

## **Respiratory Protection and Avian Influenza Viruses**

### **Frequently Asked Questions**

The following information is provided in order to assist you and answer some commonly asked questions concerning avian influenza and personal protective equipment (PPE). The responses are based on guidance and precautions issued by The U.S. Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO). The most current and complete set of information is available at the websites maintained by these health organizations:

CDC: <http://www.cdc.gov/flu/avian>

WHO: [http://www.who.int/topics/avian\\_influenza/en/](http://www.who.int/topics/avian_influenza/en/)

#### **What is avian influenza (bird flu)?**

Avian (bird) influenza (flu) is an infection caused by viruses. There are many types of avian influenza and they occur naturally among birds, primarily waterfowl. Even though wild birds carry the viruses they usually don't become sick from them. However, avian influenza is very contagious among birds and can spread to domesticated birds (e.g. chickens) and make them very sick and often kill them.

#### **How do the viruses spread among birds?**

The virus can be contained within the saliva, nasal secretions, and feces of infected birds. Birds become infected when they come into contact with infected birds (wild or domestic) or surfaces that are contaminated with excretions.

**Can humans become infected with avian influenza?**

People usually don't become infected with avian influenza, but within the last few years numerous cases of human infection have been confirmed. Typically, infection in humans has resulted from direct contact with infected birds (poultry) or contaminated surfaces.

**What are the symptoms of avian influenza?**

Symptoms of bird flu in humans have ranged from typical flu-like symptoms (fever, cough, sore throat and muscle aches) to eye infections, pneumonia, severe respiratory diseases, and other severe and life-threatening complications.

**Can avian influenza be transmitted from person to person?**

To date, the CDC and WHO have reported that, although there is evidence of limited person-to-person spread of infection, sustained human-to-human transmission has not occurred. There is a risk that the virus, if given enough opportunities, will change into a form that is highly infectious for humans and spreads easily from person to person.

**How do humans become infected with avian influenza viruses?**

As mentioned, most cases of avian influenza infection in humans have resulted from contact with infected poultry, their excretions or contaminated surfaces. However, other means of transmission are possible, such as the virus becoming aerosolized and landing on exposed surfaces of the mouth, nose, eyes, or being inhaled into the lungs.

**What precautions can be taken to reduce the risk of infection?**

Reduce exposure by keeping a safe distance from wildlife, in particular wild birds. Maintain good hand hygiene by washing your hands with soap and water. If contact with wildlife has occurred do not touch your eyes, eat, drink, or smoke before washing your hands with soap and water.

**Should I wear a face mask to prevent exposure to avian influenza?**

At present, we are not aware of the CDC or any country or government recommending the use of a face mask (e.g. surgical mask) or respirator by the general public for avian influenza. The CDC does recommend the use of a government-certified respirator for health care workers involved in the care of patients with known or suspected avian influenza and workers involved in the control and eradication of avian influenza among poultry.

**What type of government-certified respirator is recommended for health-care workers and those who are involved with disease control and eradication activities?**

According to CDC and WHO, disposable particulate respirators that are at least as protective as a US NIOSH-certified N-95 or a European Union-certified FFP2, or an equivalent should be worn. Respirators that afford a higher level protection may also be used (e.g., N-99, N-100 or FFP3). The WHO lists the following as acceptable disposable particulate respirators:

- U.S. NIOSH-certified N95 (95%), N99 (99%), N100 (99.7%)
- Australia/New Zealand: P2 (94%), P3 (99.95%)
- China: II (95%), I (99%)
- Japan: 2<sup>nd</sup> class (94%), 3<sup>rd</sup> class (99.9%)
- Korea: 1<sup>st</sup> class (94%), special (99.95%)
- EU: FFP2, FFP3

## **What is a particulate respirator and what is a NIOSH-approved N-95 respirator?**

A respirator is a personal protective device that is worn on the face, covers at least the nose and mouth, and is used to reduce the wearer's risk of inhaling hazardous airborne particles (including dust particles and infectious agents). Particulate respirators are also known as "air-purifying respirators" because they protect by filtering particles out of the air as you breathe. These respirators protect *only* against particles—not gases or vapors.

Respirators that filter out at least 95% of airborne particles during "worse case" testing using a "most-penetrating" sized particle are given a 95 rating. Those that filter out at least 99% receive a "99" rating. And those that filter at least 99.97% (essentially 100%) receive a "100" rating.

Respirators are also rated as N, R, or P for protection against oils. This rating is important in industry because some industrial oils can degrade the filter performance so it doesn't filter properly. Respirators are rated "N," if they are *not* resistant to oil, "R" if somewhat *resistant* to oil, and "P" if strongly resistant (*oil proof*).

## **Can respirators protect you from biological agents such as bacteria or viruses?**

Respirators are designed to reduce exposures of the wearer to airborne particles. Since airborne biological agents such as viruses and bacteria are particles, they can be filtered by particulate respirators. However, no respirator will prevent the inhalation of all particles; they cannot eliminate the risk of exposure, infection and illness. Keep in mind, you can catch the flu by touching your mouth, nose or eyes with contaminated hands or objects, or eating contaminated food. That is why at the present the CDC recommends hand washing as the best precaution for the general public.

## **What is the difference between a government-certified respirator and a surgical mask?**

Generally, respirators are designed to protect the wearer from respiratory aerosols, while the primary purpose of a surgical facemask is to help prevent biological particles from being expelled by the wearer into the environment (i.e. protect the patient). Another primary function of a surgical mask is to provide facial protection for the health care professional during patient care activities that are likely to generate splashes or sprays of blood or other bodily fluids. Also, a surgical facemask may not have been tested for filter efficiency and thus there is a wide variety of filtering efficiencies among available masks. Finally, a surgical facemask may not have been designed to seal tightly to the face and therefore air leakage around the edges is possible. However, some respirators are designed to have the characteristics of both an approved respirator and a surgical mask. To be sure, read the product literature or check with the manufacturer for product specifications.

