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AMERICAS

Epidemiological Update Influenza in the context of the COVID-19 pandemic

28 December 2021

Considering the increase of cases of influenza A(H3N2) in some countries in the region, mainly in the Northern Hemisphere, the Pan American Health Organization/World Health Organization (PAHO/WHO) recommends that Member States adopt the necessary measures to prepare for the concomitant circulation of influenza and SARS-CoV-2 to ensure appropriate clinical management, including the procurement of antiviral supplies and their early administration to persons at risk of severe disease, ensure strict compliance with infection prevention control measures in health care services, and continue vaccination to prevent severe cases and deaths.

Situation summary

Since the introduction of SARS-CoV-2 in the region of the Americas and despite the elevated levels of testing, the influenza detections have been exceptionally low. However, in the last four epidemiological weeks (EW) of 2021, influenza activity with predominance of A(H3N2) continue to increase in the Northern Hemisphere and in some countries in the Andean sub region and the Southern Cone. This increase is related to the beginning of the influenza season in the Northern Hemisphere, an increased in population mobility, and the relaxation of COVID-19 public health and social measures, among other factors.

Following is a summary of the influenza situation in the Region of the Americas by subregions, and of the cases reported in the last four epidemiological weeks.¹ More detailed information on the situation of influenza and other respiratory viruses can be obtained at the PAHO/WHO Regional Influenza Update, published weekly on the PAHO/WHO website at: <https://www.paho.org/en/influenza-situation-report>.

¹ Sources of information presented in this update are data reported by Ministries of Health and National Influenza Centers (NICs) of Member States via PAHO/WHO platforms (i.e., FluNet and FluID) and information from weekly reports and bulletins published online by Ministries of Health or shared directly with PAHO/WHO.

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Table 1. Influenza and SARS-CoV-2 detections by sub-regions in the Americas. EW 46-49, 2021.

		Samples processed for influenza & ORV	Influenza A(H3N2)	Influenza A(H1N1)pmd09	Influenza A non-subtyped*	Influenza B Victoria	Influenza B/Yamagata	Influenza B lineage undetermined	Influenza % (+)	Samples processed for SC-2	SC-2 positive	SC-2 % (+)
North America	Canada	143,809	34	0	45	0	0	58	0.1%	2,645,174	84,504	3.2%
	Mexico	2,622	355	0	0	22	0	3	15.4%	457,147	70,166	15.3%
	USA	386,753	1,836	3	7,032	8	1	193	2.3%	39,552,928	2,811,280	7.1%
Caribbean	Belize	61	0	0	0	0	0	0	0.0%	16,502	1,217	7.4%
	Dominican Republic	62	0	0	0	0	0	0	0.0%	2	2	100.0%
	French Guiana	21	1	0	0	0	0	0	4.8%	0	0	0.0%
	Haiti	45	0	0	0	9	0	0	20.0%	1,447	247	17.1%
	Jamaica	29	0	0	0	0	0	0	0.0%	960	34	3.5%
Central America	Costa Rica	42	0	0	0	0	0	0	0.0%	12,433	920	7.4%
	El Salvador	51	0	0	0	0	0	0	0.0%	50,114	2,648	5.3%
	Guatemala	77	0	0	0	0	0	0	0.0%	2,383	64	2.7%
	Honduras	12	0	0	0	0	0	1	8.3%	2,840	54	1.9%
	Nicaragua	375	0	0	0	0	0	0	0.0%	9,903	451	4.6%
Andean Zone	Bolivia	14	1	0	0	0	0	0	7.1%	178,936	25,142	14.1%
	Colombia	1,496	1	1	3	0	0	0	0.3%	655,934	42,208	6.4%
	Ecuador	131	2	0	0	0	0	0	1.5%	10,772	2,119	19.7%
	Peru	655	1	0	0	0	0	0	0.2%	418,334	20,213	4.8%
Brazil & Southern Cone	Argentina	1,117	0	0	1	0	0	0	0.1%	722,805	47,618	6.6%
	Brazil	4,936	134	0	0	0	0	0	2.7%	95,567	4,648	4.9%
	Chile	4,609	8	0	3	0	0	0	0.2%	308	155	50.3%
	Paraguay	603	6	0	0	0	0	0	1.0%	7,466	130	1.7%
	Uruguay	56	2	0	0	0	0	0	3.6%	267	10	3.7%
Grand Total		547,576	2,381	4	7,084	39	1	255	1.8%	44,842,222	3,113,830	6.9%

Source: Data reported by Ministries of Health and National Influenza Centers (NICs) of Member States via PAHO/WHO platforms, from sentinel and intensified surveillance for acute respiratory disease.

