Editorial

Influenza Outbreak in India: A Course Ahead

Vartika Saxena, Ashutosh Mishra

Department of Community and Family Medicine, All India Institute Of Medical Science Rishikesh, Uttarakhand, India

"Influenza" is commonly known as "flu" caused by a single-stranded RNA virus. There are four types of Influenza viruses A, B, C and D, of which type A and B are mainly known to cause respiratory tract infection in humans, especially during the winter and post-monsoon season. It is transmitted rapidly through infectious droplets in crowded places, including schools and hospitals.[1] The incubation period of influenza ranges from1 to 4 days with its period of communicability ranges from one day before the onset of symptoms to 7 days after the symptoms begin.[2] It has already caused multiple pandemics in the past, with a recent one in year 2009 was caused by the influenza subtype A H1N1 variant (pdm09). Millions of deaths have occurred during these pandemics. The vulnerable population like under-five children, elderly people (≥ 65 years of age), pregnant women, and people with comorbidity like diabetes, chronic kidney disease, chronic obstructive pulmonary disease, chronic heart disease, chronic liver disease and immunocompromised conditions (i.e., HIV/AIDS, malignancy, individuals on chemotherapy or steroid) are at higher risk of developing severe illness due to infection by Influenza viruses.[1]

Over the time, many variants of influenza viruses have evolved and created panic situations by increasing morbidity and mortality, especially in the vulnerable population Table 1.

In the current year 2023, from January onward, multiple outbreaks of different subtypes of Influenza-A viruses have been reported in various states (Tamil Nadu, Maharashtra, Gujrat, Kerala, Punjab, Delhi, Haryana, Jammu & Kashmir, Karnataka, Andhra Pradesh, West Bengal, Himachal Pradesh, Uttar Pradesh, Uttarakhand, Rajasthan, Puducherry, Chhattisgarh, Assam, Goa, Telangana, Chandigarh) of India that have led to much morbidity (3038 cases till 10.3.2023) and a few mortality.[5,6] These cases are being reported in the recent press information bureau report dated-10.3.2023. Of 3038 cases, 1245 were reported in January 1307 in February and 486 in March 2023. All of them are lab-confirmed cases of various subtypes of Influenza-A, including H1N1, H3N2 and Influenza-B (Victoria).[5] It has been observed that H3N2 is responsible for more severe disease, hospitalization and even deaths among the infected individuals, and to date, two deaths have been confirmed from Karnataka and Haryana.[5] From 2nd January 2023 to 5th March 2023 the surveillance network of India has monitored the human influenza virus among the cases of Influenza-like illness (ILI) and severe acute respiratory illness (SARI) in which it was observed the rising trends of H3N2 positive cases (451) (Figure 1).[5]

As per the information from NCDC, from 2018 to 2023 (till 28th February), a total of 61751 lab-confirmed cases of H1N1Influenza-A virus and 2825 deaths among them have been reported across various States of India (2 deaths each in Tamil Nadu, Maharashtra & Haryana, three deaths each in Punjab & Kerala and 1 in Gujrat) (Figure 2).[6]

In the current situation, the following points are of importance:

Guidelines should be Issued for Screening, Isolation and Management: In previous years, the Ministry of Health and Family Welfare(MoHFW), NITI Ayog, ICMR, NCDC and different States issued several guidelines with their collaborative efforts to prevent and control morbidity and mortality related to COVID-19. That had helped in mounting mammoth response against COVID-19 in the country and ultimately control over it. Hence, *it is essential to issue guidelines to prevent the spread of disease, especially in workplaces, schools and other places where overcrowding is common. The last revised guideline on seasonal influenza*

Address for correspondence: Vartika Saxena, Professor and Head, Department of Community and Family Medicine, All India Institute Of Medical Science Rishikesh, Uttarakhand, India
E-mail: drvartikasaxena@gmail.com

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Table 1: List of morbidity and mortality caused by Influenza Pandemics [3,4]

Year	Origin	Causative Agent	The most affected continent/countries	Number of cases (Worldwide)	Approximate number of deaths (Worldwide)	The most affected age group
1918	United States (U.S)	H1N1	U.S, Spain, France, Italy, Germany, Russia, North Africa, India, New Zealand	500 Million	50 Million	<5 years, 20-40 years, ≥65 years
1957	China	H2N2	Asia, North America, Japan	Data Not Available (NA)	1.1 Million	Children, Young adults and elderly
1968	Hong Kong	H3N2	Asia, Russia, Europe, and America	NA	0.8 Million	≥ 65 years
2009	U.S	(H1N1)pdm09	America, Asia, Africa, Europe, Australia	61 Million	0.5 Million	Children, Young & middle-aged adults

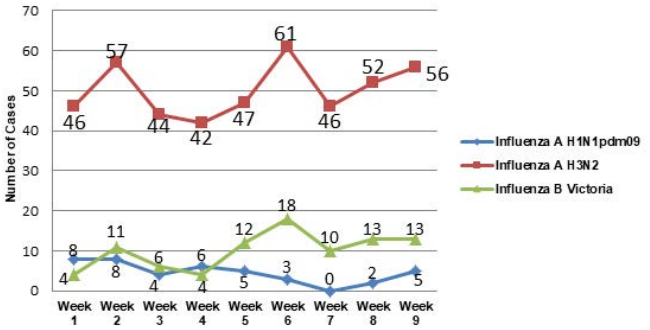

Figure 1: Influenza cases among ILI and SARI patients from January 2nd to March 5th 2023

