Widespread public misconception in the early phase of the H1N1 influenza epidemic

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Summary
Objectives: To investigate the community responses and preparedness for a possible epidemic of H1N1 influenza in Hong Kong shortly after an imported case was confirmed.

Methods: A random sample of 550 Chinese adults in the Hong Kong general population was interviewed during May 7–9, 2009.

Results: The public did not perceive a high likelihood of having a local H1N1 outbreak, nor did they regard H1N1 as a threatening disease. Frequent hand-washing (73.6%) and use of face-masks in case of flu symptoms (47.9%) were prevalent. The public approved of governmental policies including the quarantining of hotel guests, was not panicking and perceived a high self-efficacy of self-protection. However, misconceptions were prevalent and the public avoided visiting crowded places (9.3%), which many people wrongly believed was a government recommendation.

Conclusion: Although the public response demonstrated vigilance and preparedness there were signs of complacency. Clear communication, updated scientific information and transparency on government decision making are warranted. Data of the study provide a baseline for an ongoing surveillance program to help shape policy and provide information to the international community.

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Introduction

The new H1N1 virus raises world-wide concern about the possibility of an influenza pandemic. As of May 23, 2009, 12,022 confirmed H1N1 cases were detected in 43 countries and 86 deaths had been reported.1 The WHO raised the influenza pandemic alert level to ‘Phase 5’ on April 29, 2009. A preliminary study showed that the fatality and infectivity of the new H1N1 virus is more infectious and fatal, as
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compared to seasonal influenza. In Hong Kong, the first confirmed case, a traveler from Mexico, was reported on May 1, 2009, leading to the closure and isolation of the Metropark Hotel and to the quarantining of 350 guests and staff from May 1–May 8, 2009. The Hong Kong alert level was raised to the highest ‘Emergency Response Level’. Six more confirmed imported cases were reported in Hong Kong from May 13 to May 24, 2009.

Surveillance of community responses at the beginning of an emerging epidemic is particularly useful to inform the government and the public of the level of preparedness. The SARS epidemic affected 26 countries and claimed 774 lives. Hong Kong was one of the worst affected countries; 299 lives were lost; panic was wide-spread and the economic loss created severe hardship in the community. The lessons learned from the SARS experience in Hong Kong and other countries demonstrated the importance of understanding community responses.

In Hong Kong, SARS-related perceptions and behaviors changed dramatically during the early phase of the outbreak. The prevalence of preventive behaviors increased sharply and remained high throughout the epidemic, and such measures contributed its control. Panic and worry were wide-spread during the epidemic and remained high in the post-SARS period. The general public avoided going out, avoided traveling to other countries and avoided social activities to a large extent. There were misperceptions about the nature of the epidemic (e.g., mode of transmission). However, a substantial proportion of the general public doubted the government’s ability to control the SARS epidemic. Travelers were less likely to adopt preventive measures when they were out of Hong Kong and those visiting mainland China delay seeking medical consultation for flu symptoms and waited until their return to Hong Kong. Similar studies were conducted to investigate community preparedness toward human-to-human H5N1 transmissions.

The objectives of this study was to investigate the community responses and preparedness for a possible epidemic of H1N1 influenza in Hong Kong, amongst the general population between Day 7 and Day 9 following identification of the first confirmed H1N1 case in Hong Kong. The results serve as baseline data of a series of ongoing surveillance studies on the H1N1 epidemic. No similar studies have been reported.

Materials and methods

Sampling and data collection

The study population comprised of all Chinese Hong Kong adults who were 18–60 years old. Anonymous telephone interviews were conducted by well-trained interviewers, using a structured questionnaire. Random telephone numbers were selected from an up-to-date telephone directory and over 95% of the households in Hong Kong have a fix-line telephone at home. The interviews were conducted from 6:30 to 10 p.m. to avoid over-representing the non-work population. One member was selected by the last-birthday-rule from each of the contacted households. Verbal consent was sought and the study was approved by the ethics committee of the Chinese University of Hong Kong. A total of 889 eligible respondents were identified, 265 (29.8%) refused to join the study, 55 (6.2%) could not be contacted, 19 (2.1%) did not complete the interview and 550 completed the interview. The response rate was hence 61.9% (550/889).

