

With the approval of the H1N1 influenza vaccine, public health officials have begun what will be the largest vaccination campaign in Canadian history. Many readers are confused by the contradictory stories in recent weeks and are looking for clear information about the threat posed by H1N1 influenza and the benefits and risks of the vaccine. The Globe and Mail's public health reporter, André Picard, tries to clear up the "confusion" by answering reader questions:

Question: What's the difference between H1N1 flu and the seasonal flu?

Answer: The formal name for the strain that has captured our attention is influenza A/H1N1/California (H1N1 or swine flu for short). Various strains of influenza circulate every year; they are usually mutated forms of earlier flu bugs, meaning many people have full or partial immunity. H1N1 is different – it jumped directly from animals to humans. That means it has the potential to infect and sicken a lot more people.

Q: It's called swine flu. Does that mean we get it from pigs?

A: Many animals and birds get the flu, but those strains do not usually pose a threat to humans. At some point earlier this year H1N1 jumped from a pig to a human. But the virus now has nothing to do with pigs; it spreads human-to-human. Early on, the virus was dubbed swine flu because it resembled a strain that circulates in pigs. Genetic testing later showed that swine flu actually is a mixture of two types of swine flu, an avian flu and a human flu.

Q: What do all the letters in influenza A H1N1 stand for?

A: There are three types of influenza viruses: A, B, and C. Only type A influenza can cause a pandemic and it causes the most serious illness in humans. Influenza A viruses are classified by two proteins on their surface: H for hemagglutinin and N for neuraminidase. There are 16 H subtypes: H1, H2 and H3 are found in human influenza viruses. There are at least nine subtypes of neuraminidase; N1 and N2 are associated with humans. Influenza B can cause epidemics but not pandemics; it causes illness, but tends to be less deadly. Influenza C causes mild illness.

Q: So what are my odds of getting the flu?

A: In an average year, 10 to 20 per cent of Canadians get sick with the flu. With a pandemic strain like H1N1, that number could jump to 30 to 50 per cent. According to mathematical modeling done as part of the Canadian Pandemic Influenza Plan, a new strain could kill between 11,000 and 58,000 Canadians in a period of six to eight weeks. It could also send 35,000 to 138,000 people to hospital and leave 4.5 million to 10.6 million others too sick to work, which would have a devastating economic impact. But that's a worst-case scenario.

Q: Is H1N1 actually more deadly?

A: There was a long-running assumption that a pandemic strain of influenza would be more deadly than seasonal flu. So far, H1N1 is not proving more deadly. But remember, a run-of-the-mill seasonal flu kills an estimated 4,000 to 8,000 Canadians each year.

Q: Is the risk of contracting the flu and dying the same for everyone?

A: Anyone can contract the flu – seasonal or H1N1 – unless they have some immunity, either from prior exposure or vaccination. But, generally speaking, the healthier a person is, the better they can fight off infections. Seasonal flu usually kills the frail elderly and others with chronic health conditions. H1N1 is unusual in that it is killing younger people (under 50), some of them quite healthy prior to contracting the flu. Two-thirds of those dying of H1N1 are women, a fact that researchers can't really explain. People born prior to 1957 (when a similar flu strain circulated) seem to have partial immunity so a lot fewer seniors are getting sick than with the seasonal flu. However, when older people do contract H1N1, the death rate is quite high.

Q: I keep reading that there is an “epidemic” and a “pandemic,” which implies there is an imminent threat. But I just don’t see an epidemic or pandemic out there, just a lot of fear-mongering.

A: Epidemic and pandemic are technical terms that refer to the geographical spread of a disease, not its severity. H1N1 is a pandemic because it has spread to virtually every country in the world since it first surfaced in humans in March. To date, swine flu has been classified as mild.

Q: There is flu every year. Is this year any different?

A: The flu always travels from West to East across the country. It usually starts in November, peaks in January, and peters out by March. With H1N1, the flu season has started much earlier this year. Does that mean it will be done earlier? That's possible. But a more likely scenario is that there will be a second wave of influenza after Christmas, probably with a seasonal strain.

Q: I've had the flu before. What's the big deal?

A: The “flu” has become a catch-all term. But it is not a cold or a gastrointestinal bug. Influenza (H1N1 or otherwise) is unpleasant and will put you out of commission for about a week: You suffer fever, coughing, chills, muscle aches, and extreme fatigue; many people have trouble getting out of bed. The vast majority of those infected will get better with rest and plenty of fluids but, in some cases, the symptoms can be so severe that they can result in hospitalization and death.

Q: How do I know if my flu is the serious kind?

A: The flu is a respiratory illness. A person who has trouble breathing should seek immediate medical attention, as should someone with persistently high fever (particularly children). H1N1 can be treated with antivirals if treatment begins early enough. One of the distinguishing factors of those who have died of H1N1 far is that they waited too long to seek treatment.

Q: How is the flu treated?

A: Generally, bed rest will do it, but when symptoms are more serious there are two prescription drugs available, oseltamivir (Tamiflu) and zanamivir (Relenza).

