NATIONAL INFLUENZA CENTRES AND INFLUENZA SURVEILLANCE IN THE WHO'S SOUTH-EAST ASIA AND WESTERN PACIFIC REGIONS

Report of the Twelfth Bi-regional meeting
Kathmandu, Nepal
11-13 July 2018

World Health Organization
Regional Office for South-East Asia

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Abbreviations

APARIS – Asia Pacific Consortium for Acute Respiratory Infections Surveillance

APSED – Asia Pacific Strategy for Emerging Diseases and Public Health Emergencies

ARI – Acute Respiratory Infection

CVV – candidate vaccine virus

EBS – Event Based Surveillance

EQAP – External Quality Assessment Programmes

GISRS – Global Influenza Surveillance and Response System

GSD – Genetic Sequence Data

HEBS – Hospital Event Based Surveillance

HLIP – High Level Implementation Plan

IATA – International Air Transport Association

IHR – International Health Regulations

ILI – Influenza like Illness

IVPP – Influenza Virus with Pandemic Potential

LN – Liquid Nitrogen

NIC – National Influenza Centre

NIID – National Institute of Infectious Diseases, Japan

NITAG – National Immunization Technical Advisory Group

OIE – World Organization for Animal Health

PCR – Polymerase Chain Reaction

PEF – Pandemic Emergency Financing Facility

PIP – Pandemic Influenza Preparedness Framework

PIRM – Pandemic Influenza Risk Management

PISA – Pandemic Influenza Severity Assessment

PIVI – Partnership for Vaccination Introduction

SARI – Severe Acute Respiratory Illness

SEARO – South-East Asia Regional Office

SII – Specialized International Instruments

SiMEX – Simulation Exercise

US CDC – United States Centers for Disease Control

VIDRL – Victoria Infectious Diseases Reference Laboratory

VTM – Viral transport Media

WHE – WHO Health Emergencies Programme

WHO – World Health Organization

WHO CC – World Health Organization Collaborating Centre

WPRO – Western Pacific Regional Office

Executive Summary

Influenza is one of the most serious, yet under-rated, public health challenges, globally as well as in the Asia -Pacific. Seasonal influenza affects more than a billion and kills an estimated 290 000 to 645 000[1] every year globally. Influenza is also known to lead to pandemics at relatively frequent intervals, as the virus is constantly changing, which leads to the emergence of novel strains.

The National Influenza Centres (NICs), as part of the Global Influenza Surveillance and Response Network (GISRS), play a very important part in increasing our understanding of this virus, especially identifying the incremental changes, identifying the emergences of novel virus strains, detecting outbreaks, and providing other important information that lead to policy decisions. In addition, the individual NICs provide the organisms that support the development of candidate vaccine viruses (CVV), both for seasonal vaccines as well as pandemic vaccines. The meeting of NICs and others in the influenza community is an important opportunity to exchange information and further skills. The Twelfth Bi-Regional Meeting of National Influenza Centres (NICs) and Influenza Surveillance in the WHO South-East Asia and Western Pacific regions, held in Kathmandu, Nepal, from 11 - 13 July 2018, focused on pandemic influenza preparedness.

The meeting was inaugurated by the Deputy Prime Minister and Health Minister of Nepal, Mr. Upendra Yadav. In his special remarks, he spoke of bolstering influenza surveillance and response systems as part of strengthening universal health systems, reflecting the high political commitment towards influenza. Also present were the Nepalese Health Secretary, Ms Pushpa Chaudhury, and the Director General of Health Services, Nepal, Dr Gun Raj Lohani, as well as representatives of the three levels of WHO – Dr Khurshid Hyder, Acting WHO Representative for Nepal; Dr Roderico Ofrin, Director, WHO Health EmergenciesPprogramme, SEARO; Dr Masaya Kato, Programme Area Manager, Country Emergency Preparedness and International Health Regulations, WPRO; and Dr Wenqing Zhang, Coordinator, and Manager, Global Influenza Programme, WHO HQ. The Regional Director, Dr Poonam Khetrapal Singh, in a speech read out by Dr Ofrin, spoke of the importance of strengthening human-animal health coordination for better pandemic preparedness.

Technical sessions on the first day provided an overview of the current influenza situation and policies. The experiences and lessons learnt from the first pandemic of the 20th century, the 1918 pandemic, which was one of the most severe, and its continuing relevance today were presented. Updates were provided on the current situation of the northern hemisphere and southern hemisphere seasonal influenza activity. The World Organization for Animal Health (OIE) informed on the current panzoonotics in the avian world. China's experience in managing the A(H7N9) avian and human disease outbreak was shared, with the message that multi-sectoral coordination is key to managing and mitigating such outbreaks.

1Iuliano D, et al, "Estimates of global seasonal influenza-associated respiratory mortality: a modelling study." Lancet. 2018 Mar 31;391(10127):1285-1300. doi: 10.1016/S0140-6736(17)33293-2. Epub 2017 Dec 14.

The draft Global Influenza Strategy 2018-2030, APSED III as a regional action framework, the second High Level Implementation Plan (HLIP-II) of the Pandemic Influenza Preparedness (PIP) Framework were the themes in the next session. In addition, two countries spoke of their own experiences – Timor-Leste on establishing an influenza surveillance system, and Mongolia on its new Disaster Preparedness Plan.

The final session of the first day explored influenza vaccines globally and in Asia Pacific, specifically. It highlighted the reasons for vaccination, the growing Partnership for Vaccination Introduction (PIVI) programme, and regulatory capacity development in different country contexts. In a panel discussion, countries spoke about their experiences in introducing vaccines to pregnant women (Maldives), the role of the National Immunizations Technical Advisory Group (Myanmar), dealing with vaccine hesitancy in healthcare workers (Thailand), and with adverse events following vaccination (Mongolia).

While the first day provided the issues and the context, the second day saw discussions on the tools to move ahead. Participants were acquainted with the new WHO tools available for pandemic preparedness: the revised Pandemic Influenza Risk Management (PIRM) document which incorporates the recommendations of the IHR review committee following the 2009 pandemic; the checklist for pandemic influenza risk and impact management; and the essential steps for developing or updating a national pandemic influenza preparedness plan. The Asia-Pacific Strategy for Emerging Diseases and Public Health Emergencies (APSED III) was highlighted as a regional framework that incorporates all the key elements of International Health Regulations (IHR 2005) and other key Frameworks for emergency preparedness. The need for an Asia Pacific Consortium was also mentioned.

A key recommendation of the IHR (2005) review committee was to define and assess severity of a pandemic. Accordingly, the Pandemic Influenza Severity Assessment (PISA) tool has been developed, and was shared with participants of the meeting, along with a training on the Moving Epidemic Method (MEM) that supports the requirements of the PISA tool. The focus then shifted to the country level, as Indonesia and Cambodia shared their learnings from simulation exercises, involving a whole-of-society approach. One critical issue in an emergency response is funding, and this is where the World Bank's Pandemic Emergency Response Funds, is important for countries. This was presented, including criteria on who is eligible, and the financial mechanisms involved.

Effective influenza surveillance involves good data analysis. In the separate epidemiology session, participants got to know how to report to FluMart, that is, to FluNet (for laboratory data) and FluId (for epidemiological data). Sri Lanka and Vietnam then presented their perspectives on sharing of data. In the session on laboratory, participants learnt about new Terms of Reference for NICs, global external quality assessment programmes (EQAP), influenza genome sequencing platforms, RT-PCT support strategies, and the WHO Laboratory Biosafety Manual. Challenges to virus sharing, such as specimen shipping, were also discussed.

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On the final day, there was a presentation on the training tools developed for pandemic preparedness, a collaboration between CDC and member countries from across the Asia Pacific bi-region. A panel discussed a variety of laboratory issues, including the implications of the Nagoya Protocol.

The Conclusions and Recommendations were discussed. A key recommendation is the formation of the Asia Pacific Acute Respiratory Infection Surveillance (APARIS) consortium, to provide critical evidence for burden of disease as well as for risk and severity assessments.

Introduction

The impact of influenza on public health is well documented; yet, in national policy decisions, it often does not get the priority concomitant with its impact. Seasonal influenza is estimated to affect more than a billion people every year 3-5 million of them severely, and lead to 290 000 to 645 000 deaths every year. However, in public perception, influenza is frequently confused with less severe respiratory diseases.