Measures

The structured questionnaire took about 20 min to complete. The items were modified from the questionnaire which was used in some avian flu studies and some SARS studies.

Data analysis

Descriptive results are presented in this report. SPSS version 16.0 was used for data analysis.

Results

Socio-demographic characteristics

The distributions are presented in Table 1. The age and gender compositions are more or less comparable to those of the recent census data (see footnote of Table 1).

Knowledge, misconceptions and unconfirmed beliefs

Of all respondents, 43.1% wrongly believed that the new H1N1 influenza is one type of avian flu. The prevalence of unconfirmed beliefs related to modes of transmission were high: ‘via eating well-cooked pork’ (6.9%), ‘via long-distance airborne aerosols (from one building to another)’ (39.0%), ‘via insect bites’ (25.3%) or ‘via water sources (such as rivers or reservoirs)’ (39.5%). The majority of the respondents (66.5%) possessed at least one of the 4 aforementioned misconceptions or unconfirmed beliefs (with 29.8% with ≥ 2 items).

In contrast, the prevalence of respondents not knowing that the virus is transmittable via droplets, via contact with affected persons and contact with contaminated objects were, respectively, 2.0%, 24.8% and 21.1% (39.2% gave ≥ 1 wrong answers to these 3 questions). A total of 38.7% wrongly believed that influenza vaccine against seasonal flu could effectively or very effectively protect one against the new H1N1 virus, and 42.9% believed that there are no effective drugs available to treat the disease.

Perceived risk, perceived susceptibility and perceived severity of the H1N1 epidemic

Only 22.1% of the respondents believed that there would be an outbreak of H1N1 in Hong Kong in the coming 12 months; corresponding figures for anticipating outbreaks in mainland China and in other countries were much higher (50.5% and 46.9%). Similarly, 53.6% and 48.1%
perceived that Hong Kong, as compared to China or other countries, would be less likely to encounter a H1N1 outbreak in the future 12 months. Only around 10% of the respondents believed that there are high or very high chances for themselves (7.5%), their family members (8.4%) or the general public (12.2%) to contract the virus in the future 12 months.

Of the respondents, 22.2% believed that H1N1 has high fatality (9.7% and 21.1% erroneously believed that the fatality associated with H1N1 is higher than that of SARS and avian flu, respectively) and 21.5% believed that it would result in permanent physical damage. When compared with the SARS outbreak, a minority of the respondents believed that H1N1 would have worse consequences in terms of infectivity (23.5%), duration of the outbreak (16.1%), total number of infected cases (6.6%), and economic loss (4.7%) in Hong Kong and that it would have less negative influence on oneself and one’s family (2.2%).

Support toward the Hong Kong Government

An overwhelming majority of the public supported the quarantine measure applied to the Metropark Hotel (necessary or absolutely necessary; 92.4%), and believed that the government would be likely or very likely to be able to control a future local H1N1 outbreak (84.0%) and that the government would have a better ability to control a H1N1 outbreak in the future than controlling SARS in the past (91.6%). The overall evaluation score given to the governmental performance with respect to the control of the H1N1 in Hong Kong was 7.3 (a scale of 0–10); the majority (86.7%) gave a score >5.0 (a rating >5.0 meant a ‘passing grade’).

The majority of the public would comply to quarantine measures if necessary (98.4%) and to governmental recommendations of consulting a doctor immediately in case of fever (95.5%) and making a declaration at cross-border customs if they had flu symptoms (89.3%). However, some personal hygiene measures which were recommended by the government were less likely to be recalled by the respondents in an open-ended question, such as ‘avoiding touching eyes and noses’ (6.9%), ‘washing hands with detergents in case of sneeze and coughs’ (16.2%), ‘do not attend school nor go to work in case of flu symptoms’ (10.4%) or ‘covering nose and mouth in case of cough and sneeze’ (13.1%). A high percentages of the public believed that Hong Kong would not have an adequate supply of vaccines (45.5%), drugs (38.6%) and personal protective equipment (32.2%) in case of a local H1N1 outbreak.

