ORIGINAL RESEARCH

Survey of Hospital Healthcare Personnel Response during a Potential Avian Influenza Pandemic: Will They Come to Work?

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There was no funding support for this study and manuscript. Charlene B. Irvin, retains all of the data for this study, and takes full responsibility for the integrity of the data and accuracy of the data analysis.

Keywords: absenteeism; avian flu; fear; healthcare workforce; pandemic; planning; safety

Abbreviations:
SARS = severe acute respiratory syndrome

Received: 01 January 08
Accepted: 21 April 08

Web publication: 27 August 2008

Abstract

Introduction: In order to prepare for pandemics, it is important to assess the likelihood that hospital personnel would report to work and to identify the issues that may affect this decision.

Objective: To survey hospital personnel regarding their attendance at work in the hypothetical event of avian influenza pandemic, and what factors might influence this decision.

Methods: A voluntary, confidential, institutional review board-approved survey was offered to a convenience sample of hospital workers regarding their willingness to report to work and what issues would be important in making this decision. Surveys not returned and individuals declining to participate were recorded.

Results: Of 187 surveys offered, 169 were completed (90% response rate): 34% were doctors, 33% were nurses, and 33% were clerical and other associates (other). The average age of the participants was 38 years, and 32% were males. Participants were asked: "In the event of an avian pandemic, and patients were being treated at this hospital, would you report to work as usual?". Of those who responded to the survey, 50% reported "yes", 42% reported "maybe", and 8% reported "no". Doctors were more likely than nurses or others to respond "yes" (73%), as were males (66%). For the "maybe" responders, the most important factor (83%) was: "How confident I am that the hospital can protect me". For 19% of the "maybe" responders, financial incentives would not make a difference for them to work, even up to triple pay.

Conclusions: Personnel absenteeism during a pandemic due to fear of contracting an illness may result in a significant personnel shortage. Ensuring worker confidence in adequate personal protection may be more important than financial incentives.

Irvin CB, Cindrich L, Patterson W, Southall A: Survey of hospital healthcare personnel response during a potential avian influenza pandemic: Will they come to work? ***Prehospital Disast Med*** **2008;23(4):328–335.**

Introduction

It has been suggested that the most important questions to ask regarding an influenza pandemic, is not if, but when a pandemic will happen.[1–4] An influenza pandemic would place a significant burden on all healthcare systems. The demand for increased emergency care, inpatient care, and intensive care unit (ICU) care would be substantial.[5] In fact, in an attempt to address the need to potentially ration intensive care, the Canadian health system has developed national guidelines to use in the event of a pandemic.[6]

The avian influenza H5N1 virus is considered the most likely current threat for a pandemic, and has been the focus of substantial funding, research, and preparedness planning.[7] Currently, the avian influenza primarily is transmitted from bird-to-bird; however, cases of bird-to-human and probable human-to-human transmission have been reported.[8–9] The current pandemic stage for an avian influenza pandemic is considered Phase 3: "No or very limited human-to-human transmission, revealing the concern regarding some cases suspected to be human-to-human transmission on a limited basis.[10] The greatest threat

relates to the possibility that the avian virus H5N1 will develop the capacity for sustained, efficient, human-to-human transmission. Should this occur, the development of a pandemic is a very realistic concern.[11]

The US Department of Homeland Security released its National Strategy for Pandemic Influenza Implementation Plan in May 2006. This report suggests that up to 40% of the available workforce may be absent for periods of about two weeks at the height of a pandemic wave. This is based on employees "...caring for ill family members at home, under voluntary home quarantine, minding children dismissed from school, following public health guidance, or staying at home out of safety concerns."[12] The proportion of the workforce that will be ill during the pandemic will be dependent on several factors such as the virulence of the virus, the transmission rate, the availability and effectiveness of a vaccine, etc. While this cannot be predicted, it may be possible to predict the proportion of the specific, key workforce who may not report to work due to safety concerns. Understanding the contribution to absenteeism based on fear of personal safety, along with assessing factors that would influence this decision, may be critical issues that the disaster plan must address.

