CDC Sample H5 Seroprevalence Investigation Materials Package

Seroprevalence investigations are an epidemiologic study design where people's blood is tested to see if they show evidence of past infections. Past infections are detected using antibody testing on blood specimens. The CDC has developed an example protocol for a seroprevalence study of highly pathogenic influenza A (H5N1) virus in farm workers to support public health partners in conducting seroprevalence investigations.

This packet includes:

- A sample protocol that could be adapted for submission to a human subjects research office (if these investigations are determined part of public health practice) or to an institutional review board (if they are developed into a research protocol). See 45 CFR§46.102(l)(2).
- A sample consent document, data collection tool, and specimen collection instructions.

Additional operational guidance and technical support are available to public health partners interested in adapting these documents to implement local versions of these investigations. For more support with investigations, please contact H5FluStudy@cdc.gov. For media inquiries, please contact Jasmine Reed (pvz1@cdc.gov).

Identifying Human Infection with Highly Pathogenic Avian Influenza A(H5N1) Among Persons in Contact with Infected Animals at Farms or Dairies, United States, 2024

I. BACKGROUND

In March 2024, USDA confirmed HPAI A(H5N1) virus infection in dairy cows for the first time. Multiple human cases have been associated with this outbreak. Rapid detection and characterization of any infections in humans remain critical components of national efforts to prevent further cases, evaluate associated clinical illness, and assess the ability of these viruses to spread to humans. Furthermore, very little is yet known about exposures and risk of transmission between cows and humans.

The purpose of this activity will be to assess the potential threat of HPAI A(H5N1) virus to humans in the U.S. and potential for infection of persons exposed to infected cows or contaminated materials in the environment such as bedding or previously worn personal protective equipment (PPE). This activity focuses on the group at highest risk of HPAI A(H5N1) infection, and includes collection of biological specimens. Collecting respiratory and blood specimens from workers exposed to infected animals will facilitate the estimation of animal-to-human transmission through detection of both symptomatic and asymptomatic infections and assess potential for human-to-human spread through viral sequencing. If risks of A(H5N1) infection are identified, the activity will guide prevention measures to prevent transmission of avian influenza viruses in commercial herds. Findings will be shared in aggregate with government agencies, industry partners, and state and local health departments.

II. OBJECTIVES

(1) Conduct active monitoring and case finding for human infection among farm workers and other persons potentially exposed to infected animals.

(2) Estimate risk of infection, including previous or asymptomatic infection, among persons exposed to sick animals.

(3) Characterize behavioral and environmental risk and protective factors in farm workers, including prevention measures such as using personal protective equipment (PPE) while working with sick animals.

(4) Sequence any A(H5N1) viruses identified from human cases and assess for adaptations in the virus that may indicate potential for increased risk to humans.

III. SUBJECTS OF INVESTIGATION

A. Workers

Persons who work at a worksite, specifically a farm or dairy, at which animals have tested positive for highly pathogenic avian influenza (HPAI).

IV. METHODS

Information will be gathered by interviewing workers at impacted farms or dairies, collecting specimens from human participants, and environmental sampling. Investigations will be conducted within 90 days of HPAI detections on the impacted farm or dairy. In addition to individual-level interviews, field staff may document characteristics of source farms or dairies.

A. Recruitment and consent

Individuals who work on impacted farms or dairies may be approached by project personnel, including CDC staff, state or local public health representatives, or other federal partner staff. Workers will be informed that participation is voluntary and will not impact employment. Project personnel will obtain informed consent for public health surveillance procedures. As a token of appreciation for time spent completing these activities, participants may receive gift cards including:

- $25 for participation in the interview
- $25 for collection of respiratory specimens
- $25 for the serological specimen.

These tokens of appreciation are being provided to correspond to the time and effort spent in completion of study activities, as workers are not expected to be compensated by their employer for time spent in completion of these activities.

B. Interview

An initial interview will be conducted among workers in English or Spanish. Real-time translation services may be considered for individuals who do not speak English or Spanish. This interview will involve collection of self-reported information on individual characteristics (age, gender, race-ethnicity, language spoken at home, and seasonal influenza vaccination status, household size and structure including presence of other individuals with occupational exposures to animals in the same household, smoking, and chronic illnesses), workplace practices and exposures at the time of the recent outbreak among farm animals (including the typical nature of work with animals, work with animals during the acute period of the outbreak, use of personal protective equipment (PPE), hygiene practices during or after specific workplace activities), out-of-workplace exposures to possible sources of influenza (including recent contact with other people who were sick or positive for influenza, at-home practices including backyard exposure to domesticated animals or wildlife, consumption of animal products including milk and cheeses that have not been pasteurized), and typical medical care-seeking behaviors. The interview may also include assessment of recent signs/symptoms consistent with influenza, or positive tests of influenza, with additional follow-up questions for those who have been ill about treatment, medical care-seeking (inpatient/outpatient), and whether individuals stayed home while ill.

