World Health Organization
REGIONAL OFFICE FOR THE Eastern Mediterranean

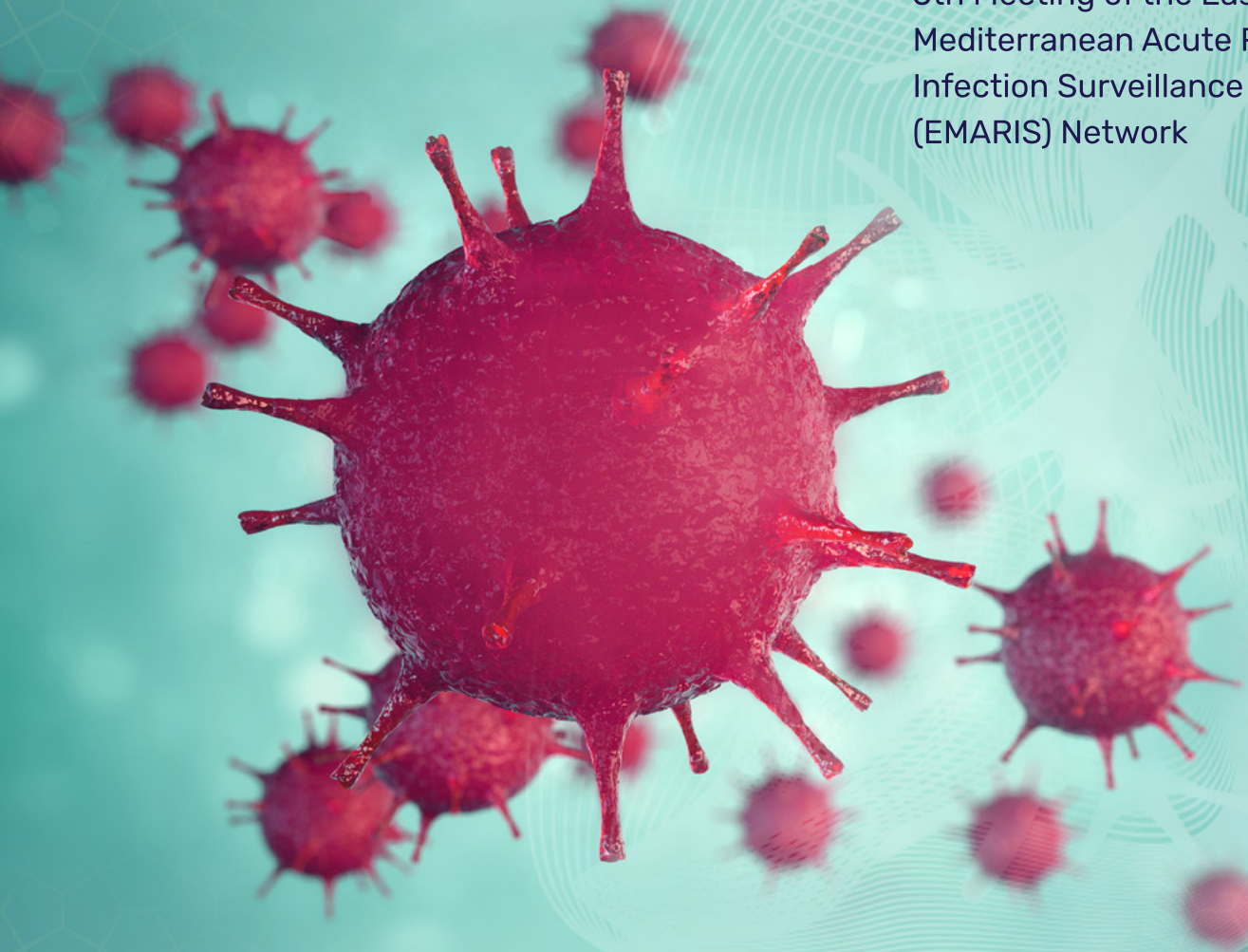
Second Scientific Conference

EMARIS 2019

Casablanca, Morocco
12-15 November

2nd Scientific Conference on Acute Respiratory Infection in the Eastern Mediterranean Region

5th Meeting of the Eastern Mediterranean Acute Respiratory Infection Surveillance (EMARIS) Network



Better Data. Better Policy. Better Action. | emarisconference.org

Organized by the Infectious Hazard Preparedness unit in the Health Emergencies Programme of the WHO Regional Office for the Eastern Mediterranean

CDC Centers for Disease Control and Prevention | OMJ Oman Medical Journal | وزارة الصحة Ministère de la Santé

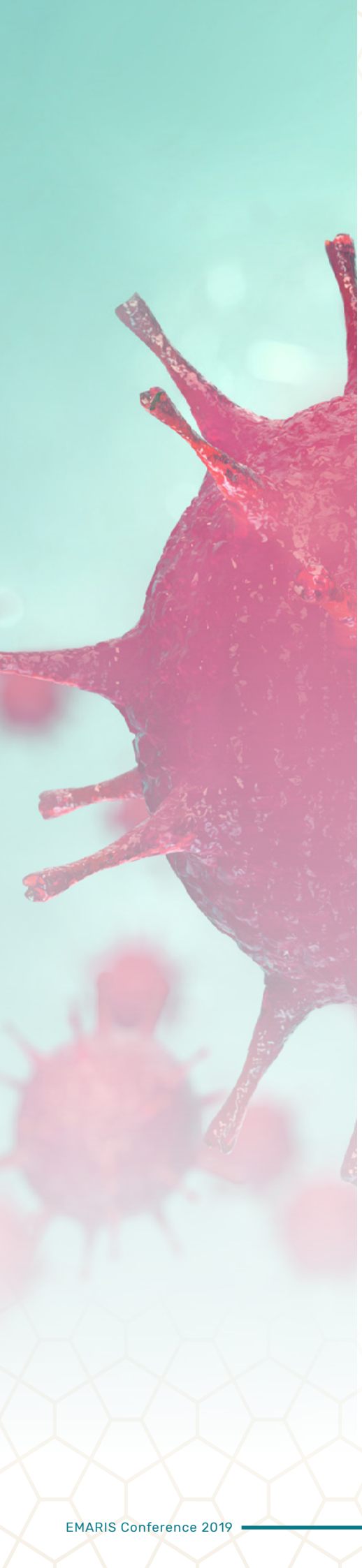


Table of contents

Message from

DR AHMED AL MANDHARI
REGIONAL DIRECTOR, WHO EASTERN MEDITERRANEAN REGION

to the

SECOND SCIENTIFIC CONFERENCE ON ACUTE RESPIRATORY INFECTION IN THE EASTERN MEDITERRANEAN REGION

AND

FIFTH MEETING OF THE EASTERN MEDITERRANEAN ACUTE RESPIRATORY INFECTION SURVEILLANCE (EMARIS) NETWORK

Casablanca, Morocco, 12–15 November 2019

Dear Colleagues, Ladies and Gentlemen,

Welcome to this meeting organized by the World Health Organization's Regional Office for the Eastern Mediterranean in collaboration with the Ministry of Health of Morocco, to whom I extend special thanks for hosting this meeting. I also wish to thank participants from ministries of health in our Region, representatives from our partner agencies, especially the United States Centers for Disease Control and Prevention and the Food and Agriculture Organization of the United Nations, and WHO staff present here today.

The Eastern Mediterranean Acute Respiratory Infection Surveillance network (EMARIS) constitutes a group of countries working together to enhance surveillance of acute respiratory infections, particularly influenza. The network aims to improve the use of surveillance data to strengthen disease control programmes and conduct research related to influenza and other respiratory pathogens, in particular Middle East respiratory syndrome coronavirus (MERS-CoV). During this fifth meeting of the network, experts will share experiences and discuss ways to enhance and sustain epidemiological and virological surveillance systems for influenza and other emerging respiratory viruses using a standardized approach. Your presence here demonstrates your strong commitment to the further development of these systems and demonstrates the importance of this biennial event.

This year's EMARIS meeting coincides with the Second Scientific Conference on Acute Respiratory Infections, for which we are joined by experts and aspiring young researchers working to tackle these diseases. The theme of the meeting, "Better Data. Better Policy. Better Action", reflects the recommendations of the previous EMARIS meeting, which highlighted the importance of linking surveillance findings with public health policies so that plans and interventions are based on solid evidence.

Esteemed Colleagues,

We look forward to learning about your latest research findings in the areas of surveillance, transmission risk factors, disease burden and medical countermeasures against influenza and other emerging respiratory infections. The contribution of your institutions to this area of work will address knowledge gaps and help us identify solutions to prevent, detect and respond to seasonal, novel and other emerging respiratory viruses.

The coming four days provide an excellent opportunity to document success stories from those countries that have achieved good quality epidemiological and virological influenza surveillance. In recent years, the capacity of Member States in the Region to detect, prepare for and respond to pandemic influenza has been enhanced through the Pandemic Influenza Preparedness (PIP) Framework. We need to build consensus and further increase our understanding of how to improve the monitoring and early detection of novel influenza and other emerging respiratory disease infections. Moreover, knowledge gaps related to prevention, detection and response to influenza and other respiratory diseases should be identified, and relevant research topics should be selected for implementation. It is a major achievement that over 170 scientific abstracts were submitted to the conference – clear evidence that influenza and emerging respiratory disease research has become a significant research topic of interest within the Region. The workshops organized during this event will help our young researchers enhance their knowledge and skills.

Distinguished Participants,

A hundred years have passed since the deadliest pandemic influenza outbreak in recorded history killed up to 50 million people. During the first two decades of the 21st century, the world was reminded that people in all countries and continents remain at risk from novel infectious respiratory diseases. Severe acute respiratory syndrome, or SARS, was not known before 2003, but more than 8000 people then became infected within a few months. The influenza pandemic of 2009 was created by a new influenza virus, H1N1, which spread to all continents in less than nine weeks. And in 2012, another new virus, MERS-CoV, first identified in Saudi Arabia, caused the MERS epidemic. These events show that the threat of emerging respiratory infections continues despite significant advances in vaccines, antivirals, antibiotics, diagnostics and therapeutic techniques.

We cannot predict when the next influenza pandemic will occur, but effective preparedness can mitigate its impact. I cannot emphasize strongly enough the importance of investing in pandemic preparedness and response capacities at national, regional and global levels. The Global Preparedness Monitoring Board has warned that governments and international organizations are not well prepared to deal with a major pandemic, including from influenza. However, with support from WHO and other partners, Member States in the Region have made significant efforts in the area of pandemic preparedness in recent years, and most now have functioning surveillance systems and pandemic influenza preparedness plans.
WHO has led the development of the Global Influenza Strategy for 2019 2030, which aims to protect people in all countries from the threat of influenza. The goals of the strategy are to prevent seasonal influenza, control the spread of influenza from animals to humans, and prepare for the next influenza pandemic. Identifying key strategic objectives and activities contributes to the overall improvement of IHR core capacities in protecting public health.

In the Eastern Mediterranean Region, WHO is developing a comprehensive and integrated regional strategic framework for the prevention and control of emerging and epidemic-prone infectious diseases. Pandemic influenza preparedness is a major component of the framework and I encourage Member States to adopt it and adapt its provisions to their local contexts, in coordination with the Regional Office and other stakeholders.
Dear Colleagues,

Let me again thank you all for attending this meeting. I am particularly grateful for the continued support of the United States' Centers for Disease Control and Prevention to enhance the influenza surveillance programme of our Region, and I also thank WHO's collaborating centres for their contributions to enhancing regional capacities for virological surveillance. Thank you to the speakers who will share their experience with us, the research presenters who will deliver oral and poster presentations of over 50 abstracts accepted by the conference, and the editorial board of the Oman Medical Journal for agreeing to publish the accepted abstracts in a special supplement.

Finally, I would like to thank the participants from our Member States. Your presence will enrich the discussions and lead to better planning and implementation of public health policies in your countries. And thanks again to the Ministry of Health of Morocco for hosting this event.
I wish you all a successful meeting and a comfortable stay in Morocco.

Welcome from the **EMARIS 2019 Planning Committee**

Dear Colleagues, Participants, and Partners,

We are pleased to welcome you to the fifth Eastern Mediterranean Acute Respiratory Infection Surveillance (EMARIS) meeting and the Second Scientific Conference on Acute Respiratory Infections (ARIs) organized by the World Health Organization Eastern Mediterranean Regional Office in collaboration with the Ministry of Health of Morocco.

During the current decade, EMARIS network meetings were held on regular basis, in order to share the best practices for influenza surveillance, track progress, and draw important lessons on public health preparedness for pandemic influenza. These meetings became a unique opportunity for networking and collaboration among regional and international scientists and other stakeholders.

In 2017, the First Scientific Conference on Acute Respiratory Infections in the Eastern Mediterranean Region was held simultaneously with the fourth EMARIS meeting. The conference aimed to give an opportunity to present research findings on the epidemiology, seasonality, and risk factors for influenza in the EMR. It represents a window to share up-to-date scientific information on influenza surveillance, burden, aetiology, and vaccination at national and regional levels.

In order to support the WHO Secretariat in organizing the Second Scientific Conference under the theme "Better Data. Better Policy. Better Action" and the fifth EAMRIS meeting; and based on the recommendations of the First EMARIS Conference, a multidisciplinary planning committee, composed of 13 members (Table 1), was established in January 2019.

The Planning Committee worked closely with EMRO team in different aspects including: the development of the conference's theme; choosing the nine thematic areas; meeting and conference formats including the expert presentations, abstract presentations and panel discussions; the skill-building workshops and their topics.

Committee members also contributed in nominating the conference abstracts reviewers, as well as, the key note and expert speakers. We tested the online abstract submission system and guidelines; promoted the conference within their networks; reviewed and validated EMARIS agenda; and suggested the nominees for different awards.

We are glad that in a very short time EMARIS Conference became considered a notable and unprecedented event in the EMR. EMARIS meetings, as well, have become a regional platform for promoting research and policy updates on respiratory infections particularly influenza. Therefore, we hope that all participants will arrive to Casablanca fully energized and excited to learn more about the tremendous progress regarding ARIs in the Eastern Mediterranean Region and are planning to contribute for making more of this progress. We challenge you to stretch your imagination and re-energize the plans for influenza preparedness in your country!

Welcome to EMARIS 2019 ...

On behalf of the Planning Committee
Dr Ehsan Mostafavi

EMARIS 2019
Planning Committee Members

Dr Aamer Ikram
Ms Ann Moen
Dr Ehsan Mostafavi
Dr Fatma Al-Yaqoubi
Dr Ghazi Kayali
Dr Hassan Zaraket
Dr Hicham Oumzil
Ms Kinda Zureick
Dr Majdouline Obtel
Dr Mohamed Elhakim
Dr Salah Al Awaidy
Dr Uzma Bashir
Dr Wafaa Al Hussaini

Message from the Oman Medical Journal

The Oman Medical Journal (OMJ) was established in 1984 and has been published under the umbrella of Oman Medical Specialty Board since 2007. Initially, we started with one issue a year, which later increased to four and now to six in 2011. OMJ currently publishes over 100 articles a year covering all aspects of medicine and healthcare. These are selected by our committed and multi-disciplinary Editorial Board members.

OMJ takes a no barriers approach to publishing and are proud to offer the journal free to all those who wish to read it and charge no publication fees to authors/researchers. The journal publishes a wide range of articles, including original research, reviews, case reports, and preliminary studies. We also publish editorials and letters intended to inform and spark debate about key medical issues. We do this to complement OMSB's mission to provide quality healthcare through quality medical education. As part of this commitment, we are listed and indexed in over 35 databases, and this number continues to grow.

On behalf of the entire OMJ team, thank you.

