Avian Influenza (H5N2) Outbreak in the United States: Personal Protective Equipment Recommendations

The United States Department of Agriculture (USDA) states that “Since December 2014, USDA has confirmed several cases of highly pathogenic avian influenza (HPAI) H5 in the Pacific, Central, and Mississippi flyways (or migratory bird paths). The disease has been found in wild birds, as well as in a few backyard and commercial poultry flocks. The Centers for Disease Control and Prevention (CDC) considers the risk to people from these HPAI H5 infections to be low. No human cases of these HPAI H5 viruses have been detected in the United States, Canada, or internationally.”

The USDA Animal and Plant Health Inspection Service (APHIS) has reported that between December 19, 2014 and June 12, 2015, the outbreak has affected over 47 million birds in the US. The virus is spread through contact with fecal droppings, saliva and nasal discharges of infected birds. More information can be found on the USDA website.

The US Centers for Disease Control and Prevention (US CDC) has stated that “Although these viruses are not known to have caused disease in humans, their appearance in North America might increase the likelihood of human infection in the United States. Human infection with other avian influenza viruses such as HPAI (H5N1) and (H5N6) viruses and (H7N9) virus has been associated with severe, sometimes fatal, diseases, usually following contact with poultry.”

The US CDC is advising that “as a general precaution, people should avoid wild birds and observe them only from a distance; avoid contact with domestic birds (poultry) that appear ill or have died; and avoid contact with surfaces that appear to be contaminated with feces from wild or domestic birds. People in contact with known infected or possibly infected birds should take precautions to protect against infection.”

On June 2, 2015 the US CDC published an official health advisory titled “Bird Infections with Highly-Pathogenic Avian Influenza A (H5N2), (H5N8), and (H5N1) Viruses: Recommendations for Human Health Investigations and Response.” This document states that “People should avoid unprotected exposure to sick or dead birds, bird feces, litter, or materials contaminated with suspected or confirmed HPAI H5 viruses. All recommended personal protective equipment (PPE) should be worn when in direct or close contact (within about 6 feet) with sick or dead poultry, poultry feces, litter or materials contaminated with suspected or confirmed HPAI H5 viruses.” In addition, US CDC advises: “Workers should receive training on and demonstrate an understanding of when to use PPE; what PPE is necessary; how to properly put on, use, take off, properly dispose of, and maintain PPE; and the limitations of PPE.” In its “Recommendations for Worker Protection and Use of Personal Protective Equipment (PPE) to Reduce Exposure to Highly Pathogenic Avian Influenza A H5 Viruses,” the US CDC recommends properly-fitted safety goggles, disposable gloves, boots, a NIOSH-certified respirator (e.g., N95 or higher), and disposable fluid-resistant
coveralls as PPE appropriate when exposed to [potentially] infected birds. The US CDC further notes that respirator use should be within a respiratory protection program per OSHA 29 CFR 1910.134.

The US CDC also recommends standard, contact and airborne infection control precautions or health care workers caring for patients who have illness consistent with influenza and recent exposure to potentially-infected birds. The US CDC document “Interim Guidance for Infection Control Within Healthcare Settings When Caring for Confirmed Cases, Probable Cases, and Cases Under Investigation for Infection with Novel Influenza A Viruses Associated with Severe Disease” pertains to avian influenza A (H7N9), Asian-origin (H5N1) and the newly detected avian influenza H5 viruses in the United States (H5N2, H5N8, and the new reassortant H5N1 virus). The document recommends that all health care workers having contact with patients suspected of any of these influenza wear gloves, gowns, eye protection (goggles or faceshield) and a NIOSH-approved respirator.

The guidelines set forth by USDA in “Foreign Animal Disease Preparedness and Response Plan (FAD PReP) Highly Pathogenic Avian Influenza (HPAI) Standard Operating Procedures: 8. Health and Safety and Personal Protective Equipment” state that all workers involved in the culling, transport, or disposal of HPAI virus-infected poultry must be provided with the following appropriate personal protective equipment: protective clothing, gloves, respirators, eye protection (e.g. goggles) and boots or protective foot covers. The protective clothing must be capable of being disinfected or discarded, preferably coveralls or surgical gowns and long cuffed sleeves (plus an impermeable apron). The minimum recommendation for respiratory protection is a NIOSH-approved disposable particulate respirator.