In addition to individual-level interviews, field staff may note farm-level characteristics including number of animals, automation, number of workers, environmental practices, communal housing for workers.

C. Human Biospecimen Collection

Multiple types of human biospecimens may be collected:

1. Serological specimens. Serological specimens of approximately 9 cc's will be collected from individuals who consent to collection at the time of interviews by field staff, sera collection should follow CDC protocol. Sera should be collected within 14-90 days from the last known exposure or symptom onset.
2. Respiratory and conjunctival specimens. Persons without active symptoms will be asked for nasal and throat swabs, which will be combined into a single vial. Persons with current conjunctivitis will be asked for a nasopharyngeal swab and conjunctival swab, which will be stored separately. Persons with current respiratory symptoms and without conjunctivitis will be asked for nasal and throat swabs (combined into one vial) and a separate nasopharyngeal swab. If an individual is suspected of being a case, they may be referred to the local health department per standard practice in the state for case investigation.

Please see current CDC guidance for specimen collection, storage and shipping.

D. Laboratory Methods

Sera will be analyzed by hemagglutination inhibition assays and/or microneutralization assays (MN) for detection of antibodies to HPAI A(H5) viruses. Additional immunological analysis can be performed as needed. As the investigation progresses, these testing methods will continue to be modified and improved.

Influenza virus detection in respiratory and/or conjunctival specimens will be performed using real-time reverse transcription-polymerase chain reaction (rRT-PCR). Additional testing may include viral culture for detection of viable virus. Further testing for other common respiratory pathogens may be considered. Select specimens may be set up for viral culture on different cell lines or sent for viral sequencing if HPAI is detected.

VI. DATA MANAGEMENT AND ANALYSIS

The investigation database will be developed by CDC. Demographic, clinical, epidemiologic, and laboratory data for participants will be entered by interview staff, who may include representatives from local dairies, local health departments, other federal agencies, or CDC staff. De-identified data from interview responses and laboratory testing will be recorded into a centralized database maintained on CDC servers. Personal identifiers will be stored locally and not sent to CDC. If an individual has laboratory results indicating current infection with HPAI A(H5N1) virus, personal identifiers will be used for follow-up by the local health department. After public health follow-up has been completed, the between personal identifiers and specimens will be destroyed.

VII. INFORMED CONSENT

Participation in the investigation is strictly voluntary. Upon initial contact, individuals who work on impacted farms/dairies will be offered the opportunity to participate in the investigation. Participants will be asked to sign the consent to participate in the investigation and have their specimens collected and stored for possible future testing. Participants will be provided with a copy of the signed consent form, and the investigation coordinator will keep another copy.

VIII. PATIENT CONFIDENTIALITY/ETHICAL ISSUES

Human subjects review is not judged to be necessary for this investigation since this investigation is not considered to be research, but a component of emergency public health response. All data will be kept confidential to the extent allowed by law.

VIII. APPENDICES

- Appendix 1: Consent form.
- Appendix 2: Participant interview tool.
- Appendix 3: Guidelines for influenza serology specimen collection.
- Appendix 4: Instructions for conjunctival specimen collection.
- Appendix 5: Instructions for nose and throat specimen collection.
- Appendix 6: Instructions for nasopharyngeal specimen collection.

Identifying Human Infection with Highly Pathogenic Avian Influenza A(H5N1) Among Persons in Contact with Infected Animals at Farms or Dairies, United States, 2024

Purpose: The <insert state health department here>, US Department of Agriculture (USDA), and U.S. Centers for Disease Control and Prevention (CDC) are working on a public health surveillance initiative to monitor human influenza infection among people exposed to animals infected with Highly Pathogenic Avian Influenza A(H5N1). Highly Pathogenic Avian Influenza A(H5N1) also known as "Bird Flu" is a virus that primarily infects birds, but recently has been found to infect dairy cattle. This response activity will guide our knowledge of the risk of human infection from interactions with animals and guide prevention measures to prevent spread of the virus to people.