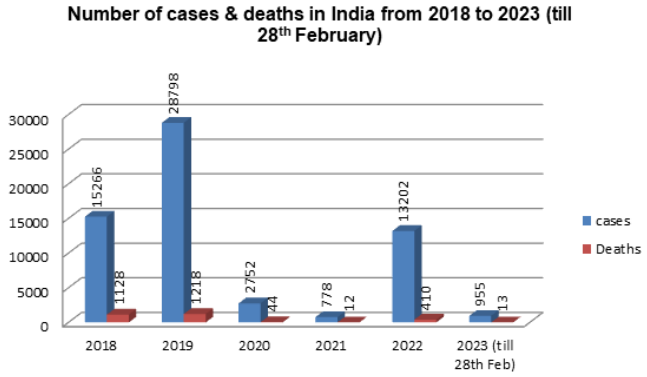

Figure 2: Number of cases & deaths due to H1N1 in India from 2018 to 2023

regarding categorization, isolation, testing, treatment and hospitalization was published by MoHFW on 18.10.2016.[7] New guidelines are important to reiterate preventive measures like *regular use of masks, respiratory and hand hygiene, avoiding crowded places, and social distancing. Initially, segregation of vulnerable populations (Young children, elderly, patients with comorbidities with diabetes, Hypertension, cancer etc.) could be a strategy to reduce infections among vulnerable populations.*

Further, it is important that the MoHFW and their designated agencies keep continuous watch over trends in morbidity and mortality due to multiple outbreaks of influenza in various states of India and this information should be put in public domain. This will help in taking decisions for imposing stringent measures like quarantine and isolation.

Continued Intensive Sero Surveillance: MoHFW has already established a robust surveillance system; it is essential for the Influenza virus, which mutates as a result of genetic drift and shift, leading to outbreaks/epidemics in different regions across the world, including India. *Regular state-specific and region-specific feedback to medical institutions is of paramount importance for a timely alert and revising the plan of diagnostics and management accordingly.*

Diagnostics for Influenza: It has been experienced during COVID-19 that sample collection, storage, transport from the collection site, and laboratory testing is a massive challenge for the health system in India, especially in situations of rise in the cases. Same can be experienced in case of influenza, so MoHFW; GoI should take all the measures for upscaling different processes for creating accessible and affordable testing facilities.

There is a need to strengthen laboratory facilities in tertiary care hospitals and medical colleges. Further, there is a need for testing kits with high sensitivity and specificity to identify the different respiratory viruses at a single point in time. It would reduce the cost and time of lab-confirmed diagnosis. Confirmed diagnosis will help in starting starting specific treatment . Rest should be deleted

Management of Cases: Confirmation of influenza is a challenge as several viral infections like *SARS CoV-2, respiratory syncytial virus, rhinovirus, adenovirus* and *parainfluenza virus,* and *bacterial infections like legionella, Chlamydia pneumoniae, Mycoplasma pneumoniae***,** and *Streptococcus pneumoniae* mimics most of the signs and symptoms like fever, chills, cough, sore throat, runny/stuffy nose, myalgia and malaise.[8] Confirmed cases of influenza with severe or progressive illness (i.e., pneumonia, sepsis or exacerbation of chronic underlying diseases) should be treated with the antiviral drug "Oseltamivir" as soon as possible, preferably within 48 hours following the onset of symptoms for maximum therapeutic effect. It should be given for a minimum duration of 5 days and can be extended until a satisfactory clinical outcome has been achieved.[1]

Oseltamivir reduces the symptoms by 55% among infected persons, and it has been proven in a prophylaxis trial.[9] In India, at present, "Oseltamivir" is not available free of cost in many government healthcare facilities, and its price in the private sector is high, which can be a deterrent for its use by many in need. So, a *generic form of Oseltamivir could be the solution to the above problem that can be made available free of cost in government hospitals.*

Vaccination against Influenza- Vaccination against Influenza is a preventive tool for people with chronic health issues.[10] Before the COVID-19 pandemic, vaccination against influenza, especially from 2019 to 2020, has prevented 7.5 million influenza illnesses, and 6,300 influenza-associated deaths.[10]

The critical issue for the Influenza vaccines is that it is most effective when the circulating influenza virus subtypes are similar to viruses contained in vaccines.[1] *Multivalent vaccines against influenza based on the currently circulating genome are needed to meet this challenge.*

As the government of India has set an example of the largest free vaccination drive against COVID-19, such efforts are *required for the Influenza vaccine also.* Here, the cost of the Influenza vaccine might be the biggest hurdle. However, vaccines could be made available at a lower cost if the government and non-government agencies join hands in the service of mankind.

Further, this vaccine can only be given to the vulnerable population, i.e., children, elderly, and people with comorbidities.

So it can be concluded that what all we have understood from the COVID-19 pandemic, several of those learnings can be utilized for curbing the Influenza outbreaks. This can be achieved with adequate preparedness and appropriate response with the help of all concerned stakeholders.

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