In the **North American sub-region**², as of EW 49 of 2021, influenza activity remained low for this time of the year; nevertheless, detections are on an increasing trend (Figure 1). Disease severity remains low; however, influenza-related hospitalizations and deaths continue to increase.

In **Canada**, co-circulation of influenza A(H3N2) and influenza B was predominant, and most detections were recorded among people less than 45 years old. Sequence analysis of the HA gene of these viruses showed that the eight A(H3N2) viruses identified belonged to genetic group 3C.2a1b.2a2. A/Cambodia/e0826360/2020 (H3N2)-like virus is the influenza A(H3N2) component of the 2021-2022 Northern Hemisphere seasonal influenza vaccine and belongs to genetic group 3C.2a1b.2a1. A/Darwin/6/2021 (H3N2)-like virus is the influenza A(H3N2) component of the 2022 Southern Hemisphere seasonal influenza vaccine and belongs to the genetic group 3C.2a1b.2a2.

In **Mexico**, influenza A(H3N2) was predominant, and most detections were recorded among people between 15 and 39 years old.

In the **United States of America**, during EW 49, the percentage of influenza-like illness was above the national baseline and activity continued to increase mainly in the eastern and central parts of the country. Influenza A(H3N2) predominated as well. Most of detections were recorded among children and young adults of 5 to 24 years old; however, the detections among people of 25 years and older continue to increase. Virus characterization data will be updated later this season when enough specimens have been tested by the country.

² Canada, Mexico, and the United States of America.

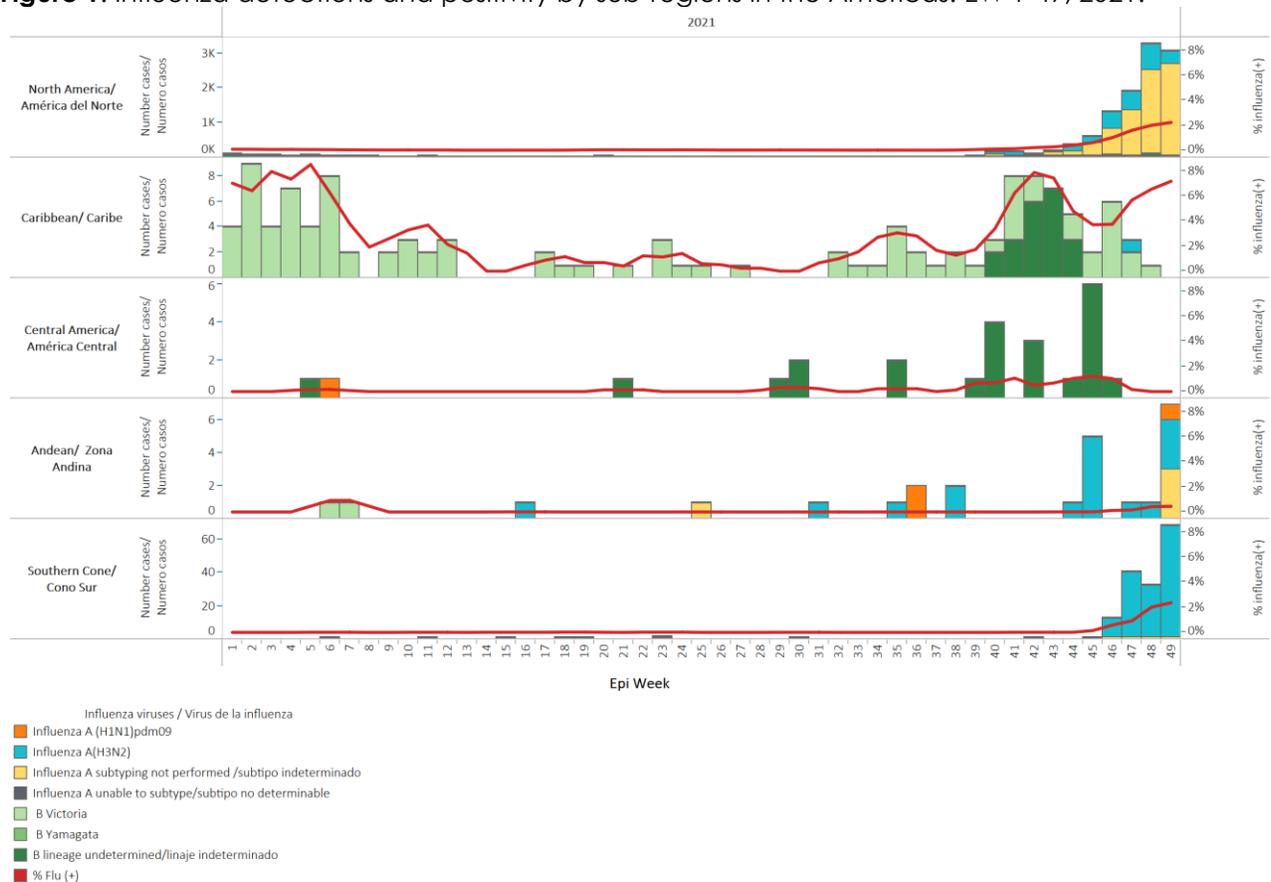
In the **Caribbean sub-region**³, as of EW 49 of 2021, influenza activity remained very low, and detections were recorded mainly in **Haiti**, with influenza B/Victoria being predominant. During EW 47 of 2021, **French Guiana** reported the detection of influenza A(H3N2) to PAHO/WHO.