## **How important is respirator fit?**

Both the CDC and WHO emphasize the importance of using a fit-tested respirator and that fit testing be performed prior to the first use to determine if an acceptable fit and seal can be achieved. In order for a respirator to work correctly, there must be a proper seal between the respirator's sealing surface and the wearer's face during the entire time you are exposed. If a respirator does not seal properly to the face, airborne hazards can enter your respirator through any leaks large enough to let them in. It is very important to always follow the donning instructions and do a user seal-check or fit-check each time a disposable particulate respirator is worn. A good fit can only be obtained if the face is clean-shaven in the area where the respirator seals against the face. Hair from beards and mustaches or anything that prevents the respirator from directly touching your skin can prevent a proper seal. Many medical facemasks, not approved as respirators, do not seal tightly to the face and thus do not prevent

leakage around the edge of the mask when the user inhales. In the workplace, a government standard sets requirements for fit testing of respirators. For information on fit testing and user seal checks see:

<http://www.osha.gov/SLTC/respiratoryprotection/standards.html>

### **How do I clean my respirator after use?**

Disposable respirators should not be cleaned. After use, dispose of the respirator.

### **Can disposable respirators be shared between people?**

No. Disposable respirators should never be shared.

### **Besides a respirator, what other type of personal protective equipment (PPE) is recommended for health care workers and those who are involved with disease control and eradication activities?**

Disposable gloves, protective clothing, shoe covers or boots, and safety goggles should also be worn by eradication workers. Disposable PPE should be properly discarded, and non-disposable PPE should be cleaned and disinfected. Hand hygiene measures (wash hands with soap and water or an alcohol-based hand gel) should be performed after the removal of PPE.

### **What specific types of gloves are recommended for health care workers and those who are involved with disease control and eradication among poultry?**

For health care workers caring for patients with known or suspected bird flu, the CDC and WHO recommend use of disposable gloves. For disease control/eradication workers, in addition to disposable gloves made of lightweight nitrile or vinyl, the CDC recommends heavy duty rubber work gloves that can be disinfected. To protect against dermatitis, which can occur from prolonged

exposure of the skin to perspiration, a thin cotton glove can be worn inside the external glove. Gloves should be changed if torn or otherwise damaged. Remove gloves promptly after use, before going to another patient or touching non-contaminated items and environmental surfaces.

**Do disposable gloves differ in barrier performance and if so what evidence is there to support the differences?**

Studies have been completed where clinical glove use was simulated and then the gloves were tested for leaks. These studies have shown that natural rubber latex gloves are much more protective than vinyl (lower rates of failure, i.e. leakage), and nitrile gloves demonstrated in-use barrier durability comparable to natural rubber latex. Performance of any glove will depend on the physical characteristics and quality of manufacture.

**While the CDC and WHO have stressed that hand washing with soap and water is critical to prevent the spread of a virus, is there any support for the use of alcohol-based hand disinfection products?**

The CDC “Guidelines for Hand Hygiene in Health-Care Settings” states that alcohol solutions containing 60%-95% alcohol are most effective, and higher concentrations are less potent because some water is needed for effectiveness. Many studies have demonstrated that influenza, an enveloped virus, is susceptible to alcohols. Ethyl alcohol has greater activity against viruses than isopropyl alcohol therefore; ethyl alcohol-based hand disinfection products may be preferred over isopropyl alcohol products. However, both the CDC and WHO stress hands must be washed with soap and water prior to using an alcohol based product if the hands are visibly dirty or contaminated with proteinaceous material.

**While use of protective clothing is recommend for healthcare and disease eradication workers, is there any further guidance regarding garment selection?**

The garment should protect the skin and prevent soiling of clothing. Furthermore, it should be appropriate for the activity and the amount of fluid likely to be encountered. Some garments are specifically designed by manufacturers to protect the user from bloodborne pathogens. The fabric in these garments is tested for penetration of pathogens using standard test methods.

**Clearly there are guidelines for workers involved in disease eradication among poultry but, is there any information directed at poultry workers?**

Yes, there are documents on the CDC and the Occupational Safety and Health Administration (OSHA) websites (see links below) which pertain to poultry workers that could be at risk to prolonged exposure to infected poultry or bird flu. The CDC and OSHA have collaborated and produced recommendations aimed at poultry growers, poultry processing technicians, layer barn workers, and chick movers. The guidance for personal protective equipment follows the recommendations given to healthcare and disease eradication workers.

[http://www.cdc.gov/flu/avian/professional/symposium\\_110304\\_archive.htm](http://www.cdc.gov/flu/avian/professional/symposium_110304_archive.htm)

<http://www.osha.gov/dts/shib/shib121304.pdf>

**What does CDC/WHO/OSHA recommend for workers likely to encounter viruses (including possible avian flu virus) as part of the job, but who are not “health care workers and those who are involved in the poultry industry” such as lab technicians, etc.?**

Outside of few other special groups such as airline crews, the CDC and WHO have not made any specific recommendations as to these other categories of people whose jobs may pose a greater-than-average viral exposure risk. It is critical that such workers and professionals follow their company’s individual internal safety procedures and OSHA regulations for safety on the job. The CDC and WHO recommendations can provide useful information which may encourage company safety procedures based on individual risk assessments.