

# Public health awareness: knowledge, attitude and behaviour of the general public on health risks during the H1N1 influenza pandemic

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## Abstract

**Objectives** Providing health information during disease outbreaks is a fundamental component of outbreak control strategies. This study aimed to identify the importance of providing information that increases community health awareness on personal hygiene and safety measures and reduces fear of the spread of disease.

**Method** A 14-item questionnaire was designed de novo and emailed to the randomly chosen general public in Trinidad and Tobago during 2016 in the aftermath of an H1N1 epidemic. The questionnaire was intended to capture the awareness of the general public regarding the H1N1 influenza and included most dimensions of the ailment. The response choices were never open ended, either ‘yes’ or ‘no’ or ‘do not know’, while one response was on a Likert scale of 1–5.

**Results** Of the 120 mailed questionnaires, 110 of those returned were eligible to be included for analysis (94% response rate). The majority of the responders were male (68.2%) and of 56.3% were Indo-Trinidadian ethnicity. Overall, 98% of the responders knew the causative organism of the illness, while they were divided in their opinion regarding the mode of disease transmission. Also there were varied responses with

regard to the high-risk groups and mode of mortality in H1N1. More than three-quarters of respondents disagreed with the statement that it was a serious illness and more than half of the respondents agreed that it was possible to prevent it.

**Conclusion** Although the general public had reasonable knowledge regarding the influenza epidemics, they were still unclear regarding details of the information such as the spread of the illness as well as preventative measures. Health information dissemination should be enhanced to create more awareness regarding pandemics, especially salient information about the availability of a vaccination. The findings also highlight the importance of providing information that increases community health awareness on personal hygiene and safety measures and reduces fear of the spread of disease.

**Keywords** Public health awareness · Influenza H1N1 · Health information · Knowledge and attitude · Prevention

## Abbreviations

CNCD Chronic non-communicable diseases  
H1N1 Haemagglutinin (H) and neuraminidase (N) represent influenza A

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## Introduction

Providing accurate and correct information during public health emergencies such as pandemic influenza is a fundamental modality of outbreak control strategies. Early knowledge about the disease outbreak will help to understand the risk behaviour and assist the general public in responding quickly to the outbreak (Balkhy et al. 2010).

The role of the general public’s adoption of preventive measures is pivotal in containing the spread of epidemics

(Bults et al. 2015). There are reported gaps in the population's knowledge with regard to pandemics and their preparedness, especially when there are disparities in the dissemination of information as well as access to the media (Kouassi et al. 2012). Research on knowledge, attitudes and behaviour in the context of a pandemic can not only guide communication and mitigation strategies during the event, but can also inform future pandemic preparedness planning (Walter et al. 2012).

The Republic of Trinidad and Tobago is a twin island country situated off the northern edge of the South American mainland and is a fast-developing country. The demographic ethnic composition of Trinidad and Tobago is made up of Indo-Trinidadians—the country's largest ethnic group (37.6%), with people of African descent making up the country's second largest ethnic group (36.3% of the population) and 24.4% of the population considered to be of 'mixed' ethnic descent according to the 2011 census. There are small but significant minorities of people of European, Chinese, and Arab (Syrian/Lebanese) descent. Although 60% of all deaths in Trinidad and Tobago are due to chronic non-communicable diseases (CNCDS), outbreaks of infectious diseases such as dengue, chikungunya and influenza still manifest in the country. Trinidad and Tobago was previously affected by the influenza A (H1N1) pandemic during 2009; recently, during early December 2015 and January 2016, there was another outbreak of H1N1 influenza in Trinidad and Tobago in which 59 cases were identified and 9 people died. The Ministry of Health urged the citizens to take steps to prevent the spread of the current seasonal influenza, also known as the swine flu.

The Ministry of Health of the Government of Trinidad and Tobago release said that influenza is an acute illness that can be caused by several different viruses, including H1N1 (swine flu), H3N2 (dog flu) and other respiratory viruses that circulate worldwide. In the release, the Ministry also said that in tropical countries, influenza occurs throughout the year, unlike in countries with colder climates, where seasonal epidemics occur during the colder months. In Trinidad and Tobago, more than 6,000 suspected cases of influenza are being reported yearly. The warning came after news reports of a suspected H1N1 flu death in the southern part of the island. In practice, convincing the public that the threat is real is often a more pressing task for public health agencies than providing reassurance (Kamate et al. 2009). Moreover, panic and fear are usually created among the general public about the spread of H1N1 influenza outbreaks. Receiving the appropriate amount of information from valid sources may impact the adherence to infection control recommendations during pandemics (Etingen et al. 2013).