Influenza has historically caused severe pandemics on average about once every 30 years, although sometimes as soon as 10 years between them (such as between the 1958 and 1968 pandemics). The influenza virus changes frequently, with small changes or "antigenic drift" which cumulatively leads to newer viruses, or occasionally a major change can occur such as recombination of two strains, which lead to an "antigenic shift" and the emergence of a novel virus. These novel viruses often lead to pandemics. There were three influenza pandemics in the 20th century, of which, the 1918 pandemic caused approximately 50 million deaths. The 21st century has also already seen a pandemic, in 2009. With greater population density and increased globalization, the next pandemic could be severe and rapidly spreading.

The National Influenza Centres (NICs), along with WHO Collaborating Centres (WHO CCs), as part of the Global Influenza Surveillance and Response System (GISRS), play a critical role in our understanding of influenza in public health, and especially in the early detecting of an outbreak or of the emergence of a novel virus. NICs and national influenza surveillance are also responsible for developing a range of important data to inform policy decisions. The Bi-Regional NIC meeting, held annually and hosted alternately by the WHO South-East Asia and Western Pacific Regions, allows the NICs, policy-makers, and the influenza community to share their findings and exchange information, experiences and best practices, which benefits all involved. This meeting, the twelfth Bi-Regional NIC meeting, focused primarily on the theme of pandemic preparedness.

Objectives and outcomes

The objectives and outcomes of this meeting are as follows:

- To provide global and regional updates on seasonal and zoonotic influenza viruses;
- To review progress and challenges in implementing surveillance priorities since last year including laboratory detection and characterization of influenza viruses;
- To prioritize multi-sectoral approaches to improve surveillance, risk assessment, response, and communication;
- To discuss optimal use of surveillance data in influenza tools, and use of disease burden estimates to guide vaccination strategies and pandemic preparedness planning; and
- To recommend priority activities for 2018-19.

Proceedings

Opening Session

Mr Upendra Yadav	Deputy Prime Minister and Minister of Health and Population of Nepal
Dr Pushpa Chaudhry	Health Secretary, Ministry of Health and Population, Nepal
Dr Gun Raj Lohani	Director General of Health, Ministry of Health and Population, Nepal
Dr Roderico Ofrin	Director, WHO Health Emergencies Programme, WHO SEARO
Dr Wenqing Zhang	Coordinator, Global Influenza Programme, WHO HQ
Dr M. Khurshid Hyder	Acting WHO Representative to Nepal
Dr Masaya Kato	Programme Area Manager, Country Health Emergency Preparedness & IHR, WHO WPRO
Dr Philip Gould, Programme Area Manager	Programme Area Manager, Infection and Hazard Management (IHM), WHO SEARO

As Master of Ceremonies, Dr Philip Gould welcomed the Chief Guest, the Deputy Prime Minister and Minister of Health and Population of Nepal, Upendra Yadav, and all other guests and participants.

The introductory remarks were made by Dr Guna Raj Lohani. He highlighted the importance of strong National Influenza Centres, considering the significant threat influenza poses for public health.

Dr Roderico Ofrin conveyed the Regional Director's message. He thanked the Minister of Health and Population for hosting this meeting. Quoting the Regional Director, he noted that as the National Influenza Centres of the WHO South-East Asia and Western Pacific regions, all in the meeting are at the frontline of the war against influenza – a virus that is intensely complex and capable of rapid mutation. In expressing thanks to the hosts of this vitally important meeting, the Regional Director also commended Nepal on the significant headway it has made in strengthening its laboratory capacity, influenza surveillance, and coordination between the animal and human health sectors.

The meeting was then inaugurated by His Excellency Mr Upendra Yadav, the Deputy Prime Minister, with the ceremonial lighting of the lamp. Addressing the meeting with Special Remarks, he emphasized that disease has no boundaries, and the poor and vulnerable are disproportionately affected by disease outbreaks. In Nepal, they are strengthening their health systems, including surveillance systems and laboratories. He also said, " this Bi-regional National Influenza Center and Influenza Surveillance meeting is an opportunity for all of us to learn from each other – from different countries, as well as different sectors. "

Following his speech, Nepal Health Secretary Dr Pushpa Chaudhry described the progress made in Nepal in influenza outbreak preparedness, including capacity building in influenza detection and management which enabled districts to manage outbreaks, as well as strengthening of ties between human and animal health. Laboratory capacity has also been enhanced, and " this Bi-regional National Influenza Center and Influenza Surveillance meeting is an opportunity for all of us to learn from each other – from different countries, as well as different sectors."

Dr. Gould then announced the nomination of the co-chairs and rapporteur. The Co-Chairs were Dr Kedar Baral, Director, Patan Institute of Health Sciences, and Dr Wang Dayan, Acting Director, WHO Collaborating Centre for Reference and Research on Influenza, Beijing. The rapporteur was Dr Supriya Bezbaruah.

Session A:
Setting the Stage: Influenza's history and updates on the current status of seasonal, avian and other novel influenza virus sub-types

Chair: Dr Wang Dayan, Director, WHO Collaborating Centre for Reference and Research on Influenza, Deputy Director, Chinese National Influenza Center, China

100 years since the 1918 pandemic

Dan Jernigan, Director, Influenza Division, National Center for Immunization and Respiratory Diseases, US CDC

To understand the future, we often need the aid of the past. The first technical session by Dr Dan Jernigan, a historic overview of the great pandemic of 1918, titled " 100 years Since 1918: Are we ready for the Next Pandemic?" gave a glimpse of the terrible power of the novel influenza virus to wreak havoc, given the right social conditions, with relevance for the world today. The full picture required piecing together evidence from history, geography and modern science. This included extracting, culturing and sequencing the latent virus from a frozen body in from permafrost, to understand its virulence, and historical papers that showed how crowding due to industrialization and war response facilitated its rapid and deadly spread. He postulated that if such a pandemic were to happen today, it would infect 20-30% of the global population and lead to 105-110 million deaths, with high economic cost and disruption of transportation and supply chains and of healthcare services. While GISRS has greatly enhanced detection capacity, gaps remain limited flu testing capacity in many countries, inadequate surveillance in birds and swine, and " data deserts" of flu circulation in many parts of the world.

Influenza activity in the Southern Hemisphere

Prof. Ian Barr, Deputy Director, WHO CC for Reference and Research on Influenza, Victorian Infectious Diseases Reference Laboratory, Australia

Bringing us from the past to the possibility of "clear and present danger" and the effectiveness of the armour we have in vaccines, Prof Ian Barr provided an update the influenza viruses detected in the Southern hemisphere. He noted that it has been a low-severity influenza season in the current Southern Hemisphere winter, and many of the southern Hemisphere strains were also in the northern hemisphere tropical countries, and southern hemisphere vaccines were now recommended for many them as well. Most countries were reporting flu data to WHO. He compared the circulating viruses so far in 2018 with the vaccine virus: A/H1N1 was similar to the vaccine virus A/H1N1/Michigan/45/2015; circulating A/H3N2 was slightly different to vaccine virus A/H3N2/Singapore, with some antigenic differences detectable between clades; Circulating B/Yamagata lineage was the dominant B-lineage and similar to B/Phuket/3073/2013 genetically and antigenically, while nearly all of the B/Victoria lineage detected were similar to B/Brisbane/60/2009 genetically and antigenically.

