وقاية

هيئة الصحة العامة
PUBLIC HEALTH AUTHORITY

Enhancement of Viral Respiratory Infections Surveillance in Intensive Care Units (ICUs)

V.1

@Saudi_PHA

1- Introduction

Viral respiratory Infections represent a major global public health concern due to their high prevalence, rapid transmission, and potential for severe outcomes. These infections, ranging from seasonal influenza and respiratory syncytial virus (RSV) to emerging threats such as novel coronaviruses, contribute substantially to morbidity and mortality across all age groups. Beyond their direct impact on health, viral respiratory diseases impose a considerable burden on healthcare systems, leading to increased hospitalizations, prolonged lengths of stay, and intensive care utilization. They also carry significant socioeconomic consequences, including loss of productivity, disruption of essential services, and strain on public health resources. The recurrent seasonal nature of many viral respiratory pathogens, coupled with the potential for epidemics and pandemics, underscores the importance of robust surveillance, effective infection prevention measures, and sustainable healthcare preparedness. Addressing the burden of these illnesses is therefore critical not only for safeguarding individual and community health but also for ensuring the resilience and efficiency of healthcare delivery systems.

1.1 Overview of Respiratory Viruses

Respiratory viruses impose a substantial disease burden on both children and adults worldwide. Among them, influenza A and B viruses and respiratory syncytial virus (RSV) account for the greatest numbers of hospitalizations and deaths. However, other respiratory viruses including rhinoviruses, parainfluenza viruses, and coronaviruses are also recognized as important causes of both mild upper respiratory tract infections and severe disease. In addition, zoonotic respiratory viruses continue to emerge as novel human pathogens, carrying the risk of widespread epidemics or pandemics.

1.2 Mode of Transmission

Respiratory viruses are spread through respiratory droplets expelled from the mouth and nose during coughing, sneezing, or talking. Indirect transmission may also occur via contaminated hands or objects carrying respiratory secretions.

1.3 Incubation Period

The incubation period depends on the pathogen but generally falls within 1 to 14 days.

1.4 Objectives of the Guidelines:

- Enhancing the surveillance of respiratory viruses in ICU admitted cases.
- Estimating the impacts of viral respiratory diseases for ICU admitted cases.
- Improve the quality of samples utilizing by Public Health Authority-Lab(PHAL).
- Help in improving the vaccine coverage for targeted population.

1.5 Targeted Health Cares Workers:

This guidance applies to healthcare professionals in ICU settings, **including but not limited to**:

- Public health and infection control specialists – epidemiologists, infection control practitioners.

- Clinical care providers – ICU physicians, pediatricians, internal and preventive medicine specialists.
- Nurses, respiratory therapists, and laboratory staff – directly engaged in ICU patient care and diagnostics.
- Other healthcare workers directly involved in the management of ICU patients.

2- Surveillance and Reporting

All intensive care unit (ICU) patients—both adult and pediatric, with the exception of neonates—who meet the case definition are required to undergo screening for respiratory viruses. The surveillance and screening data must be systematically documented and registered within the HESN Plus platform. Collected specimens should be appropriately packaged and submitted to the Public Health Laboratory as part of the national public health surveillance program.

2.1 Surveillance Case Definitions

At the time of admission, healthcare workers are required to apply the standardized case definitions for influenza, COVID-19, and MERS in order to facilitate case identification and. enhance the sensitivity of specimen collection

Case Classification	Clinical Presentation
Severe Acute Respiratory Illness (SARI)	An acute respiratory infection (onset within the last 10 days) with measured fever of ≥ 38C°and cough and requires hospitalization in ICU
Confirmed Case	A person who meets SARI case definition and confirmed by lab test[1].

[1]Laboratory Confirmation by one of the following:
Positive result on a rapid diagnostic test (RIDT)
Positive result on a more sensitive and specific test such as reverse transcription polymerase chain reaction (RT-PCR) for influenza, Covid, RSV or MERS

2.2 Reporting and Required Samples

Reporting Requirements:

1) All **confirmed hospitalized cases** of influenza, COVID-19, RSV, and MERS must be reported immediately through the HESN Plus platform.
2) All **confirmed death cases** due to influenza, COVID-19, RSV, and MERS must also be reported immediately through HESN Plus.
3) All **suspected ICU cases** should be reported immediately through HESN Plus according to the standardized case definitions (influenza, COVID-19, MERS). If classification is uncertain, the case may be reported as "*suspected influenza*" until further confirmation

Notes:

- All respiratory samples (positive or negative) from both governmental and private hospitals must be sent to the Public Health Laboratory of the Saudi Public Health Authority for further testing and characterization.

