Sixteenth Biregional Meeting of National Influenza Centres and Influenza Surveillance in the WHO South-East Asia and Western Pacific Regions

1–3 August 2023, Dhaka, Bangladesh

Meeting report

World Health Organization
REGIONAL OFFICE FOR South-East Asia

SEA-WHE-21

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Note

The views expressed in this report are those of the participants of the Sixteenth Biregional Meeting of National Influenza Centres and Influenza Surveillance in the WHO South-East Asia and Western Pacific Regions and do not necessarily reflect the policies of the WHO as the convener.

This report has been prepared by the WHO's Regional Offices for South-East Asia and Western Pacific for Member States in the Region and for those who participated in the Sixteenth Biregional Meeting of National Influenza Centres and Influenza Surveillance in the South-East Asia and Western Pacific regions held in Dhaka, Bangladesh, 1–3 August 2021

Abbreviations

APHSAF	Asia Pacific Health Security Action Framework
APHL	Association of Public Health Laboratories
APSED	Asia Pacific Strategy for Emerging Diseases
ARI	acute respiratory illness
COVID-19	Coronavirus disease 2019
eGISRS	expanded GISRS
EQAP	External Quality Assessment Project
FFX	first few cases and their contacts
GIP	Global Influenza Programme
GISAID	Global Initiative on Sharing Avian Influenza Data
GISRS	Global Influenza Surveillance and Response System
HEPR	health emergency preparedness and response
IATA	International Air Transport Association
IEDCR	Institute of Epidemiology Disease Control and Research
IHR	International Health Regulations
ILI	influenza-like illness
IRR	International Reagent Resource
NIC	national influenza centre
NPHL	National Public Health Laboratory
OIC	officer in charge
PCR	polymerase chain reaction
PHEIC	public health emergency of international concern
PHSM	public health and social measures
PIP	pandemic influenza preparedness
PISA	Pandemic Influenza Severity Assessment

PRET	Preparedness and Resilience for Emerging Threats
RCDC	Royal Centre for Disease Control
RSV	respiratory syncytial virus
RT-PCR	reverse transcription polymerase chain reaction
SARI	severe acute respiratory illness
SARS-CoV-2	severe acute respiratory syndrome coronavirus 2
SEARO	Regional Office for the South-East Asia
US CDC	United States Centers for Disease Control
VIDRL	Victorian Infectious Diseases Reference Laboratory
WHO	World Health Organization
WOAH	World Organisation for Animal Health
WPRO	Regional Office for the Western Pacific
ZIDAR	Zoonotic Influenza Distribution and Ranking

Summary

The Sixteenth Biregional Meeting of National Influenza Centres and Influenza Surveillance in the South-East Asia and Western Pacific Regions took place in Dhaka, Bangladesh, on 1–3 August 2023. Productive discussions on the status of seasonal/non-seasonal/pandemic influenza, integrated surveillance of influenza and SARS-CoV-2 (with or without respiratory syncytial viruses), laboratory diagnosis and understanding of appropriate strategies for operationalizing the Global Influenza Surveillance and Response System (GISRS) to expanded GISRS (eGISRS) in both regions were held with participants from Member States, WHO collaborating centres, temporary advisers, partners, observers, and WHO technical staff members. Successes in integrated influenza and SARS-CoV-2 control and preventive activities in the context of transitioning of COVID-19 response from an acute response stage to a sustained response stage within the framework of a broader disease control approach were acknowledged. Key priorities in moving forward were agreed upon and included building and sustaining end-to-end integrated SARS-CoV-2 and influenza virus surveillance, using the syndromic influenza-like illness (ILI) and severe acute respiratory infection (SARI) sentinel surveillance system. Also agreed were facilitating multisectoral collaborations, and harnessing increased genomic sequencing capabilities gained during the COVID-19 pandemic to strengthen influenza and other respiratory virus surveillance with a view to early detecting novel and re-emerging pathogens. Looking to the future, countries in both regions pledged to strengthen ILI and SARI sentinel surveillance systems to use them as a foundation for monitoring SARS-CoV-2 and adding further respiratory pathogens when country priorities demand it.

1. Introduction

1.1 Organization of the meeting

The Sixteenth Biregional Meeting of National Influenza Centres and Influenza Surveillance in the World Health Organization (WHO) South-East Asia and Western Pacific Regions took place in Dhaka, Bangladesh, on 1–3 August 2023.

The meeting was coordinated by the WHO Regional Office for South-East Asia (SEARO), in collaboration with the WHO Regional Office for the Western Pacific (WPRO). A total of 124 (virtual and physical) participants attended (34 from the Western Pacific Region and 55 [including virtual] from the SE Asia Region), 4 (SE Asia Region) and 4 (Western Pacific Region) temporary advisers, 4 observers and 10 members of the WHO secretariat representing headquarters, 13 members of WHO secretariat representing WPRO, two regional offices and country offices (SE Asia Region + Western Pacific Region).

The meeting had seven plenary sessions, one group work session, and a laboratory session at the Institute of Epidemiology Disease Control and Research (National Influenza Centre, Bangladesh) at Dhaka.

The agenda of the meeting and the list of participants are given in Annexes 2 and 3, respectively.

1.2 Objectives of the meeting

The general objective of the meeting was to review the status of influenza and discuss effective strategies and approaches to further strengthen capacities in influenza surveillance, laboratory diagnosis, data reporting and timely response in alignment with the

- Global Influenza Strategy (2019–2030); and
- Influenza preparedness and the Pandemic Influenza Preparedness (PIP) framework in WHO South-East Asia and Western Pacific regions.

The specific objectives of the meeting were:

(1) To review the status of seasonal/non-seasonal and zoonotic influenza in Member States of the WHO South-East Asia and Western Pacific regions from August 2022 to July 2023 and agree with Member States and major stakeholders on key important actions required for strengthened influenza preparedness.

(2) To discuss the degree to which countries have integrated surveillance of influenza and monitoring of SARS-CoV-2 by leveraging the national influenza-like illness (ILI)/ severe acute respiratory infection (SARI) sentinel surveillance system using the WHO's end-to-end integration approach, identify challenges in surveillance, detection, data sharing and use of information for response and discuss the way forward.

(3) To discuss current challenges of laboratory diagnosis of influenza, SARS-CoV-2 using the sentinel surveillance approach and influenza virus sharing with WHO collaborating centres by national influenza centres (NICs) and agree on a plan to implement WHO recommended standards in the context of integrated sentinel surveillance of influenza and SARS-CoV-2.

(4) To brainstorm to understand the specific challenges and discuss appropriate strategies for operationalizing the Global Influenza Surveillance and Response System (GISRS) to expanded GISRS (eGISRS) by national influenza programmes and NICs in the SE Asia and Western Pacific regions.

2. Proceedings

2.1 Opening session

The meeting was opened by Dr Bardan Jung Rana, WHO Representative for Bangladesh. He welcomed the participants of the meeting to Dhaka for the Sixteenth Biregional Meeting of National Influenza Centres and Influenza Surveillance. Dr Rana delivered the opening remarks of Dr Poonam Khetrapal Singh, the Regional Director of the WHO South-East Asia Region on her behalf. (A transcript of Dr Poonam Khetrapal Singh's opening address is available in Annex 1a.)

Dr Poonam Singh's speech noted the impact that the COVID-19 pandemic has had on public health systems and, in particular, on influenza surveillance. It stated that capacity for influenza surveillance had been restored since its disruption by the pandemic, although gaps and challenges persist. She observed that the threshold of samples required to be collected remained well below WHO recommended surveillance standards. It was acknowledged that despite these challenges integrated surveillance was seen as the way forward.

She highlighted the need for pressing ahead, and vigorously strengthening and integrating respiratory pathogen surveillance, in alignment with the Global Influenza Strategy 2019–2030, as well as the eGISRS and evolving emergency preparedness, response and resilience architecture. She mentioned that for countries in the SE Asia Region, this would also help fully implement the Region's Strategic Roadmap for Health Security and Health System Resilience for Emergencies 2023–2030, endorsed in September 2022. To achieve this overall objective, her speech outlined four broad areas of operations for countries in WHO SE Asia Region in the meeting.

In conclusion, she reminded that the opportunity this meeting would provide for national influenza programmes, NICs of ministries of health, WHO collaborating centres, partners, and WHO to share their experiences, best practices, and challenges with a view to strengthening the GISRS.

Dr Babatunde Olowokure , Regional Emergency Director , WPRO delivering the speech of Dr Takeshi Kasai, the Regional Director of the WHO Western Pacific Region extended a warm welcome to participants virtually. (A transcript of Dr Takeshi Kasai speech is available in Annex 1b). He reminded participants of the continued importance of emerging SARS-CoV-2 variants in terms of health security and emphasized the need for joint efforts to protect the health of populations from the adverse impacts of the variants.

Dr Olowokure echoed the Regional Director's comments, encouraging participants to reflect on the lessons learnt during the COVID-19 pandemic in the present meeting and capitalize on these experiences to reinforce and strengthen national and regional health security. He described the important role NICs play in public health and encouraged representatives to share the challenges faced while conducting surveillance during the COVID-19 pandemic (particularly with the virus-sharing process) during the meeting. He reiterated the importance of the meeting in strategizing for the expansion of GISRS with a view to strengthening the regional response to influenza and other emerging threats in a fitting manner for both regions.

Dr Abul Bashar Mohammad Khurshid Alam, Director General, Directorate General of Health Services, Bangladesh, also welcomed participants to Bangladesh on behalf of the host government. He wished both physical and virtual participants a successful meeting while encouraging participants to actively engage with discussions to seize the opportunity to learn from one another.

Mr Nguyen Phuong Nam, WPRO, presented the agenda, objectives, and expected outcomes of the meeting (see **1.2 Meeting objectives** and **Annex 2. Programme of Activities**).

Dr Simrita Singh, Additional Director, National Centre for Disease Control, Ministry of Health and Family Welfare, India, was elected as the chair of the meeting.

Dr Le Quynh Mai, National Institute of Hygiene and Epidemiology and Director, National Influenza Centre, Vietnam, was elected as the co-chair of the meeting.

Dr Chinthana Perera, Consultant Epidemiologist, Ministry of Health, Sri Lanka, was elected as the rapporteur for the meeting.

2.2 Plenary 1: Status of seasonal, non-seasonal and zoonotic influenza

Moderator: Dr Rattanaxay Phetsouvanh, Department of Communicable Disease Control, Ministry of Health, Lao PDR

2.2.1 Influenza situation in WHO South-East Asia and Western Pacific regions

Mr Francis Inbanathan, WHO SEARO

Mr Inbanathan provided an update of the influenza situation in the WHO South-East Asia Region from August 2022 to July 2023. He described an increase in ILI in the Region reported through syndromic sentinel surveillance mostly confined to

Bangladesh. He noted that the number of specimens processed by Member States of the SE Asia Region in 2023 was fewer than that in 2021, but was similar to that in 2022.

Mr Inbanathan acknowledged that due to multiple reasons some Member States were still facing challenges in sustaining influenza surveillance after the COVID-19 pandemic. He described the circulating viruses in the SE Asia Region over the past year. Influenza A/H3N2 virus was the predominant strain while influenza A/H1N1 and influenza B/Victoria viruses were the other strains in circulation.

Mr Inbanathan then described three events of interest related to influenza (signals) detected through public health intelligence in the Region. He separated both verified events as influenza and media signals suggesting events of influenza that were not verified as influenza in the verification assessment. He also listed operational activities that have occurred in the SE Asia Region during the past year. He highlighted the recent recognition of public health laboratories in Bhutan, Timor-Leste and Maldives as NICs.

Mr Nguyen Phuong Nam, WHO WPRO

Mr Nam began by describing influenza virus activity in the WPRO over the past year. He noted the increase in both influenza A/H1N1 and influenza A/H3N2 virus circulation. Mr Nam reported that the number of specimens processed in 2023 was greater than that in the previous three years and highlighted this as a positive result of enhanced laboratory capacities in the Western Pacific Region during the COVID-19 response.

Mr Nam outlined the successful detection of human cases of zoonotic influenza through existing surveillance systems in both Cambodia and China, noting that the most recent WHO risk assessment stated that the risk of human-to-human transmission of these viruses remains low.

Mr Nam also described activities undertaken by the WPRO, which included provision of equipment and reagents to Member States, leveraging expertise of WHO collaborating centres to build in-country genomic sequencing capacity, and facilitation of participation of countries in the External Quality Assessment Project (EQAP).

2.2.2 Influenza situation in the northern hemisphere

Dr Hideki Hasegawa, WHO Collaborating Centre, National Institute of Infectious Diseases, Japan

Dr Hideki Hasegawa reported that the 2022–2023 northern hemisphere influenza season differed from preceding seasons, with the epidemic beginning earlier than usual and a demonstration of a biphasic peak in late 2022. There was circulation of influenza A/H1N1, influenza A/H3N2, and influenza B/Victoria viruses. The influenza type A viruses predominated. However, Dr Hasegawa highlighted the differing circulation patterns by different geographical regions within the northern hemisphere. Viruses detected in samples tested by the Tokyo Collaborating Centre were largely influenza A/H3N2. He also discussed influenza epidemiology in Japan. Epidemiologically, the highest number of hospitalizations were observed in the youngest age group (0–14 years).