Influenza activity in the Northern Hemisphere

Prof. Takato Odagiri, Director, WHO CC for Reference and Research on Influenza, National Institute of Infectious Diseases, Japan

From the south, the session went to an overview of Northern Hemisphere viruses by Prof. Takato Odagiri. This winter influenza season of 2017-18 had the highest number of hospitalizations since surveillance started. Of the circulating viruses, all A/H1N1pdm09 viruses belonged to the HA subgroup 6B.1, and antigenically similar to the vaccine virus A/H1N1/Michigan/45/2015. A small number of viruses showed highly reduced inhibition by oseltamivir and peramivir. The majority of A/H3N2 viruses belong to the genetic group 3C.2a, 3C clade 2a2. Of the influenza B viruses, B/Victoria (genetic clade 1A0 and B/Yamagata (genetic clade 3) are co-circulating

Global updates on influenza A occurrences in birds

Dr Pasang Tshering, OIE Regional Representation for Asia and the Pacific, World Organization for Animal Health (OIE)

Pandemics have occurred in the past when zoonotic influenza viruses cross species. Shifting the lens from human to avian, Dr Pasang Shering of OIE informed on the situational differences between past and current epidemics, and geographical characteristics of the countries and the impact on domestic birds in his presentation "Global Update on Infection with High Pathogenicity Influenza A in Birds." He highlighted that the disease epidemiology in the last 13 years is characterized by two main global panzoonotics – the first in 2004, peaking in 2006, and the second that started in 2013 and is continuing today, with maximal activity in 2015. Currently, since 2013, 68 countries have reported a highly pathogenic avian influenza at least once. Since February 2018, 37 new outbreaks in domestic birds were reported in Africa, Asia, the Americas and Europe. Approximately 120 million domestic birds were killed or died, 95% of them in Asia in February 2018. He concluded by emphazing the new panzoonotic of Highly Pathogenic Avian Influenza (HPAI)with continuously changing virus behaviour, and therefore the importance of a "One Health" approach to continuously collect accurate, real-time information.

Update on H7N9 in China

Dr Wang Dayan, Director, WHO Collaborating Centre for Reference and Research on Influenza, Deputy Director, Chinese National Influenza Center, China

Indeed, one such avian influenza strain did cross the species barrier and infect humans in China in March 2013: A(H7N9). The novel reassortment virus was identified in 2013. This particular A(H7N9) had not been seen in either animals or people earlier. Wang Dayan described how China managed the outbreak– A(H7N9). There have been a total of 1567 cases, with 1536 cases in 27 provinces in mainland China, with 610 deaths. The outbreak has had five waves, of which the worst was the 5th wave in 2017. However, there has been no sustained human to human transmission. Among the lessons learnt from this experience from China is that sustained surveillance is essential. Other important lessons are the importance of multisectoral collaboration, and enhanced communication and activities to trigger behaviour change in the public e.g. changing eating habits for live poultry, cleaner live poultry markets.

Session B:
Strategies to make influenza a priority in countries

Chair: Kedar Baral, Director, Patan Institute of Health Sciences, Nepal

Global influenza strategy

Dr Wenqing Zhang, Coordinator, Global Influenza Programme, WHO HQ

The first session encapsulated the current status of influenza and lessons from the past. The underlying theme of the second session was strategies for the future. The first speaker, Dr Wenqing Zhang, made the case for a strategic global approach the public health threats from seasonal, pandemic and zoonotic influenza, and current strengths and challenges. She then unveiled the draft comprehensive WHO Global Influenza Strategy, which will be posted to the public for comments in July-August 2018, having undergone internal and external consultations. The Strategy links to the goals of the WHO Global Programme of Work (GPW) of 1 billion more people for health coverage, 1 billion people are made safer and 1 billion more lives are improved. The draft Global Influenza Strategy has laid down the vision of attainment of the best possible seasonal response and pandemic preparedness for the health of all people, and identified three strategic priorities -- strengthen pandemic preparedness and response; expand seasonal influenza prevention and control policies, and promote research and innovation.

Investing in pandemic preparedness through APSED III

Dr Masaya Kato, Programme Area Manager, Country Health Emergency Preparedness and IHR, WHO WPRO

From global strategies, participants were brought to regional ones as Dr Masaya Kato provided a regional perspective about advancing implementation of the International Health regulations (IHR 2005) through the Asia Pacific Strategy for Emerging Diseases and Public Health Emergencies (APSED III), a bi-regional framework to prepare for and respond to all diseases and public healthemergencies, including a pandemic. He also explained how it fits into the context of other frameworks and initiatives. It is a two-tier approach with emergency planning and system readiness.

Pandemic Influenza Preparedness Framework (PIP): Introducing HLIP-II

Dr Gina Samaan, Team Lead, PIP Partnership Contribution, WHO HQ

Dr Gina Samaan introduced the participants to another influential influenza framework – the Pandemic Influenza Preparedness Framework (PIP). The PIP Framework was adopted by all Member States in May 2011, and it aims to increase developing country access to vaccines and other products during a pandemic. The first High level Implementation Plan (HLIP-I) 2013-2017 was successfully implemented with 86% of indicators exceeded or met, and showed that PIP strengthened IHR core capacity. The second High Level implementation Plan (HLIP-II) runs from 2018-2023. It builds on progress in HLIP-I, and has six major outputs, including revising countries' Pandemic Influenza Preparedness Plan. All countries are now PIP countries, with some supported through country-level workplans.

Progress of influenza surveillance in Timor-Leste: *Ms Maria Angela Varela Niha, Head of Department for Surveillance and Epidemiology, Ministry of Health, Timor Leste*

Pandemic influenza preparedness in Mongolia: *Dr Darmaa Oyungerel, Epidemiologist for Influenza National Center for Communicable Diseases, Mongolia*

How do the global frameworks function at the ground level? Two countries, Timor-Leste and Mongolia, illuminated the country-level experiences. Ms Maria Niha explained how Timor-Leste established the influenza surveillance system in the country, with 5 ILI sites and 3 SARI sites. She highlighted the achievements, which included enrolling in the External Quality Assessment Programme with WHO CC Melbourne – 32 EQA specimens were 100% consistent. Capacity was also built for field epidemiology and outbreak investigation. Dr Oyungerel Darmaa of provided an overview of Pandemic Influenza Preparedness in Mongolia. She described the policies available for pandemic influenza preparedness, the influenza surveillance system, and the capacities. She spoke about the disaster preparedness exercise in 2017, as a step in the right direction. However, challenges remain, include lack of clarity on multi-sectorial coordination, budget, and partner engagement.

Session C:
Supporting the introduction of influenza vaccines

Chair: Dr Joseph Breesee, Associate Director for Global Health Affairs, Influenza Division, Centers for Disease Control and Prevention Atlanta USA

The previous session highlighted the strategies needed to battle seasonal and pandemic influenza, with vaccination as one of the tools in the armour. This session focused on how an increased number of countries could include influenza vaccination in their national programmes.

Introducing and expanding a seasonal influenza vaccine programme

Dr Joseph Bresee, US CDC

Dr Joseph Bresee spoke about the reasons for countries to have a seasonal influenza vaccination programme – the influenza burden is increasing, seasonal vaccination is a test for pandemic vaccination, and finally, health systems strengthening. He then spoke about the Partnership for Influenza Vaccine Introduction (PIVI), which works in partnership with countries, contributing partners and technical collaborators to create and support sustainable routine seasonal influenza vaccination programmes.

Augmenting national regulatory capacity to support pandemic preparedness

Dr Jinho Shin, Medical Officer, Essential Medicines and Technologies, WHO WPRO

Vaccination programmes need strong and efficient vaccine regulatory programmes, and Dr Jinho Shin presented on the important role of National Regulatory Authorities. Countries should establish National Regulatory Authorities for quality, safety and efficacy of products. He described countries producing influenza vaccines and highlighted the key country considerations for regulatory pandemic planning. These include establishing legal pathways to waive regulatory requirements of vaccines and antivirals in public health emergencies, have a harmonised regulatory approach, ensure good pharmacovigilance practices, good data sharing and strong supply chain and cold chain.

Roundtable:
Strong seasonal influenza programmes as a foundation for vaccine policy, vaccine use, and effective pandemic response

Facilitator: Dr Joseph Bresee, US CDC

Participants:

Dr Aung Myat Htay	Assistant Director, Central Epidemiology Unit, Department of Public Health, Myanmar
Dr Faisham Mohamed	Consultant in Medicine, Indira Gandhi Memorial Hospital, Maldives
Dr Nyamkhuu Dulmaa	Director, National Influenza Centre, Mongolia
Dr Suthanun Suthachana	Public Health Technical Officer, Bureau of Epidemiology, Thailand

- The role of NITAG in seasonal vaccine introduction: In Myanmar, during the seasonal influenza outbreak in 2017, there was a demand from the people for vaccines. A NITAG meeting was held on 3 September. The Pandemic vaccine deployment plan was referred to, and it was decided to prioritise vaccination for health care workers, then those with chronic disease, then children between 1 -3 years.