During cleaning and disinfection it is important to consult the MSDS and instructions for any chemical disinfectants being utilized, and to select PPE that will help reduce worker’s exposures to those chemicals. If respiratory protection from gases and vapors is needed or desired the 3M Respirator Cartridge Select and Service Life Software can be consulted: www.3M.com/servicelifesoftware

Anyone anticipating contact with infected birds or affected operations should consult the USDA and CDC websites and can report sick birds or unusual bird deaths to State/Federal officials, either through their state veterinarian or through USDA’s toll-free number at 1-866-536-7593.

3M Disinfectants
The US EPA website contains a list of disinfectants with Avian Influenza claims, but only lists the primary registered product. 3M products with supplemental registrations for those EPA listed products, and therefore recommended for Avian Influenza disinfection, include:

3M™ HB Quat Disinfectant Cleaner Concentrate 25L, 25H, 25A
3M™ HB Quat Disinfectant Cleaner Concentrate (bulk gallon)
3M™ Quat Disinfectant Cleaner Concentrate 5L and 5H
References


2. United States Department of Agriculture, Animal and Plant Health Inspection Service, Avian Influenza Disease, updated June 12, 2015 http://www.aphis.usda.gov/wps/portal/aphis/ourfocus/animalhealth/sa_animal_disease_information!ut/p/a1/tZFLU4MwFlV_SxcmUREZb0CW2xjrW2sMkECUCOBAqpo_56Q3Whi9a68O7unXPunPkOiME0xJK9iD1Topas7PfYpfOvb94OoRnM1mQCg7unaYiXYFr5thZEWjCaeb6NlhBCG5swGA_9MShhIF7nR-eGQ,-5t-CGMSpVI0qQMMAQn0raXiUtFSJC1r325gx2h9bGleph8futDEpKlbSgrNSFd8vmeq46zgVMq_b6gSh_9-kIGORxWGMCScxXJ5jw8aEGMTh2CAE1lYbNDCHL-szzJJsMTSrP8t7jIjbcOF8CS4hOwkuMlk0NHSWCrHB-op-p51fUZlhhKNzt0wVRg817C6D0x7xfD]Eni6or-RVgd2_NNRUm02FLffBF3_Mqy3uvMHaAzlNlkA/?1dmv&uritle=wcm%3apath%3a%2Faphis_content_library%2Fsa_our_focus%2Fsa_animal_health%2Fsa_animal_disease_information%2Fsa_avian_health

3. Jhung, M.A., Nelson, D.I. Outbreaks of Avian Influenza A (H5N2), (H5N8), and (H5N1) Among Birds — United States, December 2014–January 2015, MMWR February 6, 2015 / 64(04);111 http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6404a9.htm


5. US CDC Bird Infections with Highly-Pathogenic Avian Influenza A (H5N2), (H5N8), and (H5N1) Viruses: Recommendations for Human Health Investigations and Response. June 2, 2015 http://emergency.cdc.gov/han/han00378.asp


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Below are some frequently asked questions regarding the use of PPE to help reduce exposures to infectious airborne organisms, such as avian influenza viruses.

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

Bacteria and viruses may be spread from person to person in different ways. Therefore, a respirator is just one of several preventative measures that can be used to help reduce exposure to biological agents. Specifically, respirators are designed to help reduce exposures of the wearer to airborne hazards. Biological agents, such as bacteria or viruses, are particles and can be filtered by particulate filters with the same efficiency as non-biological particles having the same physical characteristics (size, shape, etc.). However, unlike many industrial particles, there are no exposure limits, such as Occupational Exposure Limits (OELs), Permissible Exposure Limits (PELs) or Threshold Limit Values (TLVs), established for biological agents. Respirators may help reduce exposures to airborne biological contaminants such as avian influenza viruses, but they do not eliminate the risk of exposure, infection, illness, or death.

