H1N1 Influenza A (Swine) Flu

Questions & Answers

June 12, 2009

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QUESTIONS AND ANSWERS

CONTENTS

A. MEDICAL SECTION
   i. Introduction to Influenza, Swine Flu and H1N1 Influenza A (swine) Flu
   ii. Transmission
   iii. Incubation, Infectivity and Infectious Period
   iv. Clinical Features
   v. Severity
   vi. Diagnosis
   vii. Treatment
   viii. Prevention and Personal Protective Equipment (PPE)
   ix. Vaccination
   x. Other Questions

B. EPIDEMIOLOGY
C. TRAVEL
D. MENTAL HEALTH
E. COMMUNICATIONS

A. MEDICAL SECTION

i. Introduction to Influenza, Swine Flu and H1N1 Influenza A (swine) Flu

1. What is Influenza or "Flu"?
Influenza is an illness due to an influenza virus. It presents as an Influenza-like illness (ILI). An ILI is defined as a clinically unexplained elevated temperature of 37.8C or higher and systemic symptoms such as muscle aches ('myalgia') and fatigue (with or without chills or headache), or/ and respiratory symptoms such as cough (with or without a runny nose ("rhinorrhoea") or sore throat). During the peak flu season the combination of fever, cough, fatigue and myalgia has a sensitivity of 30% and a specificity of 80% in diagnosing influenza.

2. What is the Influenza virus? Describe it.
Of all the Q&A in this document this is the most difficult answer for non-care health professionals to understand! The influenza virus belongs to the Orthomyxoviridae family of viruses. This family includes three branches ("genera") of influenza viruses called influenza A, influenza B and influenza C. Influenza A viruses alone cause pandemics. Influenza A viruses contain a single-stranded negative sense RNA genome divided into 8 segments. This RNA genome codes all genes. Two of the gene products are surface

proteins found on the ''envelope' of the virus. These are the haemagglutinin (HA) and neuraminidase (NA). There are 16 HA and 9 NA types and individual viral strains may have any combination of HA and NA types. There are therefore 16x9 = 144 possible types of influenza A. HA is given the shorthand of 'H" whilst NA is given the shorthand of 'N'. As an example if you have a virus with HA typed 7 and NA typed 8 the flu virus would be called H7N8. Even a particular type of influenza A has several sub-strains. Thus, for example, H3N2 may have several sub-strains – and these occur because of a gradual genetic change ("mutation") and these relatively minor changes are called "antigenic drift". Every year the major human flu viruses show some degree of antigenic drift and we need to make new vaccines against the particular sub-strain circulating every year. Major changes in the make up of an influenza A virus can also occur due to a reassortment of the RNA fragments and this is called "antigenic shift". It is antigenic shift that is normally responsible for a pandemic.

3. What is Swine Influenza?

Swine Influenza (swine flu) is a respiratory disease of pigs caused by type A influenza virus that regularly causes outbreaks of influenza in pigs. The virus causing Swine flu was first isolated in 1930. Swine flu viruses cause high levels of illness and low death rates in pigs. Swine influenza viruses may circulate among swine throughout the year, but most outbreaks occur during the late fall (autumn) and winter months similar to outbreaks in humans.

4. Why is Swine flu in pigs a problem for humans?

Like all influenza viruses, including those that infect humans and birds, swine flu viruses change constantly. Pigs can be infected by avian (bird) influenza and human influenza viruses as well as swine influenza viruses. When influenza viruses from different species infect pigs, the viruses can exchange genes and new viruses that are a mixture of swine, human and/or avian influenza viruses can emerge. It appears that the current epidemic of H1N1 Influenza A in humans is due to a new virus which is a genetic mixture of avian, pig and human influenza.

5. I have heard several different names for H1N1 Influenza A (swine) Flu. What is the current name?

"Swine flu" was the name given to the outbreak with this new virus when it started in Mexico. Because of this association with pigs many organizations and individuals started to take pork off the menu. Egypt began to slaughter all its pigs on the false assumption that pigs could spread it to humans. As a result there was a great deal of pressure on the WHO and CDC to disassociate the name of the new virus with pigs. In fact the name "swine flu" is scientifically inaccurate because this new virus is a genetic mixture of swine, avian and human influenza. The WHO have now renamed this new virus Influenza A (H1N1) whilst the US CDC at first called it Swine-Origin Influenza A Virus (S-OIV) and as of 3rd May changed the name to H1N1 Influenza (swine flu). There is a certain amount of confusion with these names because H1N1 human virus circulates normally as one of the seasonal flu viruses. However from your viewpoint when you hear references to H1N1 influenza in the future you may assume that it refers to the "swine" flu.

6. Can humans catch swine flu? (this Q. refers strictly to the use of the term swine flu as the disease in pigs)

Yes but Swine flu viruses do not normally infect humans. Most commonly, these cases occur in persons with direct exposure to pigs (e.g. children near pigs at a fair or workers in the swine industry). In the past, CDC received reports of approximately one human swine influenza virus infection every one to two years in the U.S., but from December 2005 through February 2009, 12 cases of human infection with swine influenza were reported. In addition, there have been documented cases of one person spreading swine flu to others. For example, an outbreak of apparent swine flu infection in pigs in Wisconsin in 1988 resulted in multiple human infections, and, although no community outbreak resulted, there was antibody evidence of virus transmission from the patient to health care workers who had close contact with the patient. There was also an outbreak in soldiers stationed in Fort Dix in New Jersey in 1976 where there was short-lived human-to-human transmission. The current epidemic is due to a new type of flu virus with genetic material from swine, humans and bird influenza viruses and human-to-human transmission is clearly occurring.

7. What does the WHO Pandemic Level 6 mean?

The World Health Organization raised the alert level to Phase 6 pandemic on June 12, 2009. This means that the swine flu virus has caused sustained community level outbreaks in two or more countries in one WHO region, and that two such regions have been similarly affected. However, it should be noted that this classification simply denotes a high infection rate (or the spread of the disease) and does not take into account its severity (its ability to kill humans). Therefore, the WHO has been keen to advise people that the current swine flu pandemic is considered to be ***moderate*** as opposed to 'severe'. This assessment is

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based on scientific evidence available to WHO, as well as input from its Member States on the pandemic's impact on their health systems, and their social and economic functioning. The moderate assessment reflects that:

1. Most people recover from infection without the need for hospitalization or medical care.
2. Overall, national levels of severe illness from influenza A(H1N1) appear similar to levels seen during local seasonal influenza periods, although high levels of disease have occurred in some local areas and institutions.
3. Overall, hospitals and health care systems in most countries have been able to cope with the numbers of people seeking care, although some facilities and systems have been stressed in some localities.

WHO is concerned about current patterns of serious cases and deaths that are occurring primarily among young persons, including the previously healthy and those with pre-existing medical conditions or pregnancy. Large outbreaks of disease have not yet been reported in many countries, and the full clinical spectrum of disease is not yet known.

ii. Transmission

8. How does Swine flu spread?
Influenza viruses can be directly transmitted from pigs to people and from people to pigs. Human infection with flu viruses from pigs are most likely to occur when people are in close proximity to infected pigs, such as in pig barns and livestock exhibits housing pigs at fairs. Human-to-human transmission of swine flu can also occur. This is thought to occur in the same way as seasonal flu occurs in people, which is mainly person-to-person transmission through inhalation of secretions from coughs or sneezes from infected people or from contamination of the hands from infected surfaces and then inadvertent touching of the mouth or nose.