- The lessons for administering an influenza vaccine programme for pregnant women: Dr. Faisham from the Maldives spoke about using antenatal clinics to deliver vaccines to pregnant women, after a pregnant woman died in the flu outbreak in 2017. In Lao PDR, however, there were issues with vaccine acceptability among pregnant women. A Supply vs demand skew also leads to all priority groups not being covered in influenza vaccination in the country. Mongolia mentioned its surveillance for adverse effects of vaccination.

- Influenza Vaccination programme for healthcare workers: Influenza vaccine uptake among healthcare workers is important not only because it protects them, but also because healthcare workers are often also opinion leaders for vaccines. Thailand was asked to elucidate on the top three lessons on this. Suthanan Suthchana of Thailand said that the under their influenza programme,vaccines were delivered to the hospital but vaccine supply was limited, and the first come first serve did not work as many of those who needed the vaccine most did not get it. The policy was therefore changed so that pregnant women got first priority, then those with chronic disease and healthcare workers. AEFI surveillance is in place, but there was no AEFI reported in the past 6 months.

- In the discussion, WHO's ongoing project to understand healthcare workers perspectives on influenza vaccination, and the efforts to increase their awareness, were mentioned. Open WHO is also a resource for capacity building and creating awareness among healthcare workers.

Session D:
Influenza Pandemic Preparedness Planning: building capacity for pandemic response

Chair: Roderico Ofrin, Director, WHO Health Emergencies Programme, SEARO

Introducing the session, Dr Roderico Ofrin emphasized the urgency in pandemic preparedness actions.

Pandemic planning: public health emergency preparedness

Dr Erica Dueger, Medical Officer, WHE, WHO WPRO

Preparedness for pandemics is at the core of APSED III's two-tier approach of emergency planning and system readiness, as Dr Erica Dueger explained. The IHR review Committee, after the 2009 A(H1N1) pandemic, recommended building capacity for risk management, improved severity assessments, and conduction of simulation exercises. For risk assessment including severity assessment, good hospital-based acute respiratory infection (ARI) data is essential. Therefore, an Asia Pacific Acute Respiratory Infection Surveillance (APARIS) consortium is needed, in line with similar networks in other regions.

Pandemic Influenza Risk and Impact Management (PIRM): building sustainable and resilient capacity for pandemic response

Dr Weigong Zhou, Medical Officer and Team Lead, Pandemic Preparedness, Influenza preparedness and Response (IPR), WHO HQ.

Dr Weigong Zhou revealed that 101 Member States – more than 50% – did not have a Pandemic Influenza Preparedness plan or the plan was not publicly available. Only 13 countries had plans revised after 2014. Considering the threat of an influenza pandemic and its potential impact, a national Pandemic Influenza Preparedness Plan is essential. He introduced all the available WHO guidance – Pandemic Influenza Risk management (2017); A checklist for Pandemic Influenza risk and impact management (2018); Essential Steps for Developing/Updating National Pandemic Influenza Preparedness Plans (2018) and a Practical Guide for Developing and Conducting Simulation Exercises to test and validate Pandemic Influenza Preparedness Plans, and other guides on surveillance, risk and severity assessments, and public health measures.

Introduction to the Pandemic Influenza Severity Assessment (PISA) tool

Dr Katelijib Vandemaele, Team Lead, Epidemiology and Surveillance, Influenza Preparedness and Response (IPR), WHO HQ

Dr Katelijib Vandemaele then introduced one of the WHO tools – the Pandemic Influenza Severity Assessment (PISA). She explained the three factors for influenza severity – transmissibility, seriousness of disease and impact. PISA provides information on the timing, urgency, intensity and scale of the response, and explained the methodology with examples from various countries. She also identified that WHO requests that all countries use this tool for routine seasonal influenza to help guide the utility of the tool during the pandemic.

Country Experiences:

The 2017 Pandemic Influenza Preparedness Exercise: incorporating Whole-of-Government approach –

Dr Karnely Helena, Director of Prevention and Communicable Disease Control, Ministry of Health, Indonesia

Simulation exercises – assuring a whole of society approach

Dr Seng Heng, Director, Surveillance Bureau, Ministry of Health, Cambodia

Two countries – Indonesia from SEARO and Cambodia from WPRO – shared their experience of a pandemic simulation exercise. Dr Karnely Helena described the format of the simulation in Indonesia – pre-exercise, including planning, material development and set-up; the exercise; an post-exercise evaluations. In Indonesia, the scenario was a novel avian influenza and indication of human to human transmission. The focus of the exercise was epicenter containment. Cambodia's simulation exercise, shared by Dr Seng Heng, focused on a multisectoral coordination SiMex for Public Health Emergencies. The Table Top Simex was used to identify roles/responsibilities and coordination mechanism among relevant health and non-health sectors.

Pandemic Emergency Financing Facility

Dr Manav Bhattarai, World Bank

One key feature of any emergency is resources. The World Bank's Pandemic Emergency Financing Facility (PEF) is meant to address this issue. Dr Manav Bhattarai of the World Bank acquainted the participants with the key features of this Fund. PEF is an insurance-based mechanism that provides surge financing. It covers specific diseases and disease families with pandemic potential, including influenza, coronavirus, filovirus, Lassa fever, Rift Valley fever and Crimean-Congo Hemorrhagic Fever. Premiums are paid by the development partners.

Session E:
Group Work - National Pandemic Preparedness Planning

Chair: Dr Aalisha Sahukhan,
National Advisor Communicable Disease, Ministry of Health Fiji

- **Essential capacities in pandemic preparedness planning : an overview of the WHO checklist**
  Dr Weigong Zhou, Team Lead, Pandemic Preparedness, Influenza preparedness and Response, WHO HQ

- **Introduction to the breakout session (objectives, expected outcomes, grouping,.)**
  Mr Hitesh Chugh, Consultant, PIP, WPRO

To support countries in developing capacities and a pandemic preparedness plan, a checklist has been developed. Dr Weigong Zhou introduced the checklist and how to use it to the audience.

Mr Hitesh Chugh then explained how the organization and expectations from the breakout sessions. This session's objective was to review essential capacities in pandemic preparedness planning and identify priorities for the next 1-2 years. There were three broad topics for which participants were divided into groups. All were to identify priority activities for the next 1-2 years.

Roles of National Influenza Centres (NICs) (Group 1)

The role of this group was to review lessons learned and progress made in laboratory preparedness for pandemic response, and propose good practices. They reviewed NICS in various countries in terms of surge capacity, sample transport, new virus biosecurity, connections with WHO CCs, and communications with other sectors. Surge capacity and available funding varied widely among countries, and time delay in funding was mentioned. There was a need to overload NICs with 'routine' work. Some countries mentioned equipment maintenance difficulties. Many cited challenges with sample transport logistics, especially externally. New virus biosecurity is an issue because many countries do not have P3 facilities. However, nearly all laboratories know t whom or where to refer among WHO Collaborating Centres (CCs). Some countries had structures in place for communication with other sectors. However most did not.

Surveillance, risk assessment and rapid response (Group 2)

The role of this group was to review lessons, progress, and challenges in pandemic preparedness in surveillance and response; propose good practices. This group emphasized the importance of sentinel surveillance. There has also been progress on dissemination of information and multi-sectoral collaboration based on the "One Health" approach.

Among the good practices identified were integrated capacity building for surveillance and response; high level collaborative mechanisms within animal health; multiple approaches to surveillance, including media/rumor surveillance and data mining; data quality training; use of WHO guidelines and finally, well-trained rapid response teams. However, there are many challenges including estimating disease burden; staff turnover; specimen shipment; data linkage and sharing of lab and epi data and sustainability of surveillance systems. Priority activities include risk communication, pandemic preparedness plans, and incorporating PISA into existing influenza surveillance systems.

