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Preparing for an influenza pandemic: healthcare workers' opinions on working during a pandemic

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Abstract

The aim of this study was to solicit opinions from healthcare workers (HCWs) as to their attitude to working during a pandemic. A cross-sectional survey of HCWs using a self-administered, anonymous survey was conducted between February 2007 and April 2007. The setting was a large Victorian metropolitan health service, employing over 10 000 staff. Sixty-seven percent of HCWs stated they would be available to work during a pandemic, 26% stated they would stay at home to care for their children, whereas 10% admitted they would stay away because of fear of catching influenza. The majority of employees expected to be provided with personal protective equipment, antivirals and vaccine (92%, 90% and 89%, respectively). HCWs also believed that family members should be supplied with antivirals and vaccine (64% and 63%, respectively), 20% believed they needed a place of residence while working, 45% were prepared to be relocated to another site, and 36% were prepared to change to another duty. The survey highlights several areas that need attention in preparing for a pandemic. Targeted education is required now for all those HCWs who will be expected to work during a pandemic. How we cope with the next inevitable pandemic depends on the depth of our preparation.

Introduction

Influenza experts have consistently warned of the possibility of a pandemic in the near future. Historically, pandemics have occurred at intervals of 11–42 years and it has now been 40 years since the last Hong Kong flu (H3N2) in 1968–1969.[1] Avian influenza (H5N1) has two of the three properties that are required for pandemic development. It is a new subtype of virus, so most people are immunologically naïve, and it is pathogenic to humans, with a mortality rate of over 50%.[2] Whether it develops the third requirement and undergoes mutation to enable it to transmit efficiently from human to human remains to be seen.

The provision of healthcare during an influenza pandemic will pose particular challenges. The scope of a pandemic is larger than the surge capacity of most (if not all) healthcare facilities to manage. Healthcare workers (HCWs) and first responders will be at high risk of exposure and will likely become ill at rates similar to the general population. This will reduce the number of HCWs available to cope with the expected influx of patients with influenza requiring care. The impact of a pandemic will be widespread and so help (resources, staff) from other hospitals are not likely to be available. Compounding staff shortages due to illness will be personnel who are absent from work because of the need to stay at home and care for dependents or because of fear of catching influenza themselves. Previous studies have shown that during disasters, many HCWs may be unwilling or unable to report for duty.[3] Hospitals will need to consider HCWs fears and the expectations of all employees to maximise staffing at a time when the number of staff available will be at a minimum.

Prompted by discussions at our institution on an appropriate response to pandemic influenza, we solicited opinions from our employees as to their attitude to working during a pandemic.

This study has previously been published in part, as a letter to the editor in the *Medical Journal of Australia*.[4]

Methods

The study was conducted in our institution between February and April 2007. Southern Health is the largest metropolitan health service in Victoria, Australia, providing services to a population of over 750 000 and employing over 10 000 staff. A self-administered, anonymous survey was placed on the hospital intranet. Staff were advised of its presence by personal email (medical staff), by advertisement on the intranet and in the Chief Executive Officer's newsletter. Additionally, as the survey was conducted during the annual influenza vaccination campaign, an opportunity to complete the questionnaire was also available when staff attended for their influenza vaccination. Surveys were either completed directly onto an electronic database (via intranet access) or returned to the investigator for entering.

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The survey included questions on personal characteristics such as sex, age, presence of dependent children and job classification. The job classification variable was collapsed into five categories: medical (consultants, registrars, residents, medical students), nursing, clinical support (dietician, social work, occupational therapy, physiotherapy, interpreter, pharmacy, security, patient services attendant), administration (including clerical staff) and hotel services. Respondents were also asked to respond to 16 statements using a 5-point Likert scale: 'strongly disagree', 'disagree', 'undecided', 'agree' and 'strongly agree'.

Pearson's χ^2 test was used to detect significant differences between positive responses (strongly agree or agree) from medical and nursing staff.

This study was an anonymous, infection control quality improvement study and, in line with our hospital's policy, was exempted from application to the Research Ethics Committee.

Results

We received 1440 completed surveys. Of the completed surveys, 137 (10%) were medical, 628 (43%) nursing and 352 (25%) clinical support staff (see Table 1). The mean age was 42 years (range 18–73), 83% were female and 36% had dependent children at home. These compared with the overall population within our network where medical, nursing and clinical support staff comprise 15%, 48% and 16%, respectively; females account for 79% of the population, 46% of staff are aged less than 40 years and 5% are over 60 years of age.

Responses to the 16 statements are presented in Table 2. Overall, 74% of respondents strongly agreed or agreed that they needed more education on avian influenza (medical 66%, nursing 78%, $P = 0.025$), and 48% believed that a pandemic would occur in the next decade (medical 39%, nursing 52%, $P = 0.025$).