Professor Ibrahim Al-Zakwani
Editor-in-Chief
Oman Medical Journal

General Information

Registration and Information

Onsite registration begins at 8 AM on 12 November 2019 at the registration desk outside the conference hall

Conference Hall

The meeting and conference will be held in Grand Fes ballroom (1, 2, 3 in map)

Poster Exhibition Hall

Poster presentation exhibition will be held in rooms Rabat, Marrakesh, and Lewa (5, 6, 7 on map)

Setup posters | Wednesday 13 November 2019 from 08:00 to 17:00
Presentation | Thursday 14 November 2019 from 11:50 to 12:50

Workshops

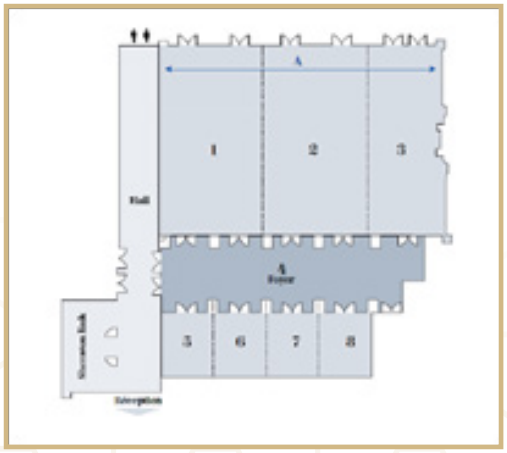
The workshops will be held on Wednesday 13 November from 16:15 to 18:15 in rooms:

- Fes I (1 on map) – Pandemic Preparedness in Fragile Contexts
- Fes II (2 on map) – Scientific Writing and Publishing
- Fes III (3 on map) – Outbreak investigation techniques and responses
- Tanger (9 on map) - Data Quality and Epidemiologic Analysis using EpiInfo
- Agadir (10 on map) – Increasing vaccine coverage: communication issues, best practices

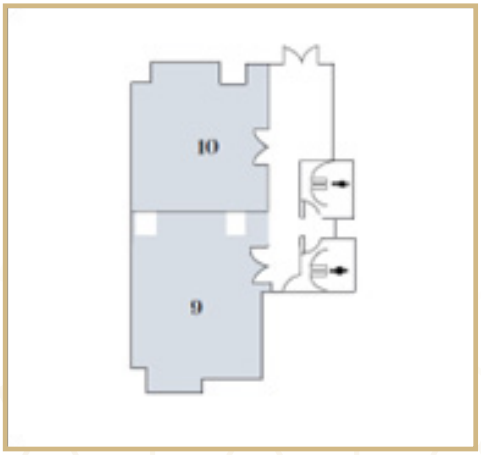
Floor Plans

Sheraton Casablanca Hotel & Towers

Floor plan for 1st floor



Floor plan for 3rd Floor



General Information

Printing

Limited printing and photocopying facilities are available. Please enquire with the registration team outside the conference hall.

Dinner

We welcome you to join us for dinner at the Dafra Restaurant on the evening of Tuesday 12 November 2019. The restaurant is located on the first floor of the hotel, behind the elevators.

Contact

For any other inquiries or support, please contact emrgoped@who.int

PROGRAMME

Programme

Tuesday, 12 November 2019

08:00 – 08:30	Registration
Opening Session	
08:30 – 09:30	**Message from WHO Regional Director** Dr Ahmed Al-Mandhari Regional Director of WHO Regional Office for the Eastern Mediterranean Dr Richard Brennan, Regional Emergency Director of WHO Regional Office for the Eastern Mediterranean Dr Daniel B. Jernigan, Director of the Influenza Division, National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention (CDC), Atlanta, United States Dr Maryam Bigdeli, WHO Representative, Morocco Ministry of Health, Morocco Dr Ehsan Mostafavi, member of the EMARIS Planning Committee Infectious Hazard Preparedness Work – Video Dr Abdinasir Abubakar, Acting Programme Area Manager, Infectious Hazard Preparedness, Health Emergencies Programme, WHO Regional Office for the Eastern Mediterranean

Session 1: Global influenza strategy: promoting "Better Data. Better Policy. Better Action."

Moderator: Richard Brennan, Regional Emergency Director of WHO/EMRO

09:30 – 09:45	The Global Influenza Strategy: Preparing the World for the Next Pandemic Ann Moen, Chief, Influenza Preparedness and Response, Health Emergencies Programme, WHO/HQ
09:45 – 10:00	Current challenges in influenza prevention and control Daniel B. Jernigan, Director of the Influenza Division, National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention (CDC), Atlanta, United States
10:00 – 10:15	Epidemiological and Virological Characteristics of Influenza in the Eastern Mediterranean Abdinasir Abubakar, Acting Programme Area Manager, Infectious Hazard Preparedness, Health Emergencies Programme, WHO Regional Office for the Eastern Mediterranean

Programme

Tuesday, 12 November 2019	
10:15 – 10:45	Group Photo and Coffee Break
10:45 – 11:00	Update on the current global and regional status of seasonal, avian and other novel influenza virus subtypes Rodney S Daniels, Deputy Director of the WHO Collaborating Centre for Reference and Research on Influenza at the Francis Crick Institute, United Kingdom
11:00 – 11:15	Global Influenza Surveillance and Response System (GISRS): Successes and solutions since 1952 Wenqing Zhang, Manager, Global Influenza Program, Influenza Preparedness and Response, Infectious Hazard Management, Health Emergency Program, WHO/HQ
11:15 – 11:30	Influenza preparedness and response in countries with complex emergencies: What needs to be done? Sk Md Mamunur Malik, WHO Representative, Somalia
11:30 – 11:45	International Influenza Program: CDC's Changing Landscape Kinda Zureick, Public Health Adviser, Influenza Division, National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention (CDC), Atlanta, United States
11:45 – 12:15	**Panel discussion:** Reducing the threat of seasonal and pandemic influenza: where do we stand in the Eastern Mediterranean Region? Moderator: Richard Brennan Panellists: Ann Moen, Daniel Jernigan, Wenqing Zhang, Sk Md Mamunur Malik, Abdinasir Abubakar
12:15 – 13:15	Coffee Break
13:15 – 14:15	**Oral Abstract Presentations**
Moderator:	Muhammad Safdar, Chief of Field Epidemiology and Disease, Surveillance Division, Ministry of National Health Services, Regulations and Coordination, Pakistan
	Factors associated with lower respiratory tract infections among children in a tertiary care hospital Rawalpindi, Pakistan, 2018-19 – a case control study Asim Minallah, Field Epidemiology and Lab Training Program, Pakistan Influenza morbidity and mortality in Tunisia, 2017-2018 Hind Bouguerra, National Observatory of New and Emerging Diseases, Tunisia Influenza epidemic with high mortality during winter months - Yemen, 2018-2019 Mohamed Al Amad, Field Epidemiology Training Program, Yemen

Programme

Tuesday, 12 November 2019

13:15 – 14:15	**Oral Abstract Presentations (cont.)** Quantitative assessment of severe acute respiratory infection surveillance database, Lebanon, 2018 Nada Ghosn, Ministry of Public Health, Lebanon Epidemiology of Influenza among patients with influenza-like illness and severe acute respiratory illness in Pakistan: a 10-year surveillance study 2008-17 Nadia Nisar, National Institute of Health, Pakistan
14:15 – 14:30	Coffee Break

Session 2: Influenza dynamics and characteristics in the Eastern Mediterranean Region (Part I)

Moderator: Wenqing Zhang, Manager, Global Influenza Programme, WHO/HQ

14:30 – 14:45	The Virological Surveillance of Influenza from the Country, to the Region, to the World John W McCauley, Director of the WHO Collaborating Centre for Reference and Research on Influenza at the Francis Crick Institute, United Kingdom
14:45 – 15:00	Detection and Characterization of Epidemic and Zoonotic Influenza Viruses David Wentworth, Chief of the Virology, Surveillance, and Diagnosis Branch, Influenza Division, Centers for Disease Control and Prevention (CDC), Atlanta, United States
15:00 – 15:15	External quality assessments program for Influenza: Achievements and challenges for Eastern Mediterranean Countries Amal Barakat, Laboratory Technical Officer, Infectious Hazard Management, Department of Health Emergencies, WHO Eastern Mediterranean Regional Office
15:15 – 15:30	Improving virological surveillance for influenza: The role of the new National Influenza Centre in Palestine Ibrahim Salem, Director of Central Public Health Laboratory and National Influenza Center, Ministry of Health, Palestine
15:30 – 15:45	Are the testing algorithms currently in NIC Oman capable of detecting emerging and variant influenza viruses? Amina Al Jardani, Director of National Influenza Center, Oman
15:45 – 16:15	**Panel discussion: How emerging technologies can enhance surveillance and our understanding of influenza?**
Moderator:	Wenqing Zhang, Manager, Global Influenza Programme, WHO/HQ
Panellists:	David Wentworth, John McCauley, Rodney S Daniels, Amal Barakat, Amina Al Jardani

Programme

Tuesday, 12 November 2019

19:00 – 21:00 **Evening Reception**

Moderator: Ibrahim El-Kerdany, WHO/EMRO

Welcome
Abdinasir Abubakar, Acting Programme Area Manager, Infectious Hazard Preparedness, Health Emergencies Programme, WHO Regional Office for the Eastern Mediterranean

Keynote speech: Addressing the public health threat of emerging infectious diseases: what needs to be done in Eastern Mediterranean Region?

Dr Richard Brennan, Regional Emergency Director of WHO Regional Office for the Eastern Mediterranean

Dr Daniel B. Jernigan, Director of the Influenza Division, National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention (CDC), Atlanta, United States

Vote of Thanks
Maryam Bigdeli, WHO Representative, Morocco

Dinner

Programme

Wednesday, 13 November 2019

Session 2: Influenza dynamics and characteristics in the Eastern Mediterranean Region (Part II)

Moderator: Omar Ramadan Elahmer, Head of Public Health Laboratory, Ministry of Health, Libya

09:00 – 10:00	**Oral Abstract Presentations** Genetic characterization of influenza viruses circulated in Oman during 2018-2019 winter season Samira Al Mahrouqi, Central Public Health Laboratories, Oman Detection of non-influenza related viral respiratory infections among returning hajj pilgrims, Iran 2017 Kaveh Sadeghi, Tehran University of Medical Sciences, Iran Contribution of non- influenza respiratory viruses during influenza epidemic using influenza surveillance platform: experience from Pakistan Hamza Mirza, National Institute of Health, Pakistan Detection and characterization of influenza virus from influenza-like illness cases in the private and public sentinel networks during the 2016-2019 influenza seasons in Morocco Hicham Oumzil, National Institute for Hygiene, Morocco Frequent detection of enterovirus d68 and rhinovirus type C in children with acute respiratory tract infections Farhad Rezaei, Tehran University of Medical Sciences, Iran
10:00 – 10:30	Coffee Break

Session 3: Estimating influenza burden: evidence-informed public health policy making for prevention and control of influenza

Moderator: Mahmood Nabavi, Technical Deputy, Centers of Diseases Control and Prevention, Ministry of Health and Medical Education, Tehran, Iran

10:30 – 10:45	FLUNET/FluMart/FluID/EMflu Reporting Platforms Maja Lièvre, Technical Officer, Infectious Hazard Management, WHO/HQ
10:45 – 11:00	Estimating national influenza burden: what is the situation in the Eastern Mediterranean region? Amgad Elkholy, Medical Officer, Infectious Hazard Management, Department of Health Emergencies, WHO/EMRO

Programme

Wednesday, 13 November 2019

Session 3: Estimating influenza burden: evidence-informed public health policy making for prevention and control of influenza (cont.)

11:00 – 11:15	Impact Modelling: Determining Illness and Death Averted from Seasonal Influenza Eduardo Azziz-Baumgartner, Team Lead for the International Epidemiology and Research Team in the Epidemiology and Prevention, Branch of the Influenza Division, Centers for Disease Control and Prevention (CDC), Atlanta, United States
11:15 – 11:30	Use of PISA in seasonal epidemics/ PISA threshold setting Katelijn Vandemael, Medical Officer, Global Influenza Program, WHO/HQ
11:30 – 11:45	Measuring the Cost of Seasonal Influenza for Policy Decision Making Bill Davis, Epidemiologist, Influenza Division, Centers for Disease Control and Prevention (CDC), Atlanta, United States
11:45 – 12:30	**Oral Abstract Presentations**
Moderator:	Leila Bouabid, Deputy Director, National Observatory of New and Emerging Diseases, Ministry of Health, Tunisia
	Estimation proportion of SARI cases attributable to influenza, Jordan, from 2015 SARI sentinel sites data Nasha'at Ta'anni, Ministry of Health, Jordan Influenza epidemiology and risk factors for severe acute respiratory infection in Morocco, 2014-2019 Hind Ezzine, Ministry of Health, Morocco Influenza a (H1N1) and influenza B among pilgrims attending Al-Mashaer hospitals in the hajj period of 1440 (2019) Ahmad Alowfi, Field Epidemiology Training Program, Saudi Arabia
12:30 – 13:00	**Panel discussion: How can burden data be utilized to advocate for better pubic health policies on influenza prevention and control?**
13:00 – 14:00	Lunch

Programme

Wednesday, 13 November 2019

Session 4: Investigating influenza and other respiratory diseases: Leveraging the existing outbreak investigation and response structure

Moderator: Abdulkader Wehliye Afrah, Director of Medical Services, Ministry of Health and Human Services, Somalia

14:00 – 14:15	Regional Capacity for Timely Outbreak Investigation and Response: The role of Rapid Response Teams Evans Buliva, Technical Officer, Infectious Hazard Management, Department of Health Emergencies, WHO/EMRO
14:15 – 14:30	Saudi FETP experience in investigating MERS outbreak Sami Almudarra, General Supervisor of Saudi Field Epidemiology Training Program and Executive Director of Surveillance and Preparedness, Saudi Center for Disease Control and Prevention (SCDC), Saudi Arabia
14:30 – 14:45	Morocco experience with influenza upsurge in 2018/19 season Mohamed Youbi, Medical Epidemiologist, Director of Epidemiology & Diseases Control, Ministry of Health, Morocco
14:45 – 15:00	Integrated human–animal surveillance and outbreak investigation and response: Egypt experience in an avian influenza outbreak Amira Abdelnabi, Consultant, One Health and risk assessment, FAO/ECTAD
15:00 – 15:15	**Oral Abstract Presentations**

Moderator: Abdulkader Wehliye Afrah, Director of Medical Services, Ministry of Health and Human Services, Somalia

MERS-CoV outbreak in Wadi Aldawasir general hospital's renal dialysis unit, 2017
Nada Saeed AlGhawi, Field Epidemiology Training Program, Saudi Arabia

15:15 – 15:45 Panel discussion: Do countries in the region have adequate capacities to investigate and respond to potential novel influenza and other respiratory disease outbreaks?

Moderator: Abdulkader Wehliye Afrah, Director of Medical Services, Ministry of Health and Human Services, Somalia

Panellists: Evans Buliva, Sami Almudarra, Mohamed Youbi, Amira Abdelnabi, Rana Jawad Asghar

15:45 – 16:15 Coffee Break

Programme

Wednesday, 13 November 2019	
16:15 – 18:15	**Skill-building Workshops**
	Pandemic Preparedness in Fragile Contexts Abrar Chughtai, School of Public Health and Community Medicine, University of New South Wales, Australia Zahra Ahmed, Health Promotion and Education Unit, WHO Regional Office for the Eastern Mediterranean Scientific Writing and Publishing Farhad Handjani, President, Eastern Mediterranean Association of Medical Editors (EMAME) Data Quality and Epidemiologic Analysis using EpiInfo Mohammed Lamtahri, Division of Health Informatics and Surveillance (DHIS), Centers for Disease Control and Prevention (CDC), Atlanta, United States Increasing vaccine coverage: communication issues, best practices Joseph Bressee, Associate Director for Global Health, Influenza Division, Centers for Disease Control and Prevention (CDC), Atlanta, United States Outbreak investigation techniques and responses Bill Davies, Epidemiologist, Influenza Division, Centers for Disease Control and Prevention (CDC), Atlanta, United States

Programme

Thursday, 14 November 2019

Session 5: Closing the knowledge gaps to advance prevention and control measures of MERS and other emerging respiratory infections

Moderator:	Rana Hajjeh, Director of Programme Management, WHO/EMRO
09:00 – 09:15	Public Health Response to MERS: Saudi Arabia Experience Abdullah Assiri, Assistant Deputy Minister of Health, Ministry of Health, Saudi Arabia
09:15 – 09:30	Middle East Respiratory Syndrome (MERS-CoV): Global perspective Maria Van Kerkhove, Scientist, Infectious Hazard Management, Department of Health Emergencies, World Health Organization
09:30 – 09:45	Progress of fulfilling knowledge gaps on MERS Malik Peiris, Professor and Chair, Division of Public Health Laboratory Sciences, School of Public Health at The University of Hong Kong
09:45 – 10:00	WHO Global RSV surveillance – an update Wenqing Zhang, Manager, Global Influenza Programme, WHO/HQ
10:00 – 10:15	Beyond influenza: epidemiology of RSV, adenovirus and enterovirus D68 Holly Biggs, Medical Epidemiologist, Respiratory Viruses Branch, Centers for Disease Control and Prevention (CDC), Atlanta, United States
10:15 – 10:30	Coffee Break
10:30 – 11:20	**Oral Abstract Presentations**
Moderator:	Badar Saif Nasser Al-Rawahi, Director of Communicable Disease Department, Ministry of Health, Muscat, Oman
	Surveillance and testing for Middle East Respiratory Syndrome Coronavirus (MERS-CoV), Saudi Arabia, March 2016 – March 2019 Abdullah Al Zahrani, Ministry of Health, Saudi Arabia
	Evidence of zoonotic MERS-CoV infection among a high-risk population in Morocco Anass Abbad, Institut Pasteur, Morocco
	MERS-CoV outbreak within health care setup the first report of nosocomial transmission in Oman Amal Al-Maani, Ministry of Health, Oman
	Qatar experience on one health approach for Middle East respiratory syndrome coronavirus, 2012–2017: a viewpoint Elmoubasher Farag, Ministry of Public Health, Qatar

Programme

Thursday, 14 November 2019

11:20 – 11:50 **Panel discussion: How do we leverage the existing influenza surveillance infrastructure with other emerging respiratory diseases?**

Moderator: Ann Moen, Chief Influenza Preparedness and Responses, WHO/HQ

Panellists: Abdullah Assiri, Maria Van Kerkhove, Malik Peiris, Holly Biggs, Wenqing Zhang

11:50 – 12:50 **Poster Presentations**

Influenza Epidemiological Surveillance

BOARD 1: Analysis of risk factors for influenza in severe acute respiratory infection (SARI) cases in Tunisia, 2015-2018
Rihab Yazidi, Pasteur Institute of Tunis, Tunisia

BOARD 2: Epidemiology and associated factors of severity of pneumonia among under five children in north of Afghanistan 2018: experiences from a chronic conflict setting
Mohammad Hafiz Rasooly, Ministry of Public Health, Afghanistan

BOARD 3: Epidemiology of influenza associated lower respiratory tract infections, 10-years results of sentinel severe acute respiratory infections surveillance, Egypt, 2010- 2019.
Manal Fahim, Ministry of Health and Population, Egypt

BOARD 4: Evaluation of SARI surveillance system in Kuwait
Mariam Al-Mansoori, Ministry of Health, Kuwait

BOARD 5: Evaluation of the influenza sentinel surveillance system, Morocco, 2007-2019
Ahmed Rguig, Ministry of Health, Morocco

BOARD 6: Influenza-associated severe acute respiratory infections among children under five years old in Morocco from September 2017 to March 2019
Zakia Regragui, National Institute for Hygiene, Morocco

BOARD 7: Nutritional factors of acute respiratory infections among children under five years of age in rural Islamabad
Mir Bullo, Federal General Hospital, Pakistan

BOARD 8: Review of surveillance system for influenza like illness and sever acute respiratory infection in State of Palestine for influenza season 2018/ 2019
Diaa Hjaija, Ministry of Health, Occupied Palestinian Territory

BOARD 9: Sentinel surveillance of severe acute respiratory infections (SARI) caused by influenza viruses in Qatar, 2017-2018
Shazia Ahmed, Ministry of Public Health, Qatar

BOARD 10: Severe acute respiratory infections of viral origin in Moroccan medical ICU: incidence, predictive and prognostic factors
Tarek Dendane, University of Mohamed V Souissi, Morocco

Programme

Thursday, 14 November 2019

11:50 – 12:50 Poster Presentations (cont.)