Dr Hasegawa then detailed the genetic and antigenic characteristics of circulating influenza viruses in the northern hemisphere. The majority of influenza A (H1N1) viruses belonged to the 6B.1A subclades 5a.2 and 5a.2a.1. The majority of these influenza viruses were well recognized by antisera raised against reference 5a.2a viruses, which represented the 2022–2023 northern hemisphere vaccine (A/Victoria/4897/2022 egg and A/Wisconsin/67/2022 cell), and reference 5a.2a.1 viruses, which represented the 2023 southern hemisphere vaccine (A/Sydney/5/2021 egg and cell).

The majority of circulating influenza A (H3N2) viruses belonged to clade 3C.2a1b, subclade 2a.2, with significant phylogenetic diversity that differed by country and regions. Most viruses were recognized by ferret antisera raised against reference viruses, including A/Darwin/6/2021 egg- and cell-propagated influenza viruses, which represent the 2022–2023 and 2023–2024 northern hemisphere vaccines and the 2023 southern hemisphere vaccine.

Viruses of subclade 2b were recognized less well by antisera raised against reference viruses.

Almost all circulating influenza B/Victoria lineage viruses belonged to the V1A clade (with triple amino acid deletion). Most were subclade 3a2. These influenza viruses were well-inhibited by ferret antisera raised against reference virus B/Austria/1359417/2021 (subclade 3a2), which represent the 2022–2023 and 2023–2024 northern hemisphere vaccines and the 2023 southern hemisphere vaccine.

To date, there have been no viruses of influenza B/Yamagata lineage confirmed by WHO collaborating centres since March 2020.

2.2.3 Influenza situation in the southern hemisphere

Professor Ian Barr, WHO Collaborating Centre for Reference and Research on Influenza, Victorian Infectious Diseases Reference Laboratory, The Peter Doherty Institute for Infection and Immunity, Australia

Professor Ian Barr described recent influenza activity in the southern hemisphere. He began by commenting on the continued abnormalities in seasonal influenza activity since the onset of the COVID-19 pandemic. During the 2023 southern hemisphere influenza season, there was great variation in epidemic timing and magnitude across countries. For example, while the majority of viruses circulating in South Africa were influenza A/H3N2, New Zealand and Fiji experienced co-circulation of influenza A/H1N1 and B/Victoria viruses.

To assess the public health impact of influenza in 2023, Professor Barr shared data from Australia, noting the variation in season timing and length over the last five years. In terms of case notification data, incidence in 2023 was greater than the 5-year average incidence, although smaller than the incidence in 2022. Influenza A/H1N1 and influenza B/Victoria lineage viruses predominated during the Australian 2023 season. The majority of cases and hospitalizations were observed in younger age groups. Of the deaths attributed to influenza in 2023, the majority were associated with influenza A/H1N1. Professor Barr noted that some deaths were associated with influenza B/Victoria viruses, which can cause myocarditis.

Professor Barr described the genomic and antigenic characteristics of influenza viruses circulating in the southern hemisphere. As in the northern hemisphere, the majority of circulating influenza A/H1N1 viruses belonged to the A.5a.2a clade and were well inhibited by human sera raised against the 2023 southern hemisphere vaccine. There was greater diversity among circulating influenza A/H3N2 viruses, but the majority belonged to subclade 2a.2a.3a.1. Like the northern hemisphere, the majority of Victoria-lineage viruses were of subclade V1A.3a.2. The Melbourne Collaborating Centre has not detected an influenza B/Yamagata virus since 2020, but Professor Barr reiterated the need to continue to lineage-influenza type B viruses to ensure influenza B/Yamagata viruses are not being missed. All influenza A/H1N1 and influenza B/Victoria viruses and most influenza A/H3N2 viruses analysed by haemagglutination assay at the Melbourne Collaborating Centre were well inhibited by human sera raised against the 2023 southern hemisphere vaccine.

Professor Barr ended his presentation by thanking NICs and other laboratories for continuing to share influenza viruses with collaborating centres, despite challenges

to influenza surveillance as countries navigate the transition from an acute COVID-19 response to more sustained, integrated response including integrated sentinel surveillance for monitoring trends of SARS-CoV-2 virus.

2.2.4 Presentation on the zoonotic influenza situation

Dr Aspen Hammond, Global Influenza Programme, WHO headquarters

Dr Hammond presented global avian influenza virus events during the last decade, highlighting that since 2021 there has been an unusually high number of events detected, and year-round detections. She described recent H5 infections in mammals, including mink, foxes, seals, sea lions and domestic animals, likely to have been affected as a result of spread by migratory birds. Dr Hammond noted that while there has been an increase in detections, none of the influenza viruses isolated from infected mammals (including humans) have changes indicating increased specificity for binding to human receptors. She shared epidemiological curves for zoonotic influenza A viruses overall by the subtype, and then by the subtype and the country, demonstrating the global heterogeneity of zoonotic influenza cases.

Dr Hammond highlighted the need for a "mosaic" of surveillance systems to best detect zoonotic influenza, as described in WHO document "Crafting the mosaic": a framework for resilient surveillance for respiratory viruses of epidemic and pandemic potential. The timely detection of a virus that could emerge, spread and cause illness in humans requires the use of multiple event-based and indicator-based systems that work together. Such approaches include health facility event-based surveillance, community event-based surveillance, notifiable disease surveillance, laboratory networks, targeted special population surveillance, syndromic surveillance, and media-based surveillance.

Dr Hammond highlighted the important role investigations play in zoonotic influenza surveillance and emphasized the need for a One Health approach that facilitates collaboration between public health and animal sectors. She reiterated the required response: readiness, control of transmission, and mitigation of impact of zoonotic influenza viruses.

Dr Hammond gave examples of risk assessments undertaken by WHO at the global level, e.g. for risk of human-to-human transmission and risk of international spread. She reported results from a recent risk assessment, which found that despite the increased number of reports of spillover to mammalian species, zoonotic influenza is likely to cause high prevalence in avian populations, rather than increasing the risk for human infections.

Dr Hammond concluded her presentation by reminding participants, firstly, of the recommendations for conducting surveillance, investigations, and responding to human cases, and secondly the WHO resources for zoonotic influenza available to countries.

2.2.5 Panel discussion: Key actions required for strengthened influenza preparedness including those at the human–animal–environmental interface

The members of the panel were Dr Hideki Hasakawa, Professor Ian Barr, Dr Hirve Siddhi and Dr Lesa Thompson.

The panel fielded questions from the chair and co-chair, as well as the audience. Some highlights from the discussion were as follows.

Dr Siddhi discussed the need for strategic thinking for influenza preparedness based on experiences of the COVID-19 pandemic. He emphasized the need for broader engagement with non-traditional sectors and stakeholders, including engineering, tourism, media and trade, in a "whole of society" approach. He noted that though this is not a new concept, there is a need for operationalization of it. Dr Siddhi noted that securing access to non-pharmaceutical interventions increasingly continues to be important for influenza preparedness. He stated that the huge influx of data during the COVID-19 pandemic could not all be used for decision-making and informing policy. He was of the opinion that in future, it was important to strategize how data could be effectively used for response and there existed a need to refine core data quality standards.

Professor Barr was asked to discuss the importance of sharing viruses with collaborating centres. He reiterated that virus sharing that has existed since its conception is the cornerstone of the GISRS. He noted that while genomic sequencing is important, not all surveillance can be supplemented with genetic data. Highlighting the importance of virus sharing for determining influenza vaccine composition, Professor Barr described its other important uses including investigating antiviral resistance, antigenic characterization, and investigation of un-typeable influenza viruses.

Dr Hasakawa described the specific role of collaborating centres in strengthening influenza preparedness. It entails mainly supporting and building country capacities by collecting data and generating information related to influenza viruses in the Region. The next generation sequencing was highlighted as an example.

Dr Thompson was asked about key actions recommended by the World Organisation for Animal Health (WOAH) for strengthening influenza preparedness to control the risk of zoonotic influenza. Among actions, she highlighted ensuring strong biosecurity on animal farms and in marketplaces, as well as recognizing the potential impacts these activities may have on the animal sector. She gave examples such as job losses, culling of healthy birds, and restrictions on international trades. She also discussed the role of financial compensation in mitigating these impacts. Dr Thompson highlighted the need for minimizing the risk of the disease spread from migratory to domesticated birds, and as discussed by Dr Hammond earlier in the day, she too flagged the major concerns regarding species barrier crossing (e.g. domesticated animals). Dr Thompson encouraged countries to continue to report infections in usual hosts, reiterating that timely, high-quality information is key to support early detections of zoonotic influenza infections.

2.3 Plenary 2: Role of public health laboratories in surveillance

Moderator: Dr Mandeep Chadha, Temporary Adviser, WHO
Co-moderator: Dr Runa Jha, Temporary Adviser, WHO

2.3.1 An update on achievements and challenges of public health laboratories in the area of surveillance in the SE Asia Region

Mr Francis Inbanathan, WHO SEARO

Mr Inbanathan described the status of the WHO South-East Asia Region's current influenza laboratory capacities.

For influenza:

- There are now 10 active (and one prospective) NICs.
- SEARO facilitates IRR supply to 10 Member States.
- Regular participation of Member countries of the SE Asia Region in EQAP occurs across the Region.
- All Member States report laboratory data to the FluNet.
- Four Member States now sequence influenza viruses.

For COVID-19:

- All Member States have capacity for reverse transcription polymerase chain reaction (RT-PCR).

- 10 Member States sequence SARS-CoV-2 viruses and share the data with the Global Initiative on Sharing Avian Influenza Data (GISAID).
- There is both national and subnational participation in EQAP.
- In terms of integrated surveillance, there has been a decentralization of influenza testing throughout the WHO SE Asia Region.
- Multiplex testing is performed in 10 Member States.
- 10 Member States report both influenza and SARS-CoV-2 data to the FluNet.

Moreover, seven Member States forwarded timely shipments to WHO collaborating centres for the February 2023 vaccine composition meeting. This activity was an improvement compared with the status reported in the previous meeting.

Other activities undertaken in the Region included bio-risk management training for implementation of WHO Laboratory Biosafety Manual 4th version and training of trainers on "Infectious substance shipping" conducted by the International Air Transport Association (IATA).

Mr Inbanathan summarized the lessons learnt during the past 12 months and described how they have been drivers of success for preparedness and readiness in the WHO SE Asia Region. These lessons included having the private sector to scale up laboratory testing capacities, improvement of workforce surge capacity through hiring and additional training, building genomic sequencing capacity, and rapid sharing of information in the public domain.

Finally, Mr Inbanathan described the new South-East Asia regional roadmap for diagnostic preparedness, integrated laboratory networking and genomic surveillance (2023–2027), which provides Member States with a range of policy options for sustainable strategies to improve national laboratory systems. This will enable Member States to more effectively respond to emerging and re-emerging diseases.

2.3.2 An update on achievements and challenges of public health laboratories in the area of surveillance in the Western Pacific Region.

Mr Nguyen Phuong Nam, WPRO

On behalf of WPRO, laboratory consultant, Dr Darwin Operario, Mr Nam presented recent achievements and challenges of public health laboratories in the area of integrated surveillance of influenza and SARS-CoV-2 in the Region. He summarized participation of countries in SARS-CoV-2 EQA in 2022 in the Western Pacific Region,

with 331 participating laboratories among nine countries. The median score obtained was high at 99%. As far as influenza EQA was concerned, 48 laboratories (including 19 NICs) participated, with generally high scores except among new laboratories where errors identified were mistyping and detection of incorrect viruses.

Mr Nam described challenges to influenza testing and reporting in the Western Pacific Region. The quality of samples received at central laboratories did not always allow for virus isolation or influenza testing. Mr Nam pointed out the need for building capacity of subnational laboratories to circumvent the above-mentioned challenge. He described difficulties encountered in linkage of surveillance, clinical and laboratory information to support decision-making and public health response. Mr Nam also summarized ongoing challenges for laboratories in obtaining funding from governments for procurement of reagents and human resources, particularly as the response to SARS-CoV-2 virus transitions from the acute phase of response. Finally, he discussed supply chain issues in particular shipment delays for materials and reagents, especially in remote areas.

2.3.3 Issues and challenges on laboratory diagnosis for public health surveillance: country experiences.

2.3.3.1 Bangladesh

Professor Tahmina Shirin, Institute of Epidemiology Disease Control and Research (IEDCR) and NIC, Bangladesh

Professor Shirin began by describing the historical timeline of IEDCR since it being designated as an NIC in 2007. She focused on its added capacities such as zoonotic influenza surveillance in live bird markets, regular data entry to the FluID, and IEDCR's role as the driver of the country's COVID-19 pandemic response.