9. How does H1N1 Influenza A (swine flu) spread?
The new H1N1 (swine flu) virus spreads from human-to-human in the same way as seasonal flu i.e. person-to-person transmission through inhalation of droplets from coughs or sneezes from infected people or from contamination of the hands from surfaces contaminated by droplets and then inadvertent touching of the mouth, nose or eyes. In view of the fact that 25% of cases have had diarrhea the possibility of viral shedding in the feces and resultant transmission via the fecal-oral route should be considered.

10. Are surfaces contaminated by H1N1 Influenza A (swine) a source of infection?
Germs can be spread when a person touches something that is contaminated with germs and then touches his or her eyes, nose, or mouth. Droplets from a cough or sneeze of an infected person move through the air. Germs can be spread when a person touches respiratory droplets from another person on a surface like a desk and then touches their own eyes, mouth or nose before washing their hands.

11. How long can Influenza A viruses live outside the body?
We know that many viruses and bacteria can live 2 hours or longer on surfaces like cafeteria tables, doorknobs, and desks. Frequent handwashing will help you reduce the chance of getting contamination from these common surfaces. It is not known how long the H1N1 (swine flu) virus can live on surfaces but it is likely to be several hours. In an environmental survival study, influenza A virus placed on hard, nonporous surfaces (steel and plastic) could be cultured from the surfaces at diminishing titer for <24 to 48 h and from cloth, paper, and tissues for <8 to 12 h at conditions of 35% to 40% humidity and a temperature of 28°C. Higher humidity shortened virus survival. Virus on nonporous surfaces could be transferred to hands 24 h after the surface was contaminated, while tissues could transfer virus to hands for 15 min after the tissue was contaminated. On hands, virus concentration fell by 100- to 1,000-fold within 5 minutes after transfer. Transmitting infection from the surfaces tested would require a high titer of virus on the surface; such titers can be found in nasal secretions at an early stage of illness.

12. Can a person be infected by contact with blood from a person who has H1N1 Influenza ?
Yes, all influenza A viruses are capable of surviving outside the body - in blood, hard surfaces, etc. What is not known is how long the H1N1 can survive - using the other influenza A viruses as models, at least a few hours under favorable conditions and up to several days in certain limited conditions.

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13. Can people catch H1N1 Influenza A (swine) flu from eating pork?
Swine influenza viruses are not transmitted by food. You can not get swine influenza from eating pork or pork products. The H1N1 Influenza A (swine) virus is not *strictu sensu* a swine virus. It has infected a herd of pigs in Alberta, Canada. The WHO on May 6, 2009 cautioned against eating meat from sick and dead pigs infected with H1N1 Influenza A (swine) virus. The question arises whether or not you could get H1N1 Influenza A by eating pork from infected pigs. The answer is extremely unlikely. In the first place most countries have safeguards in place to prevent diseased pigs making it to market. Secondly, and most importantly, cooking pork to an internal temperature of 160°F (70C), or until pork is white and no longer pink, kills the swine flu virus and the H1N1 Influenza A (swine) virus as it does other bacteria and viruses. Proper handling and storing of raw pork is necessary, as well as maintaining rigid hand hygiene practices during food preparation. In fact nobody should eat undercooked pork as there is a great risk of contracting parasitic diseases such as trichinosis or cysticercosis, or bacterial diseases such as listeriosis, salmonella or E.coli. There is then **no reason to stop eating properly cooked pork or pork products**. Butchers involved in slaughtering and pork preparation should take the usual precautions to prevent pork contaminating their hands etc as there is a risk of transmission of *Streptococcus suis*, which can cause serious disease in humans.

14. Can H1N1 influenza be transmitted through foods?
No. According to FDA, influenza viruses are not known to be spread by eating food items. Influenza viruses are spread through inhalation or through touching contaminated surfaces and then touching the mouth, nose, or eyes.
http://www.fda.gov/oc/opacom/hottopics/H1N1Flu/faq_food.html

15. Could a sick restaurant worker transmit H1N1 Influenza A (swine) flu?
Yes – but only through the normal routes of infection, that is coughs and sneezes and touching contaminated surfaces and then touching the mouth, nose or eyes. Influenza is not known to be spread through consumption of a food item. However, in accordance with long-standing FDA recommendations, food workers experiencing symptoms of respiratory illness should not work with exposed food, clean equipment, utensils, linens or unwrapped single-service or single-use articles.

16. Should restaurants alter cooking methods to decrease the risk of H1N1 influenza A?
FDA indicates it is not necessary to alter cooking times or temperatures for any food products in order to reduce chances of contracting H1N1 Influenza A (swine) virus.

17. Do we need to be concerned about foods coming from Mexico?
No, H1N1Influenza A (swine) viruses are not transmitted by food.

iii. Incubation, Infectivity and Infectious Period

18. What is the incubation period of the H1N1 flu (Swine flu)?
The incubation period is the time it takes from getting infected to the time you first start showing symptoms of a disease. For seasonal influenza the incubation period is two days with a range of 1-7 days. We do not yet know the exact incubation period for H1N1 (swine flu) but current information suggests it is the same as for seasonal flu i.e. two days with a range 1-7 days.

19. What is the infectious period for H1N1 (Swine flu)?
The infectious period is the length of time in which a person can spread a disease. In seasonal flu the infectious period is for 24 hours before a person has symptoms until 7 days after they have had symptoms. It is uncertain but H1N1 (swine flu) appears to parallel seasonal flu.

20. When is someone who has H1N1 (Swine flu) able to spread it to others?
This is also answered in Q18. A person with H1N1 (swine flu) appears to be able to spread it to others for one (and possibly two) day before symptoms first occur. This is because a person infected with swine flu virus may have it present in their nose, mouth and throat for one to two days before they get symptoms. Spread of infection can continue for up to 7 days after symptoms first appear. Children, especially younger children, might potentially be contagious for up to 10 days.

21. When is a person with H1N1 (Swine flu) *most* infectious to others?
In seasonal flu a person is most infectious at the onset of symptoms and in the first few days after the onset of symptoms. Preliminary reports suggests that H1N1 (swine flu) parallels seasonal flu.

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22. How many people can an infected person transmit H1N1 (swine flu) to? How infectious is it?
The basic reproductive number (Ro) is essential to understanding the spread of an infectious disease. It is defined as the average number of secondary cases generated by a typical primary case in an entirely susceptible population. If the Ro is <1 transmission dies out. Measles has an Ro of around 15 meaning that one person infects fifteen person. SARS had an Ro between 2.8-3. The Ro in the 1968 flu pandemic was 1.89. Seasonal flu has an Ro of around 1.5-2.6 (UK) and 1.5-3 (USA). As of June 11, 2009, the Ro of H1N1 (swine flu) is currently around 1.4-1.6 (average 1.5) and this is similar to seasonal flu. However this Ro has been calculated from cases circulating in the spring and it is quite likely that the Ro will be much higher in the winter. It should also be remembered that when a novel flu virus first circulates the Ro typically starts out a little above 1.0 and then with each generation of transmission it will increase as the virus adapts to humans to make human-to-human transmission easier. Thus the Ro in the Spanish flu pandemic of 1918 was initially 1.5 but was 3.5 in the second wave several months later.

