Emerging Spread of H3N2 Influenza Virus

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Abstract - Infecting large portions of the global population, seasonal influenza is a major burden on societies around the globe. While the global source sink dynamics of the different seasonal influenza viruses have been studied intensively, its local spread remains less clear.

Index Terms - -H3N2, H3 hemagglutinin, N2 neuraminidase, IDSP-IHIP (integrated health Information Platform).

I. INTRODUCTION

Influenza sometimes referred to as "the flu," is a contagious illness brought on by influenza viruses. Fever, runny nose, sore throat, headache, coughing, and exhaustion are among the symptoms, which can range in severity from moderate to severe.

Influenza viruses, which cause the infectious disease known as flu, are of four different types: A, B, C, and D.

- Influenza B virus (IBV) and Influenza C virus (ICV) primarily infect humans.
- Influenza D virus (IDV) is found in cattle and pigs.

Influenza A is further classified into different subtypes and one of them is H3N2.

- Aquatic and wild birds are the major source of the influenza A virus.
- It can spread to mammals too, including pigs and humans.
- Occasionally, it is transmitted from wild to domestic birds, and this may cause severe disease, outbreaks, or human influenza pandemics.

Influenza A is an RNA virus. It is categorized into subtypes based on the type of two proteins on the surface of the viral envelope-

- H for hemagglutinin, a protein that causes red blood cells to agglutinate.
- N for neuraminidase, an enzyme that cleaves the glycosidic bonds of the monosaccharide sialic acid (previously called neuraminic acid).

II. H3N2 INFLUENZA VIRUS

The influenza-causing virus subtype H3N2 (A/H3N2) is a subtype of influenza viruses.

- Both birds and mammals can contract H3N2 viruses.
- The virus has evolved into several strains in pigs, humans, and birds.
- Hospitalizations are higher in years where H3N2 is the prevalent strain.

This virus is extremely contagious and spreads through droplets released by an infected person when coughing, sneezing, or talking. According to the International Health Regulations (IHR), a human infection caused by a novel influenza A virus subtype is an event that has the potential for high public health impact.

Symptoms- Its symptoms are similar to that of any other flu.

- They include cough, fever, body ache and headache, sore throat, a runny or stuffy nose, and extreme fatigue.
- Nausea, vomiting, and diarrhea have been seen in very few cases.

According to the Indian Medical Association (IMA), an infection caused by H3N2 generally lasts for five to seven days and the fever starts going away after three days. However, the coughing can persist for up to three weeks. Real time surveillance through countrywide network of labs A near real time surveillance of cases of Influenza like Illness (ILI) and Severe Acute Respiratory Infections (SARI) presenting in OPDs and IPDs of health facilities is undertaken by Integrated Disease Surveillance Programme (IDSP), National Centre for Disease Control (NCDC).

- According to the latest data available on IDSP-IHIP (integrated health Information Platform), a total of 3038 laboratory confirmed cases of various subtypes of Influenza including H3N2 have been reported till 9th March 2023 by the States. This includes 1245 cases in January 1307 in February and 486 cases in March (till 9th March).
- Further, the IDSP-IHIP data from health facilities indicate that during the month of January 2023, a total of 397,814 cases of Acute Respiratory Illness/Influenza Like Illness (ARI/ILI) were reported from the country that increased slightly to 436,523 during February 2023. In the first 9 days of March 2023, this number stands at 133,412 cases.
- The corresponding data for admitted cases of severe acute respiratory illness (SARI) is 7041 cases in January 2023, 6919 during February 2023 and 1866 during the first 9 days of March 2023. In 2023 (till 28 th February), a total of 955 H1N1 cases have been reported. Majority of the H1N1 cases are reported from Tamil Nadu (545), Maharashtra (170), Gujarat (74), Kerala (42) and Punjab (28).

Influenza data from ICMR network of laboratories

In India, an integrated surveillance of Influenza like Illness (ILI) and Severe Acute Respiratory Illness (SARI) for the detection of human influenza virus and SARS-COV-2 virus is ongoing through structured ILI/SARI surveillance network of 28 sites. The surveillance network is comprised of 27 DHR-ICMR's Virus Research & Diagnostic Laboratories and country's National Influenza Centre (WHO-NIC) housed at ICMR-National Institute of Virology Pune, also a WHO Collaborating Centre for Global Influenza Surveillance & Response System (GISRS).