Professor Shirin described the status of co-circulation of influenza and SARS-CoV-2 viruses since January 2020 using the epidemiological curve and demonstrating the value of integrated surveillance. She also showed the results of the two principal influenza surveillance systems functioning in Bangladesh (National Influenza Surveillance and Hospital Based Influenza Surveillance) to display trends in seasonality of influenza over the past decade. She described other activities undertaken by the NIC in Bangladesh that included quarterly virus sharing with WHO collaborating centres, participation in EQAP, monthly reports published online, outbreak investigations, and research conducted (including time-series analysis of influenza seasonality and co-seasonality with avian influenza).

Professor Shirin addressed issues and challenges faced by the NIC of Bangladesh, including delayed receipt of reagents, inadequate laboratory supplies, lack of sustainable financial support, the diversion of ILI cases to SARS-CoV-2 clinics (being diverted away from sentinel surveillance sites), difficulties in defining the denominators to determine influenza severity assessment, and lack of patient outcome data for ILI and SARI patients.

Professor Shirin finished her presentation by describing the important contribution of influenza surveillance to public health security in Bangladesh. She described its role in identifying novel strains, contributing influenza virus-related data for influenza vaccine strain selection, provision of early warning signals during epidemics, and the influenza surveillance's invaluable part in the COVID-19 pandemic response in Bangladesh.

2.3.3.2 Bhutan

Mr Sonam Gyelthsen, Royal Centre for Disease Control (RCDC) and the NIC, Bhutan

Mr Gyelthsen began by describing the operational aspects of ILI and SARI surveillance systems in Bhutan, where 11 sentinel surveillance sites cover all three regions of the country. He described the optimal pathway from patient enrolment and sampling to onsite testing or storage and transport to the central laboratory.

Mr Gyelthsen described the challenges at sentinel surveillance sites for maintaining surveillance capacities, including a lack of systematic policies, lack of awareness among newly recruited clinicians and other health-care providers, overburdened health-care workers, and high staff attrition rates. Together these issues mean case enrolment is often unintentionally overlooked. Shortage of reagents and other consumables also lead to issues with onsite testing and storage.

Mr Gyelthsen also described challenges for laboratories including the need for continuous calibration and maintenance of laboratory equipment, lack of awareness and training for biosafety and biosecurity practices, and maintaining the quality, accuracy, and consistency of laboratory testing. He pointed out the lack of dedicated fund allocation, which causes difficulties in equipment, reagent, and consumable acquisition. Mr Gyelthsen described challenges in maintaining the cold chain at subnational laboratories, which causes issues with viability and integrity of samples. He highlighted challenges in terms of Bhutan's newly built genomic sequencing capacities include inadequate funding and lack of bioinformatics or data analyst support.

After describing the challenges that the sentinel surveillance sites and laboratories have experienced in Bhutan, Mr Gyelthsen described the way forward to mitigate impact of experienced challenges. He was of the opinion that regular training for health-care providers to ensure continuity of surveillance, conducting periodic monitoring and supervisory visits to surveillance sites, development of national laboratory policy to strengthen the network, and streamlining the procurement procedure for equipment, reagents, and consumables, among others as actions for the way forward.

2.3.3.3 Malaysia

Dr Rozainanee Mohd Zain, Ministry of Health/Institute for Medical Research, National Institute of Health

Dr Zain began by describing the recent influenza activity in Malaysia using SARI sentinel surveillance data and the development of in-country capacity for genomic sequencing, which resulted in over 5000 Malaysian genomic sequences uploaded to the GISAID EpiCoV database from 2023 to date. This has enabled Malaysia to monitor the distribution of SARS-CoV-2 variants circulating over time in the country.

Dr Zain discussed issues and challenges that Malaysia has experienced. Firstly, there is a need for improving timeliness of samples forwarded by sentinel surveillance sites. There have also been issues with subtyping positive influenza samples, which may be a result of pre-analytic issues including storage and transportation. Dr Zain also highlighted issues related to in-country influenza virus sequencing capacity, including lack of personnel with appropriate training and the need for continued reagent support.

2.3.3.4 Philippines

Dr Ana Duran, Officer in Charge (OIC)/Research Institute for Tropical Medicine, Philippines

The Philippines presentation shared issues and challenges encountered by public health laboratories in sentinel surveillance. The presentation was began by addressing the fragmented laboratory system, where there is a lack of investment in data sharing among laboratories, hospitals, public health units, and academic/research institutions. The presentation described the need for standardization of techniques and processes among laboratories and for further training on standardized guidelines and protocols for laboratory procedures and surveillance. Also discussed was the effects of insufficient financial and human resources on sentinel surveillance, including issues with procurement, human resources, sample storage and transport, and a lack of BSL-

3 facility in the country. Further discussed were the issues with some virus transport mediums used in sample collection, which cause cell toxicity, contributing to poor recovery in virus isolation. The presenter described the flow-on effects of a lack of feedback mechanism has on quality assurance of laboratory data.

Subsequent issues, the potential solutions to mitigate those issues were presented. The presenter pointed out the opportunity available to tap potential local and international funding sources, and the need to conduct training for clinical and public health laboratories and shift to the use of enhanced information systems for reporting. Finally, the presentation focused on the importance of implementing pan-respiratory surveillance capacity in the country. With respect to this goal, the presentation shed light on the requirement for streamlining the integrated surveillance process (e.g. one case investigation form for all respiratory viruses, one information system) and progress integration (e.g. a simple diagnostic algorithm utilizing multiplex assay testing).

2.3.4 New global updates on virological surveillance of influenza

Dr Philip Gould, Influenza and Animal–Human Interface Programme, US-CDC, Viet Nam

Dr Gould began by reiterating that influenza remains a global health priority and constant monitoring is required to detect increased activity and novel viruses. He pointed out that continued detections of avian and variant virus influenza infections in humans show the importance of disease surveillance.

Dr Gould discussed the role of public health laboratories in disease surveillance, differentiating activities by the extent to which they require sequencing resources. He began by outlining activities that require a limited effort, requiring either no sequencing or occasional sequencing for follow-up: identification of the causative agent of disease, diagnostic support for influenza, and support for development of therapies and vaccines. Dr Gould then discussed activities that require sustained sequencing activities over a longer period of time: influenza evolution and its impact on change in viral characteristics, immunity, diagnostics, and therapeutic interventions, and monitoring viral movement and activity to investigate geographical spread between populations, investigate outbreaks in specific settings and populations, and track zoonotic infections.

Dr Gould reiterated the importance of sample selection criteria to ensure appropriate samples are sequenced. High priority samples were highlighted as those that include cases with an epidemiological link to zoonotic infections or a diagnosis indicative of an unusual virus and cases linked to outbreaks. For surveillance sampling,

he emphasized the importance of adherence to timeliness for surveillance sensitivity; the fact that current samples give the best representation of influenza viruses currently circulating and causing the disease. He underscored the importance of sample representativeness.

Before addressing the important role of genomic sequencing, Dr Gould reminded participants of the importance of building capacity using a stepwise approach and in a manner which meets country-specific goals. Genomic sequencing requires bioinformatics personnel, and this is currently a key limitation of the in-country sequencing capacities built during the COVID-19 pandemic. Dr Gould emphasized the need to ascertain laboratories that can function as influenza sequencing centres with the capacity to provide regional training and/or technical support to other countries. Dr Gould pointed out both the Global Influenza Programme (GIP) of WHO and the influenza division of the United States Centers for Disease Control (US CDC) as bodies that can support countries for genetic surveillance strategies through assistance with training, technical support, and funding mechanisms. He gave specific information on the techniques and methods the US CDC can provide to Member States in both WHO regions.

2.4 Plenary 3: Expansion of the Global Influenza Surveillance and Response System (GISRS) – GISRS to eGISRS

Moderator: Dr Ana Duran, Officer in Charge (OIC) /Research Institute for Tropical Medicine, Philippines

2.4.1 Future GISRS: vision, principles, and the process

Dr Wenqing Zhang, Global Influenza Programme, WHO headquarters

Dr Zhang began her presentation by describing the achievements of GISRS since its conception 70 years ago. She discussed its key role in enhancing influenza surveillance, preparedness and response and then described the future of GISRS – expanded GISRS (eGISRS). While the idea of an expanded GISRS became well-known during the COVID-19 pandemic, it actually began in 2015 with the integration of respiratory syncytial virus (RSV).

Importantly, the foundation of eGISRS does not differ from that of GISRS. Core functions also remain the same: detection and monitoring of respiratory viruses, risk assessment, recommendation of countermeasures, monitoring and evaluating countermeasures, and capacity-building at all levels. As a global system, eGISRS also functions to connect external collaborators to further strengthen capacities for

preparedness and response to pandemics and outbreaks due to respiratory pathogens. GISRS is built on people, public health needs, country ownership, global coordination, and capacity-building. The proposed future approach of the GISRS will address public health issues by implementing end-to-end integration of influenza, SARS-CoV-2, and additional respiratory pathogens on the basis of the needs at the country-level.

2.4.2 Expanding the GISRS: between now and the future – process and timelines

Dr Jean-Michel Heraud, Global Influenza Programme, WHO headquarters

Dr Heraud followed Dr Zhang's presentation to discuss the next steps toward building eGISRS. He stated that consideration of other priority respiratory viruses requires to focus on a virus that:

- it has a predominant respiratory mode of transmission;
- it is either novel or known;
- it has epidemic or pandemic potential;
- its prevention and control are directly informed by surveillance; and
- it can be integrated cost-effectively and seamlessly into the existing GISRS operation.

He elaborated that the eGISRS will take a collaborative public health intelligence approach, which will involve coordinating with other networks for early detection of outbreaks, monitoring spread and evolution of viruses, and informing medical countermeasures.

He stated that the system will take a modular approach that is adapted to countries' needs. The primary focus will be capacity-building at the national and regional/global levels for the integrated surveillance of influenza and other respiratory viruses using the existing GISRS system (i.e. infrastructure, workforce, trust and confidence). The modular approach embodies in that the influenza surveillance will be a requirement to all GISRS members, SARS-CoV-2 is an additional pathogen for most GISRS members, and a subset of GISRS members (based on country needs) will incorporate further policy relevant respiratory viruses.

For the GIP of WHO, the next steps in developing eGISRS are convening technical working groups to discuss and develop technical guidance documents where needed. Issues addressed will include case definitions, sample size determination, laboratory algorithms, and terms of refence. A convening body to support the

coordination of activities will be developed, and the strategic action plan will be adopted and implemented.

In summary, Dr Heraud reminded participants of the opportunity existing global surveillance systems provide to eGISRS to leverage – integration is less costly than having separate systems. He asked, in the pending group work, Member States to consider the key challenges and top priorities to implement eGISRS and also advise how WHO can ensure the sustainability of eGISRS activities.

2.5 Plenary 4: End-to-end integrated surveillance of influenza and SARS-CoV-2 by leveraging national ILI/SARI sentinel surveillance system

Moderator: Dr Siddhartha Saha, Director, Influenza Programme US CDC – India

2.5.1 The global update on integrated surveillance of influenza and SARS-CoV-2

Dr Siddhivinayak Shriram, Global Influenza Programme, WHO headquarters

Dr Shriram's presentation focused on the incorporation of SARS-CoV-2 into integrated surveillance. He acknowledged the progress many countries have made towards integrated surveillance and emphasized the need for countries to identify their priorities in the context of pandemic preparedness in moving forward. He stated that there is no other parallel system such as GISRS in terms of global scale for monitoring co-circulation of different viruses, their types, subtypes, and lineages.

Dr Shriram described the current global status of integrated surveillance. Since 2020, 129 countries have integrated SARS-CoV-2 with influenza surveillance. However, he noted that there are gaps in terms of target sample sizes (only 105 of 129 countries reported at least 50 specimens processed in a given week in the past 12 months to the GISRS), consistency (only 48 of 129 countries have reported at least 50 specimens processed in at least 30 weeks in the past 12 months to the GISRS), and timeliness (only 44 of 129 countries have reported at least 50 specimens in the same reporting week period).

It was reminded that Multiplex kits are the primary assay used in the ILI/SARI surveillance for conducting integrated surveillance. However, Dr Shriram pointed out the difficulties in monitoring their usage. Efficiency of multiplex PCR assays is currently assessed by comparing the number distributed to a country and the number of specimens processed according to data reported to the FluNet. Dr Shriram highlighted the higher efficiency of multiplex PCR kits in sentinel surveillance settings, where the

yield of unique sequences of SARS-CoV-2 is higher than in non-sentinel settings. In this respect, Dr Shriram reiterated the importance of systematic, representative sourcing of samples at the sentinel surveillance sites.

He informed that within GISRS, genomic surveillance capacities have been strengthened over the past few years. Contributions were made by activities such as bioinformatics trainings, webinars conducted by the GISAID, hands-on sequencing training conducted together with US CDC/the Association of Public Health Laboratories (APHL), and an OpenWHO online training course on next generation sequencing.

In terms of transitioning to a sustainable integrated surveillance system, Dr Shriram listed development of new tools (e.g. Genomics Laboratory Costing Tool), improved outputs to show relative co-circulation of influenza and SARS-CoV-2, and continued participation in EQAP for influenza and SARS-CoV-2 as vital components.