23. What is the definition of a close contact of a case of H1N1 Influenza A (swine) flu?
A close contact is defined as within 6 feet (2 meters) of an ill person who is a confirmed or suspected case of H1N1 Influenza A (swine) flu during the case's infectious period.

iv. Clinical Features

24. What are the symptoms of H1N1 Influenza A (swine flu) in humans?
The symptoms of H1N1 Influenza A (swine) flu in people appear similar to the symptoms of regular human seasonal influenza and include fever >37.8C (100F), (94%), aches & pains, cough (92%), sore throat (66%) tiredness, headaches, chills and lack of appetite. Some people with swine flu also have reported runny nose, nausea. Vomiting (25%) and diarrhea (25%) appears to be more common than in seasonal influenza. 38% of cases have had either vomiting or diarrhea. Severe illness (pneumonia and respiratory failure) and death has been reported with H1N1 Influenza A (swine) flu infection in people. Like seasonal flu, H1N1 Influenza A (swine) flu may be worsened by, and worsen, underlying chronic medical conditions.

25. What is the case definition for H1N1 Influenza A (swine) flu?
A *confirmed* case is defined as a person with an acute febrile respiratory illness with H1N1 Influenza A (swine) flu confirmed by one of the following tests: (1) real-time RT-PCR or/and (2) viral culture.
A *probable* case is defined as a person with an acute febrile respiratory illness who is positive for influenza A, but negative for H1 and H3 by influenza RT-PCR and has a history of contact as indicated below.
A *suspected* case is defined as a person with an acute febrile respiratory illness with onset (a) within 7 days of close contact with a confirmed case or (b) within 7 days of travel to a country where there are one or more confirmed cases or (c) resides in a community where there are one or more confirmed cases.

26. When should I go and see a doctor if I am sick?
If you develop fever, chills, unusual tiredness, muscle aching, loss of appetite, headache, cough then see your doctor. If you have these symptoms and have recently traveled, be sure to mention this to your doctor. Some people have reported diarrhea and vomiting in association with H1N1 swine flu. These symptoms may also be caused by seasonal influenza viruses or other respiratory infections.

27. What do I do if a family or household member develops flu-like symptoms?
If a family or household member of an employee in an affected area has fever, cough and symptoms that suggest an influenza-like illness (ILI) then the employee must assume the person has influenza and the employee is advised to (and depending upon company policy) quarantine himself or herself at home for 7 days or until it is proven that the person does not have H1N1 Influenza A. (swine). The employee should increase hygienic measures at home, consider wearing a mask (preferably one of the next-generation 'intelligent' masks) and do frequent hand-washing to try and prevent transmission. It is important to educate ***all*** household members in proper hygiene practices.

28. How can I tell the difference between H1N1 Influenza A (swine) flu and seasonal flu?
You cannot tell the difference clinically as both may have exactly the same symptoms. In some parts of the world the season for seasonal flu is just ending and unusual outbreaks of flu after this season is over may lead to a suspicion of swine flu. In other parts of the world the seasonal flu 'season' is just beginning whilst in some parts of the world (e.g the tropics) 'seasonal' flu occurs year round. In such cases there is no clue available to distinguish seasonal from H1N1 Influenza A (swine) flu and the distinction must be made by laboratory testing. In Canada 70% of suspected cases of H1N1 Influenza A (swine) flu turned out to be due to seasonal flu.

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v. Severity

29. What is meant by the Case Fatality Rate (CFR)?
The Case Fatality Rate (CFR) of a disease is the percentage of people who die from any particular disease. Thus if there are 1,000 cases and 100 die the CFR is 10%. If there are 1,000 cases and 1 person dies the CFR is 0.1%. In the 1918 flu pandemic the CFR was around 2-2.5%. In the 1957-58 pandemic the CFR was 0.2-0.5%. In the 1968-69 pandemic the CFR was 0.15-0.25%. Seasonal flu has a CFR of around 0.2% and around 36,000 die from seasonal flu in the USA annually whilst between 250,000 – 500,000 die globally from seasonal flu annually. The CFR in seasonal flu is greatest in the very young and the very old and in those with chronic underlying medical conditions.

30. What is the CFR of H1N1 Influenza A (swine) flu? How serious is it?
According to the World Health Organization, on June 12, 2009 it designated the swine flu pandemic as ***moderate*** as opposed to 'severe'. This assessment is based on scientific evidence available to WHO, as well as input from its Member States on the pandemic's impact on their health systems, and their social and economic functioning. The moderate assessment reflects that:

(i) Most people recover from infection without the need for hospitalization or medical care.

(ii) Overall, national levels of severe illness from influenza A(H1N1) appear similar to levels seen during local seasonal influenza periods, although high levels of disease have occurred in some local areas and institutions

(iii) Overall, hospitals and health care systems in most countries have been able to cope with the numbers of people seeking care, although some facilities and systems have been stressed in some localities.

However, the WHO also advises that we do not have full information on how virulent (serious) this new strain of swine flu is. At the beginning of this epidemic Mexico reported a significant number of deaths but laboratory confirmation was lacking in many cases and the number has been revised down. As of June 11, 2009 there were 27,737 official cases with 141 deaths. This gives an overall CFR of 0.51%, and has recently been trending downwards. As time proceeds the CFR will become clearer.

31. How do you explain the relatively high death rate in Mexico from H1N1 and the low death rate elsewhere?
We do not know the reason for this. Some think that there were tens of thousands of cases in Mexico with all but the most serious hidden in a background of illness in a crowded population. It may also be because victims sought medical help late in the infection process and that the hospitals were ill-equipped to deal with the influx. According to Mexican authorities, this has largely been remedied.

32. Will the CFR of H1N1 Influenza A (swine) flu increase in the 'second' or 'third' wave of this epidemic?
This is uncertain. All we can say is that in all previous pandemics in the last 100 years the CFR was much less in the first wave than in the second wave. This is why we must remain highly vigilant in tracking this disease.

33. How does H1N1 Influenza A (swine) flu compare to H5N1 'bird' flu in terms of severity?
The current version of the H1N1 (swine flu) is much less 'severe' than H5N1 Bird flu where the case fatality rate (CFR) approaches 50%, compared to 0.51% of Swine flu. Bird Flu differs from the swine variant, at the moment, in that it is significantly less infectious but a lot more deadly. This means that Bird flu has a low transmission rate between humans but when it does infect a human, that person tends to have a 50% chance of survival. By comparison, currently the H1N1 (swine) flu has the ability to infect more humans but when infected, the person (so far) experiences only a mild to moderate infection.

34. What factors increase the chances of developing severe H1N1 Influenza A (swine) flu?
In seasonal flu the ones most at risk of developing serious complications and dying are the very old, the very young, those who are immunosuppressed and those with diabetes, chronic respiratory disease or chronic heart disease. Whether or not this applies to the current swine flu virus is not yet known. There is preliminary evidence that, like the great pandemic 1918 H1N1 virus, this new swine flu virus has a

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predilection to cause severe disease in those aged 20-40. This is another area that requires vigilant monitoring by all countries.