What is a type N95 respirator?

N95 is the simplest of the US NIOSH classifications of negative pressure filtering facepiece disposable particulate respirators.

What do N, R, and P stand for?

NIOSH designates negative pressure particulate respirators and filters as N (Not Resistant to oil), R (Resistant to oil) or P (oil Proof).

Can medical facemasks be used to help reduce exposures to biological agents?

Medical, surgical and patient care masks are not designed to protect the wearer from inhaling airborne hazards; therefore, 3M recommends that they not be used for this purpose, or in place of an approved respirator. Facemasks are sometimes recommended by health authorities to help reduce the spray generated when the wearer coughs and sneezes.
What is the difference between a government-certified respirator and a surgical mask?

Respirators are designed to help reduce the wearer’s exposure to airborne particles. The primary purpose of a surgical facemask is to help prevent biological particles from being expelled by the wearer into the environment. Surgical masks are also typically designed to be fluid resistant to splash and splatter of blood and other infectious materials and not necessarily for filtration efficiency. Surgical facemasks are not necessarily designed to seal tightly to the face, and therefore the potential of air leakage around the edges exists. Even some masks that appear similar to respirators may have not been designed to protect the wearer from airborne hazards; therefore, they should not be considered an equivalent substitute to government-approved respirators.

Some approved respirators are designed to have the characteristics of both an approved respirator and a surgical mask. In the U.S., these products, typically referred to as “Surgical Respirators” are both approved by NIOSH and cleared by the U.S. Food and Drug Administration (FDA) for use in surgery.

For additional information, please refer to 3M Technical Data Bulletin #231.

Are there any medical restrictions for wearing a respirator?

Individuals with a compromised respiratory system, such as asthma or emphysema, or people with a history of heart disease should consult a physician before wearing a respirator. When personal protective equipment, including respirators, is used in a professional environment, its use must comply with applicable workplace standards, regulations and policies including medical clearance where required.

What are the limitations of using respirators for potential exposures to avian influenza?

Respirators are not a guarantee that the user will not develop infection with influenza. If you choose respirators as part of your efforts to help reduce exposures to influenza, the following items need to be carefully read and understood.

- Respirators must be used in the proper manner, in accordance with all manufacturer instructions and directions and local regulations.
- Respirators may help reduce exposure to airborne biological contaminants, but they do not eliminate the risk of exposure, infection, illness, or death.
- For greatest effectiveness, respirators need to be properly worn before and during the entire exposure period.
- Respirators may help protect your lungs; however, some biological contaminants may be absorbed through the skin or eyes, and other protective equipment may be required.
- The wearer must be clean-shaven to wear tight-fitting respirators that seal tightly to the face (such as an N95 filtering facepiece respirator). Beard, stubble or long mustaches may cause large leaks into the respirator. Respirator users with facial hair must use powered air purifying respirators with loose fitting facepieces, hoods or helmets.
- Fit of the respirator to the face is very important. If it does not fit properly (e.g. the wearer has facial hair) airborne contaminants will penetrate (enter underneath) the facepiece seal and you will not receive the intended benefit of wearing the respirator.

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• All users must perform a user seal check (fit check) each time the respirator is used. In the US and certain other countries workers are also required to pass a fit test, prior to use of the respirator in a contaminated area. Where not required by law, 3M recommends that all workers pass a fit test prior to use of a respirator in a contaminated area.
• Training on proper use and limitations, including practice putting the respirator on and wearing it, is required.
• Individuals with a compromised respiratory system, such as asthma or emphysema, should consult a physician before wearing a respirator.

Each facility or individual should use the best available information to determine appropriate respiratory protection for exposures to avian influenza.

Are multiple sizes of respirators needed?