Seasonal influenza vaccine programme and pandemic vaccine readiness (Group 3)

The group's task was to review progress and challenges in implementing seasonal influenza vaccine programmes and their link to pandemic vaccine preparedness, propose good practices for pandemic vaccine preparedness, andanalyse the optimal use of burden estimates and severity assessments to guide flu vaccine policy. Among the lessons learnt were the importance of linkages and communication to various key groups including decision makers, health care workers, general public; and the need for a "champion". Good practices identified include generating local data for evidence-based decisions, and monitoring after vaccine introduction, and targeting different high-risk groups with high acceptance. Among the challenges were affordability of the vaccine, vaccine effectiveness, regulatory processes in some countries, and influenza vaccine's not being included in the routine vaccination programmes. One key priority activity therefore is to build an evidence-based case for influenza vaccination, including burden data and cost-benefit estimates.

Session F: Laboratory

Chair: Dr Takato Odagiri, Director, National Institute of Infectious Diseases (NIID), Tokyo

The risk-based approach to biosafety and biosecurity and the new WHO Laboratory Biosafety Manual – Dr Karen Nahapetyan, Technical Officer (Laboratory), WPRO

New terms of reference and performance review for NICs

Dr Wenqing Zhang, Manager, Global Influenza Programme, WHO HQ

Dr Wenqing Zhang provided an overview of the GISRS system as fostering global confidence and trust for over 66 years through effective collaboration and the sharing of viruses, data and benefits based on member states commitment to a global public health model. She tracked the evolution of NIC terms of Reference (TORs) from 2002 to 2011 to 2017. The latest TORs categorize into three groups: (1) TOR for NIC working with seasonal influenza; (2) TOR for NICs working with influenza virus with pandemic potential (IVPP); and (3) TORs for NIC working with non-seasonal influenza or non-IVPP. NIC performance review was introduced in 2018 to acknowledge active NICs, identify gaps of performance with aim to bridge, and identify inactive NICs leading to potential discontinuation. Review includes three indicators: (1) virus detection capacity judged by EQA results; (2) virus sharing (at least once a year); and (3) surveillance information reporting. Overall, NIC performance review is an opportunity to strengthen NIC capacity and an official channel of communication including advocacy.

Update on the RT-PCR Global EQAP

Dr Janice Lo, Head, Public Health Laboratory Services, Department of Health, Hong Kong

Dr Janice Lo presented in detail the history of WHO External Quality Assessment Program (EQAP) for influenza A virus subtypes and B viruses by RT-PCR to monitor quality and standards of performance of influenza labs. Most of labs in Asia Pacific region demonstrate steady performance close to but not necessarily all reaching 100%. She also shared plans for further expansion and improvement of EQAP and its components and panels.

How genetic sequence data informs us on influenza

Ms Naomi Komadina, Victoria Infectious Diseases Reference Laboratory (VIDRL)

Ms Naomi Komadina updated participants on the details of influenza genome sequencing platforms (Sanger and Next Generation Sequencing), their strengths and weaknesses and purposes for which they can be effectively used, such as vaccine candidate selection, silica structuring analysis and phylogenetic analysis, vaccine effectiveness studies, etc. She introduced participants to the Global Initiative on Sharing All Influenza Data (GISAID).

Real-time RT-PCR support strategies and updates

Dr Stephen Lindstrom, Team Lead, Diagnostic Development, Influenza Division, US Centers for Disease Control (CDC)

Dr Stephen Lindstorm provided the latest updates on CDC work in real time RT-PCR, including testing algorithms, reagent kits, International Reagent Resource (IRR) and other support available to NIC from CDC. He also discussed testing for other animal viruses with pandemic potential.

The risk-based approach to biosafety and biosecurity and the new WHO Laboratory Biosafety Manual

Dr Karen Nahapetyan, Technical Officer (Laboratory), WHO WPRO

Dr Karen Nahapetyan discussed the importance of biosafety and biosecurity management programs for preventing laboratory and health facility acquired infections and their spill-over into the community. He reviewed weaknesses of the current biosafety paradigm based on generic agent risk groups and biosafety levels, with predetermined sets of administrative and engineering solutions and introduced a new approach based on rigorous risk assessment and establishment of bio-risk management systems customized for specific risks of the laboratories. He reviewed the evolution of WHO Laboratory Biosafety Manual and provided some highlights of the revised manual (currently being developed) in terms of its structure and content.

Parallel Session G1: Reporting and using Data

Chair: Dr Agustiningsih, National Influenza Center, Ministry of Health, Indonesia

This session focused on epidemiological surveillance for influenza and the importance of data, highlighting country experience. The chair, Dr Agustiningsih, spoke about how all the topics in this session linked to provide the larger picture of influenza surveillance, that provides the information based on which global decisions can be taken.

Optimizing Event Based Surveillance

Dr Serge Nzietchueng, Consultant, Country Preparedness and International Health Regulations, WHO WPRO

Dr Serge Nzietchueng began the session emphasizing the benefits of the Joint Risk Assessment, such as bringing together national information and expertise from human, animal and other relevant sectors, and revealing critical missing information and gaps.

One Health collaborations in influenza, Myanmar

Dr Ni Ni Aung, Assistant Director, Livestock Breeding and Veterinary Department, Ministry of Agriculture, Myanmar

Dr Ni Ni Aung spoke about how outbreaks of influenza A/H5N1 in poultry, including a 2016 outbreak in Sagaing Region, has brought the human and veterinary health sectors to work together in Myanmar so that there is now smooth coordination between the sectors. A draft Plan on One Health Strategy (2017-2021) has been developed.

Event based reporting: Vietnam's experience

Dr Nguyen Vu Thuong, Director, National Influenza Centre, Vietnam

Dr Nguyen Duc Khoa elucidated on disease surveillance, including influenza surveillance, in Viet Nam. The influenza surveillance system involves both event based surveillance (EBS) and indicator based surveillance. A pilot Hospital Event Based Surveillance (HEBS) was established in 2017-2018 to strengthen reporting and increase coordination between curative and preventive medicine. The experiences have been incorporated into a national EBS guideline, approved in March 2018.

FluMart and other online WHO Tools

Mr Bikram Maharjan, Data Manager (Consultant), WHO HQ

Globally surveillance data from all countries informs policy decisions from WHO. Having an updated Influenza Data Surveillance Reporting System is therefore very important. Mr Bikram Maharjan described how FluMart, the influenza Data Surveillance Reporting system, works. It integrates both FluNet, which has laboratory surveillance information, and FluID, with has epidemiological data. Consistency and timeliness of reporting was highlighted as a challenge. He provided links to videos on how to load data into these systems from Excel.

Preparing a flu report: Sri Lanka's experience

Dr Jude Jayamaha, Consultant Virologist, Medical Research Institute, Sri Lanka

Dr Jude Jayamaha spoke about influenza data dissemination and animal surveillance in Sri Lanka. He described the newsletter/e-Newsletter brought out by the NIC Sri Lanka, which began in 2014 and is distributed by email and print to 100 hospitals. The information it contains is a monthly summary, with the number of samples, number of positives, and influenza types and subtypes. Other initiatives include journal publications, compilation of frequently asked questions, and meeting/events. Texting by mobile phones and social media/facebook is also used. Information is distributed to a wide range of stakeholders. He also described animal surveillance, with the main objective of detection of highly pathogenic avian influenza (HPAI). Sri Lanka is on the route of many migratory birds. The Sri Lanka Exotic Disease Emergency Preparedness (SEDEP) involves surveillance, laboratory diagnosis and identification of risk factors. He described the various steps for surveillance in emergencies.

Preparing a flu report: Hong Kong's experience

Dr Janice Lo, Head, Public Health Laboratory Services, Department of Health, Hong Kong

In Hong Kong, though, everything is uploaded, according to Janice Lo, who spoke about the use of influenza data in the city. Their weekly report, called "Flu Express", monitors and summarizes local and global influenza activities. Describing flu outbreaks as a "catching up game" and "every season is like a war", she informed that they receive 4000-8000 specimens every week, and test for the entire panel of respiratory viruses. She provided a snapshot of ILI surveillance among sentinel general outpatient clinics and sentinel private doctors form 2014-2018. She showed the various surveillance parameters that were considered, including vaccinations, chronic illness.