2.5.2 Experience/best practices of integrated surveillance of influenza and monitoring of SARS-CoV-2 in Albania

Dr Silvia Bino, Department of Epidemiology and Control of Infectious Diseases, Institute of Public Health, Tirana, Albania

Dr Bino shared Albania's experiences of implementing integrated sentinel surveillance of influenza and monitoring of SARS-CoV-2. This involved some changes to the existing surveillance system, including an increase in the number of ILI and SARI sentinel surveillance sites, testing samples throughout the year for both SARS-CoV-2 and influenza, and digitalization of the surveillance system. The digitalization of the sentinel surveillance system involved integrating all integral systems into one platform, enabling timely linkage of laboratory, epidemiological, and vaccination data. In turn, this allowed rapid informed policy and clinical decision-making. Dr Bino described the introduction of new case investigation forms in the integrated sentinel surveillance system that can be used for monitoring both influenza and COVID-19 transmission.

Dr Bino also discussed the gradual addition of RSV to the integrated sentinel surveillance system, as well as the further addition of other respiratory viruses when outbreaks or other important events pertaining to these viruses were detected. To stress this point, she acknowledged the importance of having an agile system that can adapt to the country's changing surveillance objectives over time. On the basis of the experience in Albania, Dr Bino emphasized the importance of a gradual, deliberate approach for adding pathogens to an existing surveillance system. In this presentation, she demonstrated how Albania's sentinel surveillance system fits within the WHO

mosaic approach to operationalize a multiple, “fit-for-purpose” surveillance approach that addresses priority surveillance objectives for respiratory viruses of epidemic and pandemic potential in Albania.

Finally, Dr Bino addressed some of the challenges faced during this process. The challenges included training of staff to use the digital platform, data quality checking, selection of the types of systems to enable data integration, and ensuring case investigation forms are completed within a week by clinicians.

2.5.3 Update on RSV surveillance through influenza sentinel surveillance and future plans including “Burden of Disease” estimation

Dr Siddhivinayak Shriram, Global Influenza Programme, WHO headquarters

Dr Shriram provided an update on RSV surveillance using influenza sentinel surveillance systems. He began by reminding participants of the significant burden of RSV disease among children aged less than five years. Dr Shriram described the current RSV surveillance landscape. In this landscape, there are 25 countries (including three in the SE Asia Region, three in the Western Pacific Region) currently participating in WHO coordinated RSV surveillance project. Further 23 countries (including four in Western Pacific Region) report RSV trends on their national websites. Currently, the WHO coordinated RSV surveillance project is in phase two. Phase two focuses on children aged less than two years. It includes RSV typing, sequencing, and external quality assessment.

The WHO coordinated RSV surveillance pilot project has many objectives. It includes testing of the feasibility of using the GISRS platform for RSV sentinel surveillance, evaluation of the RSV case definition/s, evidence generation for supporting informed decision-making ahead of the availability of RSV vaccines and formulating relevant policy decisions on immunization related to RSV, evidence generation regarding seasonality, phylogenetic diversity, and risk factors for the RSV disease, establishment of surveillance laboratory standards, adaptation of data platforms, and building country capacities.

In his presentation, Dr Shriram shared results of the most recent EQAP related to RSV. In this EQAP, 88% of targeted laboratories participated, with 98% correctly detecting RSV and 88% correctly subtyping the RSV. He also shared data on RSV seasonality from a number of countries, demonstrating the diversity of RSV by factors such as hemisphere and climate. He shared information on RSV sequences uploaded to the GISAID. He highlighted the improved timeliness of submission of information-related sequences over the pilot period.

Concluding his presentation, Dr Shriram described the plan for moving forward the RSV sentinel surveillance, including EQAP and sequencing components, the introduction of a CDC single reaction multiplex assay.

2.5.4 Country presentations

2.5.4.1 Timor-Leste

Dr Maria Jose da Costa and Mrs Adriana Baptista Belo, National Institute of Public Health, Ministry of Health, Timor-Leste

The presenters from Timor-Leste described the key findings and plan to implement recommendations from the recent joint national and international review of ILI/SARI surveillance. They began by describing the achievements noted in the review which included: a geographically representative ILI/SARI surveillance system, which was successfully leveraged to integrate monitoring of SARS-CoV-2 and RSV surveillance, functional sentinel surveillance sites, an established system for patient enrolment for surveillance, data collection, sample collection, sample transportation, availability of test results, and a functional data management system. In particular, the innovative collaboration with the transport section to facilitate timely sample transportation was noted.

Timor-Leste informed that it has begun planning the implementation of joint national and international surveillance review recommendations. The implementation plan will involve development of a detailed workplan including conducting refresher trainings, scheduled monitoring and review of integrated surveillance, design of a web-based reporting system, and publication of a monthly epidemiological bulletin. Timor-Leste will also undertake strengthening laboratory capacities, with senior laboratory staff identified to address gaps in inventory management, bio-risk management, quality assurance, improved stock forecasting of surveillance-related supplies. The most important plan that was shared was working with the WHO Collaboration Centre for Influenza in Melbourne, Australia for completing the laboratory-related recommendations to make a submission to WHO for recognizing the Public Health Laboratory as an NIC in the GISRS.

2.5.4.2 Nepal

Dr Runa Jha, Director, National Public Health Laboratory (NPHL), Nepal

Dr Jha began her presentation by describing the restructure of Nepal's influenza sentinel surveillance network in 2021. Importantly, this involved expanding subnational laboratory testing capacity using provincial public health laboratories, facilitating wider

geographical coverage of the surveillance network. Nepal also integrated monitoring of SARS-CoV-2 with surveillance of influenza leveraging the influenza sentinel surveillance system as a part of this process. In this new decentralized system, the National Public Health Laboratory (NPHL) coordinates analysis and sharing of data. Meanwhile the coordination of sentinel surveillance sites, testing samples, and reporting data back to sentinel sites is shared between the NPHL and Provincial Public Health Laboratories.

Dr Jha presented information generated from influenza and SARS-CoV-2 surveillance data for 2023. It showed a peak in influenza positivity preceding a peak in SARS-CoV-2 positivity. She also showed results from RSV surveillance data of a total of 243 samples tested.

Dr Jha highlighted the process by which sentinel surveillance site performance is consistently monitored and evaluated in Nepal: there are monthly virtual meetings, annual sentinel surveillance site visits by senior staff of the NPHL, and an annual meeting in Kathmandu where staff from sentinel surveillance sites come together to share best practices. There is also a WhatsApp group with members from all sentinel surveillance sites to facilitate instant information sharing. The national laboratory also conducts its own in-house quality assurance of subnational laboratories once a year.

Dr Jha described some best practices such as having one dedicated technologist to support each provincial public health laboratory, using courier services supported by the NPHL for sample transportation, digital data capture, and continuous follow up of samples. She highlighted challenges that Nepal experienced: the additional burden of surveillance for clinicians, delays in sample transportation, the expectation of patients for instant test results, unavailability of a denominator for influenza cases, reagent shortages, and ensuring ongoing sustainability of the surveillance system.

Finally, she described the way forward for Nepal: strengthening sequencing and bioinformatics capacities, improving collaboration with the animal health sector, influenza disease burden studies, and formal establishment of RSV sentinel surveillance after the completion of the WHO coordinated pilot project in Nepal. She highlighted the need for reagent and training support from WHO and other partners to facilitate these goals.

2.5.4.3 Fiji

Dr Ripeka Kaurasi, Senior Medical Officer, Fiji Centre for Disease Control, and Gazala Buksh, Laboratory Scientist, National Public Health Laboratory, Fiji Centre for Disease Control

The presenters outlined the integration of influenza surveillance with monitoring of SARS-CoV-2 leveraging the ILI/SARI sentinel surveillance in Fiji. The integrated surveillance system in Fiji includes community-based surveillance, syndromic surveillance (indicator-based, non-sentinel), sentinel surveillance (ILI and SARI), and hospital-based surveillance (monitoring morbidity and mortality of respiratory cases).

The strategies used by Fiji to integrate other respiratory pathogen monitoring with influenza surveillance to date include: developing integrated surveillance guidelines, extending the number of sentinel surveilance sites for the purpose of including current non-sentinel surveillance sites, inclusion of acute respiratory illness (ARI) case definition for syndromic surveillance, increase of sampling strategy to 150 samples per week (testing for both influenza and SARS-CoV-2), data sharing with the FluMart, and regular field visits to monitor sentinel surveillance site performance. Moving forward, Fiji plans to update its national pandemic preparedness plan using PRET guidelines, extend laboratory testing capacities to include RSV and other viruses at the Fiji CDC, updating risk communication and community engagement strategies, and integration of current SARS-CoV-2 genomic monitoring within an overall respiratory virus surveillance system.

Lessons identified during this process have included aligning case definitions to best facilitate integrated surveillance, the need to design a comprehensive testing algorithm, the need for consistent supply of reagents, and the need to integrate reporting systems. Looking forward, Fiji plans to develop national integrated surveillance guidelines, increase capacity for multiplex testing and genomic sequencing, forward plan for laboratory consumables use, increase the number and representativeness of sentinel surveillance sites, and optimize a One Health approach surveillance system.

2.5.4.4 Mongolia

Dr Narangarav Tsegeen, Epidemiologist, NIC, Mongolia

Mongolia quickly adapted to the monitoring of COVID-19 pandemic by using WHO definitions for ILI and SARI to monitor cases. During the COVID-19 pandemic, the number of sentinel sites and laboratories involved in disease surveillance was increased. Genotyping of influenza and SARS-CoV-2 and whole genome sequencing of SARS-CoV-2 was conducted at the national reference laboratory, with results reported weekly through the NIC. Mongolia is now in the sustained management phase of the COVID-19 pandemic transition, which involves health systems strengthening and integration of COVID-19-related response activities with the existing health

system. In 2021, the Mongolia implemented Pandemic Influenza Severity Assessment (PISA) in 14 provinces.

Some challenges identified during integration of surveillance of influenza and monitoring of SARS-CoV-2 in Mongolia are as follows: separate reporting systems that have resulted in duplication of information, a need to strengthen capacities of subnational laboratories, a lack of systematic disease surveillance at the human–animal interface, expansion of whole genome sequencing beyond SARS-CoV-2, inadequate data sharing between different sectors, and inadequate data management.

A key lesson learnt during the COVID-19 response is the need for sustainable, step-wise efforts to build country capacities in epidemic and pandemic response with focus on, building on and enhancing existing health infrastructure and health systems. Moving forward, Mongolia intends to increase staff capacity at sentinel surveillance sites, and strengthen the existing surveillance data reporting system by digitalizing it.

2.6 Plenary 5: Groupwork

The group work was designed to discuss key aspects of the integrated surveillance of influenza and other respiratory pathogens and the proposed, expanded GISRS structure and function. Specifically, the objectives were:

For integrated surveillance:

- To discuss the degree to which countries have integrated surveillance of influenza and monitoring of SARS-CoV-2 by leveraging the national ILI/SARI sentinel surveillance system using the WHO's end-to-end integration approach.
- To identify challenges in surveillance, detection, data sharing, and use of information for response and discuss the way forward.

For expanded GISRS:

- To brainstorm and understand the specific challenges.
- To discuss appropriate strategies for operationalizing GISRS to expanded GISRS by national influenza programmes and NICs in the SE Asia Region and Western Pacific Region.

There were five groups that were moderated by:

(1) Dr Patrick Reading (VIDRL) and Dr Siddhi Hirve (GIP/headquarters) – physical participants

(2) Dr Katherine Tan (CDC) and Mr Nguyen Phuong Nam (WPRO) – physical participants

(3) Ms Archana Kumar (CDC) and Dr Pushpa Wijesinghe (SEARO) – physical participants

(4) Dr Ian Barr (VIDRL) and Mr Francis Inbanathan (SEARO) – physical participants

(5) Dr Runa Jha (Nepal) and Mr Tika Ram Sedia (SEARO) – virtual participants

Outcome of the breakout session discussions is summarized in Section 2.8 – Plenary 7: Feedback from group work – integrated surveillance and eGISRS.

2.7 Plenary 6: Parallel sessions

2.7.1 Plenary 6 consisted of a Laboratory Session at IEDCR (NIC, Dhaka) and an information session at the meeting venue.

The participants representing the laboratory expertise made a visit to the NIC Bangladesh. The idea was to understand the organization of the structure and functions at the NIC and the participants to benefit from the NIC Bangladesh and vice versa.

The information session targeted the programme managers and epidemiologists who participated from the Member State and partner agencies. The session pertained to new global developments and new initiatives pertaining to influenza preparedness.

Moderator: Dr Erik Karlsson, Virology Unit, Pasteur Institute, Cambodia

2.7.2 Zoonotic Influenza Distribution and Ranking (ZIDAR) project in SEARO and the way forward

Professor Ricardo J. Soares Magalhaes, University of Queensland

Professor Magalhaes described the ZIDAR project and its use to date in Nepal. ZIDAR is a decision support tool for zoonotic surveillance, aiming to address the challenges that arise during integration of multiple sectors (e.g. human, animal, wildlife) for a One Health approach. ZIDAR assists with two key decisions for zoonotic surveillance:

(1) Which types of exposure sites (e.g. markets, farms) should be targeted for zoonotic surveillance?