35. Other than Mexico this H1N1 Influenza A (swine) flu has not been very deadly. Aren't we overdoing it?

No. It is true that as of June 11, 2009, only 141 of 27,737 confirmed infections of H1N1 Influenza A (swine) flu had died giving a CFR of 0.51% which is well within the range of seasonal flu (0.4% to 0.8%). Many have said, therefore, that the WHO's warnings have been overblown. Professor Robert Webster, a world famous virologist, warns us against complacency. He states: "This H1N1 hasn't been overblown. It's a puppy, it's an infant, and it's growing," he said. "This virus has got the whole human population in the world to breed in it's just happened. What we have to do is to watch it, and it may become a wimp and disappear, or it may become nasty."

36. What is the worst-case pandemic scenario?

The H1N1 Influenza A (swine) virus is adept at snatching evolutionarily advantageous genetic material from other flu viruses. The worst case scenario is that the H1N1 Influenza A (swine) virus meets the H5N1 bird flu virus, possibly somewhere in Asia or Egypt, and combines into a new bug that is both highly contagious and lethal and can spread around the world. The Director-General of the WHO has said “Do not drop the ball in monitoring H5N1”.

vi. Diagnosis

37. How can human infections with H1N1 Influenza A (swine) flu be diagnosed?

To diagnose H1N1 influenza A (swine) infection, a respiratory specimen would generally need to be collected within the first 4 to 5 days of illness (when an infected person is most likely to be shedding virus). However, some persons, especially children, may shed virus for 7 days or longer. Identification as a swine flu influenza A virus requires sending the specimen to special laboratories for testing.

38. What are the best specimens to send for the diagnosis of H1N1 Influenza A (swine) flu?

If swine flu is suspected, clinicians should obtain nasopharyngeal aspirate (NPA) for analysis. In an ideal situation, the best method is via NPA or nasal wash aspirate into viral culture media. Some experts are recommending the use of Dacron nasal swabs to decrease aerosolization of the virus. If these specimens cannot be collected, a combined nasal swab with an oropharyngeal swab is also acceptable, provided the posterior pharyngeal wall is swabbed and this will be feasible in most settings. We do NOT recommend nasal or throat swabs. Ideally, swab specimens should be collected using swabs with a synthetic tip and an aluminum or plastic shaft. Swabs with cotton tips and wooden shafts are not recommended. Specimens collected with swabs made of calcium alginate are not acceptable. A ‘flooked’ swab is best and a rayon swab is acceptable. The specimen should be placed in a 4°C refrigerator (not a freezer) or immediately placed on ice or cold packs for transport to the laboratory. Once collected, make contact with the local health department to facilitate transport and diagnosis at a public health laboratory. Good swabbing technique will collect more virus and is more likely to confirm the diagnosis than poor swabbing technique.

39. What tests are recommended to make the diagnosis of H1N1 Influenza A (swine) flu?

The US CDC currently recommends "real-time RT-PCR for influenza A, B, H1, H3. Currently, H1N1 influenza A (swine) virus will test positive for influenza A and negative for H1 and H3 by real-time RT-PCR. If reactivity of real-time RT-PCR for influenza A is strong then this is more suggestive of a novel influenza A virus.

Rapid testing for H1N1 Influenza A (swine) flu is similar to that for seasonal flu, meaning that sensitivities range between 50% and 70% of cases (no better than using fever and cough as a marker in a patient during influenza season), depending on the manufacturer. Therefore, negative rapid tests should not indicate a *lack* of influenza. (For general guidance on rapid influenza testing, see http://www.cdc.gov/flu/professionals/diagnosis/rapidlab.htm)

Rapid tests can distinguish between influenza A and B viruses. A patient with a positive rapid test for influenza A may meet criteria for a probable case of H1N1 Influenza A (swine) flu, but again, a negative rapid test could be a false negative and should not be assumed a final diagnostic test for swine influenza infection.

Other tests. Immunofluorescence (DFA or IFA) tests can distinguish between influenza A and B viruses. A patient who is positive for influenza A by immunofluorescence may meet criteria for a probable case of

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H1N1 Influenza A (swine) flu. However, a negative immunofluorescence could be a false negative and should not be assumed a final diagnostic test for swine influenza infection. Isolation of swine influenza A (H1N1) virus by viral culture is also diagnostic of infection but may not yield timely results for clinical management. A negative viral culture does not exclude infection with swine influenza A (H1N1) virus. To stay up-to-date on the latest recommendations for testing, check regularly at: http://www.cdc.gov/swineflu/specimencollection.htm

vii. Treatment

40. My 12-year-old son has a high fever and cough. It may be H1N1. Should I give him aspirin?
Under *NO circumstances* should aspirin (or aspirin containing products eg Pepto-Bismol) be given to anyone with fever (including H1N1 Influenza A) under the age of 18 as there is a risk of developing a life-threatening illness called Reye syndrome. Instead relieve fever using acetaminophen ("Panadol", Tylenol") instead.

41. What medications are available to treat H1N1 Influenza A (swine) flu?
H1N1 Influenza A (swine) flu is sensitive to and is treated with oseltamivir (Tamiflu®) or zanamivir (Relenza®). Tamiflu is manufactured by Roche whilst Relenza is manufactured by GlaxoSmithKline. The dose in adults of Tamiflu is one capsule (75mg) twice daily for 5 days whilst the dose of Relenza in adults is two inhalations twice daily for 5 days. H1N1 (swine flu) is resistant to amantadine (Symmetrel) and rimantadine (Flumadine). ***Tamiflu® and Relenza® work best if started soon after feeling ill (within two days of symptoms). They will probably not work if started beyond this time period.*** Details of treatment can be found on:

- http://www.cdc.gov/swineflu/recommendations.htm
- http://www.cdc.gov/flu/professionals/antiviral/dosagetable.htm#table

It is important to note that to be effective both Tamiflu and Relenza should be started within 24-48 hours of developing symptoms. The earlier treatment is started the better the results.

42. What is the dose of Tamiflu in children?
There is an oral suspension available for use in children aged >1 year and <13 years old. The dose is 30mg twice daily for those weighing <15kg, 45mg twice daily for those weighing >15kg – 23kg, 60mg twice daily for those weighing >23kg – 40kg and the adult dose of 75mg twice daily for those weighing >40kg. The oral suspension contains sorbitol and it is not indicated for use in those with hereditary fructose intolerance.

43. What are the side effects of Tamiflu®?
The commonest adverse effects of Tamiflu are nausea and vomiting. Nausea occurs in 11% on treatment and 7% on prophylaxis. Vomiting occurs in 8% on treatment and 2% on prophylaxis. If Tamiflu is taken with food this will decrease these side effects. Very rarely people may have severe allergic reactions to Tamiflu including severe skin reactions such as erythema multiforme or Stevens Johnson syndrome. Anaphylaxis may occur very rarely.

44. Will my doctor prescribe Tamiflu to my child who is aged under one-year-old?
Roche advises that Tamiflu should not be used in those aged <1 year old. However the European Medicines Agency stated on 8th May 2009 that in a declared pandemic children under the age of one should receive Tamiflu because the benefits would outweigh the risks.