Multiple sizes of respirators are not mandatory. Multiple sizes or alternative facepiece designs can provide the individual with additional options for obtaining a good fit and seal. What is important is that the respirator fit the wearer. As a result, all users must follow the manufacturer’s instructions and directions, and perform a user seal check (fit check). In the U.S. and certain other countries, workers must pass a fit test prior to use of a respirator in a contaminated area. Where not required by law, 3M recommends that workers pass a fit test prior to use of a respirator in a contaminated area.

How important is respirator fit?

Fit is very important. If a respirator does not seal tightly to the face, airborne hazards can penetrate or enter underneath the facepiece seal and into the breathing zone. It is very important to always follow the donning instructions and do a user seal check (fit-check) before entering the contaminated environment. With a tight-fitting respirator, such as an N95 a good fit can only be obtained if the face is clean-shaven in the area where the respirator seals against the face. Beards, long mustaches, and stubble may cause leaks into the respirator. For workplace environments, such as health care facilities, you must follow local government standards and regulations concerning respirator use such as training and fit testing. In the U.S., the Occupational Safety and Health Administration (OSHA) requirements for respiratory protection (1910.134) must be followed including medical evaluation, training, and fit testing for employees required to use respirators in the workplace. Fit testing must be done before wearing a tight fitting respirator for the first time, and repeated at least annually or sooner if changes to facial structure occur that may affect respirator fit. A user seal check cannot be used as a substitute for the fit test.

In countries where the OSHA standards do not apply, health care workers and other employees required to wear a respirator should follow applicable national workplace standards, regulations and policies concerning use, fit-testing/checking and training.

What if I have a beard or stubble and want to wear a respirator for avian influenza exposures?

Tight sealing respirators (one where the sealing surface contacts the face) will not provide an adequate seal when placed over facial hair. Workers must shave within 24 hours of using the
respirator. A bearded worker will require a powered air-purifying respirator (PAPR) or supplied air respirator with a loose-fitting facepiece, hood or helmet in order to attain a proper seal.

**How do I put on the respirator and check for proper fit?**

The User Instructions for a 3M respirator contain the proper procedures for putting on the respirator and checking for fit and seal. It is very important to read and follow the donning instructions very carefully and to conduct a user seal check (fit check) every time the respirator is put on. The User Instructions are provided with the original packaging of the respirator. If you need instructions or have questions, please contact 3M Technical Service in the US at 1-800-243-4630 or consult the website at [www.3M.com/PPESafety](http://www.3M.com/PPESafety).

**How is a user seal check/fit check performed on a disposable filtering facepiece respirator?**

To perform a user seal check on a 3M non-valved, cup shaped disposable filtering facepiece respirator, place both hands completely over the respirator and exhale. The respirator should bulge slightly. If air leaks between the face and the faceseal of the respirator, reposition it and readjust the nose clip for a more secure seal. If air leaks around the respirator edges, adjust the position on the face and the straps along the sides of the head and recheck fit. If a proper fit cannot be achieved, do not enter the area requiring respiratory protection. See your supervisor and / or specific product User Instructions for the most current user seal check/fit check instructions.

To perform a user seal check on a 3M valved, cup shaped disposable respirator, place both hands completely over the respirator and inhale. The respirator should collapse slightly. If air leaks between the face and the faceseal of the respirator reposition it and readjust the nose clip for a more secure seal. If air leaks around the respirator edges, adjust the position on the face and the straps along the sides of the head and recheck fit. If a proper fit cannot be achieved, do not enter the area requiring respiratory protection. See your supervisor and / or specific product User Instructions for the most current user seal check/fit check instructions.

**What if I notice air leaking in during the user seal check?**

If, during the user seal check (fit check), you notice air leakage around the edges of the respirator you should readjust the respirator. If you still notice air leakage, you should remove the respirator (in a clean area only). Review the instructions if necessary to make sure that you are putting it on correctly. Inspect the respirator to make sure that there is no damage to the respirator. You must be clean-shaven. Be sure that there is no hair, clothing or jewelry between your skin and the edge of the respirator. Put the respirator on again, according to the manufacturer’s directions. Do a user seal check (fit check). If you still cannot achieve a proper seal, do not enter the contaminated area. You may need to obtain a different size, make or model respirator. See your supervisor.