Large seasonal outbreak of influenza in the Maldives, 2017

Dr Ramsha Abdul Sattar, Project Coordinator, Health Protection Agency, Maldives

Dr Ramsha Abdul Sattar began by explaining that influenza surveillance was established in 2014 with CDC support, with five ILI/SARI sentinel sites, but 2017 was the first outbreak identified since surveillance began, and the country was not prepared. By week 8 of the outbreak, the number of confirmed SARI cases was more significantly greater than the average. Respiratory physicians alerted Maldives' Health Protection Agency about an increase of patients with acute respiratory complications. She then described the outbreak response measures – relevant committees activated, surveillance actions doubled, enhanced measures for sample collection, WHO assistance sought for procurement and increased health promotion activities including press releases and press conference. Among key lessons learnt was the need for an updated outbreak/pandemic preparedness plan, influenza vaccination policy and need for risk communication.

Discussions involved ways to maximize animal and human health coordination, including joint committees and regular meetings.

Parallel Session G2: Laboratory: Shipping of Specimens

Chair: Prof. Ian Barr

Introduction of the topic –	Group discussion:	Facilitators:
Dr Karen Nahapetyan, Technical Officer (Laboratory), WHO WPRO	**Specimen shipping: barriers, challenges, and solutions**	**Prof Ian Barr,** Deputy Director, WHO CC for Reference and Research on Influenza, Victorian Infectious Diseases Reference Laboratory (VIDRL), Australia, **Dr Stephen Lindstrom,** Team Lead, Diagnostic Development, Influenza Division, US Centers for Disease Control (CDC), USA

This session revolved around a key issue facing countries – shipping of specimens especially in outbreaks in remote areas. To aid the discussion, participants were given a scenario:

"There is an outbreak of influenza-like illness with several death cases in one of the remote provinces of your country. You need to urgently organize transportation of samples to the National Influenza Center for diagnostic testing, with possible shipment to a WHO reference laboratory abroad for further characterization of the pathogen."

They were asked to elucidate on a range of relevant issues such as:

- Sample collection materials available at the site of the outbreak?
- Facilities for sample storage in the provincial laboratory
- Rapid shipping to the NIC
- Availability of proper sample packing materials in the NIC and are there certified shippers
- Access to dry ice
- Are the arrangements in place with couriers
- Export permits and import permits as necessary for NICs
- NIC standing arrangements with a WHO collaborating Centre or a WHO reference laboratory for sample referral

Countries varied in their shipping capacities. Most countries did not have a problem with international shipping or with domestic shipping from outbreak location to the NIC. Cambodia faced challenges with accessing remote areas. Bhutan, Nepal and Timor-leste did not have dry ice, although Nepal could import from India or Thailand. Cool box and Liquid Nitrogen dry shippers were available. Bhutan did not have access to World Courier or arrangements in place for shipping specimen internationally [they have since identified FedEx as an alternative to World Courier].

The discussion highlighted some challenges faced by the countries and clarified some issues:

- Clinical samples that haven't been tested are Category B NOT Category A by IATA shipping requirements, even if the potential agent is not known.
- Liquid nitrogen (LN) shippers can be used instead of dry ice, airlines usually OK with them.
- Some small countries have difficulty getting hold of swabs with viral transport media (VTM) at short notice. There is a need to have mechanisms in place to cope with outbreak in any place in country. NICs and hospitals should have stockpiles.
- Once a WHO provided (country office or regional office) IATA shipping course has been done successfully, people can do WHO refresher courses online at no cos. These IATA trainings are only available to public labs (not private) and must renew every two years.
- There are sensitivities around sharing human clinical samples to labs outside of the WHO CC's e.g. to universities; some countries can't share at all e.g. India.
- There is a need to have some process in place if clinical samples from severe respiratory cases are influenza negative; if shipping to a CC (such as US CDC, NIID, VIDRL and others) they can arrange further testing by another "sister" lab.
- Most NICs/labs have used WHO shipping fund; but some have not shipped samples to WHO CC.
- NICs/labs can send to any WHO CC, normally to the CC with the best transport link. They can send to multiple CCs but should then send different samples.
- There are questions about the impact that the Nagoya Protocol will have on the shipping of samples/isolates.

Session H:
Practical Issues Around Virus Sharing (Roundtable and Floor Discussion)

Chair: Prof Ian Barr, Deputy Director, WHO CC for Reference and Research on Influenza, Victorian Infectious Diseases Reference Laboratory (VIDRL), Australia

Virus sharing is critical for pandemic preparedness, and a fundamental part of the PIP Framework. In spite of this, virus sharing by countries has not always been optimal. This session explored some practical issues, with a presentation followed by panel discussions.

Virus Sharing

Dr Wenqing Zhang, Manager, Global Influenza Programme, WHO HQ

Wenqing Zhang presented on why virus sharing is important, how it can be done, and the current situation. She emphasized that virus sharing enables GISRS to detect and monitor detect and monitor emerging and circulating virus strains, make recommendations on candidate vaccine viruses, guide the use of anti-retrovirals, and allow WHO and WHO CCS to conduct risk assessments. She also reiterated that viruses must be shipped to a WHO CC as soon as possible if it is an un-typeable influenza A, or from human cases when there are changes in epidemiology. For seasonal influenza, there should be at least 1 shipment per year from countries, although there is funding available for up to 4 shipments per year.

For Influenza viruses with pandemic potential (IVPP), the sharing status is public and at high levels, and is recorded in IVTM. Genetic sequence data (GSD) cannot replace virus sharing.

Panel Discussion

Dr Wenqing Zhang	Manager, Global Influenza Programme, WHO HQ
Mr Bishnu Upadhyay	Deputy Chief Medical Lab Technologist, National Public Health Laboratory, Nepal
Dr Dorji Wangchuk	Laboratory Officer, Royal Centre for Disease Control, Department of Public Health, Bhutan
Dr Chen Tao	Assistant Professor, WHO Collaborating Centre for Reference and Research on Influenza, Chinese National Influenza Center, China
Dr Le Thi Quynh Mai	Director, National Influenza Centre, National Institute of Hygiene and Epidemiology, Viet Nam

In the discussion that followed, Chen Tao of China informed that in the past 10 years, it has shared more than 4000 influenza strains. Zoonotic virus sharing needs good multisectoral collaboration. Le Thi Quynh Mai said that Vietnam shares viruses with WHO CCs but it was delayed this year. Dorji Wangchuk highlighted the practical difficulties of smaller countries, that Bhutan has not shared viruses yet, and does not have a suitable courier for specimen shipping. In Nepal, too, capacity is an issue, although it started isolating viruses in 2011, as mentioned by Bishnu Upadhyay.

Discussions among the panelists ranged from what viruses to ship, on cycle threshold (ct) values, and on External Quality Assessment Project (EQAP), and on the need to have virus samples a month ahead of the vaccine composition meeting, so that the data can be analyzed and shared in time for accurate decisions. Timely shipping is very important because, after receiving virus from NIC, the WHO CCs need to propagate and characterise the virus.

Finally, the issue of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) to the Convention on Biological Diversity , referred to as the Nagoya Protocol and its implications were discussed. Wenqing Zhang gave a synopsis of the Nagoya protocol, which is a supplementary agreement to the Convention on Biological Diversity (CBD), and was adopted in 2010 and came into force in 2014. Its objective is the fair and equitable utilization of benefits arising out of genetic resources. She explained that its implication are far wider than for public health, and the focal points are usually environment ministries. But it has a significant impact on public health. Nagoya protocol has its own access and benefits sharing system (ABS). However, it does not prevent countries from implementing other relevant international agreements, or specialised international instruments (SIIs) provided that they are supportive of and do not run counter to the objectives of the Convention and this Protocol. The PIP framework is an SII. Could GISRS be an SII? It cannot be as it has no legal binding agreement signed. WHO organised a consultation on whether seasonal virus should be under the PIP framework, and therefore can follow PIP.

Session I:
Modular Training Tools for Pandemic Preparedness

Chair: Prof Ian Barr, Deputy Director, WHO CC for Reference and Research on Influenza, Victorian Infectious Diseases Reference Laboratory (VIDRL), Australia

Virus sharing is critical for pandemic preparedness, and a fundamental part of the PIP Framework. In spite of this, virus sharing by countries has not always been optimal. This session explored some practical issues, with a presentation followed by panel discussions.

