

14 December 2022

Considering the increasing detection of outbreaks of highly pathogenic avian influenza (HPAI) in birds in eight countries in the Region of the Americas, the Pan American Health Organization/World Health Organization (PAHO/WHO) reiterates the guidance on surveillance laboratory diagnostics in human and animal samples. PAHO/WHO recommends monitoring and early detection of influenza-like illness (ILI) or severe acute respiratory infection (SARI) in persons exposed to birds (domestic, wild, or captive) infected with avian influenza viruses.

### Global context

According to the World Organization for Animal Health (WOAH), the highly pathogenic avian influenza (HPAI) epidemic season continues with **outbreaks in poultry and reported outbreaks in birds other than poultry, mainly in the Regions of Europe and the Americas**. In the current epidemic period, **the predominant subtype is H5N1, and unusual persistence of the virus in wild birds during the summer months has been reported for the first time** (1, 2).

**In accordance with the seasonal pattern of HPAI<sup>1</sup>, the number of outbreaks is expected to increase in the coming months** and WOAH recommends that countries maintain and strengthen their surveillance efforts, biosecurity measures on farms, and continue with the timely notification of avian influenza outbreaks in both birds and non-avian species. The quality of surveillance is key for **the early detection and timely response to potential threats to animal health with an impact on public health** (1,2).

### Situation summary in the Region of the Americas

As of epidemiological week (EW) 49 of 2022, agricultural authorities in Canada, Chile, Colombia, Ecuador, Mexico, Peru, the United States of America, and the Bolivarian Republic of Venezuela have detected outbreaks of HPAI H5 viruses in domestic birds, farm poultry, and/or wild birds (**Figure 1**). The detection of HPAI outbreaks in five countries in South America is a situation that has never previously been recorded. To date, there has recorded only a single human infection caused by avian influenza A(H5N1) in the United States of America, which was reported on April 29, 2022. (3)

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<sup>1</sup> Avian influenza viruses are classified into low pathogenic avian influenza viruses (LPAI) and highly pathogenic avian influenza viruses (HPAI) according to their ability to cause disease in birds.

The following is a summary of the situation in countries of the Region of the Americas that reported outbreaks of avian influenza in 2022.

In **Canada**, as of 7 December 2022, multiple HPAI A(H5N1) outbreaks in poultry and non-poultry birds (including wild birds) have been reported in nine of the ten Canada provinces: Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, Nova Scotia, Ontario, Quebec, and Saskatchewan. To date, no confirmed cases of avian influenza A(H5N1) have been identified in humans in the identified outbreaks. (4,5)

In **Chile**, on 7 December 2022, the Ministry of Agriculture with the Agricultural and Livestock Service (SAG per its acronym in Spanish), confirmed the presence of a case of HPAI in a wild aquatic bird (pelican) found in the region of Arica and Parinacota. Additionally, on 8 December, the SAG reported the confirmation of two cases, one in a pelican in the Iquique region and another in the Antofagasta region. In all three cases reported in Chile, the H5N1 variant has been identified. To date, no confirmed cases of avian influenza A(H5N1) have been identified in humans in the identified outbreaks. (6,7)

In **Colombia**, between 19 October and 9 December 2022, the Colombian Agricultural Institute (ICA per its acronym in Spanish) identified 34 HPAI A(H5N1) outbreaks (12 additional outbreaks registered since the epidemiological alert published on 3 December). The outbreaks were identified in a rural area of Cartagena District (Bolívar Department), Acandí Municipality (Chocó Department), Cereté, Ciénaga de Oro, Lórica, Moñitos, San Bernardo del Viento and San Pelayo Municipalities (Córdoba Department), El Retén Municipality (Magdalena Department), and Los Palmitos and Tolúviejo Municipalities (Sucre Department). The outbreaks have been identified in backyard birds that had contact with wild birds traveling along migratory routes to the south of the continent. To date, no confirmed cases of avian influenza A(H5N1) have been identified in humans in the identified outbreaks. (8)