In a previous study, it was suggested that the rate of absenteeism due to safety concerns among public health department employees might be as high as 46%.[13] There is limited information regarding hospital workers potential absenteeism during an influenza pandemic. In a study conducted in Germany, it was determined that only 52% of healthcare professionals disagreed with the statement: "It would be professionally acceptable for healthcare professionals to abandon their workplace during a pandemic in order to protect themselves and their families".[14] In this study, physicians (65%) had the highest rate of disagreement.[14] Another study involving general practitioners, indicated that the majority would be willing to care for pandemic victims.[15] In a survey of healthcare workers at 47 different New York healthcare facilities, researchers found that healthcare workers were most likely to report to work for a mass-casualty incident (83%) and least likely to report for work during a severe acute respiratory syndrome (SARS) outbreak (48%).[16]

As all hospital associates contribute to disaster relief efforts, estimating unanticipated absenteeism due to safety-related concerns is crucial to address in the disaster plan. Proactively, implementing strategies to encourage associates to report to work ultimately may be a key portion of the disaster plan. Therefore, it is important to understand what type of incentives would deter worker absenteeism. The objectives of this study were to: (1) determine the proportion of hospital associates who would or would not report to work during an influenza pandemic through administration of a voluntary confidential survey; and (2) determine what incentives or initiatives would be most important in their decision to report to work during a pandemic.

Methods

Study Setting and Population

This cross-sectional survey was done at a medical center in the US. The medical center is a teaching facility that is a designated American College of Surgeons (ACS) Level-II trauma center with 85,000 emergency department visits per year, and 600 inpatient beds. The emergency department has approximately 250 employees, and the hospital has approximately 4,800 employees.

Study Design and Protocol

An institutional review board-approved voluntary, cross-sectional survey was piloted using 10 individuals. During the pilot phase, the individuals were queried after completing the survey regarding the clarity of the questions, and asked to identify any ambiguity in the survey instrument. There were no major changes in the survey instrument after the pilot phase was completed.

A convenience sample consisting of 187 individuals was approached about their willingness to participate in the study. Individuals were selected from the emergency department break room, the nursing documentation area, and among individuals attending educational events by one of the authors, during four convenience periods (three weekday and one weekend night) in July and August of 2006. No attempt was made to limit the survey to one type of provider. As the individuals were approached, they were informed that a voluntary survey regarding influenza was being conducted and asked if they would like to participate. If people expressed interest, they were given the survey; the number of individuals declining to participate was recorded. Whenever possible, the surveys were collected immediately after completion. No respondent names were collected. All surveys were numbered so that those not returned could be counted as non-responders. The surveys only were offered in English, and no non-English speaking employees were encountered. A copy of the survey instrument is in the Appendix.

The first part of the survey requested information regarding the respondent's role at the hospital and the usual location where they worked. They also were asked age, gender, marital status, and other demographic, ethnic, and educational information. The key outcome measured was the answer to the question: "In the event of an avian influenza pandemic, and patients were being treated at St. John Hospital and Medical Center, would you report for work as usual?" Respondents were given three choices: "Yes", "Maybe", and "No". Those who answered maybe were offered four possible reasons for their response (Appendix).

The respondent also was asked to imagine the scenario of an influenza pandemic in which patients were being treated at St. John Hospital and Medical Center. In this hypothetical scenario, there was a 50% mortality rate with treatment, and 10% of the general population was determined to be sick. The 50% mortality rate was chosen because of the current, estimated mortality rate with avian influenza. With this in mind, the respondents were asked to rate their willingness to report to work if offered various incentives. Incentives included: (1) triple pay; (2) a guaranteed influenza vaccine for the workers and their families; (3) personal protection attire (including a suit, mask, goggles, shower); and (4) antiviral medication for the workers and their families, as well as a quarantined place where they might receive care should they become infected. There also was a section for the

	%	n
Gender	1%	2
What is your position?	<1%	1
Where do you work?	<1%	1
Age	7%	12
Marital status	11%	12
Do you have a child <18yrs old?	10%	17
Ethnicity	3%	5
Level of highest education	19%	32

Table 1—Demographic questions with missing data elements and proportion missing (n = 169)

respondent to write any additional incentives that would increase their willingness to report to work.

Data were input into Excel (Microsoft Inc., Redmond WA) and any potential differences between types of healthcare workers were processed using chi-square analysis. Statistical significance was defined as $p \leq 0.05$.

Results

Surveys were offered to 187 individuals, and 169 were returned (90%). Nine individuals declined to participate, and nine surveys were not returned. Not all of the respondents answered every question; the majority of unanswered questions related to demographic information (Where you work, 5%; age, 7%; marital status, 11%; have a child, 10%; ethnicity, 3%; level of education, 19%) (Table 1). All respondents answered the key question regarding their willingness to report to work in event of an avian influenza pandemic.