In the **Central American sub-region**⁴, as of EW 49 of 2021, influenza activity remained very low, and sporadic detections were recorded mainly in **Guatemala, Honduras, and Nicaragua**, with the predominance of influenza B.

In the **Andean sub-region**⁵, as of EW 49 of 2021, influenza activity remained very low; however, influenza A(H3N2) detections continue to increase in **Bolivia, Colombia, Ecuador, and Peru**.

In **Brazil** and the **Southern Cone**⁶, as of EW 49 of 2021, influenza activity remained at inter-seasonal levels; however, influenza A(H3N2) detections continue to increase in **Brazil, Chile, Paraguay, and Uruguay**. Most of the activity and rising trend of A(H3N2) detections are recorded in **Brazil**.

Figure 1. Influenza detections and positivity by sub-regions in the Americas. EW 1-49, 2021.



Source: Data reported by Ministries of Health and National Influenza Centers (NICs) of Member States via PAHO/WHO platforms.

³ Aruba, the Bahamas, Barbados, Bermuda, the Cayman Islands, Cuba, Curacao, Dominica, the Dominican Republic, French Guiana, Guyana, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago.

⁴ Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panamá.

⁵ Bolivia (Plurinational State of), Colombia, Ecuador, Perú, and Venezuela (Bolivarian Republic of).

⁶ Argentina, Brazil, Chile, Paraguay, and Uruguay.

Recommendations

PAHO/WHO reiterates its previous recommendations to the Member States regarding surveillance, implementation of infection prevention control measures in health care services, and communication with the public about preventive measures, which are listed below, following the recommendations for the use of oseltamivir.

In the current scenario of simultaneous circulation of influenza and SARS-CoV-2, some recommendations regarding the use of oseltamivir in this context are provided below.

Use of oseltamivir in the context of concomitant circulation of influenza and SARS-CoV-2

Acute respiratory infections are known to be one of the leading causes of morbidity and mortality worldwide. Each year, between 290,000 and 650,000 seasonal influenza-associated respiratory deaths occur.⁷ In this century, other respiratory viruses have gained epidemiological importance, such as the respiratory syncytial virus (RSV).⁸ Moreover, new viruses such as SARS-CoV-2 (responsible for the current pandemic) have been detected.

Clinical presentation of influenza and COVID-19 is very similar, especially in the initial phase of the disease, although severity and mortality are different. Strategies for early diagnosis, pharmacological and non-pharmacological management, in addition to vaccination, have been developed for both influenza and COVID-19. Recently, increases in COVID-19 cases continue to be reported in different regions of the world, including the concomitant circulation of influenza in North America, and some countries in the Andean subregion and the Southern Cone.