In **Ecuador**, on 25 November 2022, the Ministry of Agriculture and Livestock detected an outbreak of H5 avian influenza in a poultry production farm in the province of Cotopaxi. The detection is the result of controls carried out periodically and that were increased due to the detection of HPAI H5 in several countries of the Region. As a result of this outbreak, around 180,000 birds were culled from the affected property. Additionally, the final disposal of the poultry, products and by-products of the farm was carried out. To date, no confirmed cases of avian influenza A(H5N1) have been identified in humans. (9,10)

In **Mexico**, between October and 30 November 2022, the National Agrifood Health, Safety, and Quality Service (SENASICA per its acronym in Spanish) identified outbreaks of HPAI A(H5N1) in backyard birds, poultry farms, and wild birds. The outbreaks in wild birds were identified in wetlands in the states of Mexico and Jalisco, as well as in Texcoco (a protected natural reserve) and in parks in Baja California, Aguascalientes, and Puebla. The outbreaks in birds from poultry farms were identified in the states of Nuevo León, Sonora, Aguascalientes, Jalisco, and Yucatán, and in backyard farms in the states of Chiapas, Chihuahua, and the state of Mexico. As of 3 December, outbreaks have affected almost four million birds, mostly laying, from 17 commercial poultry production units. To date, no confirmed cases of avian influenza A(H5N1) associated with this outbreak have been identified in humans. (11)

In **Peru**, as of 22 November 2022, several outbreaks of HPAI A(H5) virus were identified in wild aquatic birds (pelicans) at Cangrejos beach in the department of Piura. Additionally, similar cases have been found at Pimentel beach and in the San José wetlands, both in the department of Lambayeque, and at Puerto Viejo beach, in the department of Lima. The

laboratory of the Department of Virology and Emerging Diseases Naval Medical Research Unit - Six (NAMRU-6, per its acronym in Spanish) communicated the preliminary result of the samples of the first case in Piura, which has been subtyped as Influenza A(H5N1) On 28 November 2022, the National Agrarian Health Service (SENASA per its acronym in Spanish) notified the identification of the first outbreak of avian influenza A(H5N1) in a backyard poultry breeding ground at the District of San José in the Lambayeque Department. To date, no confirmed cases of avian influenza A(H5N1) have been identified in humans.(12,13)