Q: Can the flu really kill you? I mean, it's just the flu.

A: The little H1N1 viruses in your body are not carrying knives to stab you in the heart. But the virus can, in some cases (about one in 1000), get deep into the lungs, causing pneumonia. The lungs fill with liquid and a person essentially drowns. Patients with severe infection are put on respirators and sometimes even heart-lung machines - but about one in five die.

Q: Is there a vaccine for H1N1?

A: In Canada, there are actually two versions of H1N1 vaccine: an adjuvanted vaccine that has the brand name Arepanrix and a vaccine without adjuvants. The Public Health Agency of Canada has ordered 50.4 million doses, 1.8 million of them non-adjuvanted. Massive inoculation campaigns are now under way.

Q: There are 34 million Canadians, so why did we order 50 million doses?

A: Fifty million doses is the equivalent of two doses for 75 per cent of the population. Initially, it was believed two doses of the vaccine would be required to produce immunity, and it takes about six months to produce the vaccine. In the interim, research showed that one dose was sufficient to provide immunity. Excess stock will go to developing countries that cannot afford the H1N1 vaccine.

Q: Was the government only planning to immunize 75 per cent of the population?

A: While public health officials say repeatedly that everyone should be immunized, realistically, they know that many (if not most) Canadians will not get immunized. Only about one-third of people get the seasonal flu vaccine and a recent poll showed that approximately the same number plan to get the H1N1 vaccine. In the U.S., however, interest in the vaccine was tepid until a lot of people started getting sick. In recent days, there has been a stampede to vaccine clinics.

Q: Is the flu vaccine free?

A: The H1N1 vaccine will be offered to all Canadians free of charge. For seasonal flu, the rules vary from province-to-province. Virtually every province offers the vaccine gratis to members of high-risk groups like seniors, but charge a minimal fee to others. (Those fees are often covered by employers and insurers.)

Q: How does the vaccine work?

A: The vaccine contains antigens that trick the immune system into thinking it is being attacked by the H1N1 virus so it produces antibodies. It takes about a week for immunity to develop after vaccination.

Q: Does that mean I can get the flu from the flu shot?

A: No. The vaccine does not contain live virus so you cannot contract influenza from it.

Q: I really don't like needles. Is there any other way to get vaccinated?

A: In the U.S., some vaccination is done with a nasal spray called FluMist. The product is not (yet) available in Canada.

Q: What's an adjuvant?

A: An adjuvant is a substance used to bolster the antigens in the vaccine; an adjuvant was used in the H1N1 vaccine because of fears that manufacturers would not be able to harvest sufficient stocks from eggs to make antigen. The adjuvanted vaccine, Arepanrix, contains 3.75 micrograms of antigen; the non-adjuvanted version has 15 micrograms of antigen.

Q: What's in the adjuvant ?

A: The product from GlaxoSmithKline, Canada's sole provider of H1N1 vaccine, called Arepanrix, uses an adjuvant called AS03, which consists of squalene (shark liver oil), DL-alpha-tocopherol (vitamin E) and polysorbate 80 (an emulsifier also used in ice cream). There are claims that squalene, part of the adjuvant used in the anthrax vaccine, was to blame for Gulf War syndrome, but the evidence is weak.

Q: This is a new, experimental vaccine. Has it been properly tested?

A: The H1N1 vaccine is similar to past flu vaccines – except with a different antigen, of course – which have a good safety record. New versions of the flu vaccine do not require new human trials each year. The controversial aspect of Arepanrix is the adjuvant. While adjuvants have been used in vaccines for some time, AS03 has undergone limited safety testing. Health Canada insists that there have been no shortcuts taken in the approval process for the vaccine.

Q: What do you mean by limited safety testing?

A: Approximately 45,000 people have received a flu vaccine containing AS03 but that was a vaccine designed to protect against H5N1 (avian influenza) not H1N1. A similar adjuvant, MF59, has been used in about 40 million vaccinations in Europe.

Q: Is H1N1 vaccine safe?

A: Like every drug, the H1N1 vaccine has benefits and risks. The benefit is that it can prevent infection with swine flu – though the protection is not 100 per cent. The risks for most people are minimal, some redness and maybe a slight fever but in rare cases, there can be serious complications like Guillain-Barré syndrome. But those risks are not unique to this vaccine. And bear in mind that vaccines are among the safest drugs on the market.

Q: Isn't there mercury in the vaccine?

A: Flu vaccine is packaged in vials that contain multiple doses; to avoid contamination, a mercury-based preservative called thimerosal is added. One dose of vaccine contains about 5 micrograms of mercury; tuna sandwich contains about 25 micrograms of mercury. There are persistent claims that mercury in vaccines causes autism but this has been debunked.

Q: Should pregnant women get the H1N1 vaccine?

A: Pregnant women, whose immune systems are suppressed, are at high risk of complications from the flu. Therefore, it is recommended that they be the first in line to get the H1N1 vaccine. The H1N1 vaccine that is recommended for pregnant women does not contain adjuvants.