Because of your work at an affected dairy farm, we would like to include you in our study. If you take part in this response activity, we will ask you some questions about your work activities and other personal questions that may be related to the way a person could acquire Bird Flu. We will also collect a swabs and a blood samples to test to see if you are or have been infected with Bird Flu.

Procedures: If you agree to participate in this response activity:

- We will ask you questions about contact that you have had with animals, use of personal protective equipment, and any signs of personal illness. We will also ask about demographic and contact information.
- We will take swabs from your nose, throat, and/or eye area.
- We will take a small amount of blood (9cc's, 1 vial) from a vein in your arm.
- We will test the swabs and blood sample(s) to see if you have been infected with influenza A(H5N1). These swabs will be tested for the presence of the virus. If traces of the virus are found in your nose, throat, or eyes, you may have an active Bird Flu infection. The blood sample will be tested for antibodies to Bird Flu. Antibodies are proteins in the blood that fight infection. If antibodies are found in your blood, this means you were infected or exposed to Bird Flu in the past.
- If you are found to have a current influenza A(H5N1) infection, <insert state health department here> will contact you.

Risks: When the blood sample is taken, you may feel discomfort, including feeling ill or lightheaded. There could be slight bleeding, bruising, tenderness, or infection at the site where blood was drawn. People on the team who draw blood are trained medical staff and will do everything possible to minimize discomfort.

Benefits: By contributing information about exposures to influenza A(H5N1), you will help us learn information that will guide infection prevention protocols and public health messaging regarding the prevention of future human A(H5N1) infection and transmission.

Confidentiality: Anything you tell us, and your test results, will be kept private to the extent allowed by the law. To protect your privacy, all files containing personally identifying information (e.g., name, contact information) will be stored only on a file accessible to _____ (name of the responsible party on-site). Your records and samples will be kept under a code number and will not be able to be linked to your name. Any paper surveys will be stored in locked filing cabinets.

Participation:

- Your participation is voluntary. There is no penalty if you choose not to participate.
- You have the right to refuse or stop participation at any time.
- You can skip any questions you do not want to answer.
- If you want to stop participation, please notify personnel and let them know how you'd want prior information that was collected to be used going forward.
- You will receive a gift card for participation, of $25 for the interview, $25 for swabs, and $25 for blood specimens.

Persons to Contact: If you have any questions about this project or feel that you have been injured or harmed by participating in this evaluation, you can contact <insert contact here>. If you have any questions about your rights as a participant, you can contact <insert contact here>.

The above has been explained to me and I agree to take part in the public health surveillance initiative. I agree to participate in the interview and donate swabs and blood samples.

Date: _____ Name of the participant: _____
Signature of the participant: _____

After the testing for this activity is complete:

Are you willing to allow any left-over blood to be stored for research testing of influenza A(H5N1) in the future? The blood sample will not be labelled with your name, nor will it be linked to other identifying information. The sample will be stored at CDC in Atlanta, Georgia indefinitely. You can still take part in the response activity if you decide you do not want your sample to be stored.

I agree _____ (initials)

I do not agree _____ (initials)

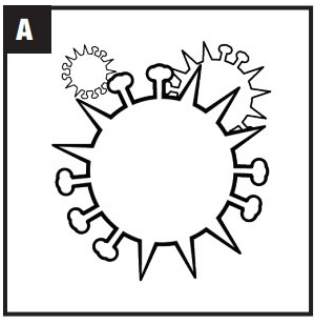
CONJUNCTIVAL COLLECTION INSTRUCTIONS

NOTE: Specimens should be collected by field staff.

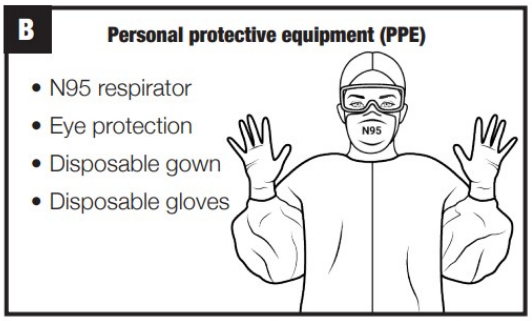
Materials Needed:

- 2x Dacron polyester swabs
- 1x Viral transport media tube containing 1-3ML of sterile media