(2) Which communities are most vulnerable to exposure or spill over?

ZIDAR uses a standard approach that can be applied to different scenarios (i.e. countries or areas) to determine bespoke locations to undertake zoonotic disease surveillance most efficiently. It consists of two interlinked systems of data:

(1) ZIDAR-A (animal): animal infection data, spatial distribution of animal markets and farm, wildlife ecosystems, physical environment

(2) ZIDAR-H (human): human infection data, sociodemographic data, characteristics of animal markets, characteristics of farms

Professor Magalhaes described the implementation of the ZIDAR project in Nepal. This was a two-step process. Firstly, a stakeholder workshop was held, which aimed to determine the interfaces and risk factors that are important to consider in the Nepal-specific context. He noted the vast amount of data gathering required for this exercise. Data gathering included collating data from the global data-sharing platform of WHO (FluNet) and the WOAH, public health data, and environmental data. Then, there was an inter-country technical workshop held to co-design the model structures for ZIDAR-A and ZIDAR-H.

The output of the ZIDAR models are maps of surveillance suitability for each sector (i.e. human, animal, wildlife), that is, where samples should be collected for zoonotic surveillance. The maps are then validated using available data. They can be continuously updated as new data become available or new outbreaks occur.

Professor Magalhaes concluded by saying that ZIDAR is a completely scalable tool and therefore can fit the specific objectives of a country's zoonotic disease surveillance system.

2.7.3 Introduction to WHO's new guidance of Pandemic Influenza Severity Assessment (PISA)

Dr Kaat Vandemaele, Global Influenza Programme, WHO headquarters

Dr Vandemaele briefed about the ongoing process of updating the WHO's Pandemic Influenza Severity Assessment (PISA) guidance. PISA guidance was developed after the 2009 influenza pandemic. It assesses the transmissibility, seriousness, and impact of the disease using historical data from existing surveillance system. PISA allows the calculation of thresholds for above three indicators (transmissibility, seriousness and impact) that delineate the level of intensity of disease circulation.

The PISA guidance is currently undergoing an update based on observations of challenges noted during the COVID-19 pandemic. For example, existing disease

surveillance systems (e.g. ILI, SARI) were severely disrupted during the pandemic, while parameters relating to hospital usage and hospital capacity were useful in informing implementation of public health and social measures (PHSM). Further, syndromic parameters were shown to be important to understand the impact of multiple pathogens, rather than focussing on influenza alone. As a result, in the proposed new, updated guidance, there are now four indicators: transmissibility, seriousness of disease, morbidity and mortality, and impact of health-care capacity.

In spite of the current efforts of updating, the PISA approach remains the same, i.e. countries use quantitative data (parameters) within each of the four indicators to facilitate a qualitative assessment of disease activity in relation to the four indicators. What will change in the updated version is the specific indicators and parameters pertaining to PISA. However, there were key requirements: parameters should still be reliable (i.e. a surveillance system that is stable over time) and timely (i.e. data available on a weekly basis where applicable) and historical data must be available. However, Dr Vandemaele stated that the most suitable parameters to achieve this tends to vary by Member State. In conclusion, Dr Vandemaele emphasized that the most important consideration is that the parameter scores must be interpreted in the context of other information (e.g. social disruption, health-seeking behaviour, specimen testing patterns).

2.7.4 Mosaic surveillance and conducting unity studies 2.0 (pandemic investigations and studies)

Dr Joshua Mott, Global Influenza Programme, WHO headquarters
Dr Isabel Bergeri, Global Influenza Programme, WHO headquarters

Dr Mott introduced the WHO Mosaic Respiratory Surveillance Framework. This new framework addresses the current requirement for a coordinated approach to respiratory pathogen surveillance, recognizing that the complex needs of respiratory virus surveillance require multiple systems. Together, different surveillance systems and special studies fit together as a mosaic to provide a full picture of respiratory virus activity.

Dr Mott noted that GISRS and its assets are already functional at multi-pathogen surveillance, pointing to the RSV surveillance pilot project and the use of GISRS during the COVID-19 pandemic. While sentinel surveillance remains the core component of GISRS, additional systems are important to provide better insight into respiratory pathogen activity, including surveillance at the animal–human interface, event-based surveillance, and special investigations or studies (e.g. to determine vaccine effectiveness, burden of disease).

The mosaic framework does not supersede existing guidance or systems. Instead, it provides a context for their use, optimizing what is already undertaken within a preparedness and response for multi-respiratory pathogen framework. The vision is a mosaic of efficient and well-coordinated surveillance systems to detect and monitor respiratory viruses of epidemic and pandemic potential.

Dr Mott reminded that there are three surveillance domains (detection and assessment, monitoring epidemiological characteristics, and informing use interventions) with focused implementation guided by five aims, and facilitated by enablers (e.g. governance, local priorities, financing). The guidance documents pertaining to the mosaic framework are available now on the WHO website.

Dr Bergeri introduced Unity Studies 2.0, which is a subset of the mosaic system. The Unity Studies are investigations that focus on objectives not efficiently met by the standards of existing systems. By nature, the Unity Studies are pan-respiratory in approach, with some disease specificities. For example, these studies focus on transmissibility, population susceptibility, disease severity, and vaccine coverage. It aims to aid public health and laboratory personnel by providing the best evidence to decision-makers. There are 10 currently available protocols, which include the first few cases and their contacts (FFX), household transmission, and population seroprevalence. The participation of multiple Member States in these protocols allows meta-analysis to synthesize the best possible evidence for public health decision-makers. Dr Bergeri briefly described the Terms of Reference for joining the proposed Unity network, which includes exercising at least one of the currently available protocols per year.

2.7.5 Introduction to and discussions on the Preparedness and Resilience for Emerging Threats (PRET) initiative

Dr Gina Samaan, Pandemic Preparedness Global Platform, WHO headquarters
Dr Pushpa Wijesinghe, SEARO
Mr Nguyen Phuong Nam, WPRO

Dr Samaan began by introducing the Preparedness and Resilience for Emerging Threats (PRET) framework and its alignment with both the health emergency preparedness and response (HEPR) strategy and International Health Regulations (IHR) 2005 framework. PRET was driven by the current global context for pandemic planning, particularly around the inequity of existing systems, governance, and finance. The PRET framework aims to share how we move forward in pandemic preparedness. Dr Samaan described the “5 Cs” of pandemic preparedness:

collaborative surveillance, community protection, safe and scalable care, access to countermeasures, and emergency coordination.

Dr Wijesinghe provided the South-East Asia regional context for PRET. The Seventy-fourth session of WHO Regional Committee for South-East Asia (2021) recommended the development of a regional roadmap to strengthen health security within the SE Asia Region. As a result, SEARO synthesized the lessons learnt during the COVID-19 response at a regional level to prepare the Regional Strategic Roadmap on Health Security and health system resilience for emergencies (2023–2027), which was endorsed at the Seventy-fifth session of the Regional Committee (2022). The regional roadmap is directly aligned with the PRET framework through providing guidance to Member States of the SE Asia Region on core health security systems, health emergency response plans, and regional health security systems.

Dr Wijesinghe briefly described the plans for PRET roll-out in the SE Asia Region over the next 6 months. The roll-out plan includes an awareness webinar to be held with IHR national focal points and other selected experts, PRET secretariat engagement with senior management on advocating for PRET in the Region, and conducting a two-day regional meeting in Delhi focusing on implementation of the PRET framework in the Region.

Next, Mr Nam described the PRET context in the Western Pacific Region, which will be guided by the following principles: continuous preparedness planning while responding, keeping the country at the centre (i.e. recognizing the local context), and multisectoral collaboration using the One Health approach. He described the six domains for health security in the Asia Pacific, which is built on the achievements made under the Asia Pacific Strategy for Emerging Diseases (APSED) – III framework over the last decade. In terms of next steps for the WPR, the PRET will be used as a reference to support the implementation of the new Asia Pacific Health Security Action Framework (APHSAF) that helps to coordinate regional, national (and subnational) health security. WPRO will provide tailored support to countries for developing preparedness or national health security plans.

Dr Samaan then gave a detailed insight into PRET. She pointed out that PRET is a new approach to improve pandemic preparedness for groups of pathogens based on their mode of transmission. Integration of multiple pathogens within a pandemic preparedness framework is functional, risk-based, efficient, collaborative, and innovative. She informed that PRET encompasses two mutually reinforcing approaches to preparedness to efficiently utilize core capacities:

(1) The **cross-cutting all-hazards approach**, which is efficient to improve the underlying systems and IHR capacities common for managing the risks and responses to different types of emergencies.

(2) The **vertical hazard-focused approach**, which provides technical specificity to address similar groups of hazards, including specific pathogens and their associated subtypes and variants.

Dr Samaan emphasized that this integrated approach to pandemic planning is already occurring, driven by the COVID-19 pandemic. She also introduced PRET Module 1, which is a framework with operational stages, triggers, and assumptions to assist Member States structuring their preparedness plans for respiratory pathogens. A checklist to assist Member States prioritize key actions will also become available, which builds on the "5 Cs" of pandemic preparedness.

2.8 Plenary 7: Feedback from group works – integrated surveillance and eGISRS

Chair: Dr Simrita Singh, Ministry of Health and Family Welfare, India
Moderator: Dr William Davis, Director, Influenza Programme, US CDC -Thailand

2.8.1 Group 1: Country challenges in integrated end-to-end surveillance of influenza and SARS-CoV-2 (Timor-Leste, Sri Lanka and Philippines)

Group 1 discussed the challenges their countries faced during implementation of integrated surveillance of influenza and SARS-CoV-2, the potential interventions to address these challenges, and support required from WHO and partners. Challenges included: data management (e.g. no capacity for detailed analysis), human resources (e.g. high turnover of personnel at laboratories and sentinel sites), specimen transport (e.g. geographical coverage), changes in government and/or funding, procurement of equipment/reagents, and managing sequencing/genomic data. The group considered cost–benefit evaluations of sentinel surveillance sites and expanded PCR capacity in the post-COVID-19 pandemic period as those that are essential to ensure sustainability of the integrated respiratory virus surveillance system. They also discussed methods by which to better engage clinicians at sentinel surveillance sites (e.g. sending out brief surveillance reports). Finally, they discussed areas of need for WHO, CDC and other partner support, The required specific support included advocacy for strengthening the WHO's relationship with ministries of health, development of tools for costing surveillance systems, guidance/assistance with data

management systems, and continuing to support and share reagents and technical expertise.

2.8.2 Group 2: Country challenges in integrated end-to-end surveillance beyond influenza and SARS-CoV-2 (Bangladesh, Malaysia and Nepal)

Group 2 discussed the potential challenges of incorporating RSV as a third pathogen in the integrated sentinel surveillance system. Firstly, they highlighted the overarching challenges. They emphasized that each virus or pathogen added to an existing sentinel surveillance system requires caution. And to add such a pathogen it must be a country priority. Hence adding RSV to the existing sentinel surveillance system must have clear, country-defined objectives that outline what needs to be learnt about RSV for the benefit of countries (e.g. the disease burden, impact of the virus on particular risk groups, seasonality, vaccine effectiveness against the disease caused by the virus). They then discussed specific challenges in the event of addition of RSV to the existing respiratory pathogen sentinel surveillance system. These challenges include additional burden on clinicians, need for using additional case definitions, more time and effort required for the work by country laboratory teams, as RSV surveillance is important among children, difficulties in obtaining surveillance samples from children of a young age, and the need for changes in existing national testing algorithms. With reference to the support required from WHO and other partners to incorporate RSV, the group agreed that building a strong case on clear rationale for introducing RSV surveillance to the decision-makers at the country level was key. Additionally, clear WHO guidance on sustainable integration of RSV in to the existing syndromic sentinel surveillance of respiratory pathogens, support for reagents for laboratory testing, assistance in advocating for the importance of conducting RSV surveillance in countries to governments, and developing a risk communication package to ensure that the addition of a new virus is not viewed as a novel pathogen or new outbreak were highlighted as key asks from WHO.

2.8.3 Group 3: Specific challenges and identifying appropriate strategies for operationalizing the GISRS to expanded GISRS (eGISRS) in Member States of the SE Asia Region and Western Pacific Region (Cambodia, India, Thailand and Singapore)

Group 3 discussed their understanding of eGISRS and the challenges they foresee in undertaking it. They agreed that eGISRS is a system that goes beyond disease surveillance. It is a platform for obtaining both epidemiological and laboratory data to generate information that can inform decision-making. eGISRS could conceivably be used for any pathogen. Its core functions are detection and monitoring, risk assessment, recommendations for countermeasures, monitoring and evaluation, and

capacity-building at all levels. Its benefits included sustained funding, efficiency, and product development (e.g. vaccines). With respect to engagement with the WHO, the group outlined the need for clear scientific reasoning for the addition of specific priority pathogens and the end goals. Potential challenges highlighted include the integration of data systems, human resources, priority-setting of pathogens and alignment of resources, obtaining stakeholder support, and budget limitations.

