

Original Research

Emerging and reemerging infectious diseases

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ABSTRACT:

Aim: The objective of this study is to get the overall picture about the knowledge of emerging and reemerging infectious diseases in public and provide a scientific basis for developing health information strategies. **Methods:** We used the structured questionnaire to interview 800 residents by health enquiry hotline. Descriptive analysis was presented to evaluate the knowledge of the participants. Multiple logistic regression model was performed to determine the influence factors for knowledge of emerging and reemerging infectious diseases. **Results:** Among the 900 participants who were approached for the interview, a total of 800 agreed to participate and finish the questionnaires, including 350 men (43.75%) and 450 women (56.25%). The effective response rate was 88.8%. A total of 425 respondents were aged 15–35 years (573.12%), and 600 respondents (75%) were college or bachelor degree or above. **Conclusion:** The low-level knowledge called for the improvement in health information to the public, especially those with low level of education and income. Effective and precise health information was urged to carry out to improve the prevention for the emerging and reemerging infectious diseases.

Keywords: knowledge, public health, health information, emerging infectious diseases, re-emerging infectious diseases

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INTRODUCTION

Emerging infectious diseases (EIDs) are diseases of infectious origin whose incidence in humans has increased within the recent past or threatens to increase in the near future. These include new, previously undefined diseases as well as old diseases with new features. These new features may include the introduction of a disease to a new location or a new population (e.g. it may present in youth where previously it was only seen in the elderly); new clinical features, including resistance to available treatments; or a rapid increase in the incidence and spread of the disease. Reappearance of a disease which was once endemic but had since been eradicated or controlled, would classify it as a re-emerging infectious disease. Emergence may also be due to a new recognition of an infectious agent in the population or the realization that an established condition has an infectious origin¹

In recent years, emerging and reemerging infectious diseases such as Middle East respiratory syndrome (MERS), Ebola, Zika virus (ZIKV), and plague, have caused great disease burden worldwide. MERS is a

highly lethal respiratory disease, and the first case of which was reported in MERS is a highly lethal respiratory disease.²

Understanding the mechanisms that underlie newly emerging and reemerging infectious diseases (EID) is one of the most difficult scientific problems facing society today. EIDs are diseases that have recently increased in incidence or in geographic or host range (e.g., tuberculosis, cholera, malaria, dengue fever, Japanese encephalitis, West Nile fever, and yellow fever), diseases caused by new variants assigned to known pathogens (e.g., HIV, new strains of influenza virus, SARS, drug resistant strains of bacteria, Nipah virus, Ebola virus, hantavirus pulmonary syndrome, and avian influenza virus), and bacteria newly resistant to antibiotics, notably the multiple resistant strains that render the armamentarium of antibiotics useless.³

Epidemics or pandemics caused by these emerging and re-emerging infections often take a heavy toll of life and by rapidly spreading across borders are responsible for much concern and panic. Besides health, emerging infections also present a grave

economic, developmental and security challenge. The objective of this study is to get the overall picture about the knowledge of emerging and reemerging infectious diseases in public and provide a scientific basis for developing health information strategies.

METHODS

STUDY PARTICIPANTS

Study participants were recruited by telephone interview aged >15 years from a telephone list. Previous studies had used the same method to choose the participants.^{4,5}

SAMPLING METHODS

The cross-sectional survey was conducted from June 2018 to June 2019. We calculated the minimum sample size by cross-sectional sampling size estimation methods. The equation was as follows.

$$n = \mu^2 @ P(1 - P) / \delta^2$$

n represents sample size, a is set as 0.05; P represents the knowledge rate and was set as 50% in our study to obtain maximum value of P(1-P), and d is the allowable error and set as 0.05 in our study. The minimum estimation sample size was 300. Due to previous telephone survey study, the response rate is about 60%^{4,6}, so the minimum sample size should be 600, and we increase the sample size to 800 in our study.