The professions of the respondents were distributed evenly among doctors, nurses, and other ancillary associates: 57 physicians (37 residents and 20 attending physicians), 55 nurses, 56 other associates (four environmental, 24 clerical, 28 other paramedical); and one was not identified. Respondents were primarily emergency department associates (107/160 (67%)). Almost half were married (77/151 (57%)) and 40% (61/152) noted that they had children under age 18 years. For the respondents that identified their ethnicity, 25/164 (15%) were African American, 108/164 (66%) were white, six were Arab, 10 were Asian, seven were Hispanic, and eight selected "other". The average age was 38 years, and 67% of respondents were females.

Only 54% of all respondents answered "Yes" to the question: "Do you feel you have an understanding of the avian influenza (bird flu) threat?" Doctors were most likely to feel they had an understanding of the threat, and Other personnel were the most likely to be unsure. For nurses, 22% responded "No", indicating they did not feel they had an understanding of the threat (Figure 1).

When asked: "If this flu became contagious (transmissible) from human to human, does that mean you may get it from another person?" a total of 90% responded "Yes". There were two non-responders to this question, and one non-responder to the hospital role query. When the data were organized according to hospital roles, doctors and other personnel were most likely to respond "Yes" (Figure 2).

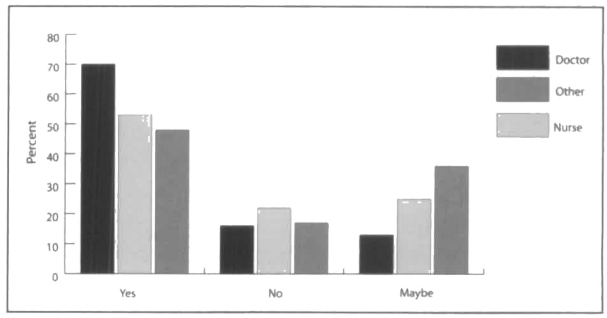

Figure 1—Response to question: "Do you feel you understand the avian influenza (bird flu) threat?"

When asked: "In the event of an avian influenza pandemic, and patients were being treated at St. John Hospital and Medical Center, would you report for work as usual?" 50% (85/169) responded "Yes"; 42% (71/169) responded "Maybe"; and 8% (13/169) responded "No, even if I might lose my job." (Figure 3). When organized by hospital role, doctors were most likely to respond to work (74% "Yes"), and nurses were most likely not to respond to work (15% "No") in this circumstance (Figure 4 and Table 2).

There was no difference in the willingness to report to work when comparing respondents married or those with children. Half of the respondents reported being married (51% (77/151)), and 54% (40/77) of the married respondents indicated they would report to work as usual, compared to 46% of identified single individuals (34/74) who would report to work as usual (p = NS). Only 40% (61/152) of the respondents reported having children <18 years old. There was no statistically significant difference in the proportion of respondents having children <18 years old that would report to work as usual (46% (28/61)), compared to those without children (54% (49/91)) who would report to work as usual (p = NS).

Some respondents only provided input to some of the incentive questions; thus the total for each incentive does not equal 169 (the number answering the survey). Interestingly, for 19% of respondents, monetary incentives (up to triple pay) would not make a difference, while for 52% of the respondents, providing triple pay would impact their decision to come to work.

Discussion

The results of this survey indicate that approximately 50% of respondents would report to work in the event of influenza pandemic. These results are similar to a study that was conducted in New York regarding healthcare workers' response during several different types of disasters, in which approximately 50% of respondents noted that they would plan to work in the event of a SARS outbreak.[16] The current study offers additional information on what factors may influence the decision to come to work. The importance of providing adequate protection for the workforce may be very helpful in minimizing absenteeism.

Considerable focus has been directed to influenza pandemic planning. Although substantial resources have been

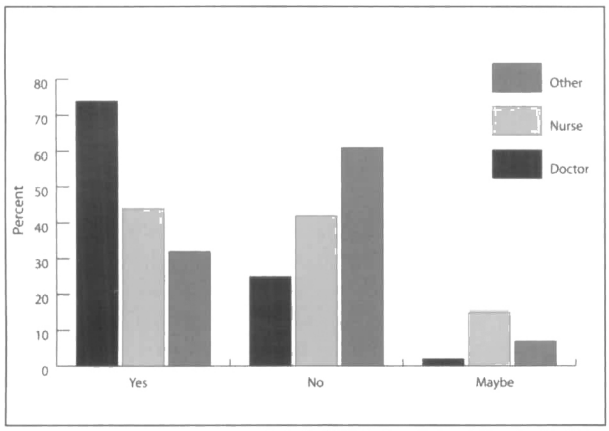

Figure 2—Response to question: "If this flu became contagious (transmissible) from human to human, does that mean you may get it from another person?"