In the U.S. and certain other countries, workers need to pass a fit test before wearing a tight-fitting respirator for the first time. In countries where fit testing is not required, 3M recommends that workers pass a fit test prior to use of a respirator in a contaminated environment. If you do not pass a fit test on the first try, you should remove the respirator. Reread the instructions and put it on again. Conduct a user seal check (fit check). If you do not feel any air leakage around the respirator edges, then you should try the fit test again. If you fail the fit test on the second try, do not enter the

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contaminated area. You should obtain a different size, make or model of respirator and conduct a fit test on that respirator. See your supervisor.

**Can disposable respirators, such as an N95 respirator be shared between people?**

Disposable respirators should never be shared.

**What is the risk of inhaling biological particles that have been collected by the respirator filter?**

The risk of inhaling particles that have been collected by a filter is low, particularly in very clean areas (such as a patient care setting or a home). When particles are collected on a filter they are strongly held to the filter. Breathing through a filter has not been shown to dislodge the particles collected in that filter. However, it is important to note viruses may be spread by touching contaminated objects. Based on the US CDC recommendations for SARS, a respirator worn in an area with a suspect or confirmed patient is considered potentially contaminated with infectious material.

**Can particles, such as bacteria or viruses, be reaerosolized from the respirator filter?**

Particles are collected on a filter are strongly held to the filter. Proper and normal use of a respirator has not been shown to reaerosolize the particles collected in that filter. However, just because particles may not reaerosolize, does not mean that a respirator can be reused. It is important to note that some viruses may be spread by touching contaminated objects. Based on the US CDC recommendations for SARS, a respirator worn in an area with a suspect or confirmed patient is considered potentially contaminated with infectious material.

**Do 3M disposable respirators contain natural rubber latex?**

None of 3M’s NIOSH approved N95, N100, R95, P95, or P100 disposable respirators contain components made from natural rubber latex. Many other 3M respirators sold outside the U.S. do not contain components made from latex. However, there are some that contain natural rubber latex components, and these respirators carry a statement on the primary packaging similar to the following: “This product contains components which contain natural rubber latex which may cause allergic reaction.” If you require information on which 3M products contain natural rubber latex components, please contact your local 3M office.

**Do any of 3M’s disposable respirators contain fiberglass material?**

No. All 3M disposable respirators have filter media made from polypropylene and coverings made from a combination of polypropylene and polyester.
Is a fit test hood system safe from contamination?

The fit test hood used in the 3M™ FT-10 and 3M™ FT-30 is a closed environment. The following precautions apply:

1. All individuals with a suspect or confirmed infection should be eliminated from fit testing.
2. All subjects should thoroughly wash their hands.
3. The subject should not touch the test hood with his or her hands, and should wear protective gloves and/or practice proper hand hygiene following any contact with the fit test hood. The test administrator handles the placement of the hood.
4. If the subject coughs or sneezes during the test, the hood should be disinfected with typical disinfectant such as dilute solution of common bleach.

http://www.cdc.gov/hicpac/Disinfection_Sterilization/3_2contaminatedDevices.html

EYE AND FACE PROTECTION

Can eye or face protection protect you from biological agents such as bacteria or viruses?

Bacteria and viruses may be spread from person to person in different ways. Therefore, eye or face protection is just one of several preventative measures that can be used to help reduce exposure to biological agents. Eye protection is intended to help provide a barrier to materials entering the eye, and is often used in conjunction with other personal protective equipment (PPE) such as gloves, gowns, and respirators. During the H5N1 avian influenza outbreak, NIOSH recommended poultry workers wear unvented or indirectly vented safety goggles when working with poultry. "Eye or face protection may help reduce exposures to airborne biological contaminants, but they do not eliminate the risk of exposure, infection, illness, or death. Please check the NIOSH website periodically for any updates.