RESULTS

TABLE 1: Sociodemographic characteristics of the respondents

Variable	N%
Gender	
Male	350(43.75)
Female	450(56.25)
Age	
15	425(53.12)
35	275(34.36)
55	100(12.5)
Residential area	
Downtown	550(68.75)
Suburbs	250(31.25)
Education	
Senior high/vocational High/secondary technical school and below	200(25)
College/bachelor degree or above	600(75)

SOCIODEMOGRAPHIC CHARACTERISTICS

Among the 900 participants who were approached for the interview, a total of 800 agreed to participate and finish the questionnaires, including 350 men (43.75%) and 450 women (56.25%). The effective response rate was 88.8%. A total of 425 respondents were aged 15–35 years (53.12%), and 600 respondents (75%) were college or bachelor degree or above.

DISCUSSION

The emerging infectious diseases account for 26 per cent of annual deaths worldwide. Nearly 30 per cent

STUDY DESIGN

A structured questionnaire interview was designed to collect information, divided into basic information and knowledge of emerging and reemerging infectious diseases, including MERS, ZIKA, Ebola, and plague. Basic information included the age, gender, degree of education, degree of income, residential region (suburb or downtown), residence time (less or more than 3 months), and occupation. Knowledge of emerging and reemerging infectious diseases included heard about the diseases, main countries where the outbreak occurred, and preventive ways to diseases. The preventive ways contained that avoiding to the epidemic countries or regions, avoiding to contact with infectious agents such as animals and vectors, and seeking medical care during the incubation period after returning from the epidemic countries or regions if they felt sick.

To ensure the reliability of the questionnaire, three experts for infectious disease were invited to review and revise it. Pilot surveys were conducted prior to the study, to confirm that participants could understand the survey questions and to ensure the validity of the questionnaire content, the Cronbach's coefficient alpha larger than 0.6. The KMO was over 0.6 and the p-value of Bartlett's test of sphericity was <0.05. Using the results of this pilot study, the survey questionnaire was amended to create a final version. All questions were either closed-ended or multiple choice.

of 1.49 billion disability-adjusted life years (DALYs) are lost every year to diseases of infectious origin.^{7,8}

The burden of morbidity and mortality associated with infectious diseases falls most heavily on people in developing countries, and particularly on infants and children (about three million children die each year from malaria and diarrhoeal diseases alone).⁹

Developing countries such as India suffer disproportionately from the burden of infectious diseases. India the second most populous country in the world is in the midst of a triple burden of diseases; the unfinished agenda of communicable diseases, noncommunicable diseases linked with lifestyle

changes, and emergence of new pathogens and overstretched health infrastructure.¹⁰

A study about Zika virus knowledge in suburban New York city showed that over 90% participants were aware of ZIKA transmission by mosquitoes¹¹, which was higher than our result about 18.75%. Moreover, the sexual transmission of ZIKA was seldom mentioned by most of the participants, which was similar to other studies showing low level of knowledge about sexual transmission in Brazil¹², Peru¹³, and USA.¹⁴

Our findings showed that education and income play the important and positive roles in the knowledge of emerging and reemerging infectious diseases. Although a study about the ZIKA knowledge from suburban New York showed that the education was unrelated to the knowledge¹¹, our finding was consistent with previous studies in communicable and noncommunicable diseases, which demonstrated that high educational status was correlated with improved vector borne diseases prevention knowledge¹⁴ and the participants with lower educated and those with lower income had higher prevalence of chronic diseases.¹⁵ Health inequalities have persisted among different socioeconomic groups.¹⁶

It highlighted that we should pay more attention to the public with low education and/or low income on health information. Taken together, the combination of traditional media, new media, and healthcare professional experts would be a better choice to improve the knowledge about emerging and reemerging infectious diseases in the public.