Modular training tools for pandemic preparedness –

Dr Joshua Mott, Director, Influenza Program, US CDC South-East Asia Regional Office, Thailand

Joshua Mott presented on US CDC's Best Practices Training tools on the Detection and Response to Novel Influenza Viruses. The training material was developed through a meeting hosted by the Ministry of Public Health, Thailand, and

involving
150
participants

from
11
Member States.

It brought human and animal sectors together in developing material for

- Human epidemiologic response to novel viruses
- Animal response following international guidance
- Medical management of novel influenza
- Laboratory specimen collection, transport and diagnostics

Each technical group reviewed and provided comment on applicability of material for the local context, and 29 modules and exercises were developed, along with the user's guide.

Conclusions and Recommendations

Conclusions

- A century after the great influenza pandemic of 1918, the world has progressed significantly in influenza preparedness. With support from WHO collaborating centres and other partners, national and regional influenza surveillance systems have been strengthened, particularly over the last 10 years. This includes strengthening of the NICs, an integral part of the GISRS.
- Influenza surveillance and response remains a priority for the WHO Health Emergencies Programme and is embedded within all focus areas of APSED III, an action framework for implementation of IHR (2005).
- Preparedness for influenza pandemics takes place within the broader framework of health security, and requires investment of resources by Member States, donors and partners.
- For enhanced preparedness for an influenza pandemic, all Member States require systems that are strong enough to detect, prevent and effectively respond. The Pandemic Influenza Preparedness Framework (PIP), the Pandemic Influenza Risk Management (PIRM) guidance document, as well as pandemic preparedness tools for risk and severity assessment e.g. Pandemic Influenza Severity Assessment (PISA), help Member States strengthen and coordinate influenza surveillance, risk assessment and preparedness.
- Influenza's substantial impact in terms of mortality and morbidity is well recorded and needs to be accorded higher priority in public health policy making. The draft Global Influenza Strategy 2018-2030 provides guidance for Member States and WHO to strengthen influenza surveillance and response, in synergy with overall health systems.
- A strong "One Health" approach, with close collaboration and coordination between the human, animal, and environmental health sectors, is essential to support rapid detection and response to unusual events of zoonotic influenza viruses and influenza viruses with human pandemic potential.
- EQA programmes are a critical component of a broader laboratory quality management systems for monitoring and improving laboratory proficiency of molecular diagnosis and isolation of influenza viruses. It is therefore imperative that all NICs participate in such programmes.
- Indicator-based surveillance data, including from high-quality hospital surveillance sites in the Asia Pacific Acute Respiratory Infection Surveillance (APARIS) consortium, can provide critical evidence for burden of disease as well as for risk and severity assessments. These can support formulation of policy decisions.
- Implementation of seasonal influenza vaccine strategies to high-risk populations, as identified by the SAGE in 2012, is an important part of influenza prevention, control, and pandemic preparedness strategies.
- It is critically important to engage the whole of society to advance pandemic preparedness and response, by developing or updating a national plan and validating it through simulation exercises.

Recommendations for Member States

Member States are encouraged to:

- Review and provide feedback on the new draft Global Influenza Strategy.
- Develop/update and implement national action plans for health security, as guided by APSED III to advance IHR (2005), including strengthening of laboratory capacity, surveillance, joint risk assessment, pandemic preparedness and response readiness.
- Review and update national pandemic preparedness plans, using the *PIRM framework, A check-list for pandemic influenza risk and impact management, Essential steps for developing or updating a national pandemic influenza preparedness plan,* and other WHO tools as guidance.
- Strengthen collaboration and coordination between the human and animal health sectors to generate data that support joint risk assessments for informed decision making.
- Improve timely sharing of (a) seasonal influenza viruses with WHO collaborating centres (b) genetic sequence data with sequence databases, and (c) national virologic and epidemiologic surveillance data with FluNet and FluID.
- Sustain and use multiple sources of information from event-based and indicator-based surveillance, to provide critical evidence for burden of disease, as well as risk and severity assessments, to support policy decisions.
- Participate in the APARIS Consortium to support PISA by promoting consistent and comparable SARI surveillance.
- Continue to participate in EQA programmes for influenza diagnostics and use their findings to optimize laboratory performance.
- Encourage collaborations between laboratory and epidemiologic surveillance, policy-makers and immunization programmes to ensure evidence-based vaccination strategies are developed and implemented.
- Ensure a whole-of-society approach to advance pandemic preparedness and response.

Recommendations for WHO

WHO is requested to:

- Facilitate Member States to review and provide comments to the draft new Global Influenza Strategy.
- Assist Member States in strengthening mechanisms to foster collaboration and coordination at the human–animal-environment interface, for timely public health action and pandemic influenza preparedness.
- Provide tools and strategies to support Member States, to build capacity and strengthen systems for influenza pandemic preparedness, within the larger efforts in health security capacity development.
- Support Member States to improve and update pandemic preparedness and response plans through multi-sectoral planning and exercises.
- Provide technical support to strengthen laboratory quality, including through facilitating NICs' participation in EQA programmes.
- Encourage the sharing of viruses and genetic sequence data globally and the regular reporting of influenza surveillance data to improve the detection of unusual events.
- Promote consistent and comparable surveillance for hospitalized acute respiratory infections including facilitation of Member State participation in the APARIS Consortium and regular completion of severity assessments through PISA.
- Encourage Member States to introduce influenza vaccination for high-risk groups such as pregnant women and health care workers and put in place the logistics and mechanisms for facilitating pandemic vaccination.

Annex 1
Agenda

Objectives

- To provide global and regional updates on seasonal and zoonotic influenza viruses;
- To review progress and challenges in implementing surveillance priorities since last year, including laboratory detection and characterization of influenza viruses;
- To prioritize multi-sectoral approaches to improve surveillance, risk assessment, response, and communication;
- To discuss optimal use of surveillance data in influenza tools, and use of disease burden estimates to guide vaccination strategies and pandemic preparedness planning; and
- To recommend priority activities for 2018-19.

Agenda

Time	Topic	Presenter
Day 1: Wednesday, 11 July 2018		
0800 – 0830	Registration	
0830 – 1000	**Opening Session –** **Opening Chair: Pushpa Chaudhary,** Health Secretary, Ministry of Health and Population **MC: Philip Gould,** IHM, SEARO	
	Introduction: Guna Raj Lohani, Director General, Department of Health Services Regional Director's **Message:** Roderico Ofrin, Regional Emergencies Director **Lighting of lamp:** Upendra Yadav, Honorable Minister, Ministry of Health and Population **Special remarks:** Upendra Yadav, Honorable Minister, Ministry of Health and Population **Inauguration remarks:** Pushpa Chaudhary, Health Secretary, Ministry of Health and Population • Introduction of countries and partner organizations • Nominations for co-chairs and rapporteurs • Objectives and administrative items **Group Photo**	

Time	Topic	Presenter
Day 1: Wednesday, 11 July 2018		
1000 – 1020	**Coffee Break**	
1020 – 1220	**Session A: Setting the Stage:** Influenza's history and updates on the current status of seasonal, avian and other novel influenza virus sub-types **Chair: Dayan Wang,** China CDC	
1020 – 1040	100 years since the 1918 pandemic	**Dan Jernigan,** US CDC
1040 – 1100	Influenza activity in the Southern Hemisphere	**Ian Barr,** VIDRL
1100 – 1120	Influenza activity in the Northern Hemisphere	**Takato Odagiri,** NIID
1120 – 1140	Global updates on influenza A occurrences in birds	**Pasang Tshering,** OIE
1140 – 1200	Update on H7N9 in China	**Wang Dayan,** China CDC
1200 – 1220	Discussion	
1220 – 1320	**Lunch**	
1320 – 1520	**Session B: Strategies to make influenza a priority in countries** **Chair: Kedar Baral,** Nepal MoH	
1320 – 1340	Global influenza strategy	**Wenqing Zhang,** WHO HQ
1340 – 1400	Investing in pandemic preparedness through APSEDIII	**Masaya Kato,** WPRO
1400 – 1420	Pandemic Influenza Preparedness Framework (PIP): Introducing HLIP-II	**Gina Samaan,** WHO HQ
1420 – 1435	Progress of influenza surveillance in Timor-Leste	**Maria Angela Varela Niha,** Timor-Leste MoH
1435 - 1450	Pandemic influenza preparedness in Mongolia	**Darmaa Oyungerel,** Mongolia MoH
1450 – 1510	Discussion	
1000 – 1020	**Coffee Break**	
1530 – 1700	**Session C: Supporting the introduction of influenza vaccines** **Chair: Joe Bresee,** US CDC	
1530 – 1550	Introducing and expanding a seasonal influenza vaccine programme	**Joseph Bresee,** US CDC
1550 – 1600	Augmenting national regulatory capacity to support pandemic preparedness	**Jinho Shin,** WPRO
1600 – 1700	Roundtable: Strong seasonal influenza programmes as a foundation for vaccine policy, vaccine use, and effective pandemic response	**Joseph Bresee,** US CDC **Aung Myat Htay,** Myanmar MoH **Ramsha Abdul Sattar,** Maldives MoH **Nyamkhuu Dulmaa,** Mongolia MoH **Suthanun Suthachana,** Thailand MoH
1900 – 2100	**Reception, hosted by the Ministry of Health, Nepal**	