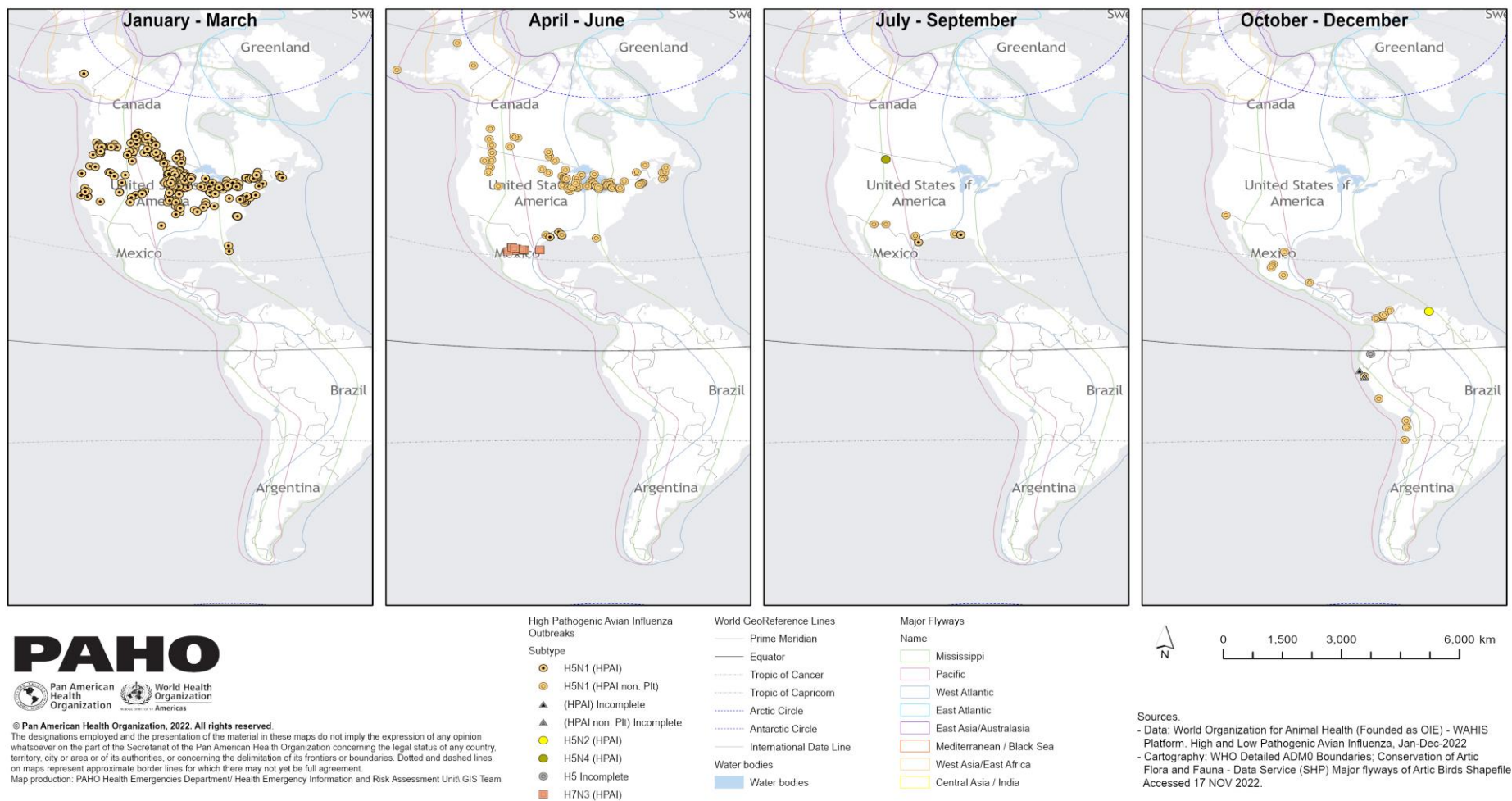
In the **United States of America**, since late 2021 through 7 December 2022, outbreaks of HPAI A(H5) virus have been reported in wild waterfowl, commercial poultry, and backyard poultry. These are the first detections of avian influenza A(H5) viruses in the United States since 2016. Preliminary genetic sequencing and RT-PCR tests on some virus samples show that these viruses correspond to HPAI A(H5N1) virus of the 2.3.4.4 clade. During the same period, HPAI outbreaks have been reported in wild birds in 48 states and in poultry in 47 states. More than 53 million poultry were affected due to identified and controlled outbreaks. (14)

On 28 April 2022, a case of Influenza A(H5N1) was identified in the United States in a person who participated in the culling of birds at a commercial poultry facility in Colorado, where influenza A(H5N1) virus was detected in birds. This was the second human case associated with this specific group of H5 viruses that are currently predominant, and the first case in the United States. The patient was isolated and treated with antivirals, did not require hospitalization, and made a full recovery. In this event, no evidence of person-to-person transmission of influenza A(H5N1) virus was identified. (3)

In **Venezuela**, on 29 November 2022, the Ministry of Popular Power for Productive Agriculture and Land, through inspection and epidemiological surveillance activities, identified an outbreak of HPAI in pelicans in Puerto Piritu, in the west area of the state of Anzoátegui. Molecular studies detected Influenza A/H5 virus; this is the first time that HPAI has been detected in Venezuela. Subsequently, the Venezuelan Institute of Scientific Research (IVIC per its acronym in Spanish) confirmed the diagnosis by completing the characterization of the virus as H5N1. To date, no confirmed cases of avian influenza A(H5N1) have been identified in humans. (15,16,17)

In 2022, in the **Region of the Americas**, of the total number of avian influenza outbreaks reported as of EW 49, only one case of HPAI has been identified corresponding to the detection of influenza A(H5N1) in a person who participated in the slaughter of birds in a commercial poultry facility, and that was in the United States. (3)

**Figure 1.** Avian influenza outbreaks and main migratory routes of wild birds. Region of the Americas, as of EW 49 of 2022.