Influenza Virological Surveillance

BOARD 11: Respiratory disease surveillance and laboratory capacity at national influenza center (NIC), Lebanon, 2015-2019: results and achievements
Nisrine Jammal, Rafic Hariri University Hospital, Lebanon

Influenza Disease Burden

BOARD 12: Clinical Presentation of Influenza Among children admitted in Mohammed Alamin Hamid Paediatrics Hospital- 2017
Hamedna Elseed Ali Mohammed, Ministry of Health, Sudan

BOARD 13: Description of epidemic severe influenza A(H1N1)pdm09 virus circulated in Tunisia in 2017-2018 season
Salma Abid, National Influenza Center, Tunisia

Outbreak Investigation and Response

BOARD 14: Linking Bioinformatics to epidemiological in outbreak investigation of influenza Respiratory infection, integrating Molecular Technologies into Public Health
Hamid Yahya, Dubai Health Authority, United Arab Emirates

MERS-CoV and other Emerging Respiratory Infections

BOARD 15: Middle East respiratory syndrome coronavirus (MERS-CoV) testing in Qatar: preliminary study
Mohamed Ali Ben Hadj Kacem, Hamad Medical Corporation, Qatar

BOARD 16: No MERS-V but human rhinovirus and respiratory syncytial virus in Iranian pilgrims in 2015 and 2017
Jila Yavarian, National Influenza Center, Iran

BOARD 17: Outbreak of Middle East Respiratory Syndrome in Wadi AlDawasir City, Saudi Arabia, 2019
Fatimah Alghawi, Field Epidemiology Training Program, Saudi Arabia

Biosafety and Biosecurity

BOARD 18: Assessment of disaster health management system Of Kasserin regional hospital 2018
Moncef Mhamdi, Ministry of Health, Tunisia

BOARD 19: Multilateral collaboration towards the implementation of biorisk management program in Libyan universities: promoting one health concept
Omar Elahmer, Ministry of Health, Libya

Influenza at the Human-Animal Interface

BOARD 20: Characterization of avian influenza viruses in poultry: Results from Egypt epidemiological surveillance, 2016-2018
Heba Ahmed Hosni, Ministry of Agriculture and Land Reclamation, Egypt

12:50 – 13:30 Lunch

Programme

Thursday, 14 November 2019

Session 6: Curbing influenza burden through promoting vaccination of high-risk groups

Moderator: Hadeel Nazieh Al Sayeh, Director, Communicable Diseases Directorate, Ministry of Health, Amman, Jordan

13:30 – 13:45	Expanding Influenza Vaccination in the Eastern Mediterranean Region: challenges, opportunities and lessons learned Joseph Bressee, Associate Director for Global Health, Influenza Division, Centers for Disease Control and Prevention (CDC), Atlanta, United States
13:45 – 14:00	Improving influenza vaccine introduction and uptake for Hajj and Umrah visitors: successes and challenges. Abdullah Assiri, Assistant Deputy Minister for Preventive Health, Ministry of Health of Saudi Arabia
14:00 – 14:15	CDC's support of vaccine policy and evidence base development Margaret McCarron, Epidemiologist for Global Health, Influenza Division, Centers for Disease Control and Prevention (CDC), Atlanta, United States
14:15 – 14:30	Tailoring influenza immunization programs to improve vaccine coverage: examples from the WHO European Region Sonja Olsen, Technical Officer, High Threat Pathogens Team, Division of Health Emergencies and Communicable Diseases, Infectious Hazard Management, WHO/EURO
14:30 – 14:45	Implementing successful seasonal influenza vaccine among HCW: lessons learned and challenges Hassan Zaraket, Assistant Professor, Department of Experimental Pathology, Immunology & Microbiology, Member of Center for Infectious Diseases Research, Faculty of Medicine, American University of Beirut, Beirut, Lebanon
14:45 – 15:00	Strategies to increase seasonal influenza vaccine uptake and utilization: Oman experience Fatma Al-Yaqoubi, Head of National TB and Acute Respiratory Disease Section, Department of Communicable Diseases, Ministry of Health, Oman

Programme

Thursday, 14 November 2019	
15:00 – 15:50	**Oral Abstract Presentations**
Moderator:	Amjad Ghanem Mohamed, Chief of Public Health Laboratory, National Influenza Center, Ministry of Health, Bahrain
	Seasonal influenza vaccination coverage among healthcare workers in the Eastern Mediterranean Region: Meta-analysis Mohamed Farouk Allam, Ain Shams University, Egypt
	Influenza vaccination among healthcare workers: vaccine coverage and reasons for non-compliance to vaccination, El Mahalla El Kubra, Gharbia Governorate, Egypt 2018 Shereen Elghazaly, Ministry of Health and Population, Egypt
	Seasonal influenza vaccination: knowledge, attitudes and behaviors in pregnant women - Morocco, 2018 Loubna Alj, Centre Anti Poison et de Pharmacovigilance du Maroc, Morocco
	Evolutionary analysis of influenza B lineages in Pakistan 2011–2019; surveillance to evaluate vaccine effectiveness Nazish Badar, National Institute of Health, Pakistan
15:50 – 16:15	**Panel discussion: Improving influenza vaccine introduction and uptake in the region: Do we need a new strategy to reach the target and manage the challenges?**
	Moderator: Hadeel Nazieh Al Sayeh Panellists: Joseph Bressee, Hassan Zaraket, Fatma Al-Yaqoubi, Abdullah Assiri, Sonja Olsen
16:15 – 16:30	Coffee Break

Session 7: The evolving global landscape of biosafety and biosecurity: where we stand as a region	
Moderator:	Sarah Jassem Al Qabandi, Director, Public Health Laboratories, Kuwait
16:30 – 16:45	The revised WHO laboratory biosafety manual: a new direction Uzma Bashir, Technical Officer Laboratory, WHO Country Office Pakistan
16:45 – 17:00	Pakistan experience in establishing an effective biosafety and biosecurity system in the context of global health security Aamer Ikram, Executive Director, National Institute of Health, Islamabad, Pakistan
17:00 – 17:15	Moroccan Experience in Implementing Biosafety and Biosecurity in Public Health Laboratories of Ministry of Health Rhizlane Selka, Head of Bureau des Laboratoires, Biosafety Officer, Institut National d'Hygiene, Rabat, Morocco

Programme

Thursday, 14 November 2019	
17:15 – 17:45	**Oral Abstract Presentations**
Moderator:	Ghada Ghaleb Flaieh, Specialist Bacteriology, Head of the Central Public Health Laboratory, Ministry of Health, Baghdad, Iraq
	Assessment of the compliance of the National Influenza Center (Morocco) to the biorisk management standards of the CWA 15793 :2011 Hassan Ihazmade, National Institute for Hygiene, Morocco
	The role of biorisk department in improving biosafety and biosecurity in department dealing with infectious disease Siza Obied Mukhtar, National Public Health Laboratory, Sudan
	Establishing a biosafety level III laboratory in Abu Dhabi, UAE (reference laboratory for infectious diseases- SKMC - Abu Dhabi) Stefan Weber, SKMC, Reference laboratory for Infectious Diseases, United Arab Emirates
17:45 – 18:15	**Panel discussion: What actions and capacities are needed by countries to improve biosafety and biosecurity?**
	Moderator: Sara Al Qabandi Panellist: Aamer Ikram, Rhizlane Selka, Uzma Bashir

Programme

Friday, 15 November 2019

Session 8: The human-animal interface: the continuing threat from influenza and other emerging zoonotic diseases at the human-animal interface

Moderator: Manal Labib Fahim Morcos, National Focal Person for Influenza Surveillance, Preventive Sector, Ministry of Health and Population, Cairo, Egypt

09:00 – 09:15	One Health Framework: progress and challenges for the future in Eastern Mediterranean Region Ghazi Kayali, Chief Executive Officer, Human Link, Adjunct Assistant Professor, University of Texas Health Sciences Center, Department of Epidemiology, Human Genetics, and Environmental Sciences, Houston, Texas
09:15 – 09:30	Lessons learnt from influenza surveillance in animals and implications on human health Nicola Lewis, Associate Professor in Infectious Diseases and Co-ordinator of the Livestock Production and Health research program; Deputy Director of the OIE/FAO International Reference Laboratory for avian influenza, swine influenza and Newcastle Disease at APHA-Weybridge, United Kingdom
09:30 – 09:45	Prioritization of zoonotic diseases towards addressing "One Health" issues Salah AlAwaidy, Senior Consultant Medical Epidemiologist Communicable Diseases Adviser to Health Affairs, Ministry of Health, Oman
09:45 – 10:25	**Oral Abstract Presentations**

Moderator: Nada Ghosn, Director of Epidemiology, Communicable Disease Control, Ministry of Public Health, Beirut, Lebanon

	Identify inappropriate practices associated with highly pathogenic avian influenza spread among backyard poultry flocks using participatory method as new approach in Egypt, 2014-2017 Hend Elsheikh, Ministry of Agriculture and Land Reclamation, Egypt
	Molecular evolution of low pathogenic H9N2 influenza viruses in poultry in north Africa Mariette Ducatez, INRA-ENVT, France
	Evidence of H9N2 avian influenza virus infection in Lebanese poultry: findings of active surveillance, march through June 2017 Rebecca Badra, Human Link, Lebanon
10:25 – 10:40	Coffee Break

Programme

Friday, 15 November 2019

10:40– 11:00 **Panel discussion: Challenges at the human-animal interface: how can we help the countries to improve and integrate human and animal surveillance systems for timely detection and response to any potential zoonotic threat?**

Moderator: Manal Morcos, National Focal Person for Influenza Surveillance, Preventive Sector, Ministry of Health and Population, Cairo, Egypt
Panellist: Ghazi Kayali, Nicola Lewis, Salah AlAwaidy, Amira Abdelnabi

Session 9: Pandemic Influenza Preparedness in the 21st century: Understanding the evolving challenges

Moderator: Said Iftekhar Sadaat, Director of Research Coordination and Evaluation, General Directorate of M&EHIS, Ministry of Public Health, Kabul, Afghanistan

11:00 – 11:15	Progress PIP Framework PC implementation Gina Samaan, Team Leader, PIP, Infectious Hazard Manager, Department of Health Emergencies, WHO/HQ
11:15 – 11:30	Pandemic Influenza threat among Refugees and Displaced Persons Alice Wimmer, Migration Health Officer, Health Systems Strengthening and Health Emergencies, International Organization of Migration (IOM), Geneva
11:30 – 11:45	Can We Get Pandemic Preparedness “Right”? Stephen S Morse, Professor of Epidemiology, Director of the Infectious Disease Epidemiology certificate, at Columbia University Mailman School of Public Health; Chair of the Columbia University Institutional Biosafety, Committee, Columbia University, New York, US
11:45 – 12:00	Influenza Readiness Capacity in lead up to World Cup 2022 in Qatar Hamad Al Romaihi, Manager Of Health Protection and Communicable Diseases Public Health Department, Ministry of Health, Qatar
12:00 – 12:15	Pandemic influenza vaccine development Richard Webby, Director, WHO Collaborating Center for Studies on the Ecology of Influenza in Animals and Birds, United States
12:15 – 12:30	Pandemic Preparedness from Regulatory Perspective: EMR Experience Houda Langer, Regional Advisor, Essential Medicines and Technology, Department of Health Systems, WHO/EMRO
12:30 – 12:45	Assess the “potential” to cause a pandemic of a zoonotic influenza virus using TIPRA Magdi Samaan, Technical Officer, Global Influenza Program, WHO/HQ
12:45 – 13:00	GOARN: International Network For Readiness, Response And Research In Infectious Disease Epidemics In The 21st Century Patrick Drury, Manager of Acute Events Management, Emergency Medical Operations, WHO/HQ

Programme

Friday, 15 November 2019	
13:00 – 13:30	**Oral Abstract Presentations**
Moderator:	Eyad Kamal Muhanna, Head of the Epidemiological Investigation Team, Ministry of Health, Damascus, Syria
	Defining influenza baseline and threshold values using weekly sentinel surveillance data- Afghanistan, 2018/2019 Mohammad Nadir Sahak, World Health Organization, Afghanistan
	Implementation of pandemic influenza severity assessment tool in Morocco, 2018-2019 Soumia Triki, World Health Organization, Morocco
13:30 – 14:30	Lunch
14:30 – 15:00	**Panel Discussion: A hundred years after the worst influenza pandemic: Are we prepared for the next pandemic?**
	Moderators: Said Saddat Panellists: Hamad Al Romaihi, Stephen Morse, Gina Samaan, Richard Webby, Alice Wimmer
15:00 – 15:30	**Closing Session**
	Moderator: Ibrahim El-Kerdany
	Award distribution to the best abstract presenters (oral and poster) and other recognitions Rana Hajjeh, Director of Programme Management, WHO/EMRO Abdinasir Abubakar, Acting Programme Area Manager, Infectious Hazard Preparedness, Health Emergencies Programme, WHO/EMRO
	Next Steps for EMARIS Network Abdinasir Abubakar, Acting Programme Area Manager, Infectious Hazard Preparedness, Health Emergencies Programme, WHO/EMRO
	Closing remarks and vote of thanks Rana Hajjeh, Director of Programme Management, WHO/EMRO

SPEAKERS

KEYNOTE SPEAKERS

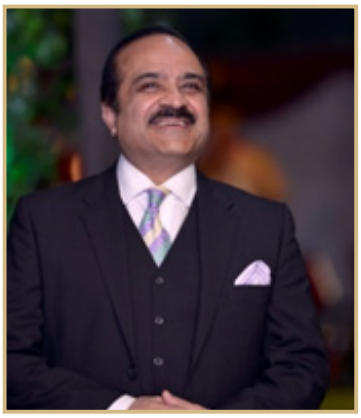
DR RICHARD BRENNAN is the Regional Emergency Director for the World Health Organization's (WHO) Regional Office for the Eastern Mediterranean (EMRO), based in Cairo, Egypt. Previously, he had spent seven years at WHO headquarters as Director of Emergency Operations, Director of Ebola Coordination and Response and Director of Emergency Risk Management and Humanitarian Response.

Dr Brennan has extensive experience in health emergencies and humanitarian settings in over 35 countries across Africa, Asia, the Middle East, and Eastern Europe. He received his medical degree from the University of Sydney and undertook emergency medicine training in Australia, followed by a clinical and research fellowship in the United States. After receiving a Master of Public Health degree from Johns Hopkins University, he worked with the US Centers for Disease Control and Prevention (CDC) on humanitarian, chem-bio-nuclear and civil-military issues. Thereafter, Dr Brennan spent 10 years as the Health Director of the International Rescue Committee (IRC) in New York, overseeing technical support to humanitarian programmes worldwide. Immediately prior to joining WHO, he spent two-and-a-half years with JSI Research and Training in Liberia, managing a large post-conflict health system reconstruction project.