2.8.4 Group 4: Specific challenges and identifying appropriate strategies for operationalizing the GISRS to eGISRS in Member States of the SE Asia Region and Western Pacific Region (Bhutan, Fiji, Maldives and Laos)

Group 4 also discussed their understanding of eGISRS. They were of the opinion that at its basis, it involves the expansion of current GISRS systems to include respiratory pathogens other than influenza and SARS-CoV-2. However, they discussed the ambiguity regarding inclusion criteria and the purpose for including other respiratory pathogens. They agreed that the number one requisite from the country perspective for introducing eGISRS was assured sustained reagent supply. Other country expectations were new WHO guidance documents on new testing algorithms, sampling strategies and surveillance case definitions, assistance to influenza/respiratory disease control programmes to conduct advocacy to governments to ensure financial investments, funding for training, and ensuring continuity of current influenza and SARS-CoV-2 integrated sentinel surveillance systems. The group presented benefits of eGISRS, including better understanding of the disease burden, opportunity to have a more holistic view of broad respiratory pathogen activities, and opportunity for vaccine roll-out against vaccine-preventable respiratory viruses. The potential challenges that emerged in the discussion included database management, reagent and personnel shortages, resistance from hospital staff regarding the incremental workload, and the possible extra burden on the laboratory staff.

2.8.5 Group 5: Country challenges in integrated end-to-end surveillance beyond influenza and SARS-CoV-2 (virtual group)

Participants in Group 5 discussed the degree to which their country has integrated surveillance of influenza and SARS-CoV-2, the current challenges, and possible interventions to address these challenges. Common challenges included: resistance by policy-makers in moving from universal to sentinel SARS-CoV-2 surveillance, differing case definitions, health emergencies disrupting influenza surveillance, the availability of self-testing kits diverting potential ILI cases, inadequate funds for reagents, sample transport, and equipment, lack of bioinformatics support, and turnover of personnel. Potential solutions (and required WHO/other partner support)

included: availability of standardized guidelines (WHO publication of best practices and good case studies), dedicated human resources for sample and data collection (technical and financial support), development of a national system for sample transportation, harmonizing data across multiple systems and platforms (specialized training), ensuring sustainable access to reagents/kits, and continued support for bioinformatics.

2.8.6 Group 6: Specific challenges and identifying appropriate strategies for operationalizing the GISRS to eGISRS in Member States of the SE Asia Region and Western Pacific Region (virtual group)

Group 6 brainstormed potential challenges that may arise during operationalization of eGISRS and proposed strategies for addressing these challenges. Participants agreed that eGISRS is expected to include respiratory pathogens beyond influenza and SARS-CoV-2 for surveillance and will act as a platform for data management and sharing.

However, they also discussed some ambiguous aspects, including specific viruses beyond RSV that may be added to the eGISRS, whether additional support for testing other pathogens would be provided by collaborating centres, whether whole genome sequencing will be required for each additional pathogen, and the rationale for adding each additional pathogen. They then discussed technical areas that would require strengthening for eGISRS, including conducting specialized projects (e.g. burden of disease). WHO support for training, reagents, and equipment, and advocacy to government for allocation of funds for the expanded system was also underlined.

Potential benefits of eGISRS to countries discussed included applied research development and product development. With respect to WHO's role in ensuring commitment from countries to implement eGISRS, participants came up with a number of ideas. These ideas included consultations with NICs, policy-makers, the private sector and academic institutions, guidance on advocating for the importance of adding pathogens, clear explanation of the added value of eGISRS, and ensuring continued receipt of necessary reagents. Importantly, the group agreed that the extended capacity of eGISRS implemented through use of a syndromic approach will be essential for preparedness for responding to the next pandemic.

2.9 Conclusions and Recommendation

In the final session moderated by Dr Pushpa Wijesinghe, the draft conclusions and recommendations were tabled to meeting participants for their input.

The final conclusions and recommendations generated from the meeting are given in 3. Conclusions and recommendations.

2.10 Closing remarks

Dr Nilesh Buddha, Lead Regional Emergencies, SEARO

Dr Buddha noted the practical importance of the Sixteenth Biregional meeting of influenza surveillance and NICs held after the most recent meeting of the Regional Committee for South-East Asia in which the ministers committed to support influenza preparedness. He reminded that it acknowledged that influenza preparedness remains one of the highest priority in terms of regional and global health security given the risk of influenza viruses of pandemic potential. He noted that the COVID-19 pandemic is no longer a public health emergency of international concern (PHEIC) and countries are now progressing from an emergency response to sustainable and comprehensive management of COVID-19 within broader disease control and response programmes. Dr Buddha emphasized that broader work on respiratory pathogens becomes important during this transitional period. He thanked participants for their contributions over the past three days as they reviewed the current influenza status in two regions, discussed how to strengthen influenza surveillance, assessed how countries have integrated influenza surveilance and COVID-19 sentinel monitoring, and discussed issues and challenges during the process of integration. He noted that these deliberations are invaluable to countries as they plan to improve integrated surveillance systems with support from WHO, WHO collaborating centres, CDC, and other partners. Concluding the Sixteenth Biregional meeting of influenza surveillance and NICs, Dr Buddha extended his gratitude to all participants for their deliberations and discussions during the meeting and acknowledged that they had achieved the meeting objectives. That concluded the Sixteenth Biregional meeting of influenza surveillance and NICs hosted by WHO SEARO together with WHO WPRO with the support from the Ministry of Health, Bangladesh and WHO Country Office for Bangladesh.

3. Conclusions and recommendations

3.1 Conclusions

Seasonal, pandemic and zoonotic influenza situation in the SE Asia and WP regions

- It was noted that there were three peaks of influenza activity in the 2022–2023 season.
- As far as the two regions were concerned, in the 2022–2023 season, influenza activity peaked in August–September 2022, March 2023, and July 2023 in the WHO SE Asia Region. The peak transmission in the WHO Western Pacific Region was observed in mid-2022 and the first quarter of 2023 in various countries/areas. In both regions, variation in the timing of activity across countries was noted.
- Though the Western Pacific Region reported human infections with avian influenza viruses A(H5N1), A(H5N6), A(H9N2) and A(H3N8) during the review period, it was concluded that the likelihood of sustained human-to-human transmission of these viruses remains low.
- The meeting highlighted reports of human infections with viruses of animal origin. However, the number of human infections remains low, despite the high number of poultry outbreaks and the likely human exposures to them. None of the viruses isolated from infected mammals (including humans) have changes indicating increased specificity for binding to human receptors.

Influenza preparedness

- The meeting noted that in the Asia-Pacific Region, influenza preparedness capacities for surveillance and laboratory confirmation of influenza have been further improved through investments made by PIP partnership contributions and activities pertaining to implementation of the IHR (2005) through APSED III. It was encouraging that further strengthening of capacities for influenza preparedness and readiness are now being discussed by Member States, guided by a new biregional health security action framework and the Regional Strategic Roadmap of the SE Asia Region on health security and health system resilience for emergencies.
- Influenza preparedness activities (including those related to the PIP Framework and High-Level Implementation Plan-II), global and regional disease surveillance efforts (related to GISRS and COVID-19), bilateral partnerships, and national pandemic preparedness efforts were recognized as major drivers of success for influenza preparedness and readiness (including laboratory) in the WHO SE Asia and Western Pacific regions.

Laboratory diagnosis in public health surveillance

- Global initiatives linked to influenza and other respiratory pathogens and regional initiatives such as the technical and governance elements in the "WHO South-East Asia Regional Roadmap for diagnostic preparedness, integrated laboratory networking and genomic surveillance (2023–2027)", and Western Pacific Region genomic surveillance network (EmPact) were viewed as complementary and synergistic to strengthen laboratory capacities for improved public health surveillance including for influenza preparedness in countries and in GISRS as a whole.
- While significant achievements in the use of laboratory diagnosis for public health surveillance have been made over the past years, Member States in both regions have identified a range of issues and challenges. These include, but are not limited to, insufficient financial and human resources, fragmented laboratory systems, limited ability to link laboratory with epidemiological and/or clinical information for decision-making, need for standardization in techniques and processes across laboratories, quality and integrity assurance of samples, and data quality issues.
- Member States proposed potential solutions for the identified challenges. Key priorities to address the challenges include the need for mobilizing resources, boosting laboratory and human resource capacity, strengthening laboratory referral systems and specimen transportation, improved access to diagnostic tools and consumables, fast laboratory diagnostic services for disease prevention, control and surveillance, outbreak response, improved analytics, and information systems, streamlined procurement services, and inter-laboratory and intersectoral networking.

Integrated surveillance

- Given that (i) the COVID-19 pandemic no longer constitutes a PHEIC, and (ii) COVID-19 testing has been de-prioritized, the meeting concluded that this is a great opportunity for countries to strengthen the integrated sentinel monitoring of COVID-19 leveraging influenza sentinel surveillance systems.
- Despite several challenges, many Member States in the WHO SE Asia and Western Pacific regions have integrated sentinel surveillance of SARS-CoV-2 and influenza, which is a cost-effective platform to conduct multiple respiratory virus surveillance. WHO, WHO collaborating centres and US CDC have played a vital role in providing supplementary technical supporting role to establish integrated surveillance in both regions.

- Implementation of multiplex testing appears to have contributed to the success of integrated sentinel surveillance. Multiplex testing reduced the burden on laboratories in Member States of the SE Asia and Western Pacific regions in the diagnosis of influenza and SARS-CoV-2 for integrated sentinel surveillance. However, reagent supply remains insufficient to conduct optimal surveillance. Given this fact, the meeting concluded that Member States should set clear objectives for surveillance that will guide the planning and use of reagents.
- Despite leveraging existing ILI and SARI sentinel surveillance to monitor COVID-19 and influenza, the Sixteenth Biregional meeting concluded that due to various reasons, consistent and regular data reporting to the RespiMart is not optimal in some countries.
- It was revealed that some Member States in the SE Asia and Western Pacific regions have added RSV as the third pathogen targeted in integrated surveillance as part of the WHO Global Influenza Programme's RSV pilot project. However, the meeting concluded that there is a need for the Member States currently conducting the pilot project to consider the added value of monitoring it as an additional infectious pathogen, as well as the human and financial resources required to sustain RSV surveillance in the longer term.
- Experience of Member States in the SE Asia and Western Pacific regions has shown that the challenges to integrated surveillance are similar to some extent in countries in the Asia-Pacific region that share similar characteristics. These included, but are not limited to financial and human resources, and the ability to efficiently use generated information for decision-making.
- A systematic and extensive exploration of specific challenges for integrated surveillance in the Sixteenth Biregional meeting has provided an opportunity for Member States, WHO and partners to plan to help Member States to overcome identified multiple challenges with a view to establishing an effective and sustainable integrated surveillance platform for respiratory pathogens.

eGISRS (expanded GISRS)

- Although the concept of eGISRS was entirely new to the participants, the meeting provided an opportunity to explain and raise awareness of the vison, principles, approach, and core components of eGISRS. In this

context, participants concluded that conversion of an existing platform (GISRS) with surveillance, preparedness and response components to a multipurpose eGISRS is useful in general to countries.

- However, Member States of the SE Asia and Western Pacific regions were of the opinion that there are areas where more clarity is needed in terms of scope, terms of reference of NICs and other collaborators, and involvement of stakeholders responsible for preparedness and response before eGISRS becomes a reality.
- Defining priority diseases of pandemic potential for inclusion and funding support were viewed as requirements that have not yet been addressed. Additional financial and material support were perceived as important for country operations.
- The meeting concluded that wider consultations with all stakeholders are needed for better consideration of eGISRS before its implementation in the WHO SE Asia and Western Pacific regions.
- The participants concluded that there is a need for considering country prioritization of pathogens for public health surveillance to generate evidence for informed decision-making when new pathogens are added to countries' existing surveillance system within the proposed eGISRS.
- As per the participants, higher level advocacy by WHO to policy-makers and emphasis of value addition of eGISRS to countries were concluded as prerequisites for acceptance and setting up of governance and coordination mechanisms for eGISRS at the country level.

3.2 Recommendations for Member States

This set of recommendations recognizes the disruptions to influenza surveillance caused by the COVID-19 pandemic. In the context of re-emerging influenza virus circulation, Member States are encouraged to further enhance multisource surveillance, with a focus on building functional capacity that is both sustainable and agile in response to emerging respiratory pathogens of pandemic potential. Specifically, Member States are encouraged to focus on the following:

(1) **Strengthen influenza preparedness**

- Member States are requested to enhance (i) event-based surveillance for timely detection of human cases of influenza including those from zoonotic origins through improved signal detection and (ii) strengthen ILI and severe

acute respiratory surveillance, including surveillance at the human–animal interface with in-country mechanisms for coordination and information exchanges between animal health and human public health sectors under the One Health approach.

