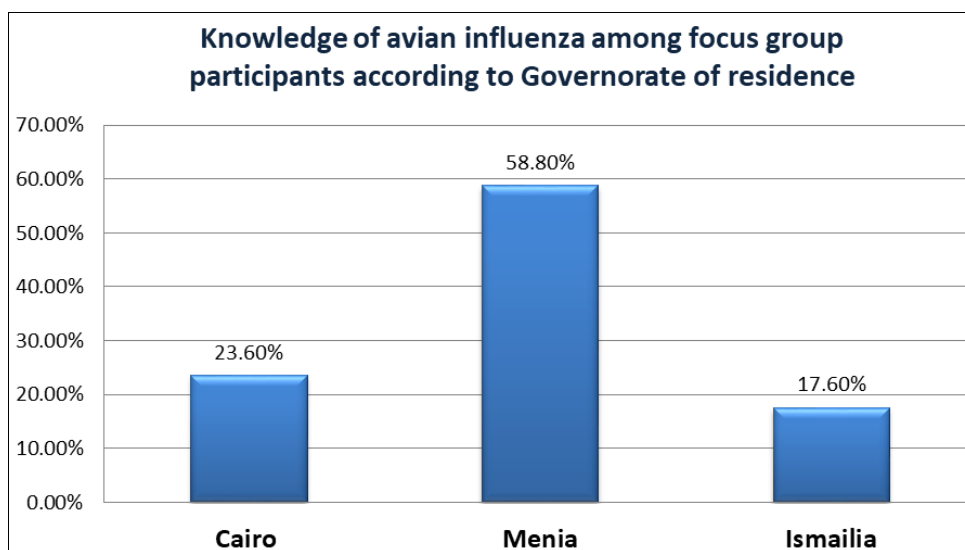


Fig 5: Knowledge of avian influenza according to Governorate of residence among focus groups' participants who gave at least one correct answer to questions about avian influenza.

Conclusion

The study findings indicate that the Egyptian Ministry of Health and Population is already using relatively proper risk communication measures in addressing communicable diseases. However, these measures are facing several challenges either internally at the level of the Government and the Public or externally by the imposed threats by the emerging and re-emerging communicable diseases.

References

1. Powell D, Leiss W. Mad cows and mother’s milk: the perils of poor risk communication. Montreal: McGill-Queen’s University Press, 1997, 85-99.
2. Glik DC. Risk communication for public health emergencies. Annual Rev Public Health. 2007; 28(1):33-54.
3. World Health Organization. WHO outbreak communication guidelines. Geneva: World Health Organization, 2005, 2-5.
4. Health Protection Network. Communicating with the public about health risks. Glasgow: Health Protection Scotland, 2008, 6-12.
5. Covello VT, Sandman PM. Risk communication: evolution and revolution. In: Wolbarst A, editor. Solutions to an environment in peril. Baltimore: John Hopkins University Press, 2001, 164-178.
6. Sandman PM. Hazard versus outrage in the public perception of risk. In: Covello VT, McCallum DB, Pavlova MT, editors. Effective risk communication: the role and responsibility of government and nongovernment organizations. New York: Plenum Press, 1989, 45-49.
7. Infanti J, Sixsmith J, Barry MM, Núñez-Córdoba J, Orovioigoicoechea-Ortega C, Guillén-Grima F. A literature review on effective risk communication for the prevention and control of communicable diseases in Europe. Stockholm: ECDC, 2013, 5-14.
8. Covello VT, Peters R, Wojtecki J, Hyde R. Risk communication, the West Nile virus epidemic, and bioterrorism: responding to the communication challenges posed by the intentional or unintentional release of a pathogen in an urban setting. J Urban Health. 2001; 78(2):382-391.
9. Plough A, Sheldon K. The emergence of risk communication studies: social and political context. SciTechnol Hum Val. 1987; 12(3/4):4-10.
10. Covello V, Von Winterfeldt D, Slovic P. Communicating scientific information about health and

- environmental risks: problems and opportunities from a social and behavioral perspective. In: Covello VT, Moghissi A, Uppulori V, editors. *Uncertainties in risk assessment and risk management*. New York: Plenum Press, 1987, 221-239.
11. Nicoll A, Murray V. Health protection: a strategy and a national agency. *Public Health*. 2002; 116(3):129-37.
 12. Reynolds B, Seeger MW. Crisis and emergency risk communication as an integrative model. *J Health Commun*. 2005; 10(1):43-55.
 13. National Research Council. *Improving risk communication*. Washington, DC: National Academy Press, 1989, 72-93.
 14. Fischhoff B. Risk perception and communication. In: Kamien D, editor. *Handbook of terrorism and counterterrorism*. New York: McGraw-Hill, 2005, 463-492.
 15. Slovic P. Trust, emotion, sex, politics, and science: surveying the risk-assessment battlefield. *Risk Anal*. 1999; 19(4):689-701.
 16. Lion R. Security or opportunity: the effects of individual and situational factors on risk information preference. Universiteit Maastricht, 2001, 97-114.
 17. Joffe H. Risk: from perception to social representation. *Br J Soc Psychol*. 2003; 42(1):55-73.
 18. Garvin T. Analytical paradigms: the epistemological distances between scientists, policy makers, and the public. *Risk Anal*. 2001; 21(3):443-455.
 19. Lupton D. Risk as moral danger: the social and political functions of risk discourse in public health. *J Health Serv*. 1993; 23(3):425-435.
 20. Janoske, Melissa, Brooke Liu, Ben Sheppard. *Understanding Risk Communication Best Practices: A Guide for Emergency Managers and Communicators*, Report to Human Factors/Behavioral Sciences Division, Science and Technology Directorate, U.S. Department of Homeland Security. College Park, MD: Start, 2012, 16-24.
 21. McComas KA. Defining moments in risk communication research: 1996-2005. *J Health Commun*. 2006; 11(1):75-91.