Q: If adjuvants are safe, then why the exception for pregnant women?

A: The short answer is that there is no safety data related to pregnant women, so officials are erring on the side of caution. The World Health Organization says pregnant women should get non-adjuvanted vaccine where possible, but that an adjuvanted vaccine could be used if necessary.

Q: What about babies?

A: Babies under the age of six months should not get the H1N1 vaccine. Some public health officials believe that children under age of three should get non-adjuvanted vaccine.

Q: Should older children get the H1N1 vaccine?

A: The vaccine is recommended for all Canadians over the age of six months, with few exceptions. However, it is recommended that children under the age of 10 get the vaccine in two half-doses, three weeks apart, instead of a single dose. The two-shot process is used because children do not produce as strong an immune response to the antigen as adults do.

Q: Is there anyone who should not get the vaccine?

A: Anyone with a severe allergy to eggs should not get the vaccine. People with other allergies that can cause anaphylaxis should consult a physician. Similarly, people who are immune-compromised are not able to generate an adequate immune response so they should not get the vaccine. People who cannot get the vaccine can take antivirals like Tamiflu as a preventive measure.

Q: Is it true that the non-adjuvanted vaccine given to pregnant women contains 10 times more mercury (thimerosal)?

A: Yes, the unadjuvanted vaccine does contain 50 micrograms of thimerosal while the adjuvanted vaccine has five micrograms

Q: Is H1N1 vaccine mandatory for anyone like doctors or nurses?

A: No, there is no mandatory influenza vaccination in Canada. However, it has been argued that health-care professionals in particular have a moral duty to get vaccinated (not to mention a practical reason) because they are in regular contact with both patients who have influenza and patients who are at greatest risk of severe complications. Vaccination rates among health professionals vary wildly among institutions; some have a culture of vaccination and some do not.

Q: Should I get the vaccine if I've already had the flu?

A: If you had a laboratory-confirmed case of H1N1, there is no need to be vaccinated. However, bear in mind that only about one-third of people who say they have had the flu actually had influenza.

Q: If I get the H1N1 vaccine do I also need to get the seasonal flu vaccine?

A: The jury is still out on that question. Right now H1N1 is the predominant strain of influenza circulating in Canada so seasonal flu may come along later, or not at all. However, frail seniors, particularly if they are living in an institutional setting, should get the seasonal flu vaccine. Some provinces are offering seasonal flu vaccine at the same time as H1N1; others are not.

Q: I've heard that the flu vaccine really hurts. Is that true?

A: It is well documented that vaccines that contain adjuvants hurt more than those that do not. So, yes, you can expect that the H1N1 vaccine will be more painful than seasonal flu vaccine. But remember, the flu itself is a lot more painful.

Q: I read that people who have had the seasonal flu shot are at greater risk of getting H1N1 so shouldn't I avoid the regular flu shot this year?

A: A study did indeed show that, among those infected with H1N1, more had been vaccinated against the seasonal flu in the past than had not. But the past vaccines did not cause them to be more at risk. Rather, it is an association. The reality is that people at highest risk of getting the flu – frail elderly, those with chronic illnesses – are most likely to get the flu shot each year. And they, particularly those with underlying illnesses like chronic obstructive pulmonary disorder and asthma, remain at very high risk.

Q: I'm worried about H1N1. Where can I get the vaccine? Can I go to my doctor?

A: The entire stock of H1N1 vaccine was purchased by the federal government and it will be distributed to the provinces. While detailed plans have not yet been unveiled, it is virtually certain that the vaccine will be distributed through mass inoculation campaigns. Many doctors do not keep flu vaccine in their offices because it requires refrigeration and the H1N1 vaccine also needs to be mixed, which is a bother.

Q: You can't vaccinate all Canadians at the same time. So is there a priority list?

A: The provinces has not established formal triage procedures but it is recommended that the following groups get the vaccine first because they are at higher risk: People under 65 with chronic health conditions; pregnant women; children aged six months to five years of age; people living in remote and isolated communities, particularly First Nations; front-line health workers and; care providers to those at high-risk. Next in line should be children/youth aged 5-18; first responders like firefighters and police; poultry and swine workers, adults aged 19-64 and, finally, adults 65 and older.

Q: If I get the vaccine can I still get the flu?

A: Influenza vaccines are not 100 per cent effective so, yes, it is possible. However, chances are the symptoms will be more mild. Getting the H1N1 vaccine does not mean you will not get sick this winter; there are other strains of flu and numerous other viruses and bacteria that circulate.

Q: How long can an infected person spread this virus to others?

A: People infected with the flu shed virus and they can infect others from one day before getting sick, to up to seven days after.

Q: How much is the “largest immunization campaign in Canadian history” costing us, the taxpayers?

A: The vaccine costs about \$8 a dose, so \$400-million for the product plus the costs of administration, which are more difficult to calculate. The federal government is picking up 60 per cent of the tab and the provinces are on the hook for the other 40 per cent.