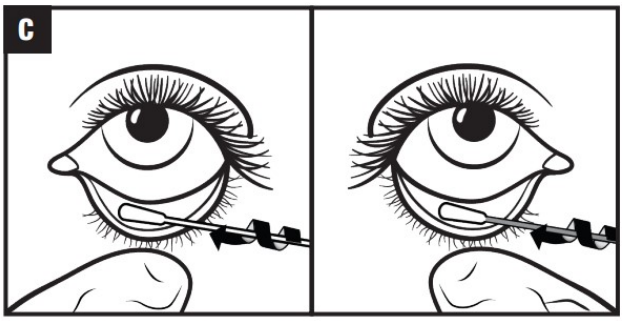
Collection Instructions:



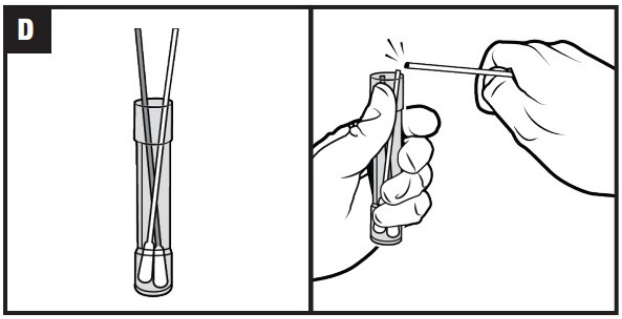
Avian influenza A(H5N1) virus can infect conjunctivae tissues and cause eye symptoms such as discomfort, irritation, redness, and drainage (referred to as conjunctivitis).



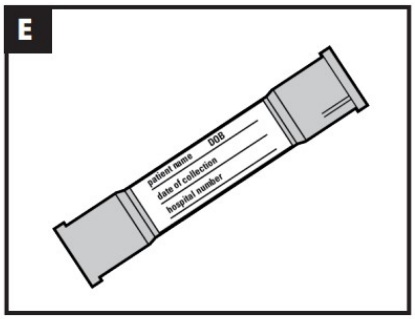
Wear recommended personal protective equipment (PPE) before collecting conjunctival swab specimens from patients with conjunctivitis who are suspected to have avian influenza A(H5N1) virus infection. The patient should also wear a facemask to the extent feasible (or except when respiratory specimens are collected).



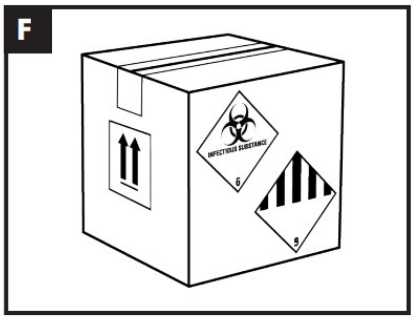
Gently pull down the lower eyelid of the patient's affected eye to expose the conjunctival tissues that line the inside of the eyelid and cover the white part of the eye. Gently swab the conjunctiva by rotating the swab over the infected area 2-3 times (avoid touching the cornea - surface of the eye). If both eyes are affected, repeat these procedures on the other eyelid, using a separate new swab.



Place the conjunctival swab specimens (or both swabs, one for each eye), into the same virus-specific tube containing Sterile Viral Transport Medium (VTM). Cut the excess swab handle to fit the VTM vial and reattach the cap security.



Label the sample appropriately with a unique identifier (e.g., name, DOB, date of collection, and Medical Record or hospital number).



Properly package the virus-specific tube and ship or deliver it to the laboratory for analysis (Learn more in the "sample storage and transportation" and "shipping instructions" sections below).

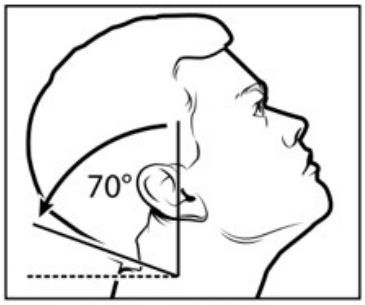
COMBINED NASAL AND THROAT SPECIMEN COLLECTION INSTRUCTIONS

NOTE: Specimens may be collected by the participant themselves or by field staff.