45. Can Tamiflu be safely prescribed to a pregnant woman or a woman who is breastfeeding?
It is not known whether Tamiflu can harm the fetus or the newborn but Roche advises that it be used in pregnancy or lactation (breast feeding) only if it is judged that the potential benefit outweighs any potential harm. The European Medicines Agency also stated on 8th May 2009 that after reviewing the available data Tamiflu should be prescribed to pregnant and breastfeeding women diring a declared pandemic.

46. I have chronic kidney failure. Can I take Tamiflu?
Tamiflu can be used in those with impaired kidney function but the dose should be halved in those with a creatinine clearance between 10-30mls/minute. It is quite safe to use in those with liver problems.

47. What is the availability of Tamiflu®?
Tamiflu® may not be available in some countries. Roche has licensed some companies to manufacture oseltamivir (the generic name for Tamivir®) in some countries. As an example Hetero Drugs in Hyderabad, India, has been licensed to produce Oseltamivir. This will be marketed under the name "Fluvir".

48. My supply of Tamiflu® has just reached its time-expiry date. What shall I do?

Do *not* throw the Tamiflu away! If it is stored properly Tamiflu will still be effective for certainly two years and possibly up to three years after its expiry date. The European Medicines Agency stated on 8th May 2009 that Tamiflu could be used for up to two years after its current five-year expiry date during a declared pandemic.

49. How much does Tamiflu® cost?

The cost of Tamiflu in Asia/Pacific varies from country to country at US$ 23 – US$ 60 per course of 10 capsules. The cost is US$28 in Hong Kong, US$35 in Taiwan, US$35 in Thailand, US$60 in Japan, US$28-37 in China, US$32 in Australia, US$33 in Philippines, US$40-48 in Vietnam, US$23 in Singapore, US$46 in Korea and US$30 in Malaysia.

50. How do I take Relenza and what is the dose?

Relenza (zanamivir) is taken by inhalation. Blister packets need to be punctured by a spike before inhalation. This is rather complex and a doctor should always demonstrate the correct way of using Relenza to the patient. The dose is two inhalations twice daily. Each inhalation involves inhaling one 5mg blister pack so the daily dose is 10mg twice daily.

51. Who should *not* take Relenza?

Relenza should not be taken by (a) those who are allergic to it (b) those with lactose sensitivity (c) those with severe underlying airway disease (d) those with severe asthma. It should not be taken by pregnant women or breastfeeding mothers unless the possible benefit to the patient is thought to outweigh the risk to the fetus or neonate. Relenza is not licensed for use in children aged <5 years and in some countries e.g. Canada, it is not licensed for use under the age of 7-years-old. Mild asthmatics should take their bronchodilators at the same time as they take Relenza.

52. Should the dose of Relenza be decreased in those with chronic liver or kidney disease or in the elderly?

No dose modification is needed for those with liver problems or with kidney problems unless the kidney problems are very severe. No dose modification is needed for the elderly.

53. What are the possible side-effects from taking Relenza?

Relenza may cause the following adverse effects: headaches, insomnia, dizziness, arrythmias (palpitations), syncope (fainting), tachycardia (fast heart rate), diarrhea, nausea, vomiting, allergic-like reactions including facial swelling and spasm of the larynx, dyspnea (breathlessness), bronchospasm and rash. This list seems rather daunting but it should be noted that only a very small minority will have any side-effects. Perhaps the most serious side effect would be bronchospasm (narrowing of the bronchi in the lungs) which would cause wheezing and breathlessness. This may occur especially in those with a history of bronchitis or asthma but occurs very rarely. Neuropsychiatric adverse effects (abnormal behavior, delusions, hallucinations, agitation, anxiety, nightmares, confusion, altered level of consciousness, delirium and seizures (fits), are reported mainly from Japan in children. It should be noted that these can occur in any case of influenza and the relative contribution of Relenza has not been established.

54. What is the shelf life of Relenza?

Sixty months.

55. How should Relenza be stored?

Relenza should be stored at a temperature <30C.

viii. Prevention

56. What can I do to reduce my risk of getting sick from H1N1 (swine flu)?

Preventative measures are exactly those we recommend to prevent seasonal influenza, that is: regular hand-washing with soap and water or alcohol hand-rub, cover your mouth and nose if you cough or sneeze (do NOT use your bare hand), try to stay in good general health, get plenty of sleep, be physically active, manage your stress, drink plenty of fluids, and eat nutritious food. Try not to touch surfaces that may be contaminated with the flu virus. Wear a face mask (preferably one of the next-generation ‘intelligent’ masks) when in crowded situations, such as on the MTR or subway. Avoid close contact with people who are sick and get a seasonal flu vaccine.

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- Cover your nose and mouth with a tissue when you cough or sneeze. Throw the tissue in the trash after you use it.
- Wash your hands often with soap and warm water, especially after you cough or sneeze. The hands should be washed for at least 20 seconds (the same time taken to sing a nursery rhyme). The water and soap emulsifies the dirt and grease, and the mechanical action of rubbing your hands together helps to eliminate dirt and germs.
- Use of alcohol-based hand cleaners containing at least 70% alcohol are also effective, and are a good choice when there is no access to warm water and soap. Some people cannot use alcohol-based sanitizers due to skin sensitivities.
- Avoid touching your eyes, nose or mouth. Germs spread this way.
- Wear a face mask (preferably one of the next-generation 'intelligent' masks) when in crowded situations, such as on the subway or MTR
- Try to avoid close contact with sick people.
- Educate all household members on proper hygiene etiquette, including mask usage and disposal
- Wipe down your work area at least daily with a disinfectant
- Ensure cleaners at your work place are regularly sanitizing high-contact locations, such as door knobs and telephones.

If you get sick with influenza, CDC recommends that you stay home from work or school and limit contact with others to keep from infecting them.

57. What effect do sanitizers have on the virus?

Alcohol-based hand cleaners with greater than 70% alcohol content are effective. If using gel, rub your hands until the gel is dry. The gel doesn't need water to work; the alcohol in it kills the germs on your hands.

58. What is the best technique for washing my hands to avoid H1N1 (swine) flu?

Washing your hands often will help protect you from many germs. Wash your hands with soap and warm water for 15-20 seconds (time it by singing a nursery rhyme). When soap and water are not available, alcohol-based disposable hand wipes or gel sanitizers may be used. You can find them in most supermarkets and drugstores. Check them to ensure they have over 70% alcohol content. If using gel, rub your hands until the gel is dry. The gel doesn't need water to work; the alcohol kills the germs on your hands. Alcohol-based hand-rub is NOT superior to washing your hands with soap and water. Similarly washing your hands with soap and water is NOT superior to alcohol-based hand-rub. Both methods are equivalent.

59. How can we prevent spreading H1N1 (swine flu) through coughing or sneezing?

If you are sick, limit your contact with other people as much as possible. Wear a face mask (preferably one of the next-generation 'intelligent' masks) and engage in heightened hygiene practices. Report your symptoms to your place of employment. Do not go to work or school if ill. Cover your mouth and nose with a tissue when coughing or sneezing - it may prevent those around you from getting sick. Put your used tissue in the waste basket. Wash your hands. Cover your cough or sneeze with your arm if you do not have a tissue. Then, clean your hands, and do so every time you cough or sneeze. Hand hygiene is of paramount importance.