Risk groups for severe disease

Patients at higher risk of severe disease, who require hospitalization, intensive care units (ICU) admission and typically die, are similar between influenza and SARS-CoV-2 infection. They are^{9,10} :

- Older adults (> 60 years);
- Pregnant women;
- Children younger than 59 months (risk for severe influenza);
- People with chronic diseases (chronic heart disease, chronic lung disease, chronic kidney failure, metabolic diseases such as diabetes, neuromuscular diseases, chronic liver diseases and chronic hematological diseases).
- Patients with immunosuppressive conditions, such as HIV/AIDS, undergoing chemotherapy or chronic corticosteroid users, neoplasms

⁷ Julian TO Rogusky KM, Chang HH, et al. Estimates of global seasonal influenza-associated respiratory mortality: a modelling study. *Lancet*. Mar 31, 2018;391(10127):1285-1300. doi:10.1016/s0140-6736(17)33293-2

⁸ WHO. WHO RSV surveillance - Objectives. Available at : <https://www.who.int/teams/global-influenza-programme/global-respiratory-syncytial-virus-surveillance/objectives>

⁹ Williamson EJ, Walker AJ, Bhaskaran K, et al. Factors associated with COVID-19-related death using OpenSAFELY. *Nature*. Aug 2020;584(7821):430-436. doi:10.1038/s41586-020-2521-4

¹⁰ WHO. Influenza (Seasonal). Available at: [https://www.who.int/news-room/fact-sheets/detail/influenza-\(seasonal\)](https://www.who.int/news-room/fact-sheets/detail/influenza-(seasonal))

Influenza

Regarding the pharmacological strategy against influenza viruses, a systematic review with meta-analysis of randomized controlled studies observed that the administration of oseltamivir within 48 hours after the onset of symptoms promotes a reduction in hospitalization, deaths¹¹, and a reduction in pulmonary complications¹². However, the indiscriminate use of the treatment could favor the emergence of resistance to oseltamivir, a situation that is still rare in most studies¹³. Therefore, the use of oseltamivir is recommended for the following conditions^{14,15,16}:

- Patients who belong to the severe illness risk group;
- Patients with unfavorable evolution and worsening of clinical signs;
- Hospitalized patients.

Clinical follow-up is the main tool to detect clinical worsening. The persistence or alteration of the fever pattern and the presence of a decrease in oxygen saturation, with or without dyspnea are the most important signs of clinical worsening. Therefore, home follow-up, when hospitalization is not indicated, is essential, regardless of the infectious agent.

COVID-19

Several options have been evaluated in randomized clinical trials for the pharmacological management of non-severe disease (patients with mild or moderate COVID-19). These include the use of monoclonal antibodies (e.g. sotrovimab and Regen-Cov) and antiviral antibodies (e.g. nirmatrelvir/ritonavir, molnupiravir and remdesivir), with variable results in terms of decreased hospital admission and other key outcomes in patients at high risk of complications. However, for some of these options, results are not yet robust and more large-scale studies are required. Early identification of patients at high risk of complications and the monitoring of their clinical evolution, in particular the appearance of hypoxemia and its subsequent management, remain essential to reduce morbidity and mortality.

Given the concomitant circulation scenario of influenza and SARS-CoV-2, the following table aims to guide the use of oseltamivir in outpatients, with the caveat that oseltamivir is not currently indicated for the management of patients with COVID-19.

¹¹ Heneghan CJ, Onakpoya I, Jones MA, et al. Neuraminidase inhibitors for influenza: a systematic review and meta-analysis of regulatory and mortality data. *Health Technol Assess*. 2016;20(42):1-242

¹² Dobson J, Whitley RJ, Pocock S, Monto AS. Oseltamivir treatment for influenza in adults: a meta-analysis of randomised controlled trials. *Lancet*. May 2, 2015;385(9979):1729-1737. doi:10.1016/s0140-6736(14)62449-1

¹³ Flash T. Influenza and antiviral resistance: an overview. *Eur J Clin Microbiol Infect Dis*. Jul 2020;39(7):1201-1208. doi:10.1007/s10096-020-03840-9

¹⁴ WHO Guidelines for Pharmacological Management of Pandemic Influenza A(H1N1) 2009 and Other Influenza Viruses (2010).