Sixty-seven percent of all responders stated they would be available to work during a pandemic. Of the questions related to availability to work during a pandemic, 26% (18% medical, 27% nursing, $P = 0.05$) stated they would stay at home to care for their children, whereas 10% admitted they would stay away because of fear of catching influenza.

The majority of employees expected to be provided with personal protective equipment, antivirals and vaccine (92%, 90% and 89%, respectively), although more nursing than medical staff believed this to be the case (96% *v.* 89%, $P = 0.025$ for personal protective equipment; 93% *v.* 85%, $P = 0.05$ for antivirals). Sixty-four percent believed that the hospital should also supply their families with antivirals, and 63% thought family members should be given vaccine. Twenty percent of employees believed they would require a place of residence while working during a pandemic (32% medical, 24% nursing, $P = 0.05$), 45% were prepared to be relocated to another site (58% medical, 40% nursing, $P < 0.001$), and 36% were prepared to change to another duty (30% medical, 39% nursing).

Table 1. Demographic characteristics of the study population.

Characteristic	*n* (%)
Age (years)	
<20	2
20–30	210 (15)
30–40	312 (22)
40–50	429 (30)
50–60	306 (22)
Over 60	73 (5)
Gender	
Male	231 (16)
Female	1186 (83)
Dependent children	
Yes	512 (36)
No	873 (61)
Job classification	
Medical	137 (10)
Nursing	628 (43)
Clinical support	352 (25)
Administration	271 (19)
Hotel services	24 (2)

Discussion

The World Health Organization has urged all countries to prepare for the next pandemic, which it has stated is 'inevitable and possibly imminent'.[5] Models developed by Meltzer estimate that Australia will have to contend with an excess of up to 700 000 outpatient visits, 24 000 hospital admissions and 10 000 deaths.[6] Whether hospitals would have the surge capacity to care for such numbers is questionable. Within our own institution, we have modelled the impact of such a scenario.[7] For a pandemic with a 25% attack rate and a duration of 8 weeks, we will be faced with a peak admission rate of 500 per week (80 per day), a peak need of 56 ventilators operating at one time and intensive care unit capacity full in Week 2.

Measures to control the spread of disease will inevitably lead to a dwindling of health services in other areas. During the severe acute respiratory syndrome (SARS) outbreak in Toronto, difficult

Table 2. Healthcare workers opinions on working during an influenza pandemic: survey results.
NS, not significant

Questions	Total employees % (n = 1440)			Medical % (n = 137)			Nursing % (n = 628)			P
	Agree	Unsure	Disagree	Agree	Unsure	Disagree	Agree	Unsure	Disagree	
I feel I have appropriate knowledge of pandemic influenza	30	24	45	57	19	22	29	21	49	<0.001
I feel I need more education on pandemic influenza	74	11	13	66	9	20	78	10	11	0.025
I am aware of the protocol for caring for a patient with pandemic influenza	26	45	37	27	14	56	30	16	52	NS
I feel confident that Southern Health is undergoing appropriate planning for a pandemic	49	43	5	34	49	13	47	47	5	0.025
I think we will face an influenza pandemic in the next decade	48	43	7	39	46	11	52	41	6	0.025
I would expect to be available to work in a pandemic	67	23	7	73	20	4	70	21	7	NS
I would stay at home to care for my children	26	19	46	18	20	55	27	19	48	0.05
I would stay away due to fear of catching influenza	10	28	59	10	20	65	7	24	66	NS
I would expect the hospital to provide me with personal protective equipment	92	3	1	89	4	1	96	1	1	0.025
I would expect the hospital to provide me with antivirals	90	6	1	85	7	2	93	4	1	0.05
I would expect the hospital to provide my family with antivirals	64	22	11	62	20	12	66	20	10	NS
I would expect the hospital to provide me with vaccine	89	6	2	89	6	0	91	5	2	NS
I would expect the hospital to provide my family with vaccine	63	22	11	70	15	9	64	23	10	NS
I would require a place of residence while working during a pandemic	20	36	39	32	31	33	24	37	36	0.05
I would be prepared to be relocated to another site	45	24	24	58	15	20	40	25	32	<0.001
I would be prepared to be relocated to another duty	36	27	29	30	27	37	39	28	28	NS

choices about which medical services to maintain and which to put on hold had to be made. Thousands of people were denied medical care and some died before receiving any treatment.[8] Hospitals need to have plans for setting priorities should a pandemic develop in the future.

