



**Swine Flu 2009  
Influenza A (H1N1)**

**What You Need To Know**

**This report is not medical advice. If you believe you have the flu or any illness see your doctor.**

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## **What is 2009 Swine Flu Influenza A (H1N1)**

The influenza virus currently called 2009 Swine Flu, influenza A (H1N1), is actually an influenza virus that is a combination of a new strain of influenza A virus subtype H1N1 that derives from one strain of human influenza, one strain of avian (bird) influenza, and two separate strains of swine influenza. The origins of this new strain are unknown at this time.

Previous to April 2009 Swine Flu had been limited to pigs aka swine. It is possible for humans to catch true swine flu but it has happened rarely. The human has to be around infected swine on a regular basis. The virus passes from pig to human. There have been different varieties or strains of swine flu through the years. Currently there is a vaccination to prevent swine flu in pigs but not in humans.

Swine flu was first diagnosed in pigs in 1930. Almost 50 years later in 1976, a little over 200 soldiers at Fort Dix in New Jersey, came down with swine flu. From that time until 2005 there were few cases reported, less than one per year. From 2005 through January 2009 there were only 12 cases reported.

The 2009 Swine Flu influenza A (H1N1) is different than historic swine flu. In April 2009 the number of reported cases began to rise, causing concern that a serious outbreak of a new swine flu, now called Swine Flu Influenza A (H1N1) might be in its initial stages.

## **Viruses Are Nasty Creatures**

Viruses are structures that only replicate or reproduce themselves within a host cell. Outside a host cell they are dormant. Scientists do not agree on whether viruses should be considered a life form or be classified as biochemical mechanisms. They only "live" for short periods of time outside the host cell if "live" is defined as maintaining the ability to reproduce themselves inside a host cell. Perhaps better terms than live or dead when talking about viruses would be active and de-activated. Viruses are not susceptible to treatment with antibiotics.

Why are viruses so dangerous to the host cells? The virus has a limited amount of DNA information for use in reproducing itself but it doesn't have all the necessary biological materials. Once it enters the host cell it uses that host's material to replicate itself thousands of times, destroying the host cell and invading other cells within the host. The viruses can leave the host cell a few at a time called "budding," or all the viruses can leave at once called "lysis."

The only purpose of a virus is to replicate itself. It can only replicate itself inside a host cell. As it replicates the host cell is destroyed. One virus can replicate itself thousands of times inside one host cell, thereby setting up the destruction of thousands of other host cells.

Every living organism, plant, animal, or bacteria matter, is susceptible to viruses. The saving grace is that specific viruses can only find the genetic material they need to replicate within specific organisms. To make matters worse there may be a hundred different viruses with the capability to infect one specific organism.

The really bad news is that viruses can evolve and mutate. One virus has the capacity to reproduce itself hundreds of thousands of times. Each reproduction can lead to a small change, or mutation, within the virus. Even if 90% of the reproduced viruses are faulty the remaining 10% are functioning. Some of the mutations may mean they can infect other organisms besides the original host. The influenza virus is notorious for doing exactly that. The avian influenza mutated to be able to infect humans in the early 2000's. And that brings us to the 2009 Swine Flu.

### **What's Dangerous About 2009 Swine Flu (H1N1)**

This new "swine flu" passes easily from human to human (not from pig to human). There is no vaccine to prevent this new strain of influenza. Vaccinations work by introducing a weakened or dead strain of the virus into the body. The body builds up an immunity to the weakened or dead virus. When the full strength live virus tries to invade the body the body can fight back with the previously produced antibodies.

Antibiotics are only useful for secondary bacterial infections. They have no effect on viral infections. None at all. Nada. Nothing. Don't think taking a series of antibiotics will prevent or treat swine flu, or any other virus for that matter.

While influenza is normally not a serious health risk there have been epidemics that have had fatal and far reaching effects. The influenza pandemic of 1917 - 1920 killed more people than the black plague, estimates range from 20 million to 50 million. Pandemic means that the disease has a wide geographic distribution. Most influenza viruses are air borne within a limited 6 foot range, which means you do not need to physically come in contact with an infected person to be infected yourself.

As of May 2, 2009 the World Health Organization released the following information:

16 countries have officially reported 658 cases of influenza A (H1N1) infection.

The United States Government has reported 160 laboratory confirmed human cases, including one death. Mexico has reported 397 confirmed human cases of infection, including 16 deaths.