Against this background, in the immediacy of the newly emerging H1N1 influenza outbreak, this study aimed to conduct a baseline survey to examine the H1N1-related knowledge and attitudes of the general public about community health awareness. This study aimed to explore the awareness of H1N1 influenza-related information and preferences of the lay

public during the peak of the outbreak in Trinidad and Tobago concerning knowledge about the mode of transmission, availability of preventative measures including vaccination as well as treatment. The study intends to provide background information that may be used to enhance programmes that increase public health awareness about personal hygiene and preventative measures and reduce the fear of the spread of the disease.

## Method

During early December 2015 and January 2016, there was an outbreak of H1N1 influenza in Trinidad and Tobago in which 59 cases were identified and 9 patients died. This study was designed in the immediate aftermath of this outbreak to elucidate the awareness of the general public regarding the risks and preventative measures.

After institutional approval, a self-assessment questionnaire was designed *de novo* to capture information regarding the respondent's knowledge on H1N1 influenza, its symptoms, high-risk groups, the modalities of spread, importance of personal hygiene and safety measures to prevent the spread of the disease. The respondents were selected from the public telephone directory, and the selected respondents were contacted and requested to provide their email addresses. Informed consent was also obtained from the participants. The link to the electronic questionnaire and consent form was emailed to the respondents, who were requested to fill in the answers electronically. An initial pilot study was undertaken with ten respondents; the questionnaire and its components were discussed with these respondents to determine whether they found any aspect of the questionnaire difficult. After minor revisions, the final questionnaire was used for the survey.

The questionnaire consisted of 14 questions including demographic information such as gender and age, whether the patient had been infected in the past, awareness about H1N1 influenza including the possible causative organism, transmission, signs and symptoms, high-risk groups, methods of prevention, vaccine availability, treatment of H1N1 influenza, seriousness of the illness, common causes of death due to H1N1 influenza (Centre for Disease Control and Prevention 2009) and whether the general public needs to be worried about this disease. The respondents were asked to choose the appropriate answers. Many questions pertaining to the respondent's knowledge about different aspects of the prevention and treatment of H1N1 had choices as statements rather than open-ended questions; many responses were either yes, no or do not know, while response for the question regarding fear of the disease was on a 5-point Likert scale with a range of 'strongly agree' to 'strongly disagree'. All the responses were analysed using the Statistical Package for Social Sciences software, version 21.

## Results

One hundred twenty (120) questionnaires were mailed to the respondents, of which 113 responses were returned (94% response rate); however, three questionnaires were incomplete. Hence, one hundred ten (110) completed responses were finally analysed.

Table 1 shows the socio-demographic characteristics of the 110 respondents. The majority (68.2%) of the respondents were males. Regarding ethnicity, the majority (56.3%) were of Indian origin and 40% were of African origin, consistent with the general trend. The age groups of the respondents ranged from 18 to 61 and the major proportion (36.4%) belonged to the middle age group (between 35 to 44 years). Although there were some variations amongst the responses according to the demographic characteristics, this was not statistically significant.

Table 2 shows the knowledge of the respondents about the causes, mode of transmission, and signs and symptoms of H1N1 influenza. An overwhelming majority (98.2%) of the respondents knew a virus is the causative organism of swine flu (H1N1). There were differences of opinion on the mode of transmission of H1N1 influenza. While 44.5% of the respondents believed that the mode of transmission of H1N1 influenza is by aerosol droplets, 42.7% responded that ‘direct contact’ is the mode of transmission of this illness. Respondents did have good knowledge about the signs and symptoms of H1N1 influenza; 76% responded that in their opinion fever is the major sign and symptom of this illness.

More than half of the respondents stated their willingness to observe detailed public health measures, including receiving an H1N1 vaccine, wearing a facemask, keeping themselves away from those infected, staying away from public events and shopping areas, and reducing the use of public transportation.