DR DANIEL B. JERNIGAN, MD MPH is the Director of the Influenza Division in the National Center for Immunization and Respiratory Diseases at CDC where he is responsible for oversight and direction of over 300 people executing a broad scientific program to improve the detection, prevention, treatment, and response to seasonal, novel, and pandemic influenza. The Influenza Division is responsible for national and global surveillance of influenza and serves as a World Health Organization Collaborating Center for the Surveillance, Epidemiology and Control of Influenza.

Dr Jernigan completed training at Duke University and Baylor College of Medicine and has completed residencies in Internal Medicine and Preventive Medicine. He entered the CDC in 1994 as an Epidemic Intelligence Officer and has been studying respiratory and emerging diseases since that time. He is a retired Captain in the U.S. Public Health Service and was the recipient of the 2019 Service to America Medal.

SPEAKERS



PROFESSOR AAMER IKRAM graduated in 1987; completed diplomas in Pathology (1990); MCPS (1991); Fellowship Microbiology (1998); Clinical Training UK (2005); and PhD 2014. Qualified Diploma OSHE; Diploma Disaster Management; Certificate Emerging Infectious Diseases (University Iowa); Dual-Use Biosecurity (Bradford University). Excelled in the fields of biosafety, biosecurity and infection control accomplishing courses from Harvard, Oxford, South Florida, Chester, Bradford, UN, WHO, CDC etc. Attained Registered Biosafety Professional (US); Biosafety Professional (ISTR UK); and IFBA Certified Professional. Awarded FRCP Royal College Edinburgh (2012); FRCPath Royal College Pathologists (2014); and Fellowship Public Health Royal Colleges UK (2018).
Actively engaged in academics and research. Presently collaborating with WHO, CDC, NIH, NASEM (US); PHE; EU; and many reputed international organizations. He has been the Chief Editor for the Infectious Diseases Journal and a member of editorial board of national/ international journals.

Holds prestigious portfolios: Member Health Security Interface WHO; International Ambassador Society for Healthcare Epidemiology America; Global Health Delivery Faculty, Harvard; Vice-Chair International Federation of Biosafety Associations; Council of ICID; adjunct faculty Emory University; President Pakistan Biological Safety Association; Ex-President Medical Microbiology & Infectious Diseases Society; HEC Focal Point of Expertise. Received 'Biosafety Heroes Award' from IFBA; and national award of Sitara-e-Imtiaz Military. Currently, Executive Director National Institute of Health Pakistan; and Pakistan Health Research Council.

DR ABDINASIR ABUBAKAR is the Acting Manager for the Infectious Hazards Preparedness unit in the Health Emergencies Programme of the World Health Organization's (WHO) Regional Office for the Eastern Mediterranean in Cairo, Egypt. He has more than 25 years of experience in public health and epidemiological research, working with national and international institutions. Dr Abdinasir was involved in the management of some of the worst epidemics within and outside the region, including meningococcal meningitis, cholera, Rift Valley fever, visceral leishmaniasis, anthrax and viral haemorrhagic fever. In June 2015, he was reassigned to WHO's Regional Office in Cairo after spending 7 years in WHO South Sudan Office with responsibility for providing technical support to Member States on improving their epidemiological surveillance and response capacity to prevent and control emerging and re-emerging infectious diseases. He has been involved in much operational research in the area of emerging and reemerging infectious diseases, including influenza, meningitis, cholera, yellow fever, nodding syndrome, visceral leishmaniasis and HIV/AIDS. He is the author and co-author of over 30 research articles published in international, peer-reviewed journals.

Dr Abubakar has a degree in Medicine from the Faculty of Medicine of the Somali National University in Mogadishu and a Master of Public Health in Epidemiology and International Health from the Johns Hopkins Bloomberg School of Public Health in Baltimore, United States of America.

SPEAKERS

DR ABDULLAH ASSIRI is currently the Assistant Deputy Minister for Preventive Health in the Ministry of Health of Kingdom of Saudi Arabia. He received his medical degree from Kind Saud University at Saudi Arabia in 1999 and then a clinical fellow in adult infectious diseases from Dalhousie University at Canada in 2003. Prior to his current position, he worked as Director of Infection Prevention and Control Administration at Ministry Health. His 22 years clinical and public health experience have focused on infection prevention and control and other communicable disease. He was the designated National IHR Focal Point for many years and he is active member of WHO IHR Emergency Committee on MERS-CoV.

He has been the leading public health expert investigating and responding to MERS-CoV outbreaks in Saudi Arabia in the last 7 years. He is an editorial Board member for Journal of Epidemiology and Global Health and a member of other professional associations. His areas of research include infection prevention and control, MERS-CoV, outbreak investigation and response and other public health areas. He has published over 132 scientific articles and reviews.

DR ALICE WIMMER, MPH, since December 2017 has worked with the International Organization for Migration as a Migration Health Officer both on health system strengthening as well as public health emergencies, with a focus on DRC, West Africa as well as the Middle East and North Africa.

She brings with her 12 years of field experience in complex operating environments in the Middle East (Lebanon and oPt), Africa (Chad) and Asia (Pakistan) working mainly with UN agencies (UNHCR, UNICEF, UNAIDS) in health project design, coordination, implementation and monitoring and evaluation. In her country of origin Austria, she focused briefly on strengthening health programmes in response to the 'European refugee crisis' including access to quality care with a special focus on maternal and child health and mental health. She obtained her education from Vienna University Medical School and Harvard School of Public Health. Her native language is German and besides English she is fluent in French and Italian. In her free time, she is a passionate skier but equally loves attending cultural events such as exhibitions, theater or opera.

SPEAKERS

DR AMAL BARAKAT is a Technical officer in the Infectious Hazards Preparedness unit in the Health Emergencies Programme of the World Health Organization's (WHO) Regional Office for the Eastern Mediterranean (EMRO) in Cairo, Egypt. She has a special interest in emerging infectious diseases, public laboratory system capacity development, and laboratory-based surveillance and outbreak response.
She brings over fifteen years of work experience in management of public health laboratories and provides technical support to the Member States of EMR for the strengthening of their public health laboratories for surveillance, alert and response.

Previously, she was working as a senior virologist at the National Institute of Hygiene in the Ministry of Health of Morocco. As a public health laboratory manager, she has developed strong laboratory management skills including supervision of the public health laboratories operations using international standards, provision of technical and scientific expertise in virology and molecular biology, oversight of quality assurance, quality control, biosecurity, biosafety and laboratory safety. She also has extensive experience in establishment and coordination of laboratory-based surveillance system for control and containment of diseases with epidemic and pandemic potential.

Dr Barakat received her doctoral degree from the University of Rabat, Morocco and a Master's Degree in microbiology and molecular biology from the University of Casablanca, Morocco.

DR AMGAD ELKHOLY is working with the Infectious Hazards Preparedness unit in the Health Emergencies Programme of the World Health Organization's (WHO) Regional Office for the Eastern Mediterranean (EMRO) in Cairo, Egypt. He has more than 20 years' experience in public health and epidemiological research, working with national and international institutions. Dr Elkholy started his career by joining the Field Epidemiology Training Program (FETP) in 1999. His experience includes three years working with US Naval Medical Research Unit #3 (NAMRU-3) as a medical epidemiologist to support establishment/ enhancing epidemiological activities. Dr Elkholy joined WHO Sudan office in February 2006 to work as an epidemiologist in Darfur and head of WHO Kadugli sub-office to provide technical assistance for health sector development and promote an intersectoral approach to health issues.

In October 2014, Dr Elkholy was reassigned to WHO's Regional Office in Cairo to provide technical support to countries within the region to establish, maintain and expand the influenza and other viral respiratory surveillances system. He contributed to enhance national and regional capacities to detect and respond to high threat pathogens. He was involved in response to dozens of epidemics including diphtheria, Typhoid, Cholera, Leishmaniasis and Viral Haemorrhagic Fever.

SPEAKERS

DR AMINA AL-JARDANI is a medical microbiology and infectious disease consultant. She is the Director of Central Public Health Laboratories (CPHL), leading the work of the national reference laboratories. She received her MD degree from Sultan Qaboos University in Oman and joined the American Board of Internal Medicine in 2003 after completing an internal medicine residency program from McGill University in Canada. She received fellowships in internal medicine, medical microbiology and in infectious diseases from the Royal College of Physicians and Surgeons of Canada.
She worked as a consultant and head of medical microbiology and infection control at the Royal Hospital (2008-2013). She also served as chairperson for the National Antimicrobial committee, the National Antimicrobial Resistance focal point and the medical microbiology residency program.
She is a member of several national committees including the national laboratory medicine committee, the vaccine committee, national polio and measles expert committee and the national infection prevention and control sub-committee. Dr Al-Jardani research interests are in the field of antimicrobial resistance, especially among Gram negative organisms such as carbapenem resistance enterobacteriaceae and Acinetobacter. She is also interested in the epidemiology of invasive pneumococcal disease and molecular epidemiology of enteric and zoonotic viral infections prevalent in Oman.

MS AMIRA ABDELNABI is a veterinary epidemiologist. She acted as head of the Epidemiology Planning Unit at the General Organization for Veterinary Services (GOVS) within the Ministry of Agriculture and Land Reclamation (MoALR). She has been assigned as a Project Manager for Strengthening Avian Influenza Detection and Response" (SAIDR), a project funded by USAID. She was responsible for strengthening the national institutional capacities of governmental veterinary services to enable early disease detections and adequate responses, establishing cross-sectoral coordination between different ministries and other relevant parties involved in disease control programs, contribute to the development and revision of HPAI national disease control and preparedness strategies and associated policy instruments.
Since 2010 she has been working as a national consultant with ECTAD/FAO starting with the responsibility to review and assess the preparedness and response system for avian Influenza in the veterinary services and the development of an updated preparedness and response plan for avian influenza. She is also responsible for risk assessment and assisting the government to implement regular risk assessment for influenza situation in Egypt jointly with the Ministry of Health. Recently became responsible for assisting the government in establishing a OH platform in Egypt and sustaining coordination and collaboration between the Ministry of Health, Ministry of Environment and the veterinary services in information sharing and joint activities.
She graduated from Cairo University in 1985 and got a diploma in microbiology. She also completed several advanced courses in various international institutes in the field of epidemiology and risk assessment.

SPEAKERS

MS ANN MOEN serves as Chief, Influenza Preparedness and Response Unit, Centers for Disease Control and Prevention (CDC), Atlanta. She has worked on influenza at the CDC for the past 18 years. She served as the Associate Director for the Extramural Program from 2006 where she developed the Influenza Division's international capacity building programme for influenza. Ms Moen has worked with more than 50 countries bilaterally to help support national capacity for laboratory, surveillance and response as well as multiple international partners. Prior to this role she was the Deputy Chief of the Influenza Branch for seven years.

Ms Moen's experience includes seven years working with the Health Resources Services Administration as a project officer for Community and Migrant Health Centers in south-eastern United States and working as a microbiologist in the Special Pathogens Branch Biosafety Level 4 laboratory on Ebola, Lassa and other haemorrhagic fever pathogens. She started her career as a Peace Corps volunteer where she worked for two years in rural Thailand at a District Hospital training on laboratory diagnostics and quality control.

DR BILL DAVIS is an epidemiologist in the Influenza Division at the Centers for Disease Control and Prevention (CDC). Bill is responsible for providing technical support on influenza surveillance, burden of disease and economic studies primarily in EMRO and AFRO regions. He is also the unit lead for global surveillance of novel influenza viruses. Bill holds a DrPH in from Johns Hopkins University and an MA in molecular biology from the University of Colorado, Boulder. Prior to working at CDC, Bill served in the Peace Corps in Tanzania and Uganda and worked in Myanmar for MSF and as an independent consultant focused on health in conflict areas.

SPEAKERS

DR DAVID WENTWORTH is Chief of the Virology, Surveillance, and Diagnosis Branch (VSDB) of the CDC's Influenza Division. He received a B.S. in Poultry Science, an M.S. in Veterinary Medicine, and a Ph.D. in Virology at the University of Wisconsin-Madison. He was a postdoctoral fellow, and later an Instructor at the University of Colorado Health Sciences Center in Denver. He has conducted virological research since 1990 and has over 100 publications.

As Chief of VSDB, Dr Wentworth leads efforts to improve global influenza virus control, prevention, and pandemic preparedness. VSDB conducts antigenic, phenotypic, genetic, surveillance, diagnostic development, and vaccine development. The data generated/ analyzed guides vaccine virus selection and VSDB provides vaccine seeds to manufacturers. Prior to joining CDC, Dr Wentworth was Director of Viral Programs at the J. Craig Venter Institute (2011 to 2014), focusing on interspecies transmission, pathogenesis, evolution and vaccine development using synthetic genomics. Dr Wentworth was the Director of the Influenza Virus and Coronavirus Pathogenesis laboratory at the Wadsworth Center, NYSDOH, and an Assistant Professor at the State University of New York-Albany (2002-2011), where his studies included interspecies transmission of influenza viruses and SARS-Coronavirus, genomic technologies, and experimental vaccine approaches.

DR EDUARDO AZZIZ-BAUMGARTNER serves as the Team Lead for the International Epidemiology and Research Team in the Epidemiology and Prevention Branch of the Influenza Division of the Centers for Disease Control and Prevention (CDC). He is an expert on the seasonality and burden of influenza in the tropics and works closely with ministries of health, the World Health Organization and other partners to inform vaccine policies. He was previously the head of the Influenza Program in Latin America and on secondment to icddr,b Bangladesh as part of the Influenza Division's International Program. During the 2009 H1N1 pandemic, Dr Azziz-Baumgartner led CDC's influenza response in Bangladesh and was deployed to Mexico to assist with the early characterization of the virus.

Dr Azziz-Baumgartner received his medical degree from the University of Alabama at Birmingham in 1997, completed his residency in Family Practice at the University of Texas in 2000, and a fellowship in minority health policy at Harvard University Medical School in 2003 where he earned a Master of Public Health at Harvard's School of Public Health.

He completed the Epidemic Intelligence Service fellowship in 2005 where he won several awards, including the Alexander D. Langmuir Prize and the Donald C. Mackel Award. He serves as the Spanish language media spokesperson for the Influenza Division and mentors young research investigators at multiple international sites.

SPEAKERS

DR EVANS BULIVA obtained his medical qualifications from the University of Nairobi and is a registered public health specialist with higher qualifications in tropical medicine and epidemiology from the Universities of Pretoria and Witwatersrand respectively.

He practiced primary health care medicine for more than twenty years before branching to HIV clinical trials research in Botswana under US CDC, and then public health practice with WHO in Botswana where he was in charge of communicable disease prevention and control. He taught community and public health practice in Kenya before joining the WHO Eastern Mediterranean Regional Office in Cairo. He also has experience in migration health having worked briefly for IOM, Cairo Regional Office.

His current works with the Infectious Hazards Preparedness unit in the Health Emergencies Programme of the World Health Organization's (WHO) Regional Office for the Eastern Mediterranean (EMRO) in Cairo, Egypt focusing on strengthening regional capacities for preparedness and response to outbreaks of emerging and re-emerging epidemic-prone diseases. He has published several of his work in peer-reviewed journals.

DR FATMA AL-YAQOUBI obtained her MSc degree in medical microbiology from Queen Mary and Westfield University of London. She then obtained her FRCPATH in medical microbiology from the United Kingdom and worked as a Senior Microbiology Consultant at the Royal Hospital. Subsequently she moved to DGDSC at the Ministry of Health where she became head of TB and Acute Respiratory Diseases at the Department of Communicable Diseases since 2016. Part of her work includes the drafting of the TB elimination strategy, estimating the disease burden in TB and influenza, as well as preparing clinical guidelines for different communicable diseases. Among her current interests are economic burden, cost effectiveness and modeling for influenza; molecular epidemiology and TB transmission; and the utilization of data to change policies through evidence-based approach. Dr Al-Yaqoubi enjoys nature and loves to discover new places.

SPEAKERS

DR GHAZI KAYALI is the CEO of Human Link, a Lebanese NGO he helped establish in 2014. His research focuses on emerging viruses at the human-animal interface with an emphasis on influenza and coronaviruses.

He runs surveillance projects in several countries in the Middle East and Africa collecting samples from animals and the exposed human populations. He is also a regional consultant for preparedness and response, zoonoses, pandemic influenza and the International Health Regulations.

DR GINA SAMAAN is a field epidemiologist with a PhD in avian influenza disease control. She currently works at the World Health Organization Pandemic Influenza Preparedness (PIP) Framework secretariat to manage the implementation of the PIP Partnership Contribution (PC) for capacity-building and strengthening pandemic preparedness. Her 17-year public health experience has focused on communicable disease surveillance and response at country, regional and global level, with an emphasis on emerging infectious diseases.
Previously, she served as resident advisor to the Indonesian Field Epidemiology Training Program (FETP) to strengthen human resource and health system capacities as mandated under the International Health Regulations (2005). Her research interests include influenza, surveillance, preparedness and policy development.