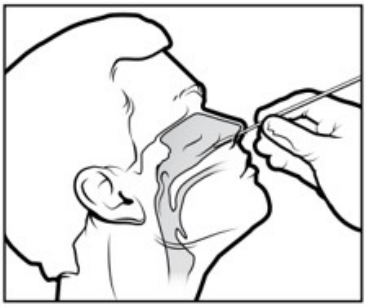
Materials Needed:

- 2x dy sterile polyester swabs (aluminum or plastic shafts preferred)
- 1x Viral transport media tube containing 1-3ML of sterile media

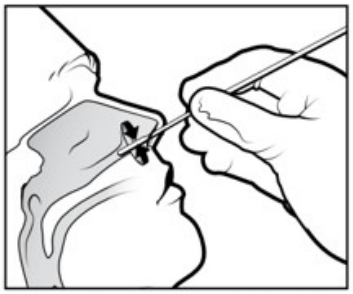
Collection Instructions:



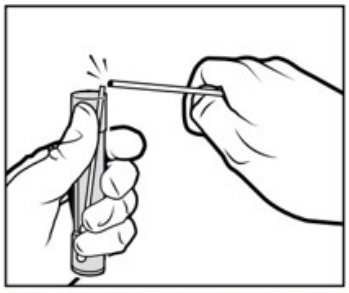
1 Tilt patient's head back 70 degrees.



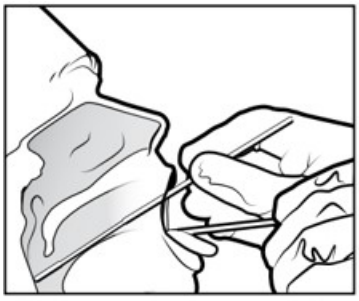
2 While gently rotating the swab, insert swab less than one inch into nostril (until resistance is met at turbinates).



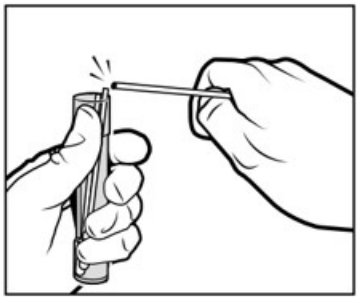
3 Rotate the swab several times against nasal wall and repeat in other nostril using the same swab.



4 Place tip of the swab into sterile viral transport media tube and cut off the applicator stick.



5 For throat swab, take a second dry polyester swab, insert into mouth, and swab the posterior pharynx and tonsillar areas. (Avoid the tongue.)



6 Place tip of swab into the same tube and cut off the applicator tip.

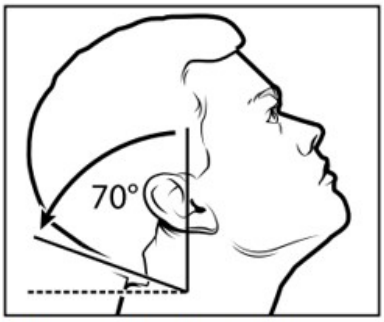
NASOPHARYNGEAL (NP) SPECIMEN COLLECTION INSTRUCTIONS

NOTE: NP specimens should be collected by experienced and trained personnel.

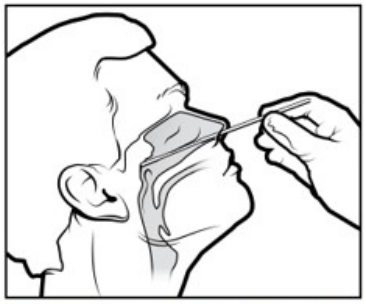
Materials Needed:

- Sterile Dacron/Nylon swab
- Viral transport media tube containing 1-3ML of sterile media

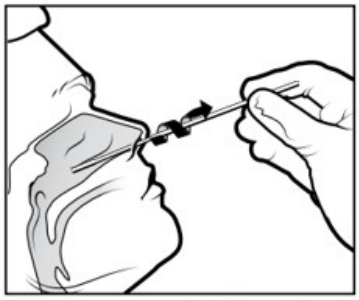
Collection Instructions:



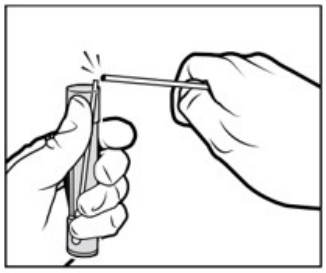
1 Tilt patient's head back 70 degrees.



2 Insert swab into nostril. (Swab should reach depth equal to distance from nostrils to outer opening of the ear.) Leave swab in place for several seconds to absorb secretions.