CONCLUSION

A meaningful response must approach the problem at the systems level. A comprehensive national strategy on infectious diseases addressing the challenges of emerging and re-emerging infections cutting across all relevant sectors, both governmental and nongovernmental, should be in place. Identification of national centres of excellence and their capacity building is of critical importance. These centres of excellence should be encouraged to develop networking and partnerships between public health organizations to improve their individual scientific capacity, share best practices and expand collective knowledge base. Concerted efforts are also needed to develop advanced countermeasures such as surveillance tools, diagnostic tests, vaccines and therapeutics through basic, translational and applied research. Sensitive rapid response mechanisms at various levels of health service are the cornerstone to detect public health threats and respond quickly enough to protect valuable human lives. National commitment and comprehensive efforts are necessary at all levels of health services in order to meet the threat of emerging and re-emerging infections.

REFERENCES

1. Bhatia R, Narain JP, Plianbangchang S. Emerging infectious diseases in East and South-East Asia. *Public Health in East and South East Asia*. 2012;43-78.
2. WHO. MERS situation update-Nov. 2019 (2019).
3. Lederberg J, Hamburg MA, Smolinski MS, editors. *Microbial threats to health: emergence, detection, and response*. National Academies Press; 2003 Sep 25.
4. Yuan J, Liao Q, Lau EH, Yang ZC, Ma XW, Chen JD, Liu YH, Wang C, Tang XP, Liu YF, Leung GM. Early Public Response to Influenza A (H7N9) Virus, Guangzhou, China, May 30–June 7, 2013. *Emerging infectious diseases*. 2014 Jul;20(7):1238.
5. Liu W, Zhang Z, Chen J, You X. Cross-Sectional study on acceptability of the media channels about ebola virus disease in Guangzhou, China. *Vector-Borne and Zoonotic Diseases*. 2018 Sep 1;18(9):475-8.
6. Della Polla G, Pelullo CP, Napolitano F, Lambiase C, De Simone C, Angelillo IF. Knowledge, attitudes, and practices towards infectious diseases related to travel of community pharmacists in Italy. *International Journal of Environmental Research and Public Health*. 2020 Mar;17(6):2147.
7. Taylor LH, Latham SM, Woolhouse ME. Risk factors for human disease emergence. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*. 2001 Jul 29;356(1411):983-9.
8. World Health Organization. *Combating emerging infectious diseases in the South-East Asia region*. WHO Regional Office for South-East Asia; 2005.
9. Fauci AS. Infectious diseases: considerations for the 21st century. *Clinical Infectious Diseases*. 2001 Mar 1;32(5):675-85.
10. Quigley MA. Commentary: shifting burden of disease—epidemiological transition in India. *International journal of epidemiology*. 2006 Dec 1;35(6):1530-1.
11. Teich A, Lowenfels AB, Solomon L, Wormser GP. Gender disparities in Zika virus knowledge in a potentially at-risk population from suburban New York City. *Diagnostic Microbiology and Infectious Disease*. 2018 Dec 1;92(4):315-8.
12. Borges AL, Moreau C, Burke A, Dos Santos OA, Chofakian CB. Women's reproductive health knowledge, attitudes and practices in relation to the Zika virus outbreak in northeast Brazil. *Plos one*. 2018 Jan 3;13(1):e0190024.
13. Weldon CT, Riley-Powell AR, Aguerre IM, CelisNascimento RA, Morrison AC, Oberhelman RA, Paz-Soldan VA. "Zika is everywhere": A qualitative exploration of knowledge, attitudes and practices towards Zika virus among women of reproductive age in Iquitos, Peru. *PLoS neglected tropical diseases*. 2018 Aug 30;12(8):e0006708.
14. Heitzinger K, Thoroughman DA, Porter KA. Knowledge, attitudes, and practices of women of childbearing age testing negative for Zika virus in Kentucky, 2016. *Preventive Medicine Reports*. 2018 Jun 1;10:20-3.

15. Campostrini S, Dal Grande E, Taylor AW. Increasing gaps in health inequalities related to non-communicable diseases in South Australia; implications towards behavioural risk factor surveillance systems to provide evidence for action. *BMC public health*. 2019 Dec;19(1):1-1.
16. Marmot M, Goldblatt P. Importance of monitoring health inequalities. *Bmj*. 2013 Nov 5;347.