SPEAKERS

DR HAMAD AL-ROMAIHI is the Manager of the Health Protection and Communicable Disease Control under the Public Health Department which covers Expanded Program for Immunization (EPI), Communicable Disease Control Program, Surveillance & Outbreak.
A fellow in Public Health, he is also a Community Medicine Consultant with special interests in emerging infections and travel health.

DR HASSAN ZARAKET is an Assistant Professor and associate director of the Center of Infectious Disease Research at the Faculty of Medicine, American University of Beirut. He received his Ph.D. from Niigata University in Japan in 2009 and his postdoctoral training at St Jude Children's Research Hospital, USA.

Dr Zaraket is a member of the WHO Pandemic Special Studies Working Group and has served as an advisor for WHO EMRO, on topics related to influenza. He is an associate editor for the BMC Infectious Diseases Journal and a board member of the International Society of Influenza and Other Respiratory Viruses (ISIRV).
His laboratory is part of the Global Influenza Hospital Surveillance Network. He published over 70 scientific articles and reviews.

SPEAKERS

DR HOLLY BIGGS is a medical epidemiologist in the Respiratory Viruses Branch at the U.S. Centers for Disease Control and Prevention where she focuses on respiratory virus surveillance and outbreak support. She has collaborated on MERS-CoV and other respiratory virus surveillance projects with partners in several countries in the Eastern Mediterranean Region.

Before joining CDC in 2013 as part of the Epidemic Intelligence Service fellowship, she completed training in internal medicine and infectious diseases at Duke University Medical Center. She completed a Master's in Public Health degree at the University of North Carolina, Chapel Hill and her medical degree at the University of Illinois.

MR IBRAHIM SALEM is the director of Central Public Health laboratory (CPHL) in the Palestinian Ministry of Health (MOH). He has more than 25 years of experience in laboratory work. He supervised CPHL since 2007, following up on the technical and managerial aspects of lab operations including the Palestinian Influenza Center (PIC). He also supervises biosafety and bio security issues related to lab work. He is the focal point for Pulse Net Middle East and is a member of the national committee on International Health Regulation, following the activity of core capacity number 8 related to lab work.

He was recently nominated by MOH to be the national focal point on antimicrobial resistance and is following the work at a national level with WHO. He participated in different publications related to food microbiology, genotyping of hepatitis C, serotyping of Streptococcus Pneumonia in Palestine and the prevalence of HIV, Hepatitis B and C among intravenous drug users in Palestine. He attended different meetings and workshops related to lab work in the technical, surveillance and biosafety issues fields.

Mr Salem is certified as an international medical laboratory lead assessor for the ISO 15189. He has a degree in biology and biochemistry from Birzeit University and a master's degree in public health from the same university.

SPEAKERS

DR JOHN MCCAULEY is Director of the Worldwide Influenza Centre at the Francis Crick Institute in London. The work of the Centre is directed to monitoring virus samples from WHO National Influenza Centres from across the globe to develop with the other WHO Collaborating Centres for Influenza the WHO recommendations for the composition for seasonal influenza vaccines and the WHO recommendations for vaccine viruses to be prepared from zoonotic influenza viruses for pandemic preparedness purposes.

The Francis Crick Institute was formed in 2015; its founding partners were the Medical Research Council (MRC), Cancer Research UK, the Wellcome Trust, University College London, Imperial College London and King's College London. The MRC National Institute for Medical Research (NIMR) became part of the Francis Crick Institute in April 2015. NIMR has worked with WHO on influenza since 1947 when, with WHO, a World Influenza Centre (WIC) was established. WIC was one of the two founding Collaborating Centres in the WHO Global Influenza Surveillance Network, now GISRS.

Prior to working at NIMR John McCauley was a group leader at the Institute for Animal Health, where he worked on influenza viruses of animals, Bovine Viral Diarrhoea Virus and Swine Vesicular Disease Virus.

DR JOSEPH BRESEE is the Associate Director of Global Health Affairs at the Centers for Disease Control and Prevention's Influenza Division in Atlanta. He also serves as the Director of the Partnership for Influenza Vaccine Introduction (PIVI) based at the Task Force for Global Health, which is a public-private partnership to accelerate pandemic preparedness through growing global seasonal influenza vaccination programs. He serves as Lead for the Global Funders Consortium for Universal Influenza Vaccine Development.

From 2005 – 2017, he was Chief, Epidemiology and Prevention Branch in the Influenza Division. He is a retired Captain in the US Public Health Service. Dr Bresee joined CDC in 1993 after his Pediatrics residency at the University of Washington in Seattle and attended medical school at Baylor College of Medicine in Houston, Texas. Dr Bresee has written more than 250 peer-reviewed publications and book chapters.

SPEAKERS

DR KATELIJN VANDEMAELE started her career as a General Practitioner in Belgium. She picked up interest for public health during the post-graduate courses in tropical medicine (Antwerp). In 1996 she joined the then newly created division of Emerging and Other communicable diseases (EMC) in WHO, Geneva led by Dr David Heymann. She worked for two years in Public Health in the Oxford Region (UK) and obtained a master's in public health at the University of Birmingham (UK).

Since 2000, she has been working in several departments in WHO Geneva on emerging and re-emerging diseases, and involved in outbreaks of SARS, H5N1, H7N9, the pandemic 2009 and MERS CoV.

In the past ten years, she has been focusing on epidemiology and surveillance of seasonal, zoonotic and pandemic influenza.

MS KINDA ZUREICK is an epidemiologist working in the Influenza Division in the National Center for Immunization and Respiratory Diseases (NCIRD) at the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia, United States of America. She serves as a Project Officer in the Division's International Program, providing technical support for influenza surveillance in the WHO Eastern Mediterranean and Pan American Regions.

Prior to joining the Influenza Division, Zureick worked in the Division for Public Health Performance Improvement (DPHPI) in CDC's Office for State, Tribal, Local and Territorial Support (OSTLTS) where she provided direct support to appointed US state, local, and territorial health officials.

SPEAKERS

DR MAGDI SAMAAN currently serves as a Technical Officer, Global Influenza Programme (GIP), Influenza Prevention and Response (IPR), Infectious Hazards Management (IHM) Department, World Health Emergencies Programme (WHE) at the World Health Organization in Geneva, Switzerland. He received a BVSc, an MVSc in Veterinary Medicine, and did his Ph.D. studies on veterinary clinical pathology and virology at Cairo University, Egypt. Currently, within the WHO Global Influenza Surveillance and Response System (GISRS-Laboratory) team, he is responsible for activities that support the function of the WHO GISRS network, which include the WHO Influenza External Quality Assessment Programmes (EQAP), coordination, recognition and designation of GISRS member institutions, influenza vaccines update meetings, WHO norms, standards and tools for National Influenza Centres (NICs), GISRS Expert working groups, risk assessment (TIPRA) and the Influenza Virus Traceability Mechanism (IVTM).
Earlier, he managed capacity building activities on biorisk and quality management systems and regulations on the transport of infectious substances.

Dr Samaan, headed the Molecular Biology Section, Virology Program, at the U.S. Naval Medical Research Unit No.3 (NAMRU-3) in Cairo, Egypt, managing virological research projects on Influenza, HIV, Hepatitis, arboviruses and enteroviruses, laboratory assessment, molecular diagnostics for countries in Africa, Europe, the Middle East and Asia.

MS MAJA LIÈVRE is a health information manager and data analyst from Germany. After studies of Health Informatics, she joined the International Agency for Research on Cancer in Lyon, France in 1991 and worked as Statistical Assistant in the Unit for Intervention Studies for five years. She then returned to Germany and worked as clinical data manager for a contract research company where she managed and analysed clinical trial data for the pharmaceutical industry.

Since 2001, she has been working at the World Health Organization's headquarters in Geneva, Switzerland. Dr Lièvre set up the HIV/AIDS case reporting system and a database producing the epidemiological country fact sheets for the HIV/AIDS and STI Surveillance Team.

For the Public Health Mapping and GIS Team, she coordinated and managed health and programme data in the Global Health Atlas and HealthMapper applications,and set up a semi-automatic system for the routine disease outbreak mapping activities of the Team. Since 2006, she has been working with the WHO Global Influenza Programme in charge of the web-based reporting system for the influenza virological surveillance data, FluNet, and managing communication and information platforms related to the Global Influenza Surveillance and Response System (GISRS).

SPEAKERS

PROFESSOR MALIK PEIRIS is a Professor of Virology at the University of Hong Kong. He is a clinical and public health virologist with an interest in emerging virus disease at the animal-human interface using a "One Health" approach. His research includes influenza, coronaviruses (SARS, MERS) and others. His research encompasses the pathogenesis, innate immune responses, transmission, ecology and epidemiology of human and animal (poultry, swine, wild birds) influenza viruses. His collaborative research has provided understanding on the emergence and pathogenesis of the 2009 pandemic H1N1 virus and on avian influenza viruses H5N1, H9N2 and H7N9. These studies have provided evidence-based options for the control of these viruses in poultry and in humans. In 2003, he played a key role in the discovery that a novel coronavirus was the cause of SARS, its diagnosis and pathogenesis and contributed to its control. He is currently researching MERS coronavirus infections in the Arabian Peninsula and Africa within camels, humans and relevant experimental models.

PROFESSOR MARIA VAN KERKHOVE is an infectious disease epidemiologist who specializes in outbreaks of emerging and re-emerging pathogens. Dr Van Kerkhove completed her undergraduate degree at Cornell University, a MS Degree at Stanford University, and a PhD in infectious disease epidemiology at the London School of Hygiene and Tropical Medicine.

Dr Van Kerkhove's main research interests include zoonotic, respiratory and emerging/re-emerging viruses such as avian influenza, MERS-CoV, Ebola, Marburg, plague and Zika. Dr Van Kerkhove is particularly interested in investigating factors associated with transmission between animals and humans, the epidemiology of zoonotic pathogens, and ensuring research directly informs public health policies for action.

Dr Van Kerkhove is currently a Manager for the Emerging and Re-Emerging Diseases Unit and the MERS-CoV Technical Lead in the World Health Organization's Health Emergency Program. Prior to WHO, she was the Head of the Outbreak Investigation Task Force at Institut Pasteur's Center for Global Health where she was responsible for establishing public health rapid response teams for infectious disease outbreaks.

Dr Van Kerkhove was previously employed by Imperial College London in the MRC Center for Outbreak Analysis and Modelling where she worked closely with WHO on influenza, yellow fever, meningitis, MERS-CoV and Ebola Virus Disease.

SPEAKERS

DR NICOLA LEWIS is a veterinary surgeon and Associate Professor in Infectious Diseases and an alumnus of the Royal Veterinary College, University of London. Her research focuses on investigating the ecology and evolution of influenza A viruses in multiple animal hosts and the risks that these viruses might pose to the human population, with a global context.

This research spans huge diversity from investigating influenza in wild birds in the Republic of Georgia, analyzing emerging highly pathogenic avian influenza viruses, to using state-of-the-art computational techniques to characterize influenza virus antigenic and genetic evolution, to assess pandemic risk, and to inform international stakeholders on vaccine strains. Her recent research publications encompass avian, swine, seal, equine and human influenza viruses as well as Newcastle Disease.

Dr Lewis is also Research Coordinator for the Livestock Production and Health Management group at the RVC. Alongside her role at the RVC, Nicola is the Deputy Director of the OIE/FAO/EU International Reference Laboratory for avian influenza, swine influenza and Newcastle Disease at APHA-Weybridge, UK. She co-ordinates a specialist team to add value and support wider programmes of work including to the UK National Reference Laboratory, and research and specialist analytical support for National Animal Disease outbreak responses.

In her roles, she also provides consultancy to a range of stakeholders including the European Commission, DEFRA, WHO, OIE, FAO, EFSA, ECDC, the US Defense Threat Reduction Agency, and PHE. She serves on the OIE expert group for the Control of Equine Influenza who meet annually to recommend global equine influenza vaccine strain selection. She is an OFFLU (OIE/FAO) Executive committee member, a member of the OFFLU swine influenza virus group, the OFFLU avian influenza network and the OFFLU wildlife group who assess emerging influenza viruses in animals and address influenza-related issues. Nicola serves as an expert for the World Health Organization Vaccine Composition Meeting panel who decide the human seasonal influenza and influenza pandemic preparedness vaccine strain selection.

SPEAKERS

DR RANA HAJJEH is a senior public health leader with extensive experience in global health, health policy and diplomacy, especially in the Middle East Region. Dr Hajjeh is currently holding the position of Director of Programme Management (DPM) at the WHO Regional Office for the Eastern Mediterranean (EMRO) in Cairo, Egypt since April 2019. In her capacity as DPM, she directs and leads all the technical public health programmes at the regional level. Prior to that position, she was holding the position of the Director of the Department of Communicable Diseases Prevention and Control. In this capacity, she played a major role in supporting emergency response in the Region, and in accelerating the agenda for prevention and control of vaccine preventable diseases, HIV, hepatitis, malaria, tuberculosis, neglected tropical diseases, and antimicrobial resistance. Prior to joining WHO/EMRO in 2016, Dr Hajjeh was working with the US Centers for Disease Prevention and Control (CDC) for 23 years, where she held many senior positions, and worked extensively in the Middle East. Between 2005-2010, Dr Hajjeh was the Director of the GAVI Hib vaccine Initiative, that introduced lifesaving vaccines for Hib meningitis and pneumonia to millions of children in limited resource countries around the world.

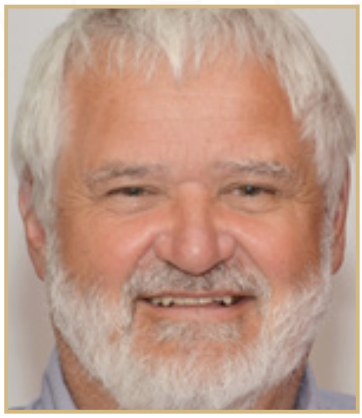
Between 1996 and 2016, Dr Hajjeh led many responses to major epidemics across the world, including meningitis during Hajj in Saudi Arabia in 2000, cholera in Haiti in 2010, and recently MERS coronavirus in Saudi Arabia and Ebola in West Africa. She has considerable experience in health policies and supported development of various global policies for prevention of infectious diseases, such as for new vaccines and strategies for building laboratory and surveillance systems.

Throughout her career, she managed increasingly complex departments and initiatives with large budgets. She is a well-known speaker, and advocate for strong public health capacity in the region. She has broad health diplomacy skills working with ministries of health and governments in the Middle East and globally. She is fully fluent in Arabic (mother language), French and English.

Dr Hajjeh holds a Medical Doctor (M.D.) degree from the American University of Beirut, Lebanon, and has benefited from extensive training in medicine (American board certified in Internal Medicine and Infectious Diseases) and public health (epidemiology training at the CDC-EIS). She has received many awards, including the prestigious U.S. Federal Employee of the Year Award in 2014 for her global vaccine work. Dr. Hajjeh has published over 150 peer-reviewed papers and book chapters, serves as a reviewer for multiple journals, and holds professor positions in medicine and public health at Emory and Johns Hopkins universities.

SPEAKERS

DR RICHARD WEBBY is the Director of the World Health Organization Collaborating Center for Studies on the Ecology of Influenza at St Jude Children's Research Hospital, Memphis USA. He is an Advisor to WHO on the recommendations for candidate influenza vaccine viruses for both seasonal and pandemic influenza. He heads a research program that explores the interplay of the various hosts of influenza with a goal of understanding interspecies transmission and viral pathogenesis.



DR RODNEY DANIELS trained as a biochemist at King's College, London 1973-79 and then took up a Post-Doctoral position in the Division of Virology at the National Institute for Medical Research UK (NIMR), Mill Hill, London with Prof John Skehel where his work focused on understanding structure/function relationships of the influenza haemagglutinin (HA). This work resulted in early characterization of antigenic epitopes and determination of amino acid substitutions defining receptor binding specificity and fusion activity of HA. From 1984-87 he continued influenza research as a laboratory head at the National Institute for Biological Standards and Controls, working on egg/cell selection of influenza viruses. He returned to NIMR in 1987, running a laboratory focusing on HIV variation and structure/function of the HIV glycoprotein. He assumed his current position as Deputy Director of the Worldwide Influenza Centre (WIC) in October 2006 and since that time has been involved in influenza research relating to influenza surveillance that contributes to biannual WHO influenza vaccine composition recommendations. In 2015 the NIMR became part of The Francis Crick Institute and the WIC moved to Central London in October 2016.

SPEAKERS

Dr Salah Al Awaidy is a Communicable Disease Surveillance and Control Adviser to the office of the Undersecretary of Health Affairs at the Ministry of Health (MOH), Oman. Dr Al Awaidy is a medical doctor and holds a Masters in Epidemiology.