Please also consult page 1 of the 3M Technical Data Bulletin #192 — Eye Protection for Infection Control http://multimedia.3m.com/mws/mediawebserver?mwsId=66666UF6EVsSyXTtNxMa5XfEEVtQEVs6EVs6EVs6E666666--

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What are safety glasses?

Safety glasses can help provide eye protection from impact hazards; however, they do not fit tightly around the wearer’s eyes and therefore do not provide the same level of splash or droplet protection as goggles and generally should not be used for infection control purposes.

What are goggles?

- Goggles are designed to fit snugly around the wearer’s eyes. During H5N1, NIOSH recommended poultry workers wear unvented or indirectly vented safety goggles when working with poultry. Unvented safety goggles do not have any ports for ventilation.
- Indirectly-vented safely goggles have ports that are covered to allow for ventilation but designed to provide protection from splashes or fine dust.
- Directly-vented goggles may allow penetration by splashes or sprays; therefore, indirectly-vented or unvented goggles are preferred.
- Properly fitted goggles should form a close fit around the wearer’s eyes and hence help provide greater protection compared to safety spectacles.

What are face shields?

Faceshields are designed to help shield portions of the wearer’s face. Face shields can be a useful complement to goggles for infection control. Goggles are designed to contact the face and help protect a wearer’s eyes from direct contact with splashes, sprays, and droplets. Face shields can help prevent splashes, sprays and droplets from reaching the face including the eye area and can help prevent contamination of PPE worn on the face. Face shields should have crown and chin protection and wrap around the face to the point of the ear. This will help reduce the possibility of splash, sprays and droplets from going around the edges of the shield and reaching the eyes or other facial areas.

What are full facepiece respirators?

Full facepiece respirators are designed to help seal against the face from below the chin to above the eyes. In the event respiratory protection along with eye and face protection is needed, a full facepiece respirator may be selected. A full facepiece respirator can be used as primary eye protection for splashes, sprays, and droplets that may be encountered in an infection control situation.

Can corrective eyeglasses or contact lenses be used to help reduce exposures to biological agents?

Corrective eyeglasses or contact lenses alone are not considered eye protection. Therefore, they should not be used to help reduce exposure to biological agents.
How important is fit?

Fit is very important. If the eye or face protection does not fit, it will not function properly and may not provide the intended level of protection.

How should I clean or wash eye and face protection that has been exposed to biological agents?

Please consult with the facility’s Infection Control Practitioner and the eye or face protection manufacturer regarding which cleaning and disinfection agents may be appropriate. Note, however, that any washing or disinfection of eyewear must occur within parameters set in the manufacturers User Instructions, and that repeated washing or disinfection of eyewear may diminish anti-scratch or anti-fog coatings.

What type of coverall should be considered?

The mechanism of H5N2 transmission among birds is not well understood, so assessing the risk of potential future transmission to humans would be highly speculative. Despite this uncertainty, selection of personal protection ensembles must be based on a site-specific hazard assessment that accounts for the degree of infectiousness, type of contact with infective materials and their physical state (solid vs liquid), physical demands of the task, work rate, temperature, humidity, availability of decontamination facilities, and other relevant factors.

In general, protective clothing offering the highest level of protection from infective agents is also the least breathable and may introduce hazards related to heat stress and dehydration. Breathable protective clothing (e.g., 3M 4520) offers less protection but may be more desired for hot conditions where the risk of contacting infective agents is low, where sufficient decontamination facilities are available at the completion of work tasks, and where the risk of harm from heat stress and dehydration is high.

If preventing dermal contact with infectious materials is indicated by the hazard assessment, consider a coverall that meets ISO 16604 or ASTM F1671, “Clothing for protection against body fluids — Test method using Phi-X174 bacteriophage.” Coveralls meeting these standards are typically made from impermeable fabric, tape-sealed seams and sealable storm flaps to cover the zipper. Again, however, the mechanism of H5N2 transmission among birds is not well understood, so make sure to review the latest guidance from health authorities on the issue frequently.