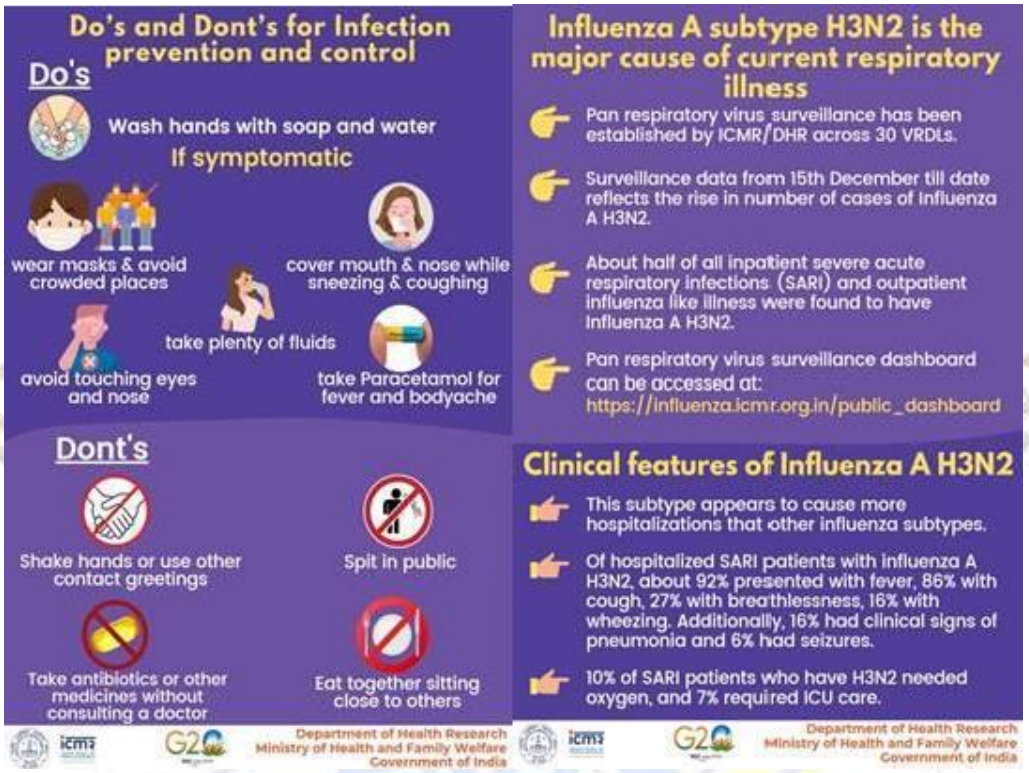
During the period of first 9 weeks (January 2 nd to March 5 th) of 2023, the surveillance network has monitored the human influenza virus and SARS-CoV-2 infection in SARI and ILI cases. The influenza typing results are summarized below:

Week	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9
Influenza-A H1N1pdm09	8	8	4	6	5	3	0	2	5
Influenza A H3N2	46	57	44	42	47	61	46	52	56
Influenza B Victoria	4	11	6	4	12	18	10	13	13

It can be seen that Influenza H3N2 is the predominant sub-type among the samples testing positive for influenza, since the beginning of this year.

Public health measures-

ICMR has issued an advisory regarding this.



Drugs and Logistics

Oseltamivir is the drug recommended by WHO. The drug is made available through the Public Health System free of cost. Government has allowed sale of Oseltamivir under Schedule H1 of Drug and Cosmetic Act in February 2017 for wider accessibility and availability. Adequate logistics is available with the States. However, in case of any emergencies the Govt. of India has been providing the support to the States to tide over the crisis.

III. CONCLUSIONS

Seasonal influenza like the H3N2 virus is an acute respiratory infection caused by influenza viruses that circulate in all parts of the world, and the cases are seen to increase during certain months globally.

Every year, India witnesses two peaks of seasonal influenza: one from Jan to March and another in the post-monsoon season. The cases arising from seasonal influenza are expected to decline from March end. State surveillance officers are therefore fully geared to meet this public health challenge.

Due to the evolution of influenza viruses, WHO continues to stress the importance of global surveillance to detect virologic, epidemiologic, and clinical changes associated with circulating influenza viruses that may affect human (or animal) health with timely sharing of such viruses and related information for further characterization and risk assessment.

IV. REFERENCES

[1] Article written by Miss Swathi Satish

[2] Article written by Miss Swathi Satish Article written by Miss Swathi Satish