From 1997 to 2012, Dr Al Awaidy held the post of Director of Communicable Disease Surveillance and Control, MOH, Oman. During this period, he was assigned the EPI National Program Manager served as a member in several of the national professional committees, namely: member and secretary of the National Immunization Technical Advisory Group (NITAG), National focal point for IHR, National Polio programme manager, national member and secretariat of the Polio Certification, Acute Flaccid Paralysis and Measles and Rubella expert and vaccine preventable diseases (VPD) national committees and the Zoonotic Committee from 1997 to August 2011.

Dr Al Awaidy played a pivotal role in reducing the national under five mortality and morbidity, preparedness, management and control of infectious diseases like SARS, avian influenza, pH1N1 and in establishing national communicable diseases, AEFI and Rotavirus surveillance, as well as in the eradication of Polio, Measles, Rubella, CRS and leprosy in Oman.

Under his leadership, Oman achieved Polio-free, Measles, Rubella, Dranculosis and CRS-free status, neonatal tetanus elimination and control and near elimination of Hepatitis B and other VPDs, TB and Schistosomiasis.

DR SAMI ALMUDARRA is an epidemiologist and public health physician with a PhD in epidemiology and public health from University of Leeds, UK with a thesis in the epidemiology of interventional cardiology. He is currently the general supervisor of Saudi field epidemiology training program at the assistant agency of preventive health, public health agency, MOH. Dr Sami is also the executive director of surveillance and preparedness at Saudi CDC, an acting board member of the Saudi board of preventive medicine and Saudi epidemiology association at the Saudi commission for health specialties. His interests have focused training, public health emergency operations, surveillance and research; manly cardiovascular diseases prevention, health indicators and life expectancy.

SPEAKERS

DR SK. MD. MAMUNUR MALIK is a WHO representative for Somalia. His prior position was Manager for the Infectious Hazards Management unit in the Health Emergencies Programme of the World Health Organization's (WHO) Regional Office for the Eastern Mediterranean (EMRO) in Cairo, Egypt. He is also an adjunct faculty member of the Bangabandhu Sheikh Mujib Medical University in Bangladesh. A medical epidemiologist by training, Dr Malik has a special interest in emerging infectious diseases and health systems' capacity development for epidemic and pandemic-prone diseases. He has over 15 years of experience in infectious disease surveillance and response to outbreaks and other pandemic-prone diseases in the WHO Eastern Mediterranean Region.

A Bangladeshi by nationality, Dr Malik has over 50 publications in peer reviewed medical journals and has presented scientific papers and abstracts in many international scientific meetings and conferences. Dr Malik has a degree in Medicine and Surgery from the University of Dhaka, Bangladesh, and a postgraduate Diploma in Health Economics and a Master's in Health Economics from the University of Dhaka, Bangladesh.

DR SONJA OLSEN is a Technical Officer in the High Threat Pathogens Team at the WHO Regional Office for Europe, where she works broadly on influenza prevention and control. She is a senior epidemiologist seconded to WHO from the U.S. Centers for Disease Control and Prevention. Dr Olsen earned her Ph.D. and M.S. degrees in epidemiology from Columbia University. She holds a M.A. in medical anthropology from Case Western Reserve University and a bachelor's degree from Dartmouth College. Dr Olsen joined the CDC in 1998 as an Epidemic Intelligence Service (EIS) Officer in the Foodborne and Diarrheal Diseases Branch, National Center for Infectious Diseases. She has worked extensively in Southeast Asia and lived in Thailand for over seven years. She has assisted in numerous outbreak investigations on emerging infections including SARS, avian influenza and Ebola. Dr Olsen has published over 150 scientific articles in peer-reviewed journals and frequently presents at international scientific meetings. She is well known both within and beyond CDC for her efforts in enhancing CDC's work as a global public health agency.

SPEAKERS

PROFESSOR STEPHEN MORSE is Professor of Epidemiology, Director of the Infectious Disease Epidemiology Certificate at Columbia University Mailman School of Public Health and Chair of the Columbia University Institutional Biosafety Committee. He was previously Assistant Professor (virology) at The Rockefeller University (1985-1995). His research interests focus on infectious disease surveillance, and the epidemiology and assessment of emerging infectious diseases, including influenza. He was Chair of the National Institute of Health's "Conference on Emerging Viruses" in 1989, for which he originated the concept of emerging viruses/infections. He was also the founding chair of ProMED (Program to Monitor Emerging Diseases), best known for originating outbreak reporting on the Internet in 1994. He served on the United States National Academy of Medicine's "Committee on Emerging Microbial Threats to Health" (1990-1992), and chaired its Virology Task Force. His book Emerging viruses (1993) was selected by American Scientist as one of the "top 100 science books of the [20th] century". He is a founding member of the National Academies' Forum on Emerging Infections (renamed the Forum on Microbial Threats), a founding section editor of the journal, Emerging Infectious Diseases, former Editor-in-Chief of the Pasteur Institute's virology journal, and Global co-Director of PREDICT (2009-2014), a USAID project working in over 20 developing countries to strengthen global capacity for surveillance and detection of new infectious disease threats.

Professor Morse serves on the Expert Group on Pandemic Influenza Preparedness Planning of the World Health Organization's Regional Office for the Eastern Mediterranean, and the US National Science Advisory Board for Biosecurity. He is a Fellow of the American Association for the Advancement of Science, American Academy of Microbiology, American College of Epidemiology, and other professional societies, and a Life Member of the Council on Foreign Relations.
Professor Morse received his PhD (in microbiology) from the University of Wisconsin-Madison.

SPEAKERS

DR UZMA AAMIR is a medical doctor and has trained in basic and molecular virology. After graduating from Rawalpindi medical college, Rawalpindi, Dr Aamir completed her M.Phil in microbiology from Quaid-e Azam University Islamabad. Her research focused on zoonotic viruses and she completed her research at NARC on influenza transmission at the animal –human interface…She trained as visiting scientist at CDC USA, department of viral pathogenesis, Influenza branch.

Her post-doctoral studies at St Jude Children's research Hospital in Memphis. TN USA involved working with highly pathogenic Influenza viruses in BSL-3 laboratories. She completed her PhD in Virology & Immunology from National University of Science and Technology (NUST), Islamabad.
She joined as a Senior Virologist at the WHO designated National Influenza Center at National Institute of Health Islamabad from 2007-17 and served as the laboratory coordinator in the Global Health Security project for public health labs, biosafety/biosecurity and Lab quality systems. She currently serves as the National Focal point for labs at the WHO country office in Pakistan. She is also actively involved in trainings on biorisk Management (BRM) with Pakistan Biological Safety Association.
Dr Uzma has served as visiting faculty member at the Atta-ur-Rahman School of Applied Biosciences at National University of Sciences and Technology. She is a WHO certified Biorisk Manager and IATA shipper and regularly conducts trainings on laboratory biosafety and quality management.

DR WENQING ZHANG heads the Global Influenza Programme of WHO in its headquarters in Geneva Switzerland since November 2012. Dr Zhang provides leadership and coordinates global activities on influenza surveillance, virus monitoring, detection of emerging novel viruses, risk assessment and evidence for policies, vaccine virus and pandemic preparedness including pandemic influenza vaccine response. From 2002 to 2012, Dr Zhang coordinated the WHO Global Influenza Surveillance and Response System (GISRS), building and functioning the global system of surveillance, preparedness and response. In response to 2009 A(H1N1) influenza pandemic, Dr Zhang directed the Laboratory Response and Capacity of WHO response. Before joining WHO, Dr Zhang worked for 9 years in the Chinese Academy of Preventive Medicine, Ministry of Health on tuberculosis, schistosomiasis and iodine deficiency disorder initiatives in collaboration with WHO, World Bank, UNICEF and UNIDO. MD by education with postgraduate training on system evaluation and epidemiology and a bachelor's degree on biomedical engineering.

JUDGES

DR EHSAN MOSTAFAVI studies tropical and neglected infectious disease such as CCHF, Brucellosis, Borreliosis, Dengue fever, West Nile fever, Rickettsial infections and Leptospirosis. He has established the national reference laboratory for Plague, Tularemia and Q fever in the research centre for emerging and re-emerging infectious diseases (RCERID) in the Institut Pasteur of Iran (IPI), which he is now the director. He is also the director of Department of Epidemiology in IPI.

Since 2015, he became the WHO Eastern Mediterranean Office (EMRO) temporary advisor on zoonotic infections, and in 2018, he was selected as the IHR roster of experts of WHO HQ in human-animal interface and Roster of Experts of WHO EMRO for the Infectious Hazard Management. Dr Mostafavi is the focal point of IPI in WHO Global Outbreak Alert and Response Network.

Dr Mostafavi is also the leader of the outbreak investigation team of IPI to investigate and control infectious diseases.

During the last five years, Dr Mostafavi has published more than 210 scientific papers, and has organized more than 30 courses that more than 700 participants from 40 countries has attended.

DR FARHAD HANDJANI, MD, is currently chairman and consultant dermatologist at the department of dermatology as well as the head of the Molecular Dermatology Research Center, at Shiraz University of Medical Sciences (SUMS) in Shiraz, Iran. In addition, Dr Handjani is the President of the Iranian Society of Dermatology.

He has also been trained as a GCP Clinical Monitor by WHO/TDR and has monitored both vaccine and drug clinical trials in a number of developing countries. He has also been invited as a guest speaker at many dermatology congresses both in Iran and across the globe. In addition, he is currently the Editor-in-Chief of the Middle East Journal of Cancer and the Iranian Journal of Dermatology and editorial board member of a number of other national and international journals.

He is also President of the Eastern Mediterranean Association of Medical Editors (EMAME), an association that has set out to promote high quality medical journals in that part of the world. Dr Handjani has conducted many national and international workshops on scientific writing, publication ethics and peer review. He is also a member of the Iranian Commission of Medical Journals, affiliated with the Iranian MoH.

JUDGES

DR IDRISS LAHLOU AMINE has received his PhD in pharmacy from Faculty of Medicine and Pharmacy, Mohammed V University (Rabat-Morocco) during the period of 1986-1993.
Mr Idriss LAHLOU AMINE graduated in 2001 with a degree in medical biology (1996-2001). He holds a degree in medical virology in 2000 from the Claude Bernard University of Lyon, a degree in systematic virology in 2004 from the Pasteur Institut of Paris and also a degree of Infectious Disease and anti-Infective Chemotherapy in 2005 from the Claude Bernard University of Lyon.

Mr Idriss LAHLOU AMINE is also Professor of Microbiology at the Faculty of Medicine and Pharmacy of Rabat. He has many international research articles in English and French with reputed publishers.

DR IMANE JROUNDI is an MD, MPH and PhD in International Health. She works at the Faculty of Medicine and Pharmacy in Rabat, Morocco as Associate Professor of Public Health. She has been focusing her research since 2008 on the pediatric population, with a special interest in investigating the epidemiology of infectious diseases preventable by vaccines and the impact of vaccines policies on microbial resistance. Also, she conducted research studies on the prognosis of pediatric asthma triggered by viral infections. These projects were carried out in collaboration with Barcelona's Institute of Global Health, University of Western Australia and the University of Montreal. In parallel, she has worked within the Moroccan Ministry of health as a staff member, taught classes of research methodology, Good clinical practices, research ethics and scientific writing for the Moroccan Field Epidemiological Training Program candidates.

JUDGES

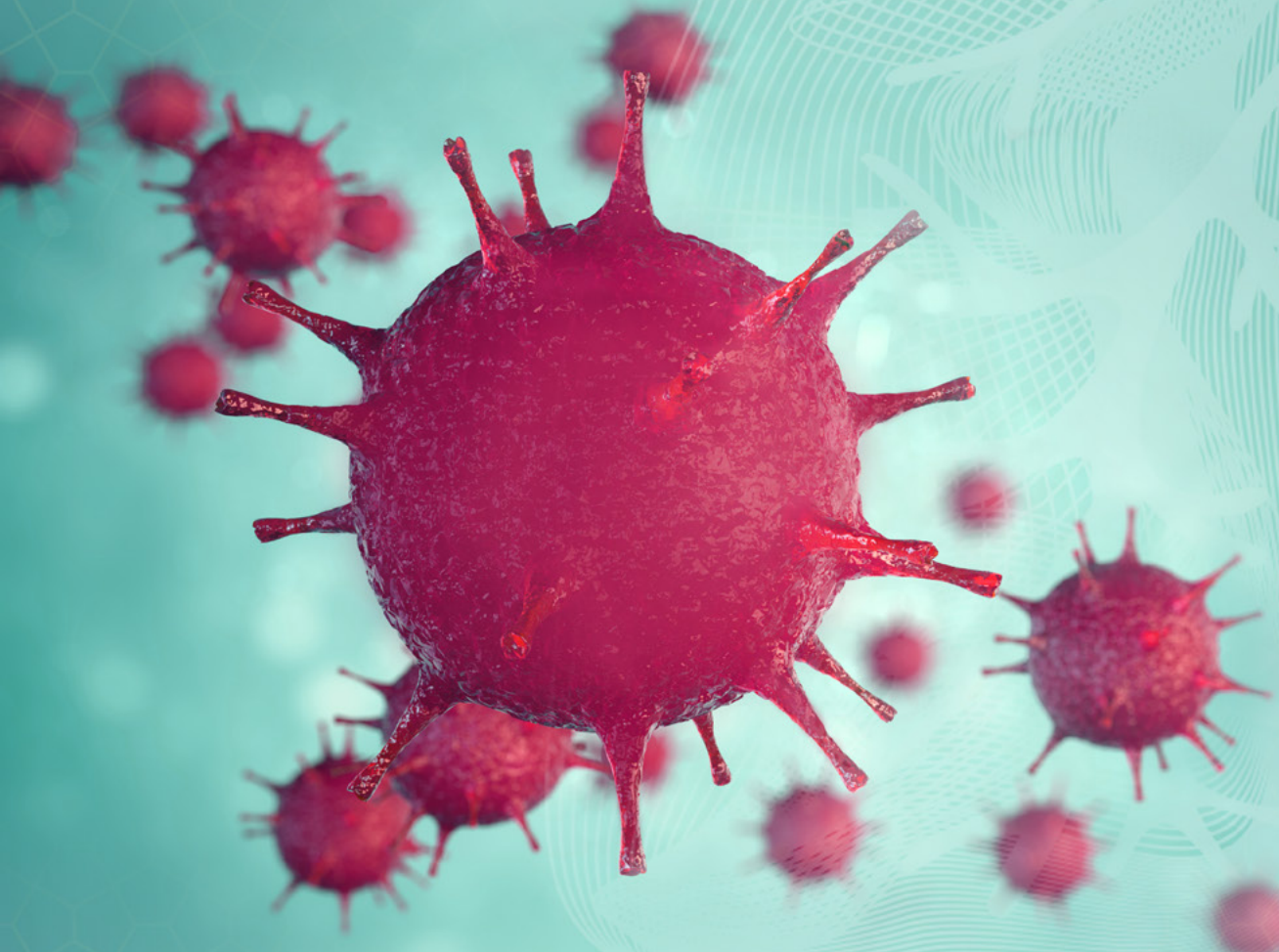
DR MOHAMED ELHAKIM is a medical epidemiologist who works as technical officer at the World Health Organization, Djibouti Country Office. He previously served in the World Health Organization Eastern Mediterranean Regional Office as a focal point for the Eastern Mediterranean Flu Network (EMFLU), a team member for the Pandemic Influenza Preparedness and Middle East respiratory syndrome at the Infectious Hazard Management Unit. He also served as a focal point for the International Health Regulations (IHR) and Health Clusters at the Health Emergency Information and Risk Assessment Unit in EMRO.
Dr Elhakim is a member of the Group of Experts for Pandemic Influenza Severity Assessment (PISA) in the Eastern Mediterranean Region. He is a peer reviewer at the Influenza and Other Respiratory Viruses (IORV) journal. An Egyptian by nationality, Dr Elhakim has a number of publications in peer-reviewed medical journals and has presented scientific papers and abstracts in many international scientific meetings and conferences.
Dr Elhakim has a Bachelor of Medicine, Bachelor of Surgery (MBBCh) degree from Ain Shams University, Egypt; a postgraduate Diploma in Healthcare and Hospital Management from the American University in Cairo; and a Master of Science in Epidemiology from Ain Shams University, Egypt.

DR RANA JAWAD ASGHAR is Chief Executive officer of GHSI (Global Health Strategists and Implementers) a consulting company in Pakistan. He is member of WHO International Health Regulations (IHR-2005) Rooster of Experts in Epidemiology and Surveillance and adjunct professor of epidemiology at the University of Nebraska, USA. He setup and led Field Epidemiology and Laboratory Training Program (FELTP) in Pakistan. Program expanded to setup disease surveillance and outbreak response systems, polio eradication and One Health. He was the fourth Pakistani to be selected in over 60-year history of Epidemic Intelligence Service, US CDC. He has served as Program Manager for Child Survival Program in Mozambique, faculty member at the London School of Hygiene and Tropical Medicine and Research Associate at the Stanford University, USA. He completed his MPH at the University of Washington, where he was a Fellow of Training in International Emerging Infectious Diseases. He did his basic medical education in Pakistan from Allama Iqbal Medical College and membership in family medicine from College of Physicians and Surgeons and was a Franklin Adams Scholar for a year in the Bristol University, UK in the department of Epidemiology.