The following countries have reported laboratory confirmed cases with no deaths - Austria (1), Canada (51), China, Hong Kong Special Administrative Region (1), Costa Rica (1), Denmark (1), France (2), Germany (6), Israel (3), Netherlands (1), New Zealand (4), Republic of Korea (1), Spain (13), Switzerland (1) and the United Kingdom (15). The very first documented case of 2009 Swine Flu is of a 5 year old boy in Mexico in early April. The boy lived in a small village of 3000 people in La Gloria in the state of

Veracruz. Flu outbreak was reported in the village. Only the boy tested positive for swine flu. The village was next to a pig farm owned by the U.S. company Smithfield Foods. None of the pigs tested positive for swine flu or exhibited swine flu symptoms.

A new influenza strain can be dangerous if it spreads quickly and mutates as it goes. The body has no chance to build up an immunity and the medical community hasn't time to develop a vaccine. Since the first case was reported April 2 the 2009 Swine Flu has spread to 4 continents and 11 countries in a little more than 4 weeks. That rate of infection is potentially dangerous. Keep in mind that while there may be less than 1000 cases officially documented there could be 100 times that many people actually infected. There is no regulation or law that says a person must see a doctor if they have flu symptoms or that the doctor must test for the flu. Many cases go unreported.

Previous flu viruses have an average infection rate of one person infecting two other people. Doesn't sound like much does it? Look at it this way: if each person infects two other people within a 48 hour period (average length of time to become infected) by the end of 30 days that one person will have caused the infection of over 130,000 others. Within 45 days the rate accelerates and nearly 17 million people will have become infected. A flu outbreak can quickly reach massive proportions.

### **How 2009 Swine Flu Is Transmitted**

First of all it is absolutely not transmitted by eating pork, bacon, sausage or any pork meat product. Even if the pig was exposed to the new 2009 Swine Flu, cooking the meat would kill the virus. Some countries have reacted hysterically to the 2009 Swine Flu by slamming their borders shut against imported pork and pork products from countries where there have been cases of influenza found. There is no basis for the restriction.

As stated above the flu is an influenza virus and can't live long outside the host. Viruses can be transmitted in a number of ways. The HIV virus is spread by direct contact with bodily fluids. Small pox, a virus deadly in the past, is contracted through lengthy exposure to an infected person. The 2009 Swine Flu is spread through respiratory droplets.

Of the cases diagnosed so far none of them have been attributed to exposure to pigs.

To become infected with 2009 Swine Flu you must be standing within about 3 to 6 feet of an infected person. Just passing by someone on the street won't get you infected. The virus is carried through the air in respiratory droplets. The droplets are released through sneezing, coughing or just breathing. These droplets can land on a hard surface and live up to 24 hours or on a soft surface and live less than 30 minutes. The UV exposure of the surface and air temperatures affect how long the virus will live as well.

Even exposure to someone with swine flu doesn't mean you'll get sick. The human body has wonderful defenses. If only a few cells are infected the body produces and secretes something called interferons. These are proteins and are designated alpha, beta, or gamma interferon. These particular proteins interact with the cells adjacent to the infected

cells to make them more resistant to viral infection. This natural defense often works to stop the virus dead in its tracks. The interferon does not kill the virus but makes the cells more resistant to the viral invasion. Later on, you may not even have known that you were infected at all.

Sometimes however the virus is stronger and spreads to more cells and you start feeling sick. At that point the immune system begins to fight by killing the viruses that are outside of the cells and the infected cells themselves.

Symptoms start 1 to 2 days after exposure and the person is the most infectious at that point. However the person can infect others before any symptoms show up.

### **Symptoms: What Happens When You Become Infected With 2009 Swine Flu**

The virus can enter through your nasal passages or your mouth but this doesn't mean you're automatically infected. The mucous membranes of your nose and throat trap the virus, as well as dust, foreign bodies, and bacteria, rendering them harmless. The small microscopic hairs, called cilia, that line air way passages sweep over 100 times per minute and can sweep the virus right back out. If a virus does get through and enters a body cell it immediately begins the replication process and that's when the trouble starts.

The body cell, once it's invaded, sends out a distress signal through MHC, a chemical in every body cell, that recognizes what's foreign to the body and what belongs. This chemical boots the viral protein to the surface of the cell. Killer T-cells, a type of white blood cell, sense the distress call and kill the cell and the virus within by coating the cell with toxic chemicals. The dead cells are cleaned up by macrophage cells which surround and consume cellular debris and pathogens. Histamines increase the blood flow to the area. More blood flow means more killer T-cells.