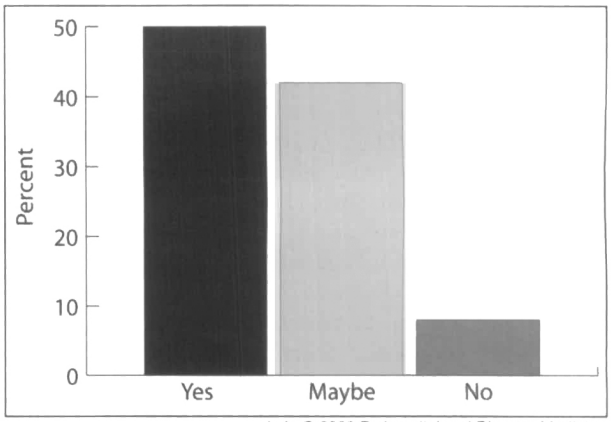

Figure 3—Overall responses to question: Would you come to work?

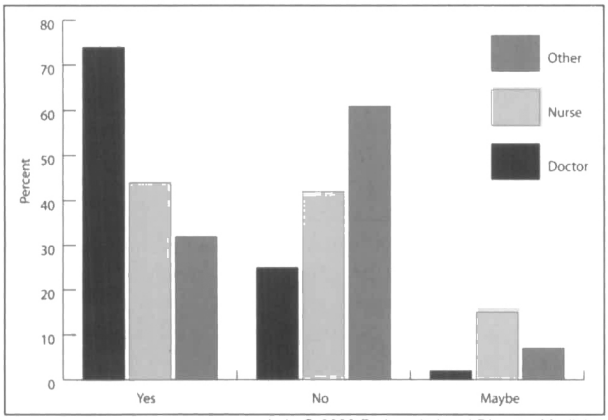

Figure 4—Responses to questions: Would you come to work as usual?

	Yes	Maybe	No, even if I might lose my job
Doctor	42/57 (74%)	14/57 (25%)	1 (2%)
Nurse	24/55 (44%)	23/55 (42%)	8/55 (15%)
Other	19/56 (34%)	34/56 (61%)	4/56 (7%)

Table 2—Results for question: "In the event of an avian influenza pandemic, and patents were being treated at St. John, would you come to work as usual?"

utilized to stockpile antiviral medications, vaccine development, and other planning activities, little has been directed at developing initiatives to provide confidence in the healthcare work force regarding safeguards to keep them from becoming ill.

The pandemic plans involve an educational component, but this relates to providing information on infection control behavior,[12] and about providing training, education, and informational material regarding employee health and safety.[17] No portion of the plan addresses the importance of developing workers' confidence regarding the ability of infection control practices to keep the workforce safe. Providing information to the workforce on infection control practices, as suggested in the national pandemic plan, falls short of initiating open and honest conversations with the staff workforce about realistic pandemic risks in the workplace, and what initiatives will be enacted to keep them safe. Discussions regarding what the workers can do to keep themselves safe (i.e., frequent hand washing, etc.), and what the employer will do to ensure their safety (liberal availability of masks or gloves, if appropriate) may be necessary. Although this only may involve improved and open communication, without this portion of the plan, the workforce may be deficient and all efforts at planning may fail.

Pandemic planning experts suggest that government and private entities assume that up to 40% of the workforce may be absent for a variety of reasons (quarantined, caring for children, caring for sick relatives, and/or personal safety fear).[12] If this study on hospital healthcare workers were extrapolated, absenteeism related to fear regarding personal safety in the hospital may exceed the total estimation of absentee workforce. When the ill workers, the workers absent due to caring for ill relatives, or quarantined workers are added to the proportion not reporting because of safety concerns, the current estimate may be a substantial underestimate of the workforce that likely will be absent.