Prevalence and perceived efficacy of preventive measures

Hand-washing

The majority of the respondents were washing hands more frequently than prior to identification of the first local H1N1 case (73.6%); 91.4% of the respondents washed hands for >6 times a day (47.4% > 10 times a day). Almost all respondents believed that frequent hand-washing is quite or very efficacious in preventing the spread of the virus (97.6%).

Using face-masks in public venues

Of the respondents, 4.4% would definitely wear a face-mask regularly in public venues and another 19.5% were most likely to do so; 13.5% reported ever having worn face-masks in public venues; only 0.7% of all respondents said that they would never wear face-masks regularly in public venues and another 19.5% were most likely to do so; 13.5% reported ever having worn face-masks in public venues; only 0.7% of all respondents said that they would never wear face-masks regularly in public venues. The two most commonly mentioned factors affecting respondents’ decision to use of face-mask regularly in public venues in the future were increasing number of local confirmed H1N1 cases (49.3%) and reports of deaths of local H1N1 patients (13.1%).

Similarly, 47.9% of the respondents would definitely wear face-mask in public venues in case of flu symptoms (41.7% most likely to do so). Wearing face-mask regularly in public venues (93.3%) was seen by the public general as an efficacious measure to control the spread of the virus (quite or very efficacious); 40.7% erroneously believed that the Hong Kong Government was currently recommending
Avoid going to different places
Around 10–15% of the respondents were avoiding visiting crowded places (9.3%), avoiding going out (10.4%), avoiding traveling to other countries (13.5%) or avoiding visiting hospitals (14.8%), in addition to 40–50% (48.2%, 37.5%, 50.4% and 52.5%) indicating that they were most likely to avoid visiting such places. Avoidance of visiting crowded places is seen by the respondents as a very efficacious or efficacious means of prevention against transmission of the H1N1 virus (94.3%); 31.6% erroneously believed that the Hong Kong Government was currently recommending the public to avoid visiting crowded places.

Emotional responses
Only less than 5% reported they were presently in panic (4.4%), felt much depressed (1.6%) or were much emotionally disturbed due to the H1N1 epidemic; the majority (64.0%) indicated that the epidemic had presently no impact on one’s daily life. The median score assessing the level of emotional disturbance due to H1N1 was 4, as compared to the median score of 7 with respect to the recalled level of emotional disturbance experienced during the SARS period (0 = no stress at all, 10 = extremely stressful).

Discussion
As the H1N1 is a new virus, this study, therefore, filled up some important information gaps. The public in Hong Kong misconceived that H1N1 is airborne, waterborne and could be transmitted via various vectors such as insects. Misconceptions about modes of transmission about avian flu were associated with emotional distress in the general population. The public mixed up different types of emerging infectious diseases (such as avian flu and the new H1N1 flu). The confusion might have misled many respondents to believe that the H1N1 virus is as fatal as, or even more fatal, than the SARS and the H5N1 human avian flu viruses. Even more complicated confusions would occur if human avian flu cases were detected alongside with H1N1 cases, which is not impossible. The belief that there is no treatment for H1N1 cases might defer people from seeking medical consultation. These misconceptions and unconfirmed beliefs could also lead to potential panic in case of community H1N1 outbreak. This underlines the importance of government and health authorities providing consistent clear updates and information about the emerging disease as well as the need to continuously assess whether the messages are being understood within the community.

The public was, however, very supportive of the government and was very willing to observe governmental policies/recommendations such as quarantine and seeking medical consultation in case of flu symptoms. Learning from the SARS experience and following relevant recommendations, the Hong Kong Government set up its Centre for Health Protection and invested more in public health. Surveillance of infectious diseases and international communications has been much improved. These actions help build up public confidence.

The public was vigilant in its adoption of public health measures such as frequent hand-washing, use of masks and completing custom declaration forms when having flu symptoms. This preparedness might have been built upon the experience of the SARS epidemic, during and after which the awareness and practice of public health measures against respiratory infectious diseases as well as government infrastructures have been much improved. However, around 1⁄4 of the respondents were unaware of the fact that the virus could be transmitted via touching contaminated objects. Some other messages about personal hygiene measures such as avoid touching eye/noses had not been recalled by the respondents. Health education about the importance of these measures in reducing of H1N1 transmission is still required.