¹⁵ Uyeki TM, Bernstein HH, Bradley JS, et al. Clinical Practice Guidelines by the Infectious Diseases Society of America: 2018 Update on Diagnosis, Treatment, Chemoprophylaxis, and Institutional Outbreak Management of Seasonal Influenza. *Clin Infect Dis*. Mar 5, 2019;68(6):895-902. doi:10.1093/cid/ciy874

¹⁶ Malosh RE, Martin ET, Heikkinen T, Brooks WA, Whitley RJ, Monto AS. Efficacy and Safety of Oseltamivir in Children: Systematic Review and Individual Patient Data Meta-analysis of Randomized Controlled Trials. *Clin Infect Dis*. May 2, 2018;66(10):1492-1500. doi:10.1093/cid/cix1040

Table 2. Indication of oseltamivir usage according to the epidemiological behavior of COVID-19 and influenza, as well as the availability of tests.

Scenario	Epidemiological behavior of COVID-19	Epidemiological behavior of influenza	Availability SARS-CoV-2 tests	Availability Influenza A/B Test	Oseltamivir**
A	High circulation	High circulation	Yes, < 48h	Yes, < 48h	For risk groups with a positive result for influenza, regardless of SARS-CoV-2 outcome [#]
B	High circulation	High circulation	Yes, < 48h	No or > 48h	For risk groups with a negative result for SARS-CoV-2
C	High circulation	Low circulation	Yes, < 48h	Yes, < 48h	For risk groups with a positive result for influenza and SARS-CoV-2 negative
D	High circulation	Low circulation	Yes, < 48h	Yes, > 48h	For risk groups with SARS-CoV-2 negative and clinical worsening
E	High circulation	Low circulation	Yes, > 48h	No or > 48h	For risk groups with a negative SARS-CoV-2 result and with clinical worsening
F	Low circulation	High circulation	Yes, > 48 h	Yes, < 48h	For risk groups with a positive influenza result
G	Low circulation	High circulation	Yes, > 48 h	No or > 48h	For risk groups regardless of outcome
G	Low circulation	Low circulation	Yes, < 48h	Yes, < 48h	For risk groups with a positive result for influenza
H	Low circulation	Low circulation	Yes, < 48h	No or > 48h	For risk groups with negative results for SARS-CoV-2 and clinical worsening*
I	Low circulation	Low circulation	No or > 48h	No or > 48h	For risk groups with a negative result for SARS-CoV-2 and with clinical worsening*

Some observational studies demonstrated a worse clinical outcome in patients with SARS-CoV-2 and influenza co-infection^{17,18}

* Investigate other etiologies

** Oseltamivir treatment should be initiated even before having laboratory confirmation of influenza infection, as treatment is more successful if started early and should be continued or discontinued once laboratory results are obtained.

The following is a summary of the main recommendations for surveillance, clinical management, communication, and vaccination.

¹⁷ Alosaimi B, Naeem A, Hamed ME, et al. Influenza co-infection associated with severity and mortality in COVID-19 patients. *Virology*. Jun 14, 2021;18(1):127. doi:10.1186/s12985-021-01594-0

¹⁸ Dadashi M, Khaleghnejad S, Abedi Elkhichi P, et al. COVID-19 and Influenza Co-infection: A Systematic Review and Meta-Analysis. *Frontiers in Medicine* (Lausanne). 2021; 8:681469. doi:10.3389/fmed.2021.681469

Surveillance

PAHO/WHO recommends strengthening sentinel influenza-like illness (ILI) and severe acute respiratory infection (SARI) surveillance systems to signal the start and end of the influenza epidemic period; identifying the local circulating viruses and their relationship to regional and global patterns; monitoring epidemiological behavior, trends, and clinical severity; and identifying and monitoring high-risk groups.