3 Slowly remove swab while rotating it. (Swab both nostrils with same swab.)



4 Place tip of swab into sterile viral transport media tube and snap/cut off the applicator stick.

Human Sera Collection Guidelines for Influenza Serology

Influenza Division
Centers for Disease Control and Prevention

Collection Details

1. For influenza serology using human sera, we suggest collecting the following volumes of whole blood:

Category	Age of blood donor	Volume of blood to collect*
Pediatric	Less than 3 years old	5.0 ml (≥1.5ml)
Children	3 through 11 years old	5-10.0 ml (≥3ml)
Teens, adults, and elderly	12 years and older	≥10.0 ml (≥3ml)

Sera may be tested in multiple assays and potentially with multiple viruses.

*In general, while the above volumes are preferred, smaller volumes can be accepted, if the situation does not allow for the collection of these amounts, e.g. for infants and young children. The minimum accepted volumes of whole blood to collect are 3ml from adults and older children and 1.5 ml from younger children.

2. Use tubes designated for the collection of serum, not plasma. We suggest the use of vacutainer tubes. The following vacutainer tubes are acceptable:

   a. glass red top vacutainer tubes
   b. plastic red top vacutainer tubes with clot activator
   c. plastic gold top serum separator tubes (SST) with clot activator and gel

3. For testing of serum samples in influenza serology assays, it is very important to minimize hemolysis. Hemolyzed serum often has a negative impact on the cells in the influenza microneutralization assays. To minimize hemolysis, the use of a butterfly needle connected to a vacutainer tube is recommended for blood collection (Barnaby DP et al., 2016; Wollowitz A et al., 2013). The butterfly needle is a safe one-way system with blood being delivered into sealed vacutainer with a consistent pressure flow. The only source of possible hemolysis with this system is if the needle in the vein scrapes against vein wall and blood cells break up as they enter the needle bore. However, if butterfly needles are not available, the use of a needle that connects directly to the vacutainer tube is acceptable as an alternative.

Sera Collection and Storage Recommendations

1. Depends on the types of serum collection tubes used, follow manufacturer's instructions for the serum collection. In general, immediately after blood collection, gently invert the tubes several times to reach a proper mix. Do not shake the tubes. Vigorous mixing may cause foaming or hemolysis. Insufficient mixing or delayed mixing in serum tubes may result in delayed clotting. Collected blood should be stored at 4°C immediately. This can be done by placing the sample on ice, in a 4°C refrigerator, or in a cooler with cold packs.

2. Allow the blood to fully clot at room temperature 25°C (minimum 30 min -1 hour depending on the tubes used). It is recommended that clotted blood be centrifuged immediately to separate from serum. Depends on the types of tubes used, follow manufacture's recommendations for centrifugation speed. For example, BD vacutainer SST tubes can be centrifuged at 1100 to 1300g for 10 minutes in swing-head units or 15 minutes in fixed angle centrifugation units (balance the tubes in the centrifuge). After centrifugation, transfer the serum to a clean tube, the clotted blood may be discarded.

Note: after the blood fully clots, it is recommended that blood be centrifuged immediately (within 2 hours) to separate clotted blood from serum. If the centrifugation cannot be performed immediately, clotted blood should be store at 4°C, and centrifuge as soon as possible. In rare scenarios if centrifugation is not immediately available at the site of the blood collection, blood may be stored at 4°C for up to 18 hours (though less ideal) prior to centrifugation.

3. Serum should be aliquoted into smaller volumes in labeled tubes to avoid repeated freeze-thaw. After aliquoting, serum samples should be immediately stored frozen at -20°C or colder.

Questions regarding the sera collection for influenza serology can be addressed to:

Dr. Min Levine
Influenza Division
Centers for Disease Control and Prevention
Email: MLevine@cdc.gov
Office: 404-639-3504

Shipping Guidelines

All shipments should be made via overnight carrier, to ensure delivery within 24 hours of shipment. All serum shipments should be packed with sufficient dry ice to ensure that samples remain frozen for a minimum of 48 hours after shipment.

Serum samples should be coordinated with and sent to CDC.

CDC - Influenza Serology
Attn: Dr. Min Levine / Ms. Xiaonan Sun / Ms. Makeda Kay
Bldg. 23, Room 8451
1600 Clifton Road, NE
Atlanta, GA 30329
Phone: 404-639-3504/404-639-4130

Send shipping questions and tracking info to: MLevine@cdc.gov/ lyz9@cdc.gov.

References:

Barnaby DP, Wollowitz A, White D, Pearlman S, Davitt M, Holihan L, Bijur P, Gallagher EJ. Generalizability and Effectiveness of Butterfly Phlebotomy in Reducing Hemolysis. Acad Emerg Med. 2016 Feb;23(2):204-7. 2016 Jan 14.