This survey was intended to identify employee attitudes and fears surrounding pandemic influenza. We received 1440 completed surveys. As the total clinical and non-clinical workforce in our health service is over 10 000, this is an overall response rate of 14%. However, as our main method of notification of the survey was via the intranet and email, the population that actually had knowledge of the survey was much smaller and hence we would estimate the response rate much higher. Nevertheless, we believe these responses to be a good representation of our health service population, with the demographics of responders comparing favourably with the general hospital population.

In the event of a pandemic, three major interventions for controlling person-to-person transmission include the use of vaccine, antiviral agents and social distancing.[9] A model based on analysis of the 1918 influenza pandemic estimates that in the developed world, one-third of transmissions will occur in the household, one-third in workplaces and schools and one-third in the general community.[10] Thus, HCWs will be infected in the home, community and hospital, and we will need to prepare for the possibility of up to 30% of employees absent for this reason.

HCWs may choose to stay at home to care for dependent children as 26% of our surveyed employees predicted they would. In the face of school and childcare centre closure during a pandemic,[11] it is hard to see how this figure can be reduced, despite the urgent need for their services in the hospital. Strategies need to be developed to enable health service delivery. Conversely, previous influenza pandemics may have actually started with children.[10,12] Therefore HCWs with children may be more likely to bring influenza into the healthcare setting. In view of this, work restriction for HCWs with ill children may need to be considered.

Only 10% of our study population cited the fear of contracting influenza in the workplace as a major factor in deciding not to come to work. HCWs should have the right to decide if they will attend work during a pandemic. However, past experience has shown that the majority believe it is their duty to attend during such mitigated disasters. There was little debate over the expected duty of HCWs during the SARS outbreak, even though some staff were infected and died as a result of their exposure.[13,14] Education may further reduce the fear of attending work. Our study showed that 74% believed they needed more education in this area. Barnett and colleagues have suggested that several issues can be addressed to improve the effectiveness of an emergency response. These include addressing the uncertainty around the safety of the working environment, emphasising the value of each employee in the emergency response and providing sufficient attention to stress management in the workplace.[15]

Pandemic planning must also include consideration of the risks to which HCWs can reasonably be expected to expose themselves and their families. Health services have a duty of care to minimise risks. Educating in advance of a pandemic, including the expected role of each HCW would assist with identifying potential risks. We have found that 92% of HCWs believe they should be supplied with appropriate protective equipment while working in the hospital, 92% believed they should be supplied with antivirals and 89% expected to be first in line to receive vaccination. This would be in keeping with the current pandemic influenza plan in Australia, where HCWs and others in essential services will be first in line to receive antiviral prophylaxis and pandemic vaccine.[11] Interestingly, although the majority of HCWs expect to receive pandemic vaccine, the annual uptake of influenza vaccine in our and other health institutions barely reaches 50%. Education is a priority here and should be commencing now, as evidence suggests that myths surrounding influenza vaccination contribute to HCWs refusal to be vaccinated.[16]

Many of our staff also believed that family members should have access to antivirals and vaccine (64% and 63%, respectively) if they were to come to work during a pandemic. Although this is probably not feasible in the current Australian plan,[11] given the fact that both vaccine and antivirals will be in short supply at least during the first wave of a pandemic, some thought in this area is worthwhile. The risk of influenza transmission to family members by front-line workers needs to be considered. Furthermore, the provision of antivirals and vaccine to close family members may also reassure HCWs and act as an extra incentive to work during a pandemic.

In order to protect their family members, 20% of our surveyed HCWs agreed they would require a place of residence while working during a pandemic. Few institutions would have an excess of rooms to house staff, but nearby facilities, that may be closed during a pandemic (e.g. motels, hotels, university accommodation), may be available to provide front line HCWs with accommodation. Such factors need to be considered in a health services' overall pandemic plan.

During a pandemic, some staff may need to move to another hospital and the majority of staff would face changes in job structure. In the 1918 pandemic, medical students ran entire wards, performing both medical and nursing duties.[17] We have found that 24% of all staff would not be prepared to be relocated to another site, while 29% were not prepared to take on another duty. Our figures reveal that medical staff were more open to the idea of site relocation during a pandemic but less responsive to the notion of a change in job structure than were nursing staff. Education and discussion of how to manage these sensitive areas is required. It is vital that all staff understand in advance the importance of their

role during an influenza pandemic, otherwise they will fail to present when they are most needed.[18]

Our survey has highlighted several areas that need attention in preparing for a pandemic. Targeted education is required now for all those HCWs who will be expected to work during a pandemic. Areas of importance include: education on hospital pandemic protocols; lectures on influenza preparedness; focussed education on the value of influenza vaccination; and infection control issues related to influenza.

How we cope with the next inevitable pandemic depends on the depth of our preparation. Health services and individual hospitals need to consider their ability to manage. They must plan well in advance to minimise the disruption that will occur.

Conflicts of interests

None declared.

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