**Suggested citation:** Pan American Health Organization / World Health Organization. Epidemiological Update: Outbreaks of avian influenza and public health implications in the Region of the Americas. 14 December 2022, Washington, D.C.: PAHO/WHO; 2022

## Guidance for health authorities in Member States

Both HPAI and LPAI viruses can be rapidly spread among poultry through direct contact with infected waterfowl or other poultry, or through direct contact with fomites or surfaces, or water contaminated with the viruses. Infection of poultry with HPAI viruses can cause severe disease with high mortality. LPAI viruses are more associated with subclinical infection. The terms HPAI and LPAI apply only to the symptoms in birds (chickens in particular), and both types of viruses have the potential to cause infections in humans.

While the potential exists for these viruses to cause human infections, infections with avian influenza viruses are punctual and when they have occurred, these viruses have not spread easily from person-to-person. To date, no person-to-person human transmission caused by avian influenza A(H5N8), A(H5N2), or A(H5N1) viruses has been reported either in the Americas or globally.

### Intersectoral coordination

Control of the disease in animals is the first measure to reduce the risk to humans. For this reason, it is important that prevention and control actions, both in the animal and human health sectors, are carried out in a coordinated and concerted manner. Agile information exchange mechanisms will have to be established and/or strengthened to facilitate coordinated decision-making.

Implementation of a comprehensive surveillance program, including wild birds and both backyard and commercial poultry, is essential. Targeted risk-based surveillance strategies should be combined with a strengthening of general surveillance. In this regard, sensor awareness tasks are key, particularly in the backyard, to encourage the detection and notification of suspicious events. These programs also provide information that enables spread modeling and more accurate risk analysis.

Comprehensive recommendations for strengthening intersectoral work on surveillance, early detection, and investigation of influenza events at the human-animal interface are available at: <https://bit.ly/3glEUNN>

### Surveillance in humans

People at risk of contracting infections are those directly or indirectly exposed to infected birds (domestic, wild, or captive), for example, poultry keepers who maintain close and regular contact with infected birds or during slaughter or cleaning and disinfection of affected farms. For this reason, the use of adequate personal protective equipment (PPE) and other protection measures is recommended to avoid zoonotic transmission in these operators.

Surveillance of exposed persons is recommended to identify early events of human-animal interface transmission. Surveillance for the identification of novel influenza viruses with pandemic potential should be maintained in the current 2019 coronavirus disease pandemic (COVID-19). Due to the constantly evolving nature of influenza viruses, PAHO/WHO continues to emphasize the importance of severe acute respiratory infection (SARI) surveillance and influenza syndrome

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(ILI) surveillance to detect virologic, epidemiologic, and clinical changes associated with circulating influenza viruses that may affect human health. In addition to the active case-finding, contact identification and follow-up activities conducted during zoonotic events, it is advisable to strengthen existing SARI and ITI surveillance systems in locations where cases reside, where animal outbreaks occur, or where the source of infection is suspected. To complement surveillance for SARI and ILI, PAHO/WHO recommends establishing early warning systems to provide an overview of the situation and to carry out a joint and coordinated risk assessment between the human and animal sectors in a timely manner.

Given the detection of an infection in humans, early notification is essential for an investigation and implementation of adequate measures that include the early isolation and treatment of the case, the active search for other cases associated with the outbreak, as well as the identification of close contacts for management and follow-up. (18)

Healthcare personnel in areas where transmission of avian influenza (HPAI or LPAI) in birds is taking place should be alerted about the possibility of infection in people exposed to these viruses.

PAHO/WHO reiterates to Member States the need to maintain influenza virus surveillance and to immediately ship human influenza samples to the WHO Collaborating Center, the US CDC.

Since information on the circulation of avian influenza A/H5 viruses is important for the human zoonotic influenza vaccine composition and for generating data for preparedness and response, countries are encouraged to share animal influenza samples with the WHO Collaborating Center, St. Jude Children's Hospital, which focuses exclusively on the threat to humans from zoonotic influenza viruses.