Wollowitz A, Bijur PE, Esses D, John Gallagher E. Use of butterfly needles to draw blood is independently associated with marked reduction in hemolysis compared to intravenous catheter. Acad Emerg Med. 2013 Nov;20(11):1151-5.

Highly Pathogenic Avian Influenza A(H5N1) Exposure Questionnaire

Section A: Recent Illnesses

I am going to start with questions about your recent health.

***(for field staff: fill in dates to assist)**: from: __/___/_____ to today, the week before cows started showing symptoms of bird flu on this dairy*

A1. Since [*the week before cows started showing symptoms of bird flu on this dairy*], did you develop any symptoms?

☐ Yes
☐ No

A1a. If yes, what symptoms did you develop? (*check 'Yes' or 'No' for each*)

		Yes	No
a.	Fever (Measured ≥ 100.4 ^{0}F)		
b.	Feverishness/chills		
c.	Cough		
d.	Fatigue or tiredness/sluggishness		
e.	Sore throat		
f.	Runny or stuffy nose		
g.	Sneezing		
h.	Nausea/vomiting		
i.	Diarrhea		
j.	Headache		
k.	Rash		
l.	Muscle/body aches		
m.	Red/draining or itching eyes		
n.	Difficulty breathing/shortness of breath		
o.	Seizures		
p.	Other _____		

A1b. If yes, when did these symptoms begin? ___/___/____ (Month/Day/Year) (*Interviewer note: earliest date of any symptoms*)

A2. (If yes to A1) Did you go to any pharmacy/medical provider for the symptoms you had?

☐ Yes
☐ No

Section B: Recent exposures, risk factors

I am now going to ask you question about specific things you might do at work, and personal clothing you might have been wearing while you did those things.

Some of these questions ask about changes since bird flu was found. We will ask about your work right before bird flu was found and right after. We're going to ask you questions about things that happened around __/__/____, [the week before bird flu was found] **and since __/__/____** [the week bird flu was found].

B1. Did you work on this dairy since [*the week before cows started showing symptoms of bird flu on this dairy*]?

☐ Yes ☐ No

B2. Since [*the week before cows started showing symptoms of bird flu on this dairy*], have you worked on any other dairies or farms?

☐ Yes
☐ No
☐ Prefer not to answer

B3. Since [*the week before cows started showing symptoms of bird flu on this dairy*], have you had access to or used any of the following PPE on this dairy? *Check all that apply.*

☐ Coveralls	☐Waterproof apron	☐ N95 or other respirator	☐ Other type of mask
☐ Safety goggles	☐ Sunglasses	☐ Head or hair cover	☐ Rubber boot or boot covers
☐ Gloves	☐ Bandana/gaiter	☐ None	☐ Other: _____

B3a. *If any are mentioned*: Where did you get this PPE? *Check all that apply*

☐ Given to me by this dairy
☐ Given to me at another place where I work
☐ Got it myself or another way

B4. Since [the week before bird flu was found], did you ever:

Activity	Yes	No
...feed or water cows?		
...help with breeding or artificial insemination?		
...work in calf pens, including feeding or medicating calves or cleaning pens?		
...help with calving?		
...work in maternity pens?		
...vaccinate or medicate cows?		
...milk cows or help in the milking parlor?		
...clean the milking parlor or milk tanks?		
...check milk quality or collect milk samples from tanks?		
....clean up or remove cow manure, dung, or feces?		
...clean up or replace cow bedding?		
...transport, haul, or move cattle?		
...transport, haul, or move milk?		
...other? Specify: _____		
...other? Specify: _____		

B5. Since [*the week before cows started showing symptoms of bird flu on this dairy*], did you identify or handle sick cows or calves, or work in hospital pens?

☐ Yes
☐ No **(Go to B6)**

B5a. How often? ☐ Every day or more ☐ Every other day ☐ Once a week ☐ Less than once a week

B5b. *If yes to B5*, did you work with sick cows in the week of [*the week before cows started showing symptoms of bird flu on this dairy*]?

☐ Yes ☐ No

B5b1. Did you ever wear any of the following PPE before bird flu was found? *Check all that apply.*

☐ Coveralls ☐ Waterproof apron ☐ N95 or other respirator ☐ Other type of mask
☐ Safety goggles ☐ Sunglasses ☐ Head or hair cover ☐ Rubber boot or boot covers
☐ Gloves ☐ Bandana/gaiter ☐ None ☐ Other: _____

B5b2. *If selected PPE in B5b1*, How often did you wear [*PPE selected*] before bird flu was found?