- Member States are encouraged to strengthen response decision-making through effective linkages and use of event-based surveillance, epidemiological and genomic data. In this effort, Member States are recommended to seek support of WHO, collaborating centres and other partners to build capacities at the national and subnational levels to detect, monitor and assess events to improve quality of information base for response decision-making.
- Member States are encouraged to continue to report epidemiological and laboratory data for both SARS-CoV-2 and influenza in a consistent and regular manner to WHO's data sharing platform (RespiMart).
- Member States are requested to re-establish virus isolation and reconsider prompt, and systematic sharing of isolates and clinical specimens with WHO collaborating centres. Virus sharing must be done at least twice a year to support northern and southern hemisphere seasonal influenza vaccine compositions.

(2) **Implementation of WHO recommended standards for laboratory diagnosis in public health surveillance**

- Member States are encouraged to consider the following when expanding laboratory diagnosis for surveillance at subnational levels:
    - Implementing mechanisms to ensure the quality of specimens through optimal specimen referral systems that maintain the integrity of the specimens.
    - Ensuring quality of testing by setting up national quality assurance programmes.
    - Maintaining consistency and timeliness in reporting data to their respective NICs.
- Member States having capacities for genomic sequencing for influenza viruses are encouraged: (i) to provide adequate internal quality assurance mechanisms to ensure the quality of data generated; (ii) to share the genetic sequence data to global genetic data-sharing platforms; and (iii) to include genomic data for multisource surveillance where possible.

- Member States are encouraged, where possible, to effectively integrate their NICs in the bigger national public health laboratory system to leverage infrastructure, expertise, and other resources available to that system to ensure sustainability and efficiency of the NICs. They should explore opportunities to strengthen the linkage of epidemiological and virological surveillance components, which has been identified as one of the challenges in many Member States.

(3) **Integrated, end-to-end approach to sentinel surveillance of influenza and SARS-CoV-2**

- Member States in the WHO SE Asia and Western Pacific regions are requested to utilize ILI/ARI/SARI sentinel surveillance system for monitoring of SARS-CoV-2 together with influenza.
- Member States that have not integrated sentinel monitoring of SARS-CoV-2 are recommended to use lessons identified by Member States that have already leveraged influenza platform to do so.
- Member States are requested to identify, prioritize key challenges and plan to implement potential solutions to operationalize end-to-end integration of SARS-CoV-2.
- Member States are encouraged to disseminate the surveillance data weekly for wider use locally, which could also help in advocating for more resources for strengthening the surveillance.
- Member States are requested to seek the support of WHO, WHO collaborating centres, partners such as US CDC and use financial resources such as PIP partnership contribution funds, cooperative agreements and other funding resources where relevant for implementing solutions.
- Member States are requested to consider country priorities and other factors including, but not limited to major challenges, incremental cost, sustainability of an additional pathogen surveillance, availability of human resources required and available basic essential capacities when considering integration of RSV (or other pathogens) to the existing integrated ILI/SARI surveillance system.

3.3 Recommendations for WHO, WHO collaborating centres, and other partners

WHO and technical partners are recommended to provide technical support to Member States to guide improved influenza preparedness through strengthening of

(i) virological surveillance; (ii) response to influenza and other respiratory virus disease outbreaks at the national and subnational levels.

- The WHO Regional Offices (SEARO and WPRO) and WHO country offices in both regions are recommended to facilitate technical support to Member States for reporting to RespiMart and quality improvement of data related to SARS-CoV-2 viruses detected through integrated surveillance.
- WHO is recommended to further strengthen partnership with technical partners to build stronger country capacities in aspects related to preparedness, early warning, laboratory diagnosis (including genomic sequencing) and response to influenza, SARS-CoV-2 and other respiratory pathogens
- The WHO SEARO–WPRO Biregional meetings provide a very good opportunity to strengthen the collaboration between the Member States, WHO offices and other partners, through structured discussions as well as informal meetings. However, given that such interaction is difficult over the virtual participation, as maximum as possible in-person participation needs encouragement.

Integrated, end-to-end approach to sentinel surveillance of influenza and SARS-CoV-2

- WHO and partners are requested to use the joint surveillance, laboratory reviews and other joint opportunities with Member States to provide technical support to establish, further strengthen, improve quality and enhance performance of integrated sentinel surveillance of influenza and SARS-CoV-2.
- WHO and partners are requested to support Member States to build capacities at the national and subnational levels to detect, monitor and assess events, building effective linkages and use of event-based surveillance, epidemiological, and genomic data to improve quality of information base for response decision-making.

Plan for eGISRS implementation in Member States of the SE Asia and Western Pacific regions

- The Global Influenza Programme (GIP)/WHO is recommended to conduct wider consultations with all stakeholders including Member States of the WHO SE Asia and Western Pacific regions for defining the scope, terms of

reference of NICs, reference laboratories, and other collaborators for better organization and coordinated implementation of eGISRS in countries.

- The GIP/WHO is recommended to engage with all stakeholders relevant to response systems to work out response mechanisms and effective utilization of these systems by the proposed eGISRS in its packaging as a surveillance, preparedness, response and capacity-building platform.
- WHO is recommended to work on defining criteria for priority diseases of pandemic potential for inclusion and funding support before operationalization of eGISRS. Within the proposed eGISRS, it was recommended to define criteria for countries to consider country prioritization of pathogens for public health surveillance to generate evidence for informed decision-making when new pathogens are added on to countries' existing surveillance system.
- The GIP/WHO is recommended to work on a higher-level advocacy package targeting policy-makers and emphasizing on the added value of eGISRS to countries for its acceptance and establishing governance and coordination mechanisms at the country level.

Annex 1a

Regional Director's message delivered by Dr Edwin Salvadore, Regional Emergency Director, on behalf of Dr Poonam Khetrapal Singh, Regional Director, SEARO

Distinguished Member State participants, experts from WHO collaborating centres, partners and colleagues,

Good morning and welcome to this Sixteenth Biregional Meeting of National Influenza Centres. It is a pleasure to host you.

Over the past three years, the COVID-19 pandemic has had profound impact on almost all areas of public health and emergency preparedness and response, not least for seasonal influenza, and influenza of pandemic potential.

At different times and places – and for varying durations – influenza sentinel surveillance, laboratory diagnosis, influenza virus sharing, and influenza data reporting for national, regional and global decision-making have been disrupted.

Today, while many key processes have been restored, for others, gaps and challenges persist. In both the South-East Asia and Western Pacific regions, sample processing, for example, remains well below WHO recommended surveillance standards.

This is not for lack of effort. In January 2021, WHO South-East Asia held a regional meeting on synergizing influenza and SARS-CoV-2 surveillance, which resulted in a series of key recommendations that were also aligned with recommendations of the fourteenth and fifteenth biregional meetings of NICs.

However, to date, country-specific challenges have impeded full implementation.

This has had important knock-on effects for the detection and reporting of influenza viruses of pandemic potential, the integrity of the Global Influenza Surveillance and Response System (GISRS), the development of optimal vaccine composition, and the molecular characterization of seasonal influenza types and subtypes, alongside SARS-CoV-2.

Today, we must therefore press ahead, and vigorously strengthen and integrate respiratory pathogen surveillance, in alignment with the Global Influenza Strategy 2019–2030, as well as the expanded GISRS and evolving emergency preparedness, response and resilience architecture.

For countries in the South-East Asia Region, this will also help fully implement the Region's Strategic Roadmap for Health Security and Health System Resilience for Emergencies 2023–2030, endorsed in September 2022.

To achieve this overall objective, in coming sessions you will:

First, review and deliberate on strategies and approaches to strengthen influenza preparedness and response capacities.

Second, agree on a series of key national and biregional actions to further strengthen influenza preparedness and response capacities.

Third, discuss the extent to which countries have integrated surveillance of influenza and monitoring of SARS-CoV-2, leveraging the national ILI/SARI sentinel surveillance system, as well as WHO's end-to-end integration approach.

Fourth, establish consensus on a plan to implement WHO recommended standards in the context of integrated sentinel surveillance.

And fifth, brainstorm challenges and strategies that will help NICs fully implement the eGISRS.

On each, I wish you all success.

And I highlight one final point: An increasing number of countries in both the South-East Asia and Western Pacific regions are becoming signatories to the Nagoya protocol, which as you know, aims to create legal certainty and benefit-sharing for the users and providers of genetic resources.

However, if improperly implemented, the protocol could have significant implications for rapid access to pathogens and benefit-sharing in public health emergencies.

It is therefore essential that beyond this meeting, you work with national biodiversity secretariats to ensure that domestic legislation safeguards rapid access to pathogens and equitable benefit-sharing and is aligned with the existing Pandemic Influenza Preparedness framework.

I once again welcome you to Dhaka and look forward to being apprised of the outcomes.

Thank you.

Annex 1b

Opening address by Dr Babatunde Olowokure, Regional Emergency Director, on behalf of Dr Takeshi Kasai, Regional Director, WPRO

The Sixteenth Biregional Meeting of National Influenza Centres and Influenza Surveillance in the WHO South-East Asia and Western Pacific Regions

(Virtual address)
1 August 2023

Esteemed colleagues and distinguished guests, I extend my warmest welcome to this momentous gathering, where we come together with a shared purpose: to strengthen influenza preparedness in the South-East Asia and Western Pacific regions.

For 16 years, the biregional NICs meeting has stood as a powerful affirmation of our unwavering commitment and joint efforts in advancing the health and well-being of our populations. For 16 years, it has fostered collaboration and partnership among several stakeholder groups, including public health laboratories, epidemiologists, NICs, WHO collaborating centres, reference laboratories, influenza surveillance networks, and policy-makers.

Today, we renew our efforts to further enhance capacity in countries for detection and monitoring of influenza and other respiratory diseases, providing essential information for planning, development and implementation of evidence-informed strategies in the Asia Pacific. As we reflect on the lessons identified from the COVID-19 pandemic, it is clear that we have opportunities before us to reinforce further our regional health security, particularly in the areas of response decision-making, surveillance and data systems, among other important areas.

Building on the achievements and approaches of the Asia Pacific Strategy for Emerging Diseases and Public Health Emergencies or APSED, our two Regions are developing the new health security action framework. This new framework aims to build stronger and resilient systems across health and other sectors in countries and areas to protect health and well-being of the population.

This will necessitate, among other important capacities, the strengthening of surveillance and public health laboratory networks. Experiences and knowledge presented in this meeting will help us identify opportunities to leverage and improve surveillance systems, gain a shared understanding of the challenges in detection, data

sharing and use of information for response, and develop innovative solutions to ensure early detection and rapid response to both influenza and emerging respiratory diseases.

Laboratory diagnosis is pivotal in our preparedness efforts, especially in the accurate and timely identification of influenza, SARS-CoV-2 and other respiratory pathogens. We need to discuss the challenges NICs face in implementing these activities including influenza virus sharing with WHO collaborating centres. By establishing a solid foundation of diagnostic excellence, we fortify our capacity to detect and respond effectively to influenza and emerging respiratory pathogens.

I believe this meeting will provide an avenue for fruitful brainstorming as we unpack specific challenges and deliberate appropriate strategies for of the expansion of GISRS and strengthening regional and global response to influenza and other emerging threats.

Esteemed colleagues and distinguished guests, the road ahead is challenging, but we stand united in our commitment to enhancing capacities for response and building resilient health systems. I am confident in the collective knowledge, expertise, and drive of the people in this room today. Let us use this opportunity to have meaningful discussions, share ideas, and work together to improve our preparedness for influenza and other respiratory diseases. Together, we can create a safer, healthier, and more resilient future for our Regions.

Thank you.