**Table 1** Socio-demographic characteristics of respondents

Socio-demographic variables	Category	n	(%)
Gender	Male	75	68.2
	Female	35	31.8
Ethnicity	Indo-Trinidadian	62	56.4
	Afro-Trinidadian	44	40.0
	Mixed	4	3.6
Age	18 to 24	16	14.6
	25 to 34	30	27.2
	35 to 44	40	36.4
	45 to 54	19	17.3
	55 and above	5	4.5

All values are based on participant self-reporting

Table 3 depicts the responses regarding risk groups and prevention strategies. The respondents had divided opinions. While 37% were of the opinion that anyone can be infected by swine flu, 32% of the respondents stated that pregnant women are a high-risk group for contracting swine flu and 22% stated that young children and 19% that very old and frail people are high-risk groups. Regarding the methods of preventing swine flu, 52% were of the opinion that vaccination is the best method to prevent infection. Eighty-six percent of respondents also stated that severe respiratory illness is the major cause of death from swine flu.

Regarding the level of fear of H1N1 influenza infection, the proportion of participants who responded that they were ‘not at all fearful’ was 72.1%, and almost a quarter (23%) stated that they are afraid of the epidemic. A severe respiratory problem (asthma) was identified as a significant risk factor for pandemic H1N1 influenza requiring hospital admission. Regarding attitudes towards influenza A/H1N1, more than three-quarters of respondents disagreed with the statement that it was a serious illness and more than half of the respondents agreed that it was possible to prevent it.

## Discussion

The present study found that the general public in Trinidad and Tobago did have reasonable knowledge regarding H1N1 influenza. Although knowledge regarding the causative organism and modalities of the spread of H1N1 influenza was adequate, the responses showed some knowledge deficiencies about other aspects of the disease, e.g., regarding the high-risk groups and susceptibility to this illness.

Researchers have shown that the paradigms of disease prevention and health promotion largely depend on understanding the health behaviours as well as associations among such behaviours (Smith et al. 2009). As is well known, H1N1 influenza is a respiratory illness caused by the type A influenza-H1N1 strain virus. The current influenza pandemic, commonly known as swine flu, was caused by a new strain of the virus named Pandemic (H1N1) 2009 by the World Health Organisation (WHO 2009). The virus spreads from person to person and is transmitted as easily as the normal seasonal flu, passed to other people by exposure to infected droplets expelled by coughing or sneezing that can be inhaled or by contaminated hands or surfaces. These droplets typically spread about 1 m. They hang suspended in the air for a while and then land on surfaces where the virus can survive for 2 to 8 h. Anyone who touches these surfaces can spread the virus further by touching anything else. Hence, personal hygiene measures are extremely important in preventing the spread of the disease.

The present study showed that there were varied opinions in the general public about prevention methodologies. Prevention is very important in controlling the global spread

**Table 2** Causes, mode of transmission and signs and symptoms of swine flu H1N1 influenza

Causes of the swine flu (influenza H1N1)		Mode of transmission of swine flu (influenza H1N1)		Signs and symptoms of swine flu (influenza H1N1)	
Bacteria	1.8%	Direct contact	42.7%	Fever	76%
Virus	98.2%	Aerosol droplets	44.6%	Cold	1%
Others	0%	Others	12.7%	Shortness of breath	3%
No opinion	0%	No opinion	0%	Others	20%

of H1N1 influenza virus. The general public needs to be educated about various prevention methods such as covering one's nose and mouth with a tissue when coughing or sneezing, throwing tissues in the trash bin after use and washing hands with soap and water, and avoiding touching one's eyes, nose or mouth. The public must also be instructed that when they develop flu-like symptoms such as high fever, headache, body pains, sore throat, coughing and runny nose, they should visit their doctor or health centre and stay home from work, school or other public places such as shops and malls as long as the doctor recommends. Increased engagement in infection control practices has been reported by the general population in response to the H1N1 pandemic (Etingen et al. 2013). The respondents did show considerable behavioural changes such as using disposable tissues when coughing and sneezing, 'washing hands frequently', 'avoiding touching the nose, eyes and mouth without sterilising hands' and 'avoiding visiting crowded places'; however, this may be part of general hygiene measures and not specifically focused towards H1N1.