PAHO/WHO recommends that sentinel influenza surveillance systems continue to use existing WHO ILI and SARI case definitions¹⁹ to identify cases and test for both influenza and SARS-CoV-2 viruses. Sampling strategies may need to be adapted to ensure adequate sourcing of specimens, and testing decision algorithms should be reviewed and adjusted based on the epidemiological situation²⁰. The PAHO/WHO Collaborating Center (CC) for influenza at the United States Centers for Disease Control and Prevention (U.S. CDC) in Atlanta has developed a real-time RT-PCR Influenza - SARS-CoV-2 (Flu SC2) Multiplex Assay^{21,22} for simultaneous detection of RNA of influenza A virus, influenza B virus, and SARS-CoV-2. This multiplex assay for surveillance testing is available to Global Influenza Surveillance and Response System (GISRS) laboratories registered with the International Reagent Resource (IRR) on a free of charge basis. The PAHO/WHO CC Flu SC2 Multiplex Assay's instructions for use²³ and the sequence information for primers and probes²⁴ are publicly available for reference in developing a diagnostic test based on the U.S. CDC design.

As an addition to indicator-based surveillance, PAHO/WHO recommends Member States to implement event-based surveillance. Event-based surveillance is the organized and rapid capture of information about events that may pose a potential risk to public health. The information may come from rumors and/or other *ad-hoc* reports transmitted through formal (pre-established routine information systems) or informal—not pre-established routine information systems channels (i.e., media, direct communication from health care workers or non-governmental organizations). Event-based surveillance is a functional component of the early warning and response mechanism.²⁵

Respiratory events that are unusual should be investigated immediately. Unusual events include influenza cases with atypical clinical progression; acute respiratory infection associated with exposure to diseased animals or observed in travelers to areas prone to novel influenza virus emergence; SARI among health care professionals; or clusters of human infections caused by influenza outside the regular circulation season.

¹⁹ ILI: An acute respiratory infection with: symptoms onset within past ten (10) days AND measured fever of 38°C or more AND cough. SARI: An acute respiratory infection with a history of fever or measured fever of ≥ 38 C°; and cough; with onset within the last ten(10) days; and requires hospitalization.

²⁰ Maintaining surveillance of influenza and monitoring SARS-CoV-2 – adapting Global Influenza Surveillance and Response System (GISRS) and sentinel systems during the COVID-19 pandemic (who.int) Available at: <https://bit.ly/3z2Y1RK>

²¹ Balakrishnan VS. In preparation for a COVID-19-influenza double epidemic. *The Lancet Microbe*. 2020;1(5):e199.

²² Shu B, Kirby MK, Davis WG, Warnes C, Liddell J, Liu J, et al. Multiplex Real-Time Reverse Transcription PCR for Influenza A Virus, Influenza B Virus, and Severe Acute Respiratory Syndrome Coronavirus 2. *Emerging infectious diseases*. 2021;27(7):1821-30.

²³ Influenza SARS-CoV-2 (Flu SC2) Multiplex Assay, 21 September 2020. Atlanta: Centers for Disease Control and Prevention; [29 October 2020]. Available from: <https://www.fda.gov/media/139743/download>.

²⁴ Research Use Only CDC Influenza SARS-CoV-2 (FluSC2) Multiplex Assay Real-Time RT-PCR Primers and Probes [website]. Atlanta: Centers for Disease Control and Prevention; [29 October 2020]. Available at: <https://www.cdc.gov/coronavirus/2019-ncov/lab/multiplex-primer-probes.html>.

²⁵ World Health Organization. Early detection, assessment, and response to acute public health events: Implementation of Early Warning and Response with a focus on Event-Based Surveillance. Interim Version. WHO/HSE/GCR/LYO/2014.4. Geneva: WHO; 2014. Available at: http://www.who.int/ihr/publications/WHO_HSE_GCR_LYO_2014.4/en/

As part of routine surveillance and for the etiological confirmation of unusual cases, nasopharyngeal and oropharyngeal specimens (or bronchial lavage in severe cases) should be obtained to detect respiratory viruses. Always prioritize laboratory analysis of the most severe cases, especially patients admitted to the ICU and fatal cases (deaths)—where it is recommended (when possible) to also sample respiratory tract tissue. All biosafety measures used for respiratory pathogens should be applied. Technical guidelines and diagnostic algorithms of the National Influenza Center or the national reference laboratory responsible for laboratory surveillance should be followed²⁶.