60. How far should I stay from someone who I think may have H1N1 Influenza A (swine) virus?

A person can be infected with H1N1 influenza virus when they inhale droplets. Droplets are spread directly by coughs and sneezes and can be spread a distance of one meter and occasionally up to two meters. Therefore, you should stay at least one meter away from a person who coughs or sneezes, in order to avoid being infected by inhaling the droplets. However, remember that you can still be infected by touching a contaminated surface and then touching your mouth, nose or eyes before you wash your hands. This is why frequent, thorough hand-washing is recommended. If you must be in contact with an infected person (for example, you are the principal carer), where a face mask (preferably one of the next-generation 'intelligent' masks) and engage in heightened hygienic practices. Try to minimize the number of people interacting with the patient.

61. What is meant by social distancing?

Social distancing simply means minimizing exposure to other people during an epidemic or a pandemic. Examples include staying home, avoiding crowds, avoiding public transport, avoiding restaurants, avoiding cinemas, theaters and sporting events. In the context of work it may involve staggering work hours to

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decrease the number of people in the work-place, working from home, avoiding face-to-face meetings and so on.

62. Is social distancing effective in decreasing the impact of a flu pandemic?

Yes. During the 1918 pandemic the mayor of St. Louis took strict social-distancing measures which included closing theaters, restaurants and sporting venues. This resulted in a low number of cases spread out over several months – allowing the city infrastructure to deal effectively with the cases. On the other hand in Philadelphia social distancing measures were not taken and there were a huge number of cases and deaths in the space of a month which totally overwhelmed not only the health infrastructure but also the whole infrastructure of the city bringing the city to a complete halt.

63. Are hygienic measures effective in decreasing the number of cases during a flu pandemic?

Yes, infection control measures decrease the spread of respiratory infections. The best proof of this is the SARS epidemic in Hong Kong in 2003. During SARS everyone took very strict hygienic measures (as well as social-distancing measures) – and the incidence of other respiratory illnesses (such as seasonal flu, adenovirus, respiratory synctial virus etc) fell dramatically.

64. What is the best mask to use?

The issue with masks is obtaining correct information on which ones are effective, how to use them correctly and availability.

Ordinary face masks: The term "mask" is often used to describe two types of ordinary face masks – ***ordinary surgical masks*** and ***ordinary N95 respirators***. Ordinary face masks are of limited value against pandemics but may help reduce transmission when worn by the sick person by preventing infected droplets from being inhaled by others. Secondary transmission by infected mask surfaces means frequent hand-washing and avoiding touching the face are also critically important.

However, while most commonly-available masks were designed for particulates there are masks which ***do*** work and people should not be discouraged from using these and should be educated as to which ones work and, most importantly, how to use them. For example, they must fit properly. They also become contaminated if the wearer handles them so the wearer must know not to touch them and they need to be changed every few hours or once wet. See below.

Intelligent face masks: Next generation face masks are beginning to emerge. These are designed specifically to combat respiratory diseases. According to representatives of the NHS in the United Kingdom, one such technology is from Hong Kong where they benefited from their experience with SARs and avian flu. They have developed a mask specifically for infectious agents which is ***anti-microbial*** and critically, ***self-sanitizing***. This mask traps the Influenza A virus and uses patented technology to destroy it using copper and zinc, on contact. This mask addresses all the known limitations with existing products because its efficiency is not affected by damp and works even when completely wet. Therefore it does not have to be changed every few hours. If you touch it which would contaminate a normal mask, it kills the virus. When you throw it away, it is clean having destroyed the virus so is not another object that can spread the virus.

65. What is the difference between an ORDINARY surgical masks and an ordinary N95 respirator?

ORDINARY Surgical masks. Surgical masks are designed to protect the wearer against blood spurts and other bodily fluid splashes. They have no filtering function and are of no use in protecting against airborne particles. According to the FDA, surgical masks are less useful in protecting the wearer against airborne pathogens than against splashes and fluid challenges. Surgical masks require proper training in donning and disposal because the mask can easily collect pathogens on its surface which can then be passively transferred to hands and surfaces.

ORDINARY N95 respirators. According to the FDA, surgical N95 respirators are protective devices first designed for industrial protection against airborne particulate hazards of various types (such as construction dust). To be effective they must fit very tightly to the face and require specialist training in order to use them effectively. For example, the NIOSH standard requires that the employer of health care workers provide wearers with respirator training and fit testing. They tend to be uncomfortable to wear for long periods or during heavy exertion. The FDA warns that ORDINARY masks can serve as passive vehicles for the transfer of microorganisms. Other

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countries and the European Union have similar requirements. In Europe, the equivalent to an N95 is FFP2.

Intelligent masks: This is a category of next generation face masks designed specifically to combat the transmission of respiratory diseases. They are anti-microbial, highly breathable and fit well. They target and kill viruses within minutes of first contact. As such they are self-sanitizing and effective in reducing cross-contamination and pathogen transmission.

It should also be noted that facial hair can interfere with the seal and a tight-fitting respirator cannot be worn by a person with a beard, goatee or large mustache.

66. Will wearing ORDINARY surgical masks stop me getting H1N1 (Swine flu)?

H1N1 (swine flu), like seasonal flu, is thought to be spread by droplets. ORDINARY surgical masks may protect you from infection by droplets. We would regard the wearing of ORDINARY surgical masks as useful in a pandemic situation, especially if you have to use public transport or mix in crowds. However it should be remembered that wearing ORDINARY masks is only useful provided the mask is worn properly. It must be replaced every 2-3 hours or when wet or otherwise soiled. It must also be disposed of safely. You must wash your hands after taking off an ORDINARY mask immediately and before you inadvertently touch your eyes, mouth or nose. It should also be remembered that droplets contaminate surfaces and if you touch a contaminated surface and then touch your eyes, mouth or nose you can get H1N1 (swine flu). Thus hand-washing is probably the most important measure. Also remember that droplets only travel one meter and social distancing is a most important way of preventing droplet infection. INTELLIGENT masks, which kill pathogens on contact, address most of the short-comings associated with ORDINARY masks and should be used in crowded places or in situations of potential high pathogen exposure.

67. When should I wear a mask?

The primary prevention action should be to try to avoid crowded settings or close contacts with others. If it is not possible to avoid these situations, surgical masks should be worn by all people who have signs of symptoms of illness to prevent them from spreading the virus through coughing or sneezing on others. The surgical masks will also provide significant protection of your nose and mouth from droplets from other people's coughs and sneezes. Using an ‘intelligent’ mask is preferable to an ordinary one.

68. How often should I change my mask?

You should replace your ORDINARY surgical mask every 2-3 hours or when it is wet or soiled or damaged. You should limit yourself from touching your facemask, washing your hands after doing so. In an extreme situation, you could wear your ORDINARY surgical mask as long as possible during a pandemic since supplies may be limited. By contrast, the new technologies offered by ‘intelligent’ masks means that the face mask can last an entire day without replacement and the self-sanitizing properties can reduce cross-contamination of hands and surfaces.

69. When would an approved respirator be more appropriate than a surgical mask?

In certain high-risk situations where an aerosol may be formed all authorities recommend the use of a respirator such as an N95 (FFP2). Such procedures include suction of the respiratory tract, bronchoscopy etc. We recommend that for extra safety respirators, with approvals for particulate protection (see NIOSH certification information in earlier question) should be worn by medical staff and emergency responders dealing with suspected or known cases of pandemic influenza. Prior to wearing any respirator, a person must be medically approved, fit-tested and trained. More information is available at www.cdc.gov/swineflu/masks.htm.