Using a facemask was accepted as an important mode of prevention of H1N1 influenza (Shilpa et al. 2014). Many respondents were willing to observe detailed public health measures, including wearing a facemask, keeping themselves away from those infected, staying away from public events and shopping areas, and reducing the use of public transportation, which is similar to the findings of a previous report (Wan-Arfah et al. 2012).

In our study, the general public showed their willingness to adhere to personal hygiene and protective measures; however, they seem not to have realised the real threat of the epidemic since the risk of spread was not strongly perceived. This was similar to a previous report from Bahrain (Janahi et al. 2011). An increased understanding of the effectiveness of risk communication strategies can provide useful information about

how policies and programmes can and should be implemented for effectiveness (Fitzpatrick-Lewis et al. 2010).

The present study also highlights that the general public was not very clear about the other ways to prevent transmission, which included vaccination. Overall, only half of the respondents responded affirmatively to a vaccine being a preventive measure, despite the fact that the Ministry had organised extensive advertising campaigns. Such deficiencies in knowledge could contribute to inadequate preventative practices by the general population and this is consistent with the very low immunization rate achieved in Trinidad (1.8%) (Ropero-Álvarez et al. 2012). There has been a strong call globally for public health officials to prepare for the influenza pandemic; there has to be cooperation between different agencies of the government for successful implementation of the epidemic preparedness programmes including immunisation (Chamberlain et al. 2012).

One of the probable reasons for the lack of clarity in the general public may be the fact that during the epidemic much information was propagated chaotically within the public, especially through social media. The information was not always checked for veracity and often was interpreted incorrectly or sometimes only partially understood by the population, and this needs to be taken into account for future successful communication in cases of epidemics. Communication inequality has been reported in the literature (Lin et al. 2014).

Signs of H1N1 influenza include fever, cough, headache, muscle and joint pain, sore throat, a runny nose and sometimes vomiting, diarrhoea and loss of appetite. Typical symptoms could manifest as sudden high fever (38 °C/100.4 °F or above) and sudden cough (Khuwaja et al. 2011). Fever was the most common symptom reported among patients with the H1N1 virus, followed by cough. Other symptoms may include tiredness, chills, aching muscles or loss of appetite. Severe illness

**Table 3** High-risk groups, methods of prevention and common cause of death from H1N1 influenza

High-risk groups for contracting H1N1 influenza	Methods of preventing H1N1 influenza	Common cause of death from H1N1 influenza			
Young children	22%	Proper hand washing	47%	Uncontrolled fever	21%
Very old frail people	19%	Protecting from sneezes and coughs	11%	Severe respiratory illness	86%
Pregnant women	32%	Vaccination	52%	Heart failure	1%
Anyone	37%	Others	0%	Kidney failure	1%



can include pneumonia, chest pain when taking a breath, respiratory failure and death. The present study found that the general public had reasonable knowledge about the signs and symptoms of H1N1 influenza.

Previous studies have shown that the knowledge or awareness regarding this illness is higher in older age groups, those with post-secondary education, people of higher socioeconomic status and employed persons (Tooher et al. 2013). The present study could not establish a distinct difference between demographic groups and knowledge.

The findings of the present study provide insight into the lay public's awareness and knowledge of high-risk groups and methods of preventing H1N1 influenza. The most important limitation of the study is that only a section of the population was covered in the survey via email and all the information obtained from the questionnaire was self-reported, so there could have been some reporting bias due to socially desirable attitudes. Nevertheless, the study provides insights into the general public's knowledge, attitude and behaviour in relation to H1N1 influenza. The findings have profound implications for future research and public awareness in health risk management of H1N1 influenza. The result provides data for future reference and research in the field of health education and creates more awareness among the public and health authorities.

In conclusion, the study shows that the public's health awareness and knowledge and attitudes concerning H1N1 influenza are reasonable, but may not be sufficient to protect them from the spread of the epidemic. There is a need to increase the knowledge, to change attitudes toward the prevention of H1N1 influenza as well as to change the kinds of practices that will contribute to the prevention of H1N1 influenza. This study suggested that health education is important for promoting the overall health of the public so that they will take precautions against H1N1 infection.

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#### Compliance with ethical standards

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**Conflict of interest** The authors declare that they have no conflict of interest.

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