The media is proliferate with discussions of inadequate preparedness for a pandemic[18] and potential predictions of high mortality rates during a pandemic,[19] along with other panic-provoking stories.[20] In fact, vaccine prioritization plans are being developed to help determine who should get the vaccine first, with the anticipation that early in the

pandemic, the vaccine will be in short supply.[21] Some experts warn that during the first six months of the pandemic, there will be inadequate supplies of vaccines.[22,23] With all of these widespread stories, it is understandable that the general public and the healthcare workforce have concerns regarding their safety in the hospital setting.

Although the media tend to focus on newsworthy stories, such as the anticipated high mortality rate of avian influenza in humans (approximately 50%), the bias of this number rarely is discussed. Many individuals with minor infections may not be reporting to healthcare facilities in developing countries, making the actual mortality rate after infection much lower than reported (spectrum bias that only those extremely ill will report to healthcare facilities in countries like Indonesia, etc.).[24] Additionally, news stories compare an upcoming pandemic with the Spanish flu and report on the millions that died worldwide in 1918. However, the mortality rate related to this virus was only about 2%.[24] This type of honest and open information helps put the risk into a more realistic perspective, and may be important to convey to the healthcare workforce in an effort to alleviate panic.[25] The World Bank Lead Economist for East Asia and the Pacific, Milan Brahmbhatt, noted in 2005: "A key policy question for government is therefore how to win the trust and confidence of the population, minimize panic and disruption and indeed mobilize the public as a key partner in beating the disease. Here an honest, transparent public information policy is likely to be critical."[22]

Finally, in a previous public healthcare survey,[13] perception of the importance of one's role in a pandemic response was associated with a self-described likelihood of reporting to work during a pandemic. Many ancillary associates (secretaries, laboratory technicians, housekeepers, etc.) may feel that their individual contribution is not important. However, as they support the infrastructure of the hospital, their reporting to work during a pandemic becomes imperative. Communicating the realistic risk to these individuals (not involved directly in patient care), and also the importance of their contribution to the pandemic response may be vital.

Although there may be a substantial proportion of individuals who don't report to work due to the fear that their personal safety may be at risk, the solution to this challenge likely is not costly. Most respondents want to be assured of personal safety. Many healthcare safety initiatives already may be planned for activation (vaccine for healthcare workers if available, personal protection equipment plans, etc.). However, if the workforce is not informed of the realistic risk and associated plans to be enacted to minimize exposure, they may not report to work. Communication, open discussions, and education regarding the realistic circumstances of healthcare workforce safety are important components of the pandemic response that must be initiated prior to any pandemic situation.

Limitations

A substantial limitation of this study is that it only was offered at one institution. It may not be reasonable to assume that healthcare associates in other institutions would respond in the same way. However, even at this small institution, it reveals the importance of educating the healthcare workforce regarding safety initiatives that would be in effect during a pandemic. This open discussion with employees, missing from the current pandemic planning process, may be very important even if it decreases only slightly the absenteeism from a lack of confidence in the safety initiatives.

One of the biggest limitations to this study is that it only reports what individuals say they will do, and not what they actually will do. Although respondents may respond one way in a survey, their behavior when confronted with the actual situation may be different. Because it is more heroic to respond that they would report to work in the event of a pandemic, it may not represent the actual number who would report. It is easy for anyone to respond on a survey that they would be responsible socially and professionally and report to work; however, during a real pandemic with neighbors and relatives dying, workers may prefer to stay at home with their family rather than risk contamination. If the perceived risk (contracting the illness and dying or transmitting it to their family) is greater than the benefit (keeping their job, continued income, social responsibility), the number of workers electing not to report to work may be greater than the estimate obtained from this survey.

Another limitation is that this is a small survey using a convenience sample. It may be that individuals working on the night shift or at other times would have different responses. Additionally, as this survey was handed out in person, it provided less anonymity than if it were mailed or offered on-line. Although no names or identifiers were collected, individuals still may have felt uncomfortable giving completely honest answers.

Conclusions

During any pandemic, rapid public health response to prevent the occurrence of new cases, coupled with treatment of victims, and maintenance of a viable healthcare delivery system for the public are essential. The results of this small survey suggests that the absenteeism related to fear of contracting influenza may lead to higher absenteeism than previously predicted. Therefore, discussion and education of healthcare workers regarding the realistic risk of infection along with measures that are in place to protect them is important. Confidence in health safety systems during a pandemic is extremely important in alleviating panic and assuring the availability of the healthcare to respond as anticipated.