JUDGES

DR MOHAMED RHAJAOUI is the Director of National Institute of Hygiene at the Ministry of Health of Morocco from 2012. He is the Executive Board Member of International Association of National Public Health (IANPHI) from 2018-2020. He is also a member of the International Society of Infectious Diseases Council, 2017-2019 and national focal point for Biological Weapons Convention from 2018. He has reviewed many scientific papers submitted to the journals including Public Health Reviews, Tropical Biomedicine Journal, Journal of Parasitology Research, and the Journal of Immunology Research.

WORKSHOPS



Workshops
Skill-Building Workshop

Increasing vaccine coverage: communication issues, best practices

Date: 13th November, 2019
Time: 16.15 – 18.15
Location: Agadir room, Sheraton Casablanca Hotel & Towers

Summary

The workshop will be a forum to learn about and discuss best practices and opportunities in expanding the use of influenza vaccines in the EMR region. Influenza is a major cause of morbidity and mortality worldwide. Each year seasonal influenza causes up to 650,000 deaths and millions of people are hospitalized due to complications. Influenza pandemics, which occur unpredictably, carry the threat of even greater impact both on health and society as a whole. A severe influenza pandemic, like the 1918 Spanish Flu, would cause millions of deaths, and cost as much as 0.7% of the global GDP. Expansion of influenza vaccination programs has been identified as an important objective of WHO and other global stakeholder as a tool for reduction of morbidity and mortality and as a mechanism to improve pandemic and epidemic preparedness. However, influenza vaccines remained underused in the region for a variety of reasons, including costs, programmatic complexity, and uncertainty of their value compared with other public health investments. Even so, successful programs in the region have provided models for successful implementation. In this workshop, activities to build the evidence base for vaccine policies and for overcoming technical and programmatic challenges to initiating or enhancing influenza vaccination will be explored.

Objectives

- To review the current landscape of influenza vaccination in the region
- To review ongoing initiatives related to influenza vaccination and preparedness that are relevant to seasonal vaccination program development
- To discuss tools and approaches to accelerate the collection of an evidence base for and/or creation of national vaccine policies
- To identify opportunities for regional collaboration to expand influenza prevention in the Africa

Target audience

Any EMARIS attendee that wishes to participate in a discussion of influenza vaccination program issues in the region. Special interest in this topic is expected from persons working in influenza surveillance, influenza vaccination program implementation, vaccine policy experts, EPI program staff and global stakeholders in disease prevention.

Workshops
Skill-Building Workshop

Data Quality and Epidemiologic Analysis using Epi Info

Date: 13th November, 2019
Time: 16.15 – 18.15
Location: Tanger room, Sheraton Casablanca Hotel & Towers

Summary

Epi Info™ is a public domain suite of interoperable software tools designed for the global community of public health practitioners and researchers. It provides for easy data entry form and database construction, a customized data entry experience, and data analyses with epidemiologic statistics, maps, and graphs for public health professionals. Epi Info™ is used for outbreak investigations; disease surveillance systems; as analysis, visualization, and reporting (AVR) components of larger systems; and in the continuing education in the science of epidemiology and public health analytic methods at schools of public health around the world. Epi Info™ mobile apps bring many of the features of Epi Info™ for Windows onto Android and iOS mobile platforms. Epidemiologists can collect data and perform analysis using their smartphones or tablets to investigate outbreaks, respond to emergencies, or conduct public health research in locations lacking IT infrastructure. Epi Info™ mobile apps are also cloud-aware, enabling organizations to quickly consume cloud services to allow teams of epidemiologists to collect data collaboratively.
The focus of this workshop is to introduce concepts of data quality and epidemiologic analysis of influenza surveillance data using Epi Info™. The workshop will include hand-on use of the software. It is recommended that participants bring their laptop and download the software prior to the start of the workshop.

Objectives

- To introduce the Form Designer for the development of case report forms with built-in data validation
- To introduce methods of statistical analysis using Epi Info's Visual Dashboard, which utilizes existing data directly, through forms created in Form Designer, or data from files and tables created in other software (Microsoft Access, Microsoft Excel, SQL Server, and ASCII)
- To introduce the capabilities of Epi Info mobile apps for data collection in the field and real-time data analysis and situational awareness

Target audience

Any EMARIS attendee that wishes to learn basic Epi Info skills for data management and analysis. Special interest in this topic is expected from persons working in influenza surveillance and/or influenza data management, analysis, and reporting.

Workshops
Skill-Building Workshop

Pandemic influenza preparedness in fragile context – lessons from the Eastern Mediterranean Region

Date: 13th November, 2019
Time: 16.15 – 18.15
Location: Fes I room, Sheraton Casablanca Hotel & Towers

Summary
Emergencies are a reality in the region and identifying the best way to support Member States though emergency to maintain strong surveillance and prevention mechanisms against potential outbreak will be vital in the future. The presence of active conflict comports additional constraints (e.g. access, insecurity, high operational costs, human resources shortages, etc.) that are not present in other EMR member states and that would affect pandemic influenza preparedness. Preparedness in fragile contexts presents challenges for health systems that have been chronically affected by protracted emergencies both natural and man-made and may have limited capacity to effectively perform the activities necessary to do so.
This workshop will describe a study that focuses on exploring the pandemic influenza preparedness plans and protocols in the following countries in the Eastern Mediterranean Region, namely Afghanistan, Yemen and Somalia. All three present with varying levels of fragility from Yemen's current and acute crisis, to Afghanistan and Somalia's chronic insecurity issues and will provide insight on efforts in these countries to address pandemic influenza preparedness despite the difficulties that exist in each respective context.

Objectives
- Present the current situation of pandemic influenza preparedness in conflict affected countries namely Afghanistan, Somalia and Yemen;
- Discussion of pandemic influenza preparedness plans in Afghanistan, Somalia and Yemen, identifying to what extent the plan are informed by the recommendations in the WHO PIP Framework;
- Identify bottlenecks that affect the implementation of PIP plans and ways in which these constrains are overruled;
- Identify promoters that aid in the contextualization of the WHO PIP Framework to fragile contexts and the successful implementation of pandemic influenza preparedness plans.

Target audience
Any EMARIS attendee that wishes to learn more about pandemic preparedness plans in emergency contexts.

Workshops
Skill-Building Workshop

Scientific Writing and Publishing

Date: 13th November, 2019
Time: 16.15 – 18.15
Location: Fes II room, Sheraton Casablanca Hotel & Towers

Summary

Appropriate public health measures to decrease the risk and impact of influenza can save large numbers of lives, reduce health costs and economic loss and mitigate potential societal disruption. However, insufficient knowledge in many areas has hampered efforts to more effectively plan for and address pandemic influenza as well as zoonotic and seasonal influenza epidemics. For example, national public health authorities have grappled with questions such as the need to stockpile masks for community use or to close schools in the event of a pandemic and how best to control and manage rumours and misinformation that can undermine efforts to control influenza. Answers to these and other complex questions require information about transmission of influenza, the efficacy, feasibility and cost effectiveness of various measures as well as understanding factors that influence the beliefs and behaviours of people. Moreover, advances in knowledge regarding many fundamental aspects of influenza infection are required to improve public health responses, so that input is needed from an array of disciplines such as virology, clinical and laboratory medicine, pharmacology, immunology, epidemiology, anthropology, sociology, health economics and mathematical modelling.

A robust and multidisciplinary scientific knowledge base, therefore, is an essential foundation for modern public health practices and policy development related to influenza control. Building appropriate skills in scientific writing and publishing is vital for building research capacity in the region in order to document experiences and share new knowledge with the global community.

Objectives

- To promote scientific writing skills among young health professionals and researchers by outlining the various sections of a scientific manuscript and providing useful tips
- To familiarize attendees with issues related to scientific writing (e.g. journal selection and different types of medical articles, authorship criteria, publication ethics)
- To introduce concepts such as peer review and open access as well as the threat of predatory journals to young researchers

Target audience

Young or mid-career health professionals, including PhD candidates, physicians and health researchers.

Workshops
Skill-Building Workshop

Outbreak Investigation Techniques and Responses

Date: 13th November, 2019
Time: 16.15 – 18.15
Location: Fes III room, Sheraton Casablanca Hotel & Towers

Summary

At least 11 of the 22 countries in the Region have reported major outbreaks and epidemics which have had the potential to spread globally, including avian influenza A(H5N1), MERS-CoV, yellow fever, RVF, monkey pox, CCHF, dengue, chikungunya and cholera. Among recent emerging zoonotic infections, SARS was the only one that did not strike the Region. In addition to protracted humanitarian emergencies, a number of environmental factors also exist in the Region that promote the survival, reproduction and distribution of high-risk pathogens, as well as their vectors and hosts. These factors, coupled with climate change, human population movements and rapid urbanization, especially in poor urban slum areas, contribute to the increased frequency and severity of emerging infectious disease outbreaks in the Region. The Region also hosts annual mass gatherings for religious, sporting and other events that increase the risk of infectious disease spread, both within the Region and globally.

High quality of risk assessment and timeliness and effectiveness of the response to acute public health risks is essential in order to minimize the negative health consequences to the affected population. Countries need to strengthen national capacity for investigation and implementation of rapid public health containment measures.

Through lectures and group work, participants will learn about disease transmission, exposures and risk factors, types of surveillance, outbreak identification and investigation techniques, including linking epidemiological and laboratory data. Participants will become familiar with the use of case investigation forms and line lists, and they will work in groups on how to use data collected by these tools. By the end of the workshop, participants should have necessary knowledge and skills to participate in an outbreak investigation.

Objectives

- To familiarize participants with surveillance and outbreak investigation techniques for avian influenza viruses and other respiratory illnesses
- To provide participants with tools to use during outbreak investigation and response

Target audience

Young or mid-career health professionals, including PhD candidates, physicians and health researchers.

SUMMERY OF PRESENTATIONS

SUMMARY OF PRESENTATIONS

Session 1 | Global Influenza Strategy: Promoting Better Data, Better Policy, Better Action

Ann Moen

Chief, Influenza Preparedness and Response, Health Emergency Program, WHO/HQ

The Global Influenza Strategy: Preparing the World for the Next Pandemic

Influenza is a serious global health threat that impacts all countries: every year, there are an estimated 1 billion cases, 3-5 million severe cases, and 290 000-650 000 influenza-related respiratory deaths worldwide. In this interconnected world, the next influenza pandemic is a matter of when not if, and a severe pandemic is believed by many experts to be potentially the most devastating global health event with far reaching consequences. The Global Influenza Strategy for 2019-2030 provides a framework for WHO, countries and partners to approach influenza holistically through robust national programmes – from surveillance to disease prevention and control – with the goal of strengthening seasonal prevention and control and preparedness for future pandemics. To achieve this, the strategy places a large focus on the following: 1. the development of better global tools, such as vaccines, antivirals and treatments; and 2. stronger country capacities that are integrated within national health security planning. Influenza prevention, control and preparedness are functional building blocks for capacity-building and can enhance core capacities and support preparedness. A country-level approach and country ownership are vital for ensuring sustainability of national influenza programmes. The strategy builds on the success of the GISRS and the PIP Framework as it integrates broader goals for prevention, control and preparedness for all countries.

Abdinasir Abubakar

Acting Programme Area Manager, Infectious Hazard Preparedness, Health Emergencies Programme, WHO Regional Office for the Eastern Mediterranean

Epidemiological and Virological Characteristics of Influenza in the Eastern Mediterranean

Infectious diseases are among the major causes of mortality and morbidity in many countries in the Eastern Mediterranean Region. Many countries in the region have experienced major outbreaks of emerging and high-threat pathogen diseases annually and those countries affected directly or indirectly by acute, protracted humanitarian emergencies have higher risk of infectious disease epidemics. The Eastern Mediterranean Regional Office of the World Health Organization (WHO) has been supporting its 22 countries to strengthen their influenza surveillance through establishment of SARI and ILI sentinel sites and improving the laboratory capacity. In the last 10 years, considerable progress has been made in improving the epidemiological and virological capacities to detect, monitor and share influenza viruses across the Region. Member States in the region have shown strong political commitment to sustain, and expand laboratory and epidemiological surveillance of influenza, including those countries that have been experiencing acute or protracted complex emergencies. 19 out of the 22 countries in the region have functioning SARI and ILI sentinel sites, while 20 out of 22 have functioning National Influenza Centers or influenza laboratories. Majority of the countries in the region have been collecting good quality surveillance data on influenza and influenza-associated illnesses in a timely and reliable manner, use these data to improve understanding of the burden, seasonality and risk factors of influenza in the Region, and use such evidence to introduce control measures such as influenza vaccines to reduce the incidence of severe disease and death attributed to influenza.

SUMMARY OF PRESENTATIONS

Session 1 | Global Influenza Strategy: Promoting Better Data, Better Policy, Better Action

Rodney S Daniels

Deputy Director of the WHO Collaborating Centre for Reference and Research on Influenza at the Francis Crick Institute, United KingdomQ

Update on the current global and regional status of seasonal, avian and other novel influenza virus subtypes

Data considered at the recent WHO Vaccine Consultation Meeting (VCM) resulting in recommendations for vaccine viruses to be used in the upcoming 2010 southern hemisphere influenza season will be summarised. For human seasonal influenza, this will encompass input from all laboratories within the Global Influenza Surveillance and Response System (GISRS) that submit information to WHO FluNet and FluID, but largely focus on analysis of the detailed virus characterisation conducted by WHO Collaborating Centres for Influenza (CCs). Surveillance of non-human influenzas conducted by CCs is enhanced by substantial input from OFFLU (the OIE-FAO global network of expertise on animal influenzas) and WHO H5-reference laboratories to assess the zoonotic and potential pandemic risk posed by these viruses with recommendations for development of candidate vaccine viruses if considered necessary. Recommendations emerging from the VCM will be given.

Wenqing Zhang

Manager, Global Influenza Program, Influenza Preparedness and Response, Infectious Hazard Management, Health Emergency Program, WHO/HQ

Global Influenza Surveillance and Response System (GISRS): Successes and solutions since 1952

The constant evolving nature of influenza virus decides that any control measures in order to be effective must be timely and globally coordinated. The approach to influenza was established 67 years before the WHO constitution entered into force – through the WHO Global Influenza Surveillance and Response System (GISRS). From 25 countries to nowadays 115 countries, GISRS has been the foundation of influenza surveillance, preparedness and response, and become the model of trust and confidence for public health with commitment from countries. The challenges for GISRS come from both the virus itself and the world outside, among which the lack of knowledge and understanding of the mechanism of virus evolution, the suboptimal vaccines, the increasing rigid legal binding for sharing and benefit return should be addressed with top priority and multi-sectoral engagement. Meanwhile, with new technology and knowledge obtained, GISRS shall be equipped timely with the development e.g. genome sequencing and bioinformatics, new diagnostics, and modelling to further strengthen its capacity to fulfil its public health responsibilities. Furthermore GISRS, being the world's asset as the fighter on the front of influenza threat, need innovative protection in the current evolving landscape of world - sharing of viruses and access to benefits, not only from health sectors, but also beyond in the whole society of the world.

SUMMARY OF PRESENTATIONS

Session 1 | Global Influenza Strategy: Promoting Better Data, Better Policy, Better Action

Kinda Zureick

Public Health Adviser, Influenza Division, National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention (CDC), Atlanta, United States

International Influenza Program: CDC's Changing Landscape

The US Centers for Disease Control and Prevention's (CDC's) Influenza Division has a long history of supporting the World Health Organization (WHO) and its global network of National Influenza Centers (NICs). In 2004, the US government (the Department of Health and Human Services [HHS]/CDC) committed resources and developed a multi-faceted approach to support global capacity for seasonal influenza and pandemic preparedness. Support was made available through cooperative agreements to enhance existing support for WHO's Global Influenza Program and WHO's Regional Offices. Substantial support was also provided to Ministries of Health in high-risk countries to enhance influenza surveillance and response capabilities. The program accomplishes key goals by building on existing programs and infrastructure including WHO and its Regional Offices, CDC Global Disease Detection sites, US Department of Defense international program sites, and by utilizing the assistance of US Embassies. Over the past 15 years the program has undergone remarkable growth and has expanded to provide support to more than 50 countries, all WHO Regional Offices, and WHO Headquarters.