### Notification of cases in humans

1. A **confirmed positive case** of human influenza A/H5 infection should be **reported immediately** via two channels—the WHO International Health Regulations (IHR) Regional Contact Point ([ihr@paho.org](mailto:ihr@paho.org)) via the IHR National Focal Point, and the WHO Global Influenza Surveillance and Response System (GISRS) managed by PAHO and WHO ([flu@paho.org](mailto:flu@paho.org)). The report should include all available results from the epidemiological case investigation and the virological characteristics of the virus.
2. A **suspected** case of human influenza A/H5 infection should be **reported immediately** to the GISRS, and information about the suspected case can be shared with the WHO IHR Regional Contact Point, given it is an unusual event. The report should include all available results from the epidemiological case investigation and the virological characteristics of the virus.

## Laboratory diagnosis in humans

### Sample collection in humans

Samples should be collected by trained personnel in adherence to all biosafety instructions including the use of appropriate personal protective equipment (PPE) for respiratory viruses.

The recommended samples are the same type(s) of samples used for influenza routine surveillance. A nasopharyngeal swab is the optimal specimen collection method for influenza

testing. However, a combined nasal and throat swab specimen or aspirate specimens can be collected. A sterile Dacron/nylon swab should be used for sample collection. Cotton tipped and wooded swabs are not recommended as they interfere in the sample processing and inhibit molecular diagnostic reactions. Swabs should be placed in a viral transport media tube containing 3 mL of sterile viral transport medium and transported in the same tube with viral transport medium (VTM).

Sample collection is recommended within 4 days of symptom onset for the highest influenza virus yield and better detection. Sampling of asymptomatic contacts is not recommended, unless considered necessary according to national guidelines.

Samples should be kept refrigerated (4-8°C) and sent to the laboratory (central, national, or reference laboratory) where they should be processed within the first 24-72 hours after collection. If samples cannot be sent within this period, freezing at -70 °C (or less) is recommended until samples are shipped (ensuring the cold chain is maintained).

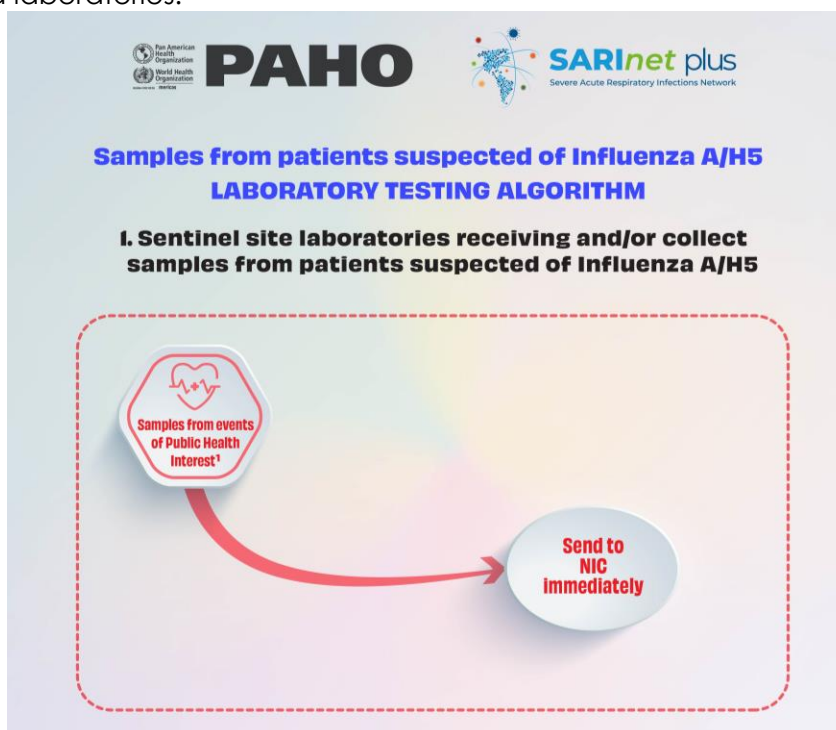
### Sample flow and laboratory testing algorithm

In the Americas, all national influenza centers (NICs) and national reference laboratories (NRL) for human influenza as part of the WHO Global Influenza Surveillance and Response System (GISRS) use molecular diagnostic protocols and reagents developed and validated by the WHO Collaborating Center at the US CDC.