Time	Topic	Presenter
Day 2: Thursday, 12 July 2018		
0830 – 0845	**Recap of Day 1**	**Supriya Bezbaruah**
0845 – 1050	**Session D: Influenza Pandemic Preparedness Planning: building capacity for pandemic response** **Chair: Roderico Ofrin,** SEARO	
0845 – 0900	Pandemic planning: public health emergency preparedness	**Erica Dueger,** IHM, WPRO
0900 – 0915	Pandemic Influenza Risk and Impact Management (PIRM): building sustainable and resilient capacity for pandemic response	**Weigong Zhou,** WHO HQ
0915 – 0930	Introduction to the Pandemic Influenza Severity Assessment (PISA) tool	**Kaat Vandemaele,** WHO HQ
0930 – 0945	2017 pandemic influenza preparedness exercise – incorporating whole of government approach	**Karnely Helena,** Indonesia MoH
0945 – 1000	Simulation exercises – assuring a whole of society approach	**Seng Heng,** Cambodia MoH
1000 – 1020	Pandemic Emergency Financing Facility	**Manav Bhattarai,** World Bank
1020 – 1050	Discussion	
1050 – 1110	**Coffee Break**	
1110 – 1310	**Session E: Group Work - National Pandemic Preparedness Planning** **Chair: Aalisha Sahukhan,** Fiji MoH	
1110 – 1120	Essential capacities in pandemic preparedness planning - an overview of the WHO checklist	**Weigong Zhou,** WHO HQ
1120 – 1125	Introduction to the breakout session (objectives, expected outcomes, grouping, etc.)	**Hitesh Chugh,** WPRO
1125 – 1230	Group discussions: Pandemic Influenza Risk and Impact Management: ■ Roles of NICs (Group 1) ■ Surveillance, risk assessment and rapid response (Group 2) ■ Seasonal influenza vaccine programme and pandemic vaccine readiness (Group 3)	**WHO resources persons:** Group 1: **Karen Nahapetyan, Sabrina Flora, Wenqing Zhang** Group 2: **Reuben Samuel, Masaya Kato, Kaat Vandemaele** Group 3: **Jinho Shin, Erica Dueger, Alba Vilajeliu, Isabel Bergeri**

Time	Topic	Presenter
1230 – 1245	Plenary feedback (5 min for each group)	
1245 – 1310	Plenary discussion	**Session Chair**
1310 – 1410	**Lunch**	
1410 – 1530	**Session F: Laboratory** **Chair: Takato Odagiri,** NIID	
1410 – 1430	New terms of reference and performance review for NICs	**Wenqing Zhang,** WHO HQ
1430 – 1445	Update on the RT-PCR Global EQAP	**Janice Lo,** Hong Kong MoH
1445 – 1500	How genetic sequence data informs us on influenza	**Naomi Komadina,** VIDRL
1500 – 1515	Real-time RT-PCR support strategies and updates	**Steve Lindstrom,** US CDC
1515 – 1530	The risk based approach to biosafety and biosecurity and the new WHO Laboratory Biosafety Manual	**Karen Nahapetyan,** WPRO
1530 – 1550	**Coffee Break**	
1530 – 1550	**Parallel Session G1: Reporting and using Data** **Chair: Dr Agustiningsih,** Indonesia MoH	
1550 – 1600	Optimizing Event Based Surveillance	**Serge Nzietchueng,** WPRO
1600 – 1610	One Health collaborations in influenza, Myanmar	**Ni Ni Aung, LBVD,** Myanmar
1610 – 1620	Event based reporting – Vietnam's experience	**Nguyen Vu Thuong,** Vietnam MoH
1620 – 1630	Discussion	
1630 – 1640	FluMart and other online WHO Tools	**Bikram Maharjan,** WHO HQ
1640 – 1650	Preparing a flu report – Sri Lanka's experience	**Jude Jayamaha,** Sri Lanka MoH
1650 – 1700	Preparing a flu report –Hong Kong's experience	**Janice Lo,** Hong Kong SAR MoH
1700 – 1710	Large seasonal outbreak of influenza – Maldives, 2017	**Ramsha Abdul Sattar,** Maldives MoH
1710 – 1720	Discussion	

Time	Topic	Presenter
1550 – 1700	**Parallel Session G2: Laboratory: Shipping of Specimens** **Chair: Dr Ravindran Thayan,** Malaysia MoH	
1550 – 1600	Introduction of the topic	**Karen Nahapetyan,** WPRO
1600 – 1640	Specimen shipping: barriers, challenges, and solutions	**Facilitators:** **Ian Barr,** VIDRL **Steve Lindstrom,** US CDC
1640 - 1700	Plenary discussion	
1730 – 1830	**Computer Setup for PISA Training** **Tomàs Vega Alonso,** Spain MoH; **Hitesh Chugh,** WPRO; **Bikram Maharjan,** WHO HQ For Epidemiologists and WHO Country Office representatives	
Day 3, Friday, 13 July		
0800 – 0815	**Recap of Day 2**	**Supriya Bezbaruah**
0815 – 0930	**Session H: Practical Issues Around Virus Sharing (Roundtable and Floor Discussion)** **Chair: Ian Barr,** VIDRL	
0815 – 0825	Virus Sharing	**Wenqing Zhang,** WHO HQ
0825 – 0835	Presentation of the findings from Laboratory parallel session	**Rapporteur from Session G2**
0830 – 0850	Short introduction by panel members	**Wenqing Zhang,** WHO HQ **Bishnu Upadhyay,** Nepal MoH **Dorji Wangchuk,** Bhutan MoH **Dr Chen Tao,** China MoH **Le Thi Quynh Mai,** Viet Nam MoH
0850 – 0930	Discussion	
0930 – 1000	**Session I: Modular Training Tools for Pandemic Preparedness** **Chair: TBD**	
0930 – 0950	Modular training tools for pandemic preparedness	**Josh Mott,** US CDC / Thailand
0950 – 1000	Discussion	

Time	Topic	Presenter
1000 – 1100	**Closing Session** Conclusions / Recommendations Closing remark by Dr. Dr Runa Jha, Ag Director National Public Health Laboratory Statement of thanks by SEAR and WPR leads	
1100 – 1120	**Coffee Break**	
POST NIC SESSIONS		
1200 – 1700	**Group 1 – EPIDEMIOLOGY – PISA Training**	
1200 – 1300	Brown bag lunch – PISA overview Open to all NIC participants who are not going to the Group 3 tour	
1300 – 1700	PISA Training	**Tomàs Vega Alonso,** Spain MoH **Kaat Vandemaele,** WHO HQ
1200 – 1430	**Group 2 – LABORATORY - GISAID Training**	
1200 – 1300	Lunch	
1300 – 1430	GISAID Training	**Naomi Komadina,** VIDRL
1200 – 1600	**Group 3 – TOURS OF NIC / Patan Academy** **(Limited to 30 participants) Presentation of Vet Disease Laboratory at NIC / Patan** Lunch provided on the bus (Lunchbox)	

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