Coveralls:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
Safety Goggles:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
Gloves:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
Waterproof Apron:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
Sunglasses:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
Bandana/gaiter:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
N95 or other respirator:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
Other type of mask:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
Head or hair cover:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
Rubber boot or boot covers:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
Other:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)

B5c. *If yes to B5*, did you work with sick cows since [t*he week after cows started showing symptoms of bird flu on this dairy*], after bird flu was found in cows?

☐ Yes ☐ No

B5c1.Did you ever wear any of the following PPE since then? *Check all that apply*.

☐ Coveralls ☐ Waterproof apron ☐ N95 or other respirator ☐ Other type of mask
☐ Safety goggles ☐ Sunglasses ☐ Head or hair cover ☐ Rubber boot or boot covers
☐ Gloves ☐ Bandana/gaiter ☐ None ☐ Other: _____

B5c2.*If selected PPE in B5c1,* How often did you wear [*PPE selected*] after bird flu was found?

Coveralls:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
Safety Goggles:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
Gloves:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
Waterproof Apron:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
Sunglasses:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
Bandana/gaiter:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
N95 or other respirator:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
Other type of mask:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
Head or hair cover:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
Rubber boot or boot covers:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)
Other:	☐ Always	☐ Sometimes	☐ Rarely	☐ Never	☐ N/A (not selected)

B5d. *If yes to B5b and yes to B5c*, Did the way you work with sick cows change after [*the week bird flu was found*]?

☐ No
☐ Yes, specify: _____

B6. Since [*the week before cows started showing symptoms of bird flu on this dairy*], were you around (within 6 feet of) any sick cows or calves for any reason?

☐ Yes
☐ No **(Go to B8)**

B7. Were any of these cows known or suspected to have bird flu? ☐ Yes ☐ No ☐ Don't know

B8. Since [*the week before cows started showing symptoms of bird flu on this dairy*], were you around (within 6 feet of) any of the following other types of animals on this dairy, another farm, or at home?

☐ Pigs/Hogs ☐ Goats ☐ Sheep ☐ Poultry ☐ Horses ☐ Cats ☐ Dogs
☐ Rodents (rats, mice) ☐ Mink ☐ Wild birds ☐ Deer
☐ Other_____

B88a. Did you touch any of these types (*only for animals participants were near*):

☐ Pigs/Hogs ☐ Goats ☐ Sheep ☐ Poultry ☐ Horses ☐ Cats ☐ Dogs
☐ Rodents (rats, mice) ☐ Mink ☐ Wild birds ☐ Deer
☐ Other_____

A88b. Were any of them sick (*only for animals participants were near)*:

☐ Pigs/Hogs ☐ Goats ☐ Sheep ☐ Poultry ☐ Horses ☐ Cats ☐ Dogs
☐ Rodents (rats, mice) ☐ Mink ☐ Wild birds ☐ Deer
☐ Other_____

B9. Since [*the week before cows started showing symptoms of bird flu on this dairy*], did you consume any of the following?

☐ Raw milk, including milk from the bulk tank?
☐ Cheese made from raw milk like queso fresco?
☐ Other dairy products made from raw milk, like ice cream, yogurt, or heavy cream?
☐ None of the above

B10. Did you receive an influenza (flu) vaccine at some point since last fall until today?

☐ Yes
☐ No
☐ Don't know

Section C: Other activities and living situation

Now I am going to ask you questions about your home and people you live with.

C2. Did you live in communal farm housing or on the premises of the dairy since [the week before bird flu was found]?

☐ Yes
☐ No
☐ Prefer not to say

C3. Do you live with anyone who: *(Check all that apply)*

- ☐ Is over 65 years old?
- ☐ Is under 5 years old?
- ☐ Has asthma, diabetes, or heart disease?
- ☐ Is pregnant?
- ☐ Also works with dairy cows?
- ☐ Also works with other animals (farm animals, pets, livestock, or wildlife)?
- ☐ Goes to a school in-person most days?
- ☐ Goes to work somewhere other than a farm or dairy most days?
- ☐ None of the above

Is there anything else you would like to tell us at this time?

_____

_____

_____

_____

Thank you for your cooperation and participation in the survey.