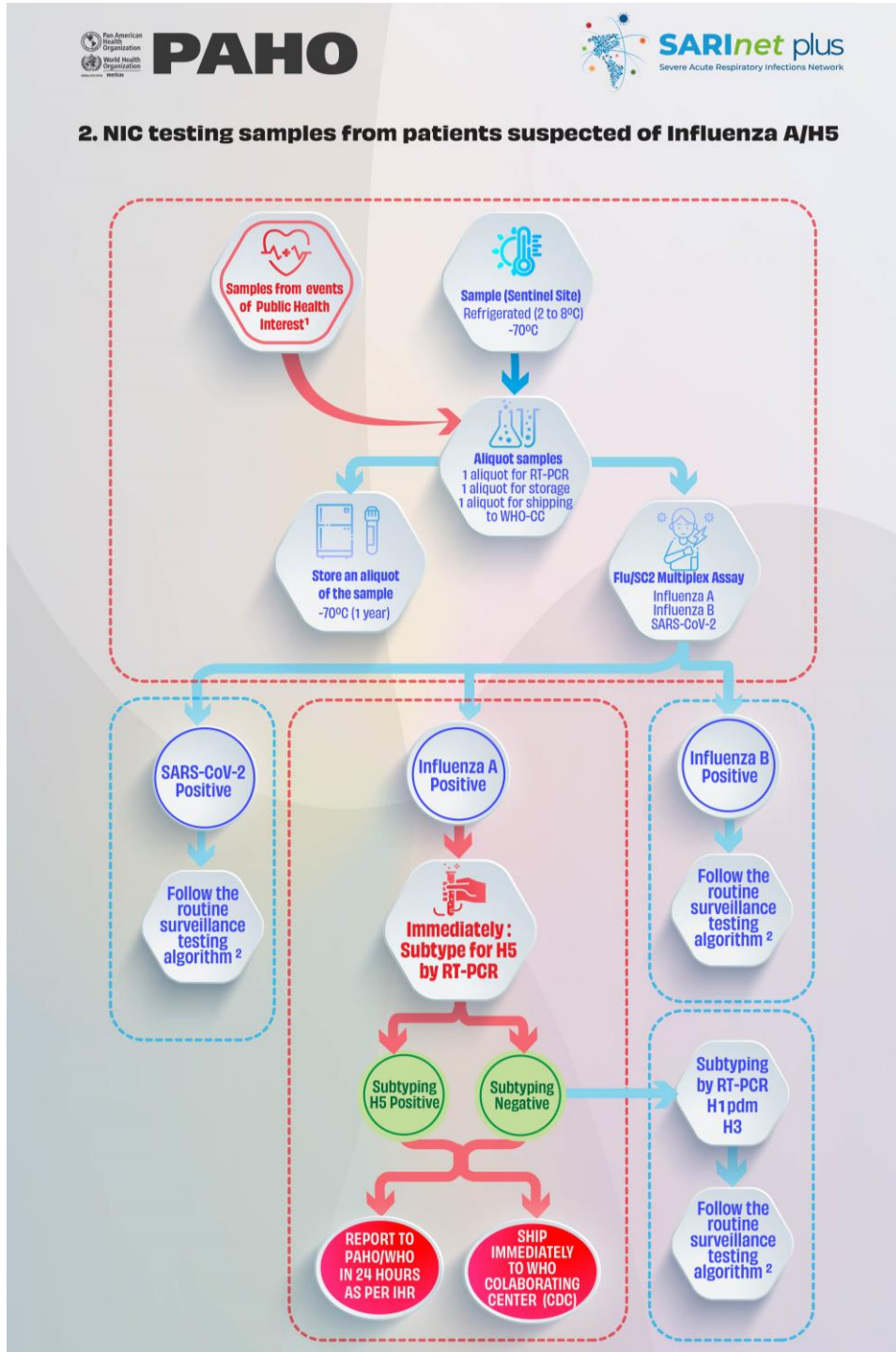
In case of identification of suspected cases of human infection caused by avian influenza A/H5, a respiratory specimen should be taken and refer to the NIC or NRL for testing (**Figure 2**). (19)

Samples collected from suspected human cases exposed to birds or humans infected with avian influenza A/H5 should be tested for influenza; influenza A-positive samples should be subsequently subtyped for H5 (**Figure 3**)

**Figure 2.** Sample flow for samples of influenza A/H5 suspected cases at sentinel sites and/or decentralized laboratories.