Annex 2

Programme of Activities

Day 1 – Tuesday, 1 August 2023

09:00 – 09:40	**Opening session**
	Welcome and opening remarks
	Dr Bardan Jung Rana, WHO Representative for Bangladesh
	Remarks of the Western Pacific region
	Dr Babatunde Olowokure, Regional Emergency Director, WHO Regional Office for the Western Pacific (WHO/WPRO)
	Remarks of the Ministry of Health, Bangladesh
	Prof Abul Bashar Mohammad Khurshid Alam, Director General, Directorate General of Health Services, Bangladesh
	Nominations of chair, co-chair, and rapporteur by WHO Representative for Bangladesh
	Group photo
	Administrative announcements
	Code of conduct (PRSEAH)
	Security briefing
09:40 – 12:20	**Plenary 1: Status of seasonal, non-seasonal and zoonotic influenza**
	Session moderator: Dr Rattanaxay Phetsouvanh, Director General of Department of Communicable Disease Control, Ministry of Health, Lao PDR
	Influenza situation in SE Asia Region/Western Pacific Region (August 2022–July 2023)
	Mr Nguyen Phuong Nam, WPRO
	Mr Francis Inbanathan, SEARO
	Influenza situation in the northern hemisphere
	Dr Hideki Hasegawa, Director, WHO Collaborating Centre, National Institute of Infectious Diseases, Japan
	Influenza situation in the southern hemisphere
	Prof Ian Barr, Deputy Director, WHO Collaborating Centre, VIDRL, The Peter Doherty Institute, Australia
	Zoonotic influenza situation
	Dr Aspen Hammond, WHO/HQ
	Panel discussion
12:20 – 15:50	**Plenary 2: Role of public health laboratories in surveillance**
	Session moderator: Dr Mandeep Chadha, Temporary Adviser, WHO
	Session co-moderator: Dr Runa Jha, Temporary Adviser, WHO

	Updates on achievements and challenges in the SE Asia Region
	Mr Francis Inbanathan, Technical Officer – Laboratory, SEARO
	Updates on achievements and challenges in WPR
	Mr Nguyen Phuong Nam, Technical Officer – Pandemic Preparedness, WPRO
	Issues and challenges on laboratory diagnosis for public health surveillance: country presentations
	Prof Tahmina Shirlin, Bangladesh
	Mr Sonam Gyelthsen, Bhutan
	Dr Rozainanee Mohd Zain, Malaysia
	Dr Ana Liza Hombrado-Duran, Philippines
16:20 – 17:00	**Plenary 3: Expansion of GISRS (GISRS to eGISRS)**
	Session moderator: Dr Ana Duran, OIC/Research Institute for Tropical Medicine, Philippines
	Future GISRS: vision, principles, and process
	Dr Wenqing Zhang, Unit Head, Global Influenza Programme, WHO HQ
	Introduction to group work for Day 2
	Dr Pushpa Wijesinghe, SEARO
17:00 – 18:00	Secretariat meeting

Day 2 – Wednesday, 2 August 2023

8:50 – 9:00	**Summary of Day 1**
	Ms Olivia Price, Temporary Adviser, WHO
9:00 – 12:00	**Plenary session 4: End to end integrated sentinel surveillance of influenza and SARS-CoV-2**
	Session moderator: Dr Siddhartha Saha,Director, Influenza Programme US CDC – India
	The global update on integrated sentinel surveillance of influenza and SARS-CoV-2
	Dr Siddhivinayak Shriram, Global Influenza Programme, WHO headquarters
	Experience/best practices of integrated surveillance of influenza and SARS-CoV-2 in Albania
	Dr Silvia Bino, Head of the Department of Epidemiology and Control of Infectious Diseases, Institute of Public Health, Albania
	Update on RSV surveillance through influenza sentinel surveillance and future plans including burden of disease estimation
	Dr Siddhivinayak Shriram, Global Influenza Programme, WHO headquarters
	Progress and challenges in integrated surveillance in SEA/WP regions: Country presentations

Dr Maria Jose da Costa, Timor-Leste

Dr Runa Jha, Nepal

Dr Ripeka Kaurasi, Fiji

Dr Gazala Buksh, Fiji

Panel discussion on strengthening integrated surveillance leveraging ILI and SARI surveillance networks and the way forward in SEAR/WPR when transition from acute response of COVID is taking place

Dr William Davis, Director, Influenza Programme, US CDC -Thailand

Dr Chakrarat Pittayawonganon, Ministry of Public Health, Thailand

Dr Seng Heng, Institut Pasteur du Cambodge

Dr Erik Karlsson, Institut Pasteur du Cambodge

13:00 – 17:00 **Group work:**

Country challenges in integrated surveillance and specific challenges and identifying appropriate strategies for operationalizing GISRS to eGISRS

Moderators:

Prof Ian Barr, WHO Collaborating Centre for Reference and Research on Influenza, VIDRL, at the Peter Doherty Institute, Australia

Prof Patrick Reading, WHO Collaborating Centre for Reference and Research on Influenza, VIDRL, at the Peter Doherty Institute, Australia

Ms Archana Kumar, US CDC

Dr Katherine Tan, US CDC

Mr Francis Inbanathan, SEARO

Mr Nguyen Phuong Nam, WPRO

Dr Runa Jha, National Public Health Laboratory, Nepal

Dr Pushpa Wijesinghe, SEARO

17:00 – 18:00 **Secretariat meeting**

Day 3 – Thursday, 3 August 2023

08:50 – 09:00 **Summary of Day 2**

Ms Olivia Price, Temporary Adviser, WHO

10:30 – 11:30 **Plenary session 6: Parallel sessions**

Laboratory session at IEDCR (NIC, Dhaka)

Information session at Raddison Hotel: New global developments and new initiatives pertaining to influenza preparedness

Moderator: Dr Erik Karlsson, Deputy Head, Virology Unit, Institut Pasteur du Cambodge

Zoonotic Influenza Distribution and Ranking (ZIDAR) project in SEARO and way forward

Prof Ricardo J. Soares Magalhaes, University of Queensland

	Introduction to WHO's new guidance on Pandemic Influenza Severity Assessment (PISA)
	Dr Kaat Vandemaele, Medical Officer, Global Influenza Programme, WHO headquarters
	Mosaic surveillance and conducting Unity Studies 2.0
	Dr Joshua Mott, Technical Adviser, Global Influenza Programme, WHO headquarters
	Dr Isabel Bergeri, Technical Officer, Global Influenza Programme, WHO headquarters
	Introductions to and discussions on PRET initiative
	Dr Gina Samaan, Unit Head, Pandemic Preparedness Global Platform
14:00 – 15:15	**Plenary session 7: Feedback from group work – integrated surveillance and eGISRS**
	Session moderator: Dr William Davis, Director, Influenza Programme, US CDC -Thailand
15:45 – 16:15	**Poster session**
16:15 – 17:00	**Conclusions, recommendations and closing remarks**
	Session moderator: Dr Pushpa Wijesinghe, SEARO
	Conclusions and recommendations
	Ms Olivia Price, Temporary Adviser, WHO
	Closing remarks
	Dr Nilesh Buddha, Regional Emergency Director and Lead Regional Emergencies, SEARO

Annex 3

List of participants, Technical Advisory Group members, temporary advisers, observers/partners, and Secretariat members

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Annex 4

Abstracts for poster presentations

List of posters and standees

(1) Epidemiology and Genetic Characterization of Influenza Virus in Bhutan in 2022: mutational analysis of haemagglutinin of H3N2 and H1N1pdm09

(2) WHO's Unity Studies: a global preparedness and readiness framework of investigations and studies of emerging respiratory pathogens of pandemic potential to inform evidence-based action

(3) International Reagent Resource (IRR) – WHO Headquarters

(4) Survey of National Influenza Centres in the WHO Global Influenza Surveillance and Response System (GISRS) –WHO Headquarters

(5) What you need to know about the updated National Influenza Centre (NIC) Terms of Reference (TOR) for seasonal influenza –WHO Headquarters

(6) Royal Centre for Disease Control has been recognized as the 150th National Influenza Centre in the Global Influenza Surveillance and Response System (GISRS) – Welcome to GISRS

(7) Indira Gandhi Memorial Hospital laboratory in Male has been recognized as the 151st National Influenza Centre in the Global Influenza Surveillance and Response System (GISRS) – Welcome to GISRS – WHO South East Asia Regional Office.

(8) Joint National and International review of influenza surveillance in Maldives, March 2023 – WHO South East Asia Regional Office.

(9) Joint National and International review of influenza surveillance in Timor-Leste, – November2022. – WHO South-East Asia Regional Office.

(10) National Influenza Programme in Maldives – Ministry of health, Maldives

(11) National Influenza Programme in Sri Lanka – Ministry of health Sri Lanka

(12) National Influenza Centre and its function in Nepal – Ministry of health, Nepal

(13) Influenza, SARS-CoV-2 and RSV: whole genome sequencing for public health surveillance in Thailand – Department of Medical Sciences and Department of Disease Control, Thai MOPH and Thailand's MOPH – US CDC Collaboration and other organizations

(14) PRET – Preparedness and Resilience for Emerging Threats Preparing for the next pandemic

Abstracts

Title: Epidemiology and Genetic Characterization of Influenza Virus in Bhutan in 2022: mutational analysis of haemagglutinin of H3N2 and H1N1pdm09

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Introduction

Influenza has caused major public health concerns with considerable morbidity and mortality, causing 3–5 million cases of severe illness and 250 000–650 000 deaths annually. In Bhutan, acute respiratory infection and the common cold is one of the top 10 diseases of morbidity, causing major public health concern. In this study, we aim to analyse the epidemiology of Influenza and its genetic characterization of Influenza A(H1N1)/pdm09 and Influenza A(H3N2) virus circulating in Bhutan during the year 2022.

Method

Respiratory specimens were collected from those who meet the case definition for influenza-like illness and severe acute respiratory infection. Specimens were tested for influenza and SARS-CoV-2 by RT-PCR using Influenza SARS-CoV-2 (Flu SC2) Multiplex Assay. Gene sequencing was performed at WHO CC US-CDC, Atlanta for genetic and antigenic characterization of the Influenza virus by using next-generation sequencing. Descriptive statistics were used to analyse the results including patient demographic to see the proportion of Influenza-associated ILI and SARI. All data were analysed using Epi Info7 and QGIS 3.16 software was used in mapping the Influenza positivity in the country.

Result

Weekly 16.2 ILI cases per 1000 outpatient visits and 1.8 SARI cases per 100 admitted cases were reported. Detected 15.2% (280/1846) Influenza positive, 4.0% (74/1846) SARS-CoV-2 and 0.3% (5/1846) coinfection, of which Influenza A/H3 (70.2%) subtype was the most predominate circulating strain, followed by Flu A (H1)/pdm09 (4.7%). Five of ILI cases were detected coinfection (1.4%) for both Flu A/H3 and SARS-CoV-2. The median age for influenza among ILI was 12 years (IQR: 5–28), while the median age for Influenza among SARI was 6.2 (IQR: 2.5–15) years. The most affected age group by Influenza was 15–29 years (35.9%) followed by 5–14 years (28.5%). Influenza A(H1N1)/pdm09 virus belonged to the 6B.1A clade and subclade 5a.2a. The phylogenetic tree analysis showed it is closely related to A/India/PUN-NIV323546/2021 and A/Sydney/5/2021 circulating Influenza strain. Influenza A(H3N2) viruses genetically characterized belonged to the 3C.2a1b clade and subclade 2a.3 and 2a.3b which are closely related to A/Alaska/01/2021 and A/Sydney/732/2022 virus strain respectively. The influenza virus in Bhutan shares a similar AA substitution with WHO recommended vaccine virus for the 2022–2023 NH vaccine composition.

Conclusion

Influenza and SARS-CoV-2 positivity rates were detected substantially high particularly during Flu season in 2022. Influenza A(H3N2) subtype was found most predominant circulating strain in the country. Genetic characterization of the Influenza virus in Bhutan showed the close relatedness to neighbouring viruses and similarities and variations with the WHO recommended vaccine virus for 2022–2023 and 2023–2024 NH vaccine composition.

Key words: Influenza, SARS-CoV-2, Influenza genetic characterization, Influenza Bhutan

Title: WHO's Unity Studies: a global preparedness and readiness framework of investigations and studies of emerging respiratory pathogens of pandemic potential to inform evidence-based action

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Background & aims: The World Health Organizations' (WHO) Unity Studies global initiative provides a generic preparedness and readiness framework for conducting detailed investigations and studies critical for risk assessment of emerging respiratory pathogens of pandemic potential to inform evidence-based action.

During the COVID-19 pandemic, the initiative produced standardized protocols and supported countries globally to generate robust and comparable data to inform national, regional, and global public health actions (1-5).

As we move towards an interpandemic period with COVID-19, countries must now develop sustainable surveillance strategies to monitor respiratory viruses of epidemic and pandemic potential. Discrete studies and investigations, are required to address certain public health objectives that are not efficiently met by other existing standard systems, such as to rapidly assess transmissibility, estimate population susceptibility/immunity, symptomatic proportion, and infection severity, and vaccine effectiveness

Methods and results: Building on the lessons learned during the COVID-19 pandemic, WHO is developing the Unity Studies 2.0 initiative. This work is being led by WHO and supported by technical partners, including the University of Melbourne and SeroTracker. The Unity Studies 2.0 'at the ready' international framework will address both disease-specific aspects, such as pandemic influenza and coronaviruses, and also other emerging respiratory pathogens of pandemic potential.

WHO is coordinating this work through two workstreams. The first workstream (architecture and governance) is developing standardized respiratory pathogens protocols (e.g. transmission and severity and supporting implementation tools e.g. protocols (6, 7), as well as duties and benefits of participating.

The second workstream operationalizes of the framework by developing a global operational network of sites worldwide, primed to conduct country-specific standardized, pre-planned and pre-approved studies. Plans include the development an acceptable architecture for timely results repository. Furthermore, network sites must exercise their investigations and studies during seasonal outbreaks/epidemics or other acute events, to ensure response readiness.

Implications: Revising standardized protocols and developing supporting implementation tools will allow for early and ongoing characterization of emerging respiratory pathogens in a globally coordinated and collaborative manner through the Unity Studies 2.0 network. Together these aim to ensure response readiness and effective response for rapid evaluation of pathogens of pandemic potential.

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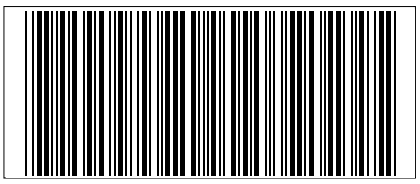

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