Emotional distress was relatively mild. However, people are already changing their routine lifestyle. A sizable proportion of the general public avoided going out or avoided traveling to other places, and many more were very likely to do so in the near future. Such behavioral changes do not seem necessary in the absence of community cases and could add further pressure to the economy already stressed by the global downturn. At the time of the survey, there were already reports that tourism was being seriously affected. The government needs to provide clearer guidelines to the public about whether it is necessary to avoid crowded places as part of the preparedness plan.

Regular use of face-masks in public venues was an icon of the SARS epidemic, and it is likely to be replicated in Hong Kong when/if the number of confirmed cases goes up or when there are local deaths. The effectiveness of the measure has been controversial as evidence is mixed, though there is some local evidence that the use of face-masks in public venues contributed to the control of SARS. Use of face-masks was seen by our study population to be an efficacious means of protection against H1N1. Some European countries are, however, advising against such a practice among the healthy population, whereas the Hong Kong government had endorsed it during the SARS period, though it had not done so at the time of the survey. The common use of face-masks might remind people of the stressful SARS experience, and anticipated panic with respect to avian flu was associated with one’s SARS experience. There is little reason for healthy people to use face-masks regularly at the time of this survey, but government guidance needs to be clear and authoritative.

The strategy of containment used in Hong Kong when the first H1N1 case was detected on May 1st, 2009. The hotel quarantine operation was seen by the government and the public to be a success since there was no local community spread. The apparent success might, however, have resulted in some degree of complacency – only 1/5 believed that there would be a local outbreak in the future year and over half believed that Hong Kong is exposed to a lower chance of H1N1 outbreak, as compared to other countries. Perceived susceptibility was low and perceived self-efficacy for protecting oneself from contracting the virus was very high. The public should be warned that the likelihood for having a community H1N1 outbreak remains very high, as
Hong Kong is an international travel hub, so that the general population would not be taken by surprise and panic would not grow when cases are detected, despite all the good preparedness that seemed to exist. The government should also explain clearly to the general public that the containment strategy would be replaced by a mitigation strategy at a later phase if there was a community outbreak and, therefore, misunderstanding or confusion in the community should be avoided as it would diminish public support for the government or cause unnecessary panic.

The study has a number of limitations. First, this was a cross-sectional baseline study. Second, the response rate was modest, though comparable to those of other relevant published studies. Moreover, the gender and age distributions were comparable to those of the census population data. Third, results were self-reported and social desirability bias may exist. The study is, however, anonymous. Fourth, the study was a descriptive one, as it aimed to describe global and multi-dimensional local community responses with respect to H1N1. Fifth, Hong Kong went through unique SARS experience, the results may not be comparable with those of other countries. It is likely that similar data will be obtained from other countries and can be compared with ours.

In summary, the public did not perceive a high likelihood of having a local outbreak and did not regard H1N1 to be a threatening disease. The public should guard against complacency as the risk for a local outbreak might have been underestimated. Misconceptions and unconfirmed beliefs are prevalent and need to be addressed. The public was very vigilant, with frequent hand-washing and wearing face-masks in case of flu symptoms. The importance of avoid touching contaminated objects and nose/eyes might, however, have been over-looked. The public was not presently in panic. However, there are reductions of public activities which might cause economic loss and many of the respondents wrongly believed that the government was currently recommending the public to avoid visiting crowded places. The public cast their vote of full support to the local government, which empowers the government to execute its preparedness plan.

It is recommended that the government and academics across Hong Kong should work jointly to create a communication platform with the general public, through which scientific knowledge and guidelines for adopting particular preventive measures can be disseminated. Since community responses to the H1N1 epidemic are fluid and dynamic, continual surveillance of community responses is valuable and would facilitate relevant governmental risk communication and health education efforts. International comparisons would allow us to be better prepared for pandemic in the future.

Conflict of interest

The authors declare no conflict of interest.

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