**Figure 3.** NIC testing samples from suspected cases of influenza A/H5 (20,21)





## Laboratory reagents

US CDC kits for real-time reverse transcription polymerase chain reaction (qRT-PCR) detection of influenza viruses are available through the International Reagent Resource (IRR).

For influenza detection and Influenza A/H5 subtyping, the following kits and controls for molecular detection are available:

- Influenza SARS-CoV-2 Multiplex Assay (RUO) (500 reactions) (Catalog No. FluSC2PPB-RUO), dried primers and probes
- Influenza SARS-CoV-2 Multiplex Assay Positive Controls Kit (RUO) (500 reactions) (Catalog No. FluSC2PC-RUO)
- CDC Real-Time RT-PCR Influenza Virus A/H5 (Asian Lineage) Subtyping Panel (VER 4) (RUO) (Catalog No. FluRUO-13)
- CDC Influenza A/H5N1 (Asian Lineage) Real-Time RT-PCR Positive Control with Human Cell Material (RUO) (Catalog No. VA2715)

## Interpretation of results

The markers (targets) of the US CDC kits for influenza A/H5 subtype detection are as follows: INFA (M), H5a (HA), H5b (HA), and RP.

When using the US CDC influenza A/H5 subtyping kit:

- Samples positive for INFA, H5a, and H5b markers are considered **positive for influenza A/H5**.
- Samples positives for only one H5 marker are considered **presumptive for influenza A/H5**.

In both cases, samples should be referred to a WHO Collaborating Center for further characterization or for confirmation (in the case of presumptive results). Nevertheless, a positive sample for Influenza A/H5 (both markers positive) should be reported immediately.

Currently, PAHO is working to support Member States on preparedness and response to Influenza A/H5. For additional support, please contact [flu@paho.org](mailto:flu@paho.org).

## Shipment of samples

The US CDC is the designated WHO Collaborating Center in the Americas Region for receiving human samples positive for Influenza A/H5. Shipment of human samples to the US CDC WHO Collaborating Center internationally and by air must be in compliance with all international standards according to the International Air Transport Association (IATA) for Biological Substances Category B.

It is important to note that the samples should **not** be sent as routine influenza samples to US CDC.

## Laboratory surveillance and diagnosis in animals

Veterinary laboratories in countries generally have the ability to detect and to some extent type the virus in both serological and molecular samples. The most recent round of proficiency developed by the WOA regional reference laboratory in Campinas, São Paulo, Brazil carried out in 2021 with the support of PANAFTOSA-PAHO/WHO, which verified the capacity of the participating laboratories to perform serological diagnostic tests (ELISA, HI

and AGID) and molecular (RT-qPCR) in order to reach a final diagnosis of avian influenza. This round included Argentina, Bolivia, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, Paraguay, Peru, and Uruguay, as well as Brazil as the coordinating laboratory.

Surveillance strategies combine the use of serological and molecular techniques to rule out not only previous exposure to the virus but also the current presence of the virus. This last point is very relevant to achieve early detection. The sub-typing of the virus in birds mainly seeks to rule out/check for the presence of influenza A, H5 or H7 viruses. Of these subtypes, laboratories usually do not have the necessary reagents to continue diagnosis. However, these analyses to differentiate the presence of HPAI are sufficient for support and field actions.

The regional reference laboratory in Campinas, Brazil, is supporting the confirmation of country diagnoses and sub-typing. Total virus sequencing is being carried out with support from other laboratories including the USDA WOAHA reference laboratory in Ames, Iowa, USA.

Countries have some demand for reagents for molecular techniques to be able to follow up on the surveillance activities required during the control of outbreaks found in birds, particularly in the perifocal zone.

### **Shipment of samples**

Animal samples should be sent to the WHO Collaborating Center at St. Jude Children's Hospital. Special documents are necessary for transportation to the United States and must be compliant with all international standards.

For further information regarding logistical and shipment of human or avian Influenza A/H5 samples, PAHO/WHO should be contacted at [flu@paho.org](mailto:flu@paho.org).

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## Useful links

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