- Testing performed under this surveillance program is conducted **solely for public health purposes** and follows defined protocols and timelines. It is **not intended for clinical diagnosis**. Patient management and treatment decisions must be based exclusively on hospital diagnostic testing and the clinical judgment of the treating physician

Category	Action	Timeline
Confirmed hospitalized cases	Report in **HESN Plus**	Immediate
Confirmed death cases	Report in **HESN Plus**	Immediate
Suspected ICU cases	Report in **HESN Plus** (if unclear, record as *"suspected influenza"*)	Immediate
All respiratory samples	Send (positive or negative) to **Public Health Laboratory**	As collected
Reminder	Testing is for **public health surveillance only**; clinical care decisions rely on hospital diagnostics and physician judgment	

3- Respiratory Specimen Collection

3.1 General Recommendations

- Always use the recommended personal protective equipment (PPE) when collecting specimens. This includes gloves, a gown, eye protection (face shield or goggles), and an N95 respirator. If an N95 respirator does not provide proper fit, a powered air-purifying respirator (PAPR) should be used.
- Change gloves between patients. Used gloves must be removed safely and disposed of in accordance with national medical waste regulations.

3.2 Upper Respiratory Tract

3.2.1 Nasopharyngeal (NP) Specimen Collection:

- Tilt the patient's head back to a 70° angle.
- Carefully insert a flexible-shaft mini-tip swab into the nostril, keeping it parallel to the palate (not upward) until resistance is felt, or until the depth equals the distance from the nostril to the ear, confirming the swab has reached the nasopharynx.
- Gently rotate the swab by rubbing and rolling it.
- Keep the swab in place for a few seconds to allow absorption of secretions.
- Slowly remove the swab while rotating it. Specimens can be collected from both sides using the same swab, but it is not necessary to collect specimens from both sides if the mini tip is saturated with fluid from the first collection.
- If a deviated septum or obstruction makes collection difficult in one nostril, use the same swab to collect from the other nostril.
- Insert the swab, tip first, into the transport tube provided.

3.2.2 Oropharyngeal (OP) (Throat) Specimen Collection:

- Gently insert the swab into the posterior pharynx and the tonsillar area.
- Move the swab across both tonsillar pillars and the back of the oropharynx, making sure not to touch the tongue, teeth, or gums.
- Place the swab, with the tip first, into the transport tube.

3.2.3 Nasal Mid-Turbinate (NMT) Specimen Collection:

- Use a tapered swab.
- Tilt the patient's head back 70 degrees.
- Gently rotate the swab and insert it less than 2 cm into the nostril parallel to the palate (not upwards) until you feel resistance.
- Rotate the swab several times against the nasal wall and repeat in the other nostril using the same swab.
- Place the swab, tip first, into the transport tube provided.

3.2.4 Anterior Nasal Specimen Collection:

- Insert the swab tip (about 1–1.5 cm) into the nostril.
- Rotate the swab in a circular motion against the nasal wall at least 4 times.
- Collecting the sample takes about 15 seconds.
- Make sure to pick up any nasal drainage on the swab.
- Repeat in the other nostril using the same swab.
- Place the swab, tip first, into the transport tube provided.

3.2.5 Nasopharyngeal Wash/Aspirate or Nasal Wash/Aspirate Collection:

- Attach the catheter to the suction apparatus.
- Tilt the patient's head back 70 degrees.
- Instill 1 mL-1.5 mL of non-bacteriostatic saline (pH 7.0) into one nostril.
- Insert the tubing into the nostril parallel to the palate (not upwards). The catheter should reach a depth equal to distance from nostrils to outer opening of ear.
- Begin gentle suction/aspiration and remove catheter while rotating it gently.
- Place specimen in a sterile viral transport media tube.

3.3 Lower Respiratory Tract

3.3.1 Bronchoalveolar Lavage, Tracheal Aspirate

- Collect 2-3 mL into a sterile, leak-proof, screw-cap sputum collection cup or sterile dry container. **For sputum:** Have the patient rinse the mouth with water, then expectorate deep-cough sputum directly into a sterile, leak-proof, screw-cap sputum collection cup or a sterile dry container. A minimum of 200 µL is required for testing**.**

- For additional details, refer to the ***Guidelines for Transport of Biological Substances v1.0***.

4- Core Infection Prevention & Control Measures

- **Respiratory Protection Program:** A comprehensive respiratory protection program must be implemented, encompassing all mandated components.
- **Standard Precautions:** Healthcare personnel must consistently implement standard precautions in all healthcare facilities to minimize the risk of transmission.
- **Universal Masking:** The decision to apply universal masking should be guided by the healthcare facility's internal risk assessment and must remain consistent with the most up-to-date national recommendations.
- **Hand Hygiene:** Hand hygiene must be performed rigorously and in compliance with national and international standards.
- **Personal Protective Equipment (PPE):** The correct selection, donning, doffing, and disposal of appropriate PPE must be ensured, with strict adherence to approved guidelines.
- **Environmental Cleaning and Disinfection:** Routine and terminal cleaning, along with disinfection practices, must follow evidence-based protocols and be applied consistently across all patient care areas.
- **Medical Waste Management:** All categories of healthcare waste, including infectious and sharps waste, must be segregated, handled, transported, treated, and disposed of strictly in accordance with the nationally approved regulations and standards for healthcare waste management
- **Outbreak Reporting**: All healthcare-associated infection outbreaks must be reported promptly in accordance with national regulations and through the official platform.

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