At this point your throat really, really hurts because the blood vessels swollen with the increased blood are pressing on nerve cells and pain receptors. The body temperature starts to rise as the number of macrophages increase. Your body aches because your pain threshold has been lowered. Fever increases as the body tries to boost new cell production. You get the chills because your muscles contract to generate more heat. Blood flows away from you skin so you feel cold. You get a headache because of the increasing pressure of the swollen blood vessels in your brain. Now, you could take aspirin to bring down the fever but that's counter productive. The fever is one way your body fights against the virus.

If the virus gains momentum and the T-cells start losing the fight the infection spreads to the lungs. The macrophages that have destroyed the dead cells are in the blood stream and pass eventually through a lymph node. The viral material in the macrophage is detected and triggers more production of white blood cells including T-cells. This increased production causes the lymph glands to swell and become tender.

The T-cells go to the site of the viral infection and start destroying more cells which increases the debris. Coughing is how the debris is expelled from the throat and lungs.

The fight isn't over yet. Another immune cell, single B-cells in the lymph glands, produces antibodies that rush to the site of the infection, trap the virus and prevent it from replicating. Finally the battle turns in favor of the body and the viral infection begins to fade. It's been a struggle but you've won and begin the road to recovery.

Vomiting and diarrhea are not common with most types of influenza but have been reported with the 2009 Swine Flu.

### **Complications of 2009 Swine Flu**

The immune system is the primary weapon in the battle with 2009 Swine Flu, and those with immature or weakened immune systems are at risk for pneumonia and secondary bacterial infections. The very young and old and those with respiratory problems are especially vulnerable.

The flu can bring on respiratory failure and death.

What is disturbing about the 2009 Swine Flu is that more deaths have been reported among young and healthy people contrary to type B and C "winter influenza" fatalities which are primarily the young, the old, and the weak. These 2009 Swine Flu victims are people with presumably strong immune systems. The 1918 Spanish flu pandemic did the same thing; more fatalities occurred in the presumably healthy 25 to 45 year old age brackets.

### **Should You Be Concerned About a Pandemic 2009 Swine Flu?**

Yes. And No.

#### **Yes**

The 2009 Swine Flu includes a strain of bird influenza which is the most deadly type of influenza.

It is also a new form which means there no resistance to it in humans.

The flu spreads quickly and is already in 11 countries, perhaps more by the time you're reading this.

Influenza viruses mutate quickly and what was effective in an older strain, perhaps just a few weeks ago may not work against new strains.

This flu has a higher fatality rate in young healthy people, a worrisome sign.

The 1918 Spanish Flu started at about the same time of year, after the winter flu season and with mild cases and a low fatality when first reported before killing 50 million people worldwide.

## **No**

While the flu has been found worldwide within 4 weeks from the first case, the fatality rate seems to be low, perhaps less than 1%.

Anti-viral drugs do work against this strain of influenza, at least for the moment.

The strain is showing up at the end of the flu season and it may peter out before there is a epidemic.

Scientists are convinced that a vaccine can be developed within 4 to 6 months.

Only one death has been found outside of Mexico.

## **Treatments for 2009 Swine Flu**

Once you have contracted influenza there isn't any so-called cure. There are things you can do to feel better and drugs you can take that lessen the severity of the flu. The 2009 Swine Flu is the same.

Antiviral drugs are available by prescription only and come in pill, liquid or inhaler form. These are not antibiotics, nor do they work the way antibiotics work by killing the bacteria causing the disease. Antiviral drugs work by preventing the virus from reproducing.

Oseltamivir and zanamivir are two antiviral drugs that have shown to be effective against the 2009 Swine Flu. They are most effective if treatment is started within 48 hours of getting sick. The drugs make you feel better faster and make the effects of the illness less severe.

Unfortunately many hospitals and pharmacies don't have enough of these drugs available if there is an epidemic of flu. Some hospitals have limited the ability of prescribing the drugs to only a few doctors in order to prevent stockpiling of the drug by people who think they may have the flu, but don't. Or those who are afraid they may get the flu and want the drug on hand "just in case."

At the writing of this report, in the United States, 17 states plus the District of Columbia do not have the required level of drugs stockpiled in the event of an epidemic flu outbreak. Some states are hesitant to stockpile because the drugs only have a shelf life of 4 years and are not effective against the deadly avian strain of influenza.

Fortunately with 2009 Swine Flu the drug treatment is not critical to survival. There are other treatments that make the patient more comfortable: Getting rest. Drinking plenty of fluids. Using a Salt water gargle. Taking aspirin or Tylenol may lower the fever and reduce pain but as noted the fever is one of the ways the body fights off the viral infection.