70. Will wearing an N95 (FFP2) mask stop me getting H1N1 (Swine flu)?

In certain situations wearing an N95 mask is preferable to wearing a surgical mask. These include health care procedures where an aerosol may be produced; close contact by a caregiver who is looking after a patient at home and occupational situations such as respirator fitting. N95 masks need to be fitted to the individual. The individual needs to learn carefully how to use an N95 mask to effect. N95 masks are uncomfortable to wear for prolonged periods. Next generation technologies offered by ‘intelligent’ masks that are N95 NIOSH-compliant would further reduce the risks of cross-contamination and improve breathability, thereby increasing user compliance.

71. Can people wear a cartridge respirator with N-95 filters instead of a disposable filtering face-piece N95 respirator?

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Yes. Since these respirators are reused, it is important to wipe them off after every use using a respirator wipe pad and to clean and sanitize periodically. This procedure requires specialized training.

72. In addition to an N-95 respirator, what other PPE should emergency responders wear?
Emergency responders and medical staff dealing with suspected or known cases of H1N1 influenza are advised to wear face-shields or goggles as droplets might also enter the eye and theoretically spread infection through the conjunctival route. They should also wear gowns and gloves to protect the skin. Remember to dispose of all PPE after seeing each patient in the trash-can and shut the lid. Also remember to wash your hands properly after removing the PPE.

73. What medicines can be taken to prevent H1N1 Influenza A (swine) flu?
The use of a medicine to *prevent* a disease is called chemoprophylaxis or more simply prophylaxis. Oseltamivir (Tamiflu®) or Zanamivir (Relenza®) can be taken prophylactically to prevent H1N1 Influenza A (swine) flu. The contraindications for taking these medicines and the adverse effects are described in section vii Treatment. The doses used for prevention are half the doses used for treatment. If Tamiflu is taken the adult dose is one capsule (75mg) daily. If Relenza is taken the adult dose is two inhalations (10mg) once a day for a maximum of 28 days.

74. When would we recommend taking medicines to *prevent* H1N1 Influenza A (swine) flu?
We recommend that the following *consider* taking Zanamivir or Tamiflu prophylactically (a) Health care workers who may look after cases of H1N1 Influenza A (swine) flu especially if they have not worn PPE (b) Close contacts of people with known or suspected H1N1 Influenza A (swine) flu, especially if these close contacts have certain chronic medical conditions (c) Those close contacts of known or suspected cases who are aged over 65 or younger than 5-years-old and pregnant women (d) high risk travelers to affected areas and (e) possibly in a corporation those *essential* workers necessary to keep the manufacturing site operational or the corporation functioning.

75. I have to travel to Mexico or another affected area. Should I take prophylactic antiviral medication?
Antiviral chemoprophylaxis (pre-exposure or post-exposure) is recommended for travelers to Mexico or other affected areas who are at high-risk for complications of influenza (persons with certain chronic medical conditions, the elderly) and can be considered for non-high risk persons who are travelers to affected areas. When in an affected area, follow local public health guidelines, including any movement restrictions and prevention recommendations. Wash hands frequently and wear a face mask (preferably one of the next-generation 'intelligent' masks) and follow the advice above for how people can protect themselves against swine influenza.

76. Can the H1N1 Influenza A (swine) virus be killed by disinfectant?
We do not have any specific data on inactivation of H1N1 virus. Because the physical and chemical properties of all influenza A viruses are similar, disinfectants effective against other influenza viruses should kill the swine flu virus; however, the proper concentration and contact time are required based upon the manufacturer's label recommendations.

Chlorine (0.1% sodium hypochlorite) and alcohol (70% ethanol) will kill influenza virus. Surfaces (especially bedside tables, surfaces in the bathroom and toys for children) should be kept clean by wiping them down with a household disinfectant according to directions on the product label. Thoroughly wash linens, eating utensils, and dishes belonging to those who are sick before reusing. And people shouldn't forget to wash their hands when done cleaning.

77. What infection-control precautions should be taken in healthcare settings?
Those who are suspected or confirmed to be a case of H1N1 Influenza A (swine) flu and who need to be hospitalized should be placed in a single-patient room with the door kept closed. The patient should wear a mask (preferably one of the next-generation 'intelligent' masks) when outside the room and whenever someone enters the room. Standard, droplet, and contact precautions should be implemented and maintained by healthcare professionals for 7 days after the illness onset or until symptoms have resolved (http://www.cdc.gov/swineflu/guidelines_infection_control.htm).

ix. Vaccination

78. Will the seasonal flu shot I received protect me from this H1N1 Influenza A (swine) flu?

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At this point it seems unlikely. This new swine flu virus appears to be the result of a mixing of genetic material from pig, bird and human influenza viruses resulting in a new type of virus. This new virus is still an H1N1 virus but genetically very different from seasonal flu. However, in an experiment on H5N1 avian influenza, one group of mice was given seasonal flu vaccine and another group was not given seasonal flu vaccine. Both groups were then exposed to H5N1. The group that had been given the seasonal flu vaccine had a significantly decreased death rate compared to the group that had not been vaccinated. It is therefore *possible* that recent influenza vaccination *may* provide some limited protection against H1N1 Influenza A (swine) flu.

79. If seasonal flu vaccine offers NO protection against H1N1 Influenza A (swine) flu should I still get it?

We would still recommend that you get an annual flu shot. This is because it will still protect you from getting seasonal flu that can circulate at the same time as H1N1 Influenza A (swine) flu. Moreover if you should get seasonal influenza it may lead to you being isolated until it is proven that you do not have H1N1 Influenza A (swine) flu. This might prove inconvenient – and to decrease the chances of this we would recommend you get an annual seasonal flu shot.

80. Is there a vaccine against H1N1 Influenza A (swine) flu?

No. Not yet, although some are in the process of being developed. Vaccines are available to be given to pigs to prevent swine influenza but there is no vaccine available yet to be given to humans to prevent H1N1 (swine flu). CDC and commercial drug companies are working on developing a specific vaccine against H1N1 (swine flu). However this vaccine may not be available for several months. Moreover vaccine manufacturers have to decide very soon whether or not to switch the production of a vaccine against seasonal flu for the coming season to a vaccine to prevent H1N1 (swine flu).

81. Are there any other vaccinations that may help lessen the severity of H1N1 Influenza A (swine) flu?

Yes. Pneumonia occurring in severe cases of influenza is due to either the influenza virus itself or to secondary bacterial infection. A common cause of secondary bacterial infection is *Streptococcus pneumoniae* also known as Pneumococcus. We would consider pneumococcal vaccination for young children, the elderly and the immunocompromized.

x. Other Questions

82. Can pets get sick from H1N1 Influenza A (swine) flu?

There is no evidence that pets can become sick from H1N1 (swine flu).

83. During a pandemic will everyone with H1N1 Influenza A (swine) flu be admitted to hospital?

No. Hospital beds are likely to rapidly fill and only the more serious cases may be admitted for hospital care.