According to WHO guidelines, influenza-positive specimens from severe cases or those with unusual presentations must be sent to the PAHO/WHO CC at the U.S. CDC in Atlanta for further characterization²⁷. Influenza A samples for which a subtype can't be determined, must also be sent immediately to the PAHO/WHO Collaborating Center at the U.S. CDC.

Clinical management

Recommendations for the clinical management of patients with severe respiratory disease indicated in previous PAHO/WHO Epidemiological Alerts and Updates²⁸ on Influenza continue to apply.

Groups at higher risk of complications related to influenza infection include children less than two years of age; adults over 65 years; pregnant or post-partum women; people with underlying clinical morbidity (e.g., chronic lung disease, asthma, cardiovascular diseases, chronic kidney disease, chronic liver disease, diabetes mellitus, neurological conditions such as central nervous system injuries and delayed cognitive development); people with immunosuppression (e.g., HIV/AIDS or due to medications); and people with morbid obesity (body mass index greater than 40). In these specific groups at risk of severe illness, the administration of antiviral treatment (oseltamivir) within the first 48 hours of the onset of symptoms is suggested if influenza infection is suspected or confirmed. Antiviral treatment should be initiated even before having laboratory confirmation of influenza infection, as treatment is more successful if started early and should be continued or discontinued once laboratory results are obtained. Additionally, any person with severe or progressive clinical presentation of respiratory illness should be treated with antivirals as soon as influenza is suspected.

For more details see the paper "Considerations and interim recommendations for the clinical management of human infection with the pandemic influenza A(H1N1)pdm09. PAHO/WHO expert consultation", available at: <https://bit.ly/3JpjEo>.

Communication

Seasonal influenza is an acute viral infection that spreads easily from person to person. Seasonal influenza viruses circulate worldwide and can affect anyone from any age group. Influenza vaccination prior to the start of seasonal virus circulation remains the best preventive measure against severe influenza.

²⁶ Manual for the laboratory diagnosis and virological surveillance of influenza. 2011. Available at: https://apps.who.int/iris/bitstream/handle/10665/44518/9789241548090_eng.pdf

²⁷ Operational Guidance on Sharing Seasonal Influenza viruses with WHO Collaborating Centres (CCs) under the Global Influenza Surveillance and Response System (GISRS). 2017. Available at: <https://apps.who.int/iris/handle/10665/259400>

²⁸ PAHO/WHO Epidemiological Alerts on Influenza are available at: <https://bit.ly/3ezcQC9>.

The public should be informed that the main mode of transmission of influenza is by interpersonal contact. Hand washing is the most efficient way to decrease transmission. Knowledge about "respiratory etiquette" also helps to prevent transmission.

People with fever should avoid going to workplaces or public places until the fever subsides. Similarly, school-age children with respiratory symptoms and/or fever should stay at home and not go to school.

Vaccination

Influenza vaccination prevents complications related to this disease. PAHO/WHO encourages Member States to continue vaccinating individuals to avoid serious cases and deaths.

PAHO/WHO recommends prioritization of allocation of influenza vaccines to pregnant women due to their vulnerability to complications from the disease. In addition to pregnant women, other risk groups that should be given priority for vaccination are the elderly, children 6 to 59 months of age, people with chronic medical conditions, and health care workers. Vaccination against influenza is not a strategy to control outbreaks, but rather a preventive measure to avoid complications related to influenza.

Related Links

- Influenza update. World Health Organization. Available at: [Global Influenza Programme \(who.int\)](https://www.who.int/flu)
- Influenza Reports. Pan American Health Organization / World Health Organization. Available at: [Influenza and other respiratory viruses - PAHO/WHO | Pan American Health Organization](https://www.paho.org/en/topics/influenza)
- Influenza - COVID-19 Interface. World Health Organization. Guidelines available at: [Influenza & COVID19 \(who.int\)](https://www.who.int/flu/covid19)
- Testing Guidance for Clinicians When SARS-CoV-2 and Influenza Viruses are Co-circulating. Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases (NCIRD). Available at: <https://www.cdc.gov/flu/professionals/diagnosis/testing-guidance-for-clinicians.htm>