## **2009 Swine Flu Prevention**

The only 100% effective method of prevention is to avoid coming in contact with anyone else. Since that's not possible for most individuals, there are some steps you can take that lessen the odds of coming down with 2009 Swine Flu and other diseases for that matter.

### Wash Your Hands

Wash your hands often with soap and warm water for at least 20 to 30 seconds. If you don't have access to soap and water use an alcohol based hand sanitizer gel. Rub a dollop of gel on your hands until it evaporates. Use an alcohol based hand wipe. Hand washing is one of the most effective ways to stop the spread of germs including viruses.

Think of all the surfaces you touch that other people touch:

- door handles
- supermarket carts
- chair arms
- telephones
- food service trays
- stair railings

If a person has the flu, even without obvious symptoms, and touches their nose or mouth and then the door handle, they leave viruses on the handle. You come along and touch the handle to open the door and the viruses are now on your hand. Touching your hand to your nose or your mouth leads the virus right to where it wants to be.

Keep a small bottle of hand sanitizer in your pocket and use it every time you touch something that other people may have touched.

If you live in an area where 2009 Swine Flu has been found you might want to consider two other measures that are a bit more extreme: wearing disposable latex gloves whenever you're in public and a wearing face mask.

If you wear gloves remember you still should not touch your nose or mouth as the virus can live on the latex surface. Dispose of the gloves and face mask so others aren't exposed. And don't become complacent thinking that if you wear a face mask or don gloves you don't have to do anything else.

### Wipe off and Disinfect

You may be diligent about washing your hands but other members of your family may not be, especially children. Wipe down counters, door handles, and telephone mouth pieces, with a disinfectant. Use paper towels in the bathrooms that are thrown away after each use. Use throw away paper drinking cups. Don't share toothbrushes. Household bleach is an effective inexpensive disinfectant. Use one part bleach to 10 parts water. Vinegar is a disinfectant as well but not as powerful as bleach.

### Stay away from crowds

It's common sense that the more people you're around the more likely it is you will come into contact with someone who is sick.

### **Boosting Your Immune System to Prevent 2009 Swine Flu**

While there is some concern with the 2009 Swine Flu that in certain individuals, a strong immune system will overreact and become threat to their health, until there is conclusive proof, it would seem prudent to bolster your body's ability to fight back.

#### Foods and Supplements that boost immunity include:

**Vitamin C:** Found in lots of fruits and vegetables but especially citrus fruits. Vitamin C fortified foods abound. And of course it's found in supplements. Why does Vitamin C work? It increases production of white blood cells, antibodies and interferon.

**Vitamin E:** Whole grains, leafy green vegetables, egg yolks, and nuts all contain Vitamin E. Vitamin E stimulates the production of Killer T-cells and increases the production of B-cells which manufacture antibodies.

**Carotenoids:** Beta carotene boosts Killer T-cells. Carotenoids are found in carrots, sweet potatoes, kale and spinach. It increases the number of infection-fighting cells, natural killer cells, and helper T-cells, as well as being a powerful antioxidant.

**Zinc:** Found in protein, primarily from animal sources and is available as a supplement. It increases the production of white blood cells that fight infection and help the body release more antibodies.

**Garlic:** A member of the onion family and available as a supplement, it boosts production of white blood cells and antibody production.

**Selenium:** Found in a number of protein sources, brown rice, sunflower seeds, and nuts and of course available as a supplement. This mineral increases Killer T-cells.

**Omega-3 fatty acids:** The omega 3 fatty acids in flax oil and fatty fish (such as salmon, tuna, and mackerel) boosts immunity by increasing the activity of macrophages.

Some people believe that herbal supplements can boost the immune system the same way that foods, vitamins, and supplements can. Four that are often mentioned are Echinacea, Ginseng, Astragalus, and Marshmallow root - also known as Althaea.

### **Get Rest**

Your body heals and recharges itself when you're asleep. It's important to give your body enough sleep time. That's not always easy in today's hectic world. There are herbal supplements that have been shown to promote sleep such as Melatonin and herbal teas like chamomile, passion flower, lemon balm, or hops. And the old fashioned remedy of warm milk really does work in promoting sleep.

Keep your bedroom sleep oriented, with no lap top computer or work related stuff around and keep it dark with light blocking shades. Wear a sleep mask; ambient light works against sleep. Turn the clock away from you so you don't see the time and worry about it. And so the light from the digital display isn't visible. Lower the temperature of the bedroom. It's been shown the people sleep better in a cooler room. A drop in body temperature means sounder sleep.

Don't drink a lot of alcohol. While you may fall asleep faster when the alcohol wears off it will disturb the sleep cycle.