84. How should I look after a family member with H1N1 Influenza A (swine) flu at home?

It is quite possible that you will have to look after a family member with pandemic influenza at home. In such cases, in order to minimize the spread of influenza throughout the house, *one* person should be assigned to look after the sick person. The sick person should be kept alone in a bedroom. The sick person should wear a surgical mask (preferably one of the next-generation 'intelligent' masks) whenever the caregiver comes into the room. And the caregiver should wear a surgical mask and consider wearing an N95 mask (preferably one of the next-generation 'intelligent' masks). Tissues should be handled carefully and disposed of in the trash can, washing hands after doing so. Surfaces should be wiped down with disinfectant at regular intervals throughout the day. Hand hygiene is of great importance. The entire household should be advised of and follow proper hygiene etiquette.

B. EPIDEMIOLOGY

85. What influenza pandemics have occurred in the last century?

A/H1N1 from 1918 through 1919, A/H2N2 from 1957 through 1963, and A/H3N2 from 1968 through 1970.

86. What were the "signature" features of past pandemics?

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There are five signature features of influenza pandemics: (1) a shift in the virus subtype (2) shifts of the highest death rates to younger populations (3) successive pandemic waves (4) higher transmissibility than that of seasonal influenza, and (5) differences in impact in different geographic regions. Although influenza pandemics are classically defined by the first of these features, the other four characteristics are frequently not considered in response plans.

87. Can you explain the shifts of highest death rates to the younger population in past pandemics?

(1) Exposure to influenza A/H1 subtypes before 1873 may have offered some protection to adults over 45 years of age during the pandemic of 1918 and 1919. Although the elderly frequently have the highest death rates during seasonal epidemics, their relative sparing during pandemics has not been generally appreciated. Such sparing may have been due to past exposure to similar flu viruses with the consequent development of antibodies (2) In the 1918 pandemic it was thought that people aged 20-40 were severely affected because of an overactivity of their immune system wherein chemical called cytokines were released in large amounts leading to failure of various body systems.

88. Can you describe the "waves" in the pandemics of the last hundred years?

The 1918 pandemic had a mild first wave during the summer, followed by two severe waves the following winter. The 1957 pandemic had three winter waves during the first 5 years. The 1968 pandemic had a mild first wave in Britain, followed by a severe second wave the following winter.

89. Can you describe the increased transmissibility in the pandemics of the last hundred years?

Increased transmissibility of influenza has been documented for all the past pandemics, and is probably due to the high susceptibility of the population. Estimates of reproductive numbers vary considerably among studies and pandemics. Recent studies suggest that during the early mild wave of the 1918–1919 pandemic, the reproductive number (i.e., the number of new cases attributable to a single established case) may have ranged between 2 and 5, as compared with the average of 1.3 for seasonal influenza.

90. How can you explain the differences in the impact of past pandemics in different parts of the world?

Great heterogeneity among regions in terms of incidence and mortality is also a characteristic of pandemics. This variability is probably explained by the complex heterogeneity in the degree of immunity in local populations to the circulating influenza strains, as well as by transmission factors such as geographic conditions (temperature and humidity), social mixing etc.

91. In which countries have people become ill with swine flu?

The current epidemic started in Mexico in April 2009 and then spread to the USA and then to Canada. Cases have since been confirmed or suspected in many other countries including Spain, France, Israel and UK in EMEA; and New Zealand, Hong Kong, Japan, South Korea and Australia in APAC. As of June 11, 2009, there were 28,774 cases reported with the vast majority (21, 904) in North America. There have been 144 reported deaths. The epidemiology is changing rapidly from day-to-day and we refer readers to the WHO link to keep up-to-date with the daily changes:

World Health Organization (WHO):
http://www.who.int/csr/disease/swineflu/en/index.html

There is also an excellent map showing the daily spread from Google Maps:
http://maps.google.com/maps/ms?ie=UTF8&hl=en&t=p&msa=0&msid=106484775090296685271.0004681a37b713f6b5950&ll=32.639375,-110.390625&spn=39.20096,74.970703&z=4

92. How long will this pandemic of H1N1 Influenza A (swine) flu go on?

No one knows at this time. Because this is a new virus and it has been found in a number of geographic locations and has also spread person-to-person, we should expect this epidemic will spread and last for quite awhile. It may spike and subside over time. The pandemics that have occurred over the past 100 years have lasted 18-24 months.

C. TRAVEL

93. Will temperature screening at airports and other 'ports-of-entry' prevent the introduction of H1N1 Influenza A (swine) flu into a country?

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No. In the medical section we noted that persons may be without symptoms and still spread the disease. Temperature screening cannot detect those infected individuals who do not have a fever but can still spread the disease. Airport temperature screening cannot prevent the spread of any influenza into a country but it may delay its introduction.

94. Can the local health authorities quarantine me on arrival at my destination?
Many countries are asking travelers if they feel sick or if they have a fever, and medically evaluating those who answer yes before allowing them to enter a country. It is *possible* that you could be quarantined on arrival even if you feel well if you are coming from a country affected by H1N1 and traveling to a country that is unaffected. You should check the situation with your local host country before you travel.

95. Should I travel if I feel ill?
No. This is especially true if you have a fever. However we would advise that in the current circumstances you do not travel if you have a cold (runny nose), sore throat or a cough. You should also not travel if you have any chronic medical condition that is not completely stable and we would advise that you check with your own doctor before you travel and ask your doctor if you are fit to travel.

D. MENTAL HEALTH

96. I fear becoming ill or dying from swine flu. How can I deal with this?
You are not alone. Many people are afraid. Fear is natural. Fear, whilst often unpleasant is actually our friend. It helps us to be aware of and to anticipate danger in response to a threat. Fear can be directed and used to support us. The key thing therefore is to turn and face your fear.

97. What can I do to face my fear?
Know that your fear is reasonable and absolutely normal. Acknowledge that you are frightened. Next understand your fear better: 'what are you really afraid of?', perhaps you don't understand something or are worried about your children or frightened of dying. False Evidence Appearing Real (FEAR) may magnify your fear, so get accurate information from reliable sources. With fear there is a simple equation: the more accurate information you know the less you fear, understanding brings calmness.

98. What if after all this I still feel anxious?
If you still feel afraid' don't worry. This indicates that the predictability of your world has been upset and this is understandable. Humans try to make their worlds predictable. Sharing experiences and feelings makes our world feel safer. If you still feel anxious about the possibility of a swine flu pandemic then you may find it very helpful to speak with someone such as your doctor or a mental health care provider.

E. COMMUNICATIONS

99. Where can I get credible information about swine flu and what to do about it?

Centers for Disease Control and Prevention (U.S.);

http://www.cdc.gov/ specifically: www.cdc.gov/h1n1flu

World Health Organization (global);

http://www.who.int/en/ specifically www.who.int/csr/disease/swineflu

Other sources of credible information include the websites for the:
Pan American Health Organization (special emphasis on Latin America): www.paho.org
Pan American Health Organization

FDA: http://www.fda.gov/oc/opacom/hottopics/H1N1Flu/
USDA: http://www.usda.gov/wps/portal/?contentidonly=true&contentid=2009/04/0131.xml
OIE: http://www.oie.int/eng/en_index.htm
Canada: http://www.phac-aspc.gc.ca/alert-alerte/swine_200904-eng.php

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