Acknowledgements

The authors thank Ruth Moore, St. John Hospital and Medical Center, for her expertise in statistical analysis. The authors also acknowledge Angela Ledbetter, MD for her assistance with data review. They also acknowledge and thank Karen Hagglund, MS for her assistance with survey instrument development and revision. There is no conflict of interest with any of the authors of this manuscript. There were no financial interests or relationships regarding this study and manuscript.

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Appendix—Survey instrument *continued on page 335*

Study No. _____

Bird Flu Survey

Researchers in the St. John Hospital and Medical Center Emergency Department are conducting a survey about the willingness of associates to report for work in the event of a 'bird flu' (otherwise known as avian influenza) pandemic (worldwide spread of the infection). Participation in this survey is voluntary and your responses will be kept confidential. Participation in this survey and the answers you give will **not** impact your employment at St. John Hospital and Medical Center.

What is your role at the hospital? Please check your job category and circle your primary location:

☐ Environmental	OR	ED	Floor	ICU	Varied
☐ Nursing	OR	ED	Floor	ICU	Varied
☐ Clerical	OR	ED	Floor	ICU	Varied
☐ Other paramedical:	ED	Floor	ICU	Varied	
☐ Technician Other_____					
☐ Resident circle specialty	EM	IM	Surg	Peds	FP Other_____
☐ Attending circle specialty	EM	IM	Surg	Peds	FP Other_____

Age:_____ Gender: ☐ Male ☐ Female Marital Status: ☐ Single ☐ Married

Do you have any children under age 18? ☐ Yes ☐ No

Ethnicity:
- ☐ African-American
- ☐ Arab-American
- ☐ Asian
- ☐ Hispanic Origin
- ☐ White
- ☐ Other _____

Years of education completed:
- ☐ Some high school
- ☐ High school graduate
- ☐ Some college
- ☐ College grad
- ☐ Postgraduate

Do you feel you understand the avian influenza (bird flu) threat? ☐ Yes ☐ No ☐ Unsure

If this flu became contagious (transmissible) from human to human, does that mean you may get it from another person?
☐ Yes ☐ No ☐ Unsure

In the event of an avian influenza pandemic, and patients were being treated at St. John Hospital and Medical Center, would you report for work as usual?
- ☐ Yes. I would plan to be at work as scheduled.
- ☐ Maybe, it would depend on (mark all that might apply):
  - ☐ How confident I am that the hospital can protect me
  - ☐ How many patients were being treated at St. John
  - ☐ If the treated death rate was a lot less than the estimated death rate of 50%
  - ☐ Other_____
- ☐ No, I would not plan to work in this event, even if it meant I might lose my job.

https://doi.org/10.1017/S1049023X00005963 Published online by Cambridge University Press

Appendix—Survey instrument

continued from page 334

Imagine an avian influenza pandemic with patents being treated at St. John Hospital and Medical Center. Assume that among our patients the death rate was 50% (half of the patients die, even after treatment). Also assume that about 10% of the general population was sick.

With this in mind, please rate how following incentives that might impact your decision to work.

Would you report to work if:	**YES, this would definitely make me come to work**	**MAYBE, I might consider coming to work**	**NO, I still wouldn't come to work**
the hospital offered you pay and 1/2?			
the hospital offered you double pay?			
the hospital offered you triple pay?			
you were guaranteed an influenza vaccine?			
you were guaranteed vaccine for all your family members?			
you were guaranteed an influenza-proof mask, goggles, suit, and had a place to take a shower before leaving?			
you knew the hospital checked all working associates daily for any signs of bird flu, and if they did appear sick they would not be allowed to work?			
you were guaranteed antiviral medicine (such as Tamiflu) if you had an unprotected exposure to an ill patient?			
you were guaranteed medicine to help prevent infection daily (such as Tamiflu) regardless if you had a known exposure?			
you were guaranteed a quarantined place to go to receive care in the event you did get sick (so you wouldn't have to go home if you were sick when you reported to work, or if you got sick at work)?			
you were guaranteed to be first in line to get antiviral medicine (such as Tamiflu) if you did get sick and the medication to treat this flu were in short supply?			
every day you worked you were given an extra dose of the preventive medicine (such as Tamiflu) for a family member?			

Place a check in one box for each question

In the event of an avian influenza pandemic, and patients were being treated at St. John Hospital and Medical Center, what incentive(s) would encourage you to report to work, if any?

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https://doi.org/10.1017/S1049023X00005963 Published online by Cambridge University Press