Drink lots of fluids during the day but limit fluids an hour or so before bedtime so sleep isn't interrupted by having to use the bathroom.

### **Decrease Stress Levels**

It is thought that prolonged high stress levels weaken the immune system. Each of us has moments when the stress in our lives seems overwhelming. We've just started a new job, had a baby, gotten married or faced an illness. But everyday life can be filled with stressful moments as well. Decreasing stress levels can boost our immunity to illnesses, including influenza. Here are a few tips to help keep stress from building up.

Changing your diet to include more fresh vegetables and fruits and less sugars, salt, and refined carbohydrates can be helpful. Obviously decreasing your caffeine intake would help as well. Caffeine can aggravate some of the symptoms of stress. Lemon balm tea is a good substitute for coffee as it has calming properties.

Increasing the level of vitamin C, an antioxidant, boosts the immune system and has been shown to decrease stress related infections. Other antioxidants you might consider are Vitamin A and E.

Aromatherapy is another way to bring down stress levels. Aromatherapy relies on the use of essential oils. Essential oils are derived from plants, herbs, flowers, woods and citrus fruit peel. Lavender, Clary Sage, Rosemary, Sandalwood, and Tangerine are a few

essential oils that have a calming soothing effect. Lavender is used in some baby bath products to help infants drift calmly off to sleep.

The oil can be added to a non scented candle and burned. Light the candle and let it develop a pool of melted wax around the wick. Blow out the candle and add the essential oil to the melted wax and then relight. If you just add the oil to the melted wax while the candle is lit, the oil floats on top and is burnt off immediately.

The oils can be added to a warm bath, ¼ teaspoon up to a full teaspoon. The warm bath itself reduces stress by increasing blood circulation and relaxing muscles. Epsom salt and sea salt (1 to 2 cups) added to a bathtub in addition to the essential oils soothes sore muscles and adds a sense of buoyancy.

Exercise is a time tested method of reducing stress levels. Just make sure that the exercise is completed at least four hours before bedtime. Exercising closer to bedtime might make it more difficult to fall asleep.

Massage, especially on the neck and shoulders reduces stress, and helps alleviate the headaches that some people experience with stress. Self massage can be performed on the temples, and back of the neck.

Yoga and Pilates (an exercise discipline) include stretching movements which releases tension within the muscles and aids in blood flow, thereby reducing stress.

Meditation is well known for its ability to decrease stress. Meditation can be combined with aromatherapy and gentle stretches after the session is completed.

### **You Think You May Have the Flu Or Even Worse the 2009 Swine Flu**

Don't panic. There isn't any way to tell if you have the common winter flu or the 2009 Swine Flu without going to a physician for testing. In either case visit your doctor and start the antiviral treatment within 48 hours of becoming ill.

Don't go to the emergency room. Hospitals are whirlpools of germs especially the emergency waiting room. If you didn't have the flu when you entered you may very well have it when you leave. If your doctor isn't available visit an Urgent Care Facility.

Use tissues when you sneeze or cough and immediately dispose of the tissue into a plastic lined paper bag. Wash your hands after every cough or sneeze. If you're too weak to get up to wash your hands use hand sanitizer. Doing this won't make you any better but it will protect your family and friends from getting sick.

Drink lots of fluids. Make yourself as comfortable as you can.

## Conclusion

While the 2009 Swine Flu has a frightening potential for spreading illness across the globe, there are efforts we can take to keep ourselves safe. Knowing what the Swine Flu is, what it isn't, how it's transmitted, and how you can decrease the odds of becoming infected are the first steps in keeping you and your family healthy and safe.

Keep up-to-date on where new cases have been found. Visit the world health organization, <http://www.who.int/en/> for the latest information.

Take necessary precautions yourself and make sure your family does the same.

Don't panic if you come down with flu symptoms.

Avoid crowded venues.

If you do become sick don't infect others by going back to work while you're still ill.

Hopefully, in a few months the 2009 Swine Flu outbreak will be winding down and no longer a front page news item. The people who came down with this new flu virus will be fully recovered and back to their normal lives with no lasting ill effects. Individuals will no longer have to be concerned about the threat of becoming infected from normal day-to-day activities such as being out in crowds or traveling. For the vast majority of people who did not experience the virus, there are still lessons to be learned about how we can all prevent the spread of viruses within our homes, workplaces and local communities. And we can certainly be more vigilant about maintaining a lifestyle that will strengthen our individual immune systems and reduce the chance each of us will become ill from new and dangerous viruses that will—inevitably—appear in the future.