Session 2 | Influenza dynamics and characteristics in the Eastern Mediterranean Region

David Wentworth

Chief of the Virology, Surveillance, and Diagnosis Branch, Influenza Division, Centers for Disease Control and Prevention (CDC), Atlanta, United States

Detection and Characterization of Epidemic and Zoonotic Influenza Viruses

Influenza type A and B viruses are diverse human pathogens that rapidly evolve to replicate and transmit efficiently in the host population. While influenza B viruses (IBV) primarily infect humans, influenza A viruses (IAV) infect diverse host species and they transmit between host species. It is important to rapidly identify transmission of IAV from animal reservoirs to humans because these zoonotic IAVs are pandemic threats. The detection of influenza A and B viruses that cause human epidemics or zoonotic outbreaks is central to surveillance and pandemic preparedness. CDC has developed sensitive Real time PCR (rtPCR) assays for the detection of IAV or IBV and to rapidly determine the IAV subtype or IBV lineage in clinical samples. This is accomplished by using primers and probes to either conserved (e.g., IAV) or specific (e.g., human H3) regions of the virus genomes. The suite of CDC rtPCR kits for detection and initial characterization of both epidemic/seasonal viruses and zoonotic subtypes that represent pandemic threats and their availability via the International Reagent Resource will be discussed. Complete genetic characterization of IAV and IBV viruses for epidemic surveillance and outbreak response is conducted by genomic amplification and next generation sequencing using multiple platforms (e.g., Illumina MiSeq or Oxford nanopore MinIon). Finally, phylogenetics is used to analyze evolutionary trends and select viruses for phenotypic analysis of antigenic characteristics or antiviral susceptibility. The ability to detect and characterize influenza viruses strengthens global surveillance and response capacities for public health decisions.

SUMMARY OF PRESENTATIONS

Session 2 | Influenza dynamics and characteristics in the Eastern Mediterranean Region

Amal Barakat

Laboratory Technical Officer, Infectious Hazard Preparedness, Health Emergencies Programme, WHO Regional Office for the Eastern Mediterranean

External quality assessments programme for Influenza: Achievements and challenges for Eastern Mediterranean Countries

The Influenza Laboratory Network, coordinated by the WHO Regional Office for the Eastern Mediterranean (EMR), is composed of 21 influenza laboratories in 20 countries, including 16 National Influenza Centers (NICs) in 15 countries and the Palestinian Influenza Center. These laboratories are mandated to maintain high technical capacity for influenza testing and are evaluated on the quality of their testing through external quality assessments (EQAs).

The number of influenza laboratories participating in the Global WHO EQAP quality assurance test for RT-PCR diagnosis has increased from 2 laboratories in 2007 to 19 in 2018. The percentage of NICs scoring fully correct results for the detection of influenza virus by PCR increased from 50% in 2007 to 100% in 2017, however this dropped to 70.6% in 2018 although the number of countries participating in the EQAP increased in 2018.

In 2018, 8 NICs participated in the EQA to assess isolation and identification of influenza viruses with cell culture techniques. For virus isolation, 5/8 laboratories obtained correct results for ≥10/15 samples. For virus identification, 6/8 laboratories obtained correct results for ≥10 samples.
In 2019, IHM/EMRO conducted a MERS-CoV EQA. Twenty laboratories returned panel results and demonstrated good proficiency at detecting MERS-CoV with 100% reporting correct results for all specimens for MERS-CoV.

Overall, EQA results showed a general improvement in the technical ability of network laboratories, but also identified topics for future training and monitoring. Laboratories with low performance in the EQA receive training and technical support aimed at instituting corrective action.

SUMMARY OF PRESENTATIONS

Session 2 | Influenza dynamics and characteristics in the Eastern Mediterranean Region

Ibrahim Salem

Director of Central Public Health Laboratory and National Influenza Center, Ministry of Health, Palestine

Improving virological surveillance for influenza: The role of the new National Influenza Centre in Palestine

CPHL is the reference governmental lab that analyzes and monitors the food, water, drugs safety and analyzes the infectious diseases tests for the diagnostic purposes as influenza. The system collects specimens from all Districts around West Bank and performs influenza viruses, types and subtypes and shared weekly on EmFlu website. Palestine Laboratory Assessment report on 2017 showed that CPHL-Palestine meets the requirements to fulfill the Terms of Reference of the National Influenza Center (NIC) of the GISRS. Accordingly, on 2019 Palestine was considered as (PIC) with enjoying the same status and benefits of NICs in the technical functions GISRS. Every year PIC collects and ship representative specimens to WHO Collaborating Center for advanced genetic analysis and the shipment process is done according WHO requirement. The methods of analysis are real time RT-PCR in which nasopharyngeal swabs received at the Palestine Influenza Centre are tested for A/B typing, sub typing (influenza A) and determination of the lineage (influenza B) and other respiratory viruses. Standard operating procedures of real-time RT-PCR assays for in vitro qualitative detection and characterization of Influenza A and B viruses from clinical samples are within available CPHL and IRR reagents from CDC are mostly used for influenza A and B detection keep in mind that CPHL- PIC is ISO15189 national accredited on influenza test with qualified well-trained staff. Lab participation with the WHO External Quality Assurance Program (EQAP) for the detection of Influenza viruses by PCR: Influenza viruses since 2010 and till now we got full mark in the evaluation and yearly certificates. CPHL-PIC has some main challenges as lack of some diagnostic and safety equipment, occupation and difficulty in the shipment process, lack and lack of Biosafety Level 3.

Amina Al-Jardani

Director of National Influenza Center, Oman

Are the testing algorithms currently in NIC Oman capable of detecting emerging and variant influenza viruses?

Influenza remains a significant public health threat. As estimated by the World Health organization, that 290 000 to 650 000 deaths occurs annually due to respiratory diseases caused by seasonal influenza. In Oman the burden is similarly significant, 2726 cases of laboratory confirmed influenza in 2017-2018 seasons, with 56 related deaths. Hospitalization rates were highest among children, and adults ≥65 years showed the highest death rate.

Emerging and variants influenza viruses create profound threats to public health nationally and globally. Therefore, establishing the laboratory capacity to detect such novel and emerging strains is crucial. This include the recommended diagnostic techniques and approaches that can rapidly and accurately detect them which are needed for prompt initiation of appropriate antiviral therapy, prophylaxis and to effectively initiate prevention and control strategies.

In Oman, the Central Public Health laboratories, the only National Influenza Center (NIC) in Oman, provide molecular testing and viral culture for respiratory infections, using nationally agreed algorithms for acute respiratory infections including testing samples from the sentential sites for severe respiratory infections (SARI) and influenza like illness (ILI). Influenza typing and subtyping are done using US CDC protocol. All unsubtypable strains will be immediately referred to WHO collaboration center for further characterization. The recently identified Avian Influenza A(H9N2) will be highlighted, this is the first confirmed human case of infection with an avian influenza virus reported from Oman.

The CPHL Oman also conduct antiviral susceptibility testing and building capacity for influenza sequencing.

SUMMARY OF PRESENTATIONS

Session 3 | Estimating influenza burden: evidence-informed public health policy making for prevention and control of influenza

Amgad Elkholy

Medical Officer, Infectious Hazard Preparedness, Health Emergencies Programme, WHO Regional Office for the Eastern Mediterranean, Egypt

Estimating national influenza burden: what is the situation in the Eastern Mediterranean Region?

Influenza disease burden is recognized as one of the major public health problems globally. Acute respiratory illnesses and influenza-like illnesses (ILI) are one of the top leading causes of morbidity and mortality in the Eastern Mediterranean Region (EMR). Available data reveals that seasonal influenza can affect up to 15% of the population presenting with upper respiratory tract infections and may result in up to 500,000 deaths worldwide annually.

EMRO supported countries within the region to establish/maintain sentinel surveillance of influenza like illness (ILI) and severe acute respiratory infection (SARI) to estimate the mild and severe outcomes of disease respectively. Surveillance of both these diagnoses provides an approximate understanding of influenza incidence with the use of data from several influenza sentinel sites.

So far, seven countries within EMR succeeded to finalize the estimation exercise at least once. More countries are expected to finish it soon while other countries will start the economic burden of influenza. Linking the influenza burden information with public health policies are highly recommended.

Katelijn Vandemael

Medical Officer, Global Influenza Program, WHO HQ

Use of PISA in seasonal epidemics/ PISA threshold setting

During the 2009 pandemic, measuring influenza severity was problematic. The International Health Regulations review committee on pandemic influenza (2011) recommended to WHO to develop and apply measures for severity that can be used to assess severity of every influenza epidemic and in the case of a pandemic. This led to the WHO Pandemic Influenza Severity Assessment (PISA) guidance.

Influenza severity is defined by three indicators: transmissibility, seriousness of disease and impact on health care system and society. Countries are encouraged to 1) choose appropriate parameters from existing surveillance systems and data sources to inform the indicators, 2) establish thresholds for these parameters using historical data, 3) compare current data to these thresholds to arrive at a near real-time severity assessment into five categories from below seasonal baseline to extra-ordinary high, and 4) report their findings (with a confidence level) locally and to WHO.

To help set thresholds mathematical methods have been used. The WHO average method and the MEM method have been used most frequently. For both methods Shiny apps have been developed to facilitate the visualization and threshold setting.

These PISA assessments, with information from special studies and advanced analytics will help guide decisions on the timing, scale and urgency of response activities.

SUMMARY OF PRESENTATIONS

Session 3 | Estimating influenza burden: evidence-informed public health policy making for prevention and control of influenza

Bill Davis

Epidemiologist, Influenza Division, Centers for Disease Control and Prevention (CDC), Atlanta, United States

Measuring the Cost of Seasonal Influenza for Policy Decision Making

Determining the cost of influenza illness can inform policy makers' decisions to support vaccine programs or other preventive measures. This talk covers approaches and methods of cost of illness studies, using a recent study as an example.

Session 4 | Investigating influenza and other respiratory diseases: Leveraging the existing outbreak investigation and response structure

Evans Buliva

Technical Officer, Infectious Hazard Preparedness, Health Emergencies Programme, WHO Regional Office for the Eastern Mediterranean

Regional Capacity for Timely Outbreak Investigation and Response: The role of Rapid Response Teams

Countries in the Eastern Mediterranean Region continues to be hotspots for emerging and re-emerging infectious diseases, with outbreaks of such diseases having a significant impact on health and economic development. Thus, the need to prevent, detect and respond to any infectious diseases that pose a threat national, regional or global health security.

Trained and equipped multidisciplinary Rapid Response Teams (RRTs) promote comprehensive outbreak surveillance and work to ensure rapid, coordinated detection and response to disease outbreaks. Availability of trained national and subnational RRTs is a strategic priority required under IHR core capacities so as to ensure timely investigation and response to disease outbreaks.

WHO EMRO continues to support RRT trainings that address gaps in their availability and capacity. The overall goal has been to build the functional skills and knowledge of the RRTs and familiarize them with mechanisms and tools for field investigations and response.

Training methodologies include tutored presentations, group discussion and exercises, as well as games, role plays and simulation exercises. The trainings focus on covering required practical activities necessary to control an outbreak rather than focusing solely on investigation. The trainings have also improved collaboration and partnerships among stakeholders working in outbreak surveillance and response.

SUMMARY OF PRESENTATIONS

Session 4 | Investigating influenza and other respiratory diseases: Leveraging the existing outbreak investigation and response structure

Sami Almudarra

General Supervisor of Saudi Field Epidemiology Training Program and Executive Director of Surveillance and Preparedness, Saudi Center for Disease Control and Prevention (SCDC), Saudi Arabia

Saudi FETP experience in investigating MERS outbreak

Since the establishment of Saudi FETP in 1989, the program provided rapid assistance to the other departments at the Public Health Agency and to the regional Public Health departments at MOH. Being part of the response mechanism, this provided Saudi FETP with the chance to respond rapidly to serious and urgent public health threats. Performing epidemiological investigations to any outbreak by field epidemiology teams assisted enormously in selecting and implementing interventions to lessen or prevent illness, injury, or death. The objectives of Saudi FETP contribution in the epidemiological investigations are to define the parameters of an outbreak and to identify control or prevention measures. It's also an opportunity to conduct public health research and to train field investigators/epidemiologists in the methodology of field investigations.
In 2013, several outbreaks of MERS CoV occurred in Saudi Arabia; and Saudi FETP was immediately involved in almost all outbreaks related to the virus since then. My presentation will focus on addressing the contribution of Saudi FETP in MERS CoV outbreaks over the last few years and how can this experience be imitated by other countries in the region that have a mine of young workforce of investigators called field epidemiologist who are trained for such emergencies.

Mohamed Youbi

Medical Epidemiologist, Director of Epidemiology & Diseases Control, Ministry of Health, Morocco

Morocco experience with influenza upsurge in 2018/19 season

Since 1996, Morocco has begun phasing in the components of the national influenza control program.
The epidemiological surveillance is based essentially on the evolution of the proportion of influenza like illness (ILY) among the primary health care consultants, and on the follow-up of the viruses identified in the nasopharyngeal samples analyzed in the laboratories.
During the influenza season 2018-2019, over-mediaization of the death of a pregnant woman infected with the A-H1N1 virus reminded the population of the porcine origin of this subtype, during the 2011 pandemic and an unusual interest in epidemiological data, especially influenza-related mortality, and led to increased demand for Oseltamivire.

SUMMARY OF PRESENTATIONS

Session 4 | Investigating influenza and other respiratory diseases: Leveraging the existing outbreak investigation and response structure

Amira Abdelnabi

Consultant, One Health and risk assessment, FAO/ECTAD, Egypt

Integrated human–animal surveillance and outbreak investigation and response: Egypt experience in an avian influenza outbreak

Egypt has a long history of being infected with Avian Influenza, now a day there are three detected strain entrenched in the country, H5N1, H5N8 and H9N2. Many techniques and ideas of control and actions has been implemented with various successes and failures. Lessons learned from Egypt experience can be beneficial to all countries. Since the emergence of HPAI in Egypt in 2006, strong collaboration has been established between public and animal health in several domains. This presentation will illustrate the experience of Egypt with HPAI along 13 years and describe the collaborative system between Human and animal health in HPAI surveillance, outbreak investigation and response with emphasis on success stories, lessons learned and challenges encountering the implementation of joint control measures. In addition, brief information will be presented on OH actions and way forward within the country to establish a OH platform, which will assist in better coordination and more systematic control actions. The objective of the presentation is to share the benefits from joint actions and the establishment of a one-health context in daily routine.
Main lessons learned from Egypt experience can be summarized in that detection of and response to zoonotic influenza with epidemic potential can be improved by enhancing surveillance at the human animal interface including periodic information sharing and joint risk assessment between the animal and human health sectors. In addition, the response to zoonotic influenza should rely on joint surveillance, investigation and laboratory detection under the One Health framework.

Session 5 | Closing the knowledge gaps to advance prevention and control measures of MERS and other emerging respiratory infections

Abdullah Assiri

Assistant Deputy Minister of Health, Ministry of Health, Saudi Arabia

Public Health Response to MERS: Saudi Arabia Experience

Human infections with Middle East respiratory syndrome coronavirus (MERS-CoV) continue to be reported from the Arabian Peninsula and the Middle East. 78% of lab-confirmed MERS were reported from KSA. Surveillance has human and animal components. Healthcare facilities are required to report MERS and weekly pneumonia suspicion index is used as a surrogate indicator. Camels are screened on different occasions e.g. in response to human cases, risk mitigation during camel festivals, at markets and slaughterhouses and at point of entries. We are working to integrate MERS surveillance into other respiratory infection surveillance. We will discuss other public health issues like Vaccines (especially for animals), the practicality of universal respiratory triage, tools for difficult-to-identify patients and POC testing.

SUMMARY OF PRESENTATIONS

Session 5 | Closing the knowledge gaps to advance prevention and control measures of MERS and other emerging respiratory infections

Maria Van Kerkhove

Scientist, Infectious Hazard Management, Department of Health Emergencies, World Health Organization

Middle East Respiratory Syndrome (MERS-CoV): Global perspective

Since its identification in Saudi Arabia in 2012, Middle East Respiratory (MERS) has become a global public health threat. Typical of an emerging zoonosis, MERS-CoV has an animal reservoir, i.e. dromedary camels in which the virus causes little to no disease. Many details about the extent of circulation and the mechanisms of transmission within dromedaries, or factors related to zoonotic transmission and differences in circulating MERS-CoV strains, remain unknown. The virus has jumped from camels to humans principally in countries on the Arabian Peninsula, causing significant morbidity and mortality in humans. However, the geographic range of spillover risk extends across large parts of Africa, the Middle East and into South Asia. Human-to-human transmission in health care facilities can be amplified, causing large outbreaks, as has been seen in the Middle East and in the Republic of Korea, with significant public health and economic impacts. As of August 2019, more than 2,464 cases from 27 countries have been reported to WHO.

More than six years after the first human cases of MERS were identified, the world remains under threat from this pathogen. The critical needs for research have been identified by the public health community and used to inform the WHO R&D MERS-CoV Roadmap and a broader Public Health Research Agenda. More focused efforts in our activities and investments to address scientific and public health research questions, accelerate promising medical interventions and are more strategic on where activities are conducted globally will go further to address remaining public health unknowns.

Malik Peiris

Professor and Chair, Division of Public Health Laboratory Sciences, School of Public Health at the University of Hong Kong

Progress of fulfilling knowledge gaps on MERS

MERS remains a major threat to global public health. The source of zoonotic infection is the dromedary camel but transmission between humans can contribute to major outbreaks, especially within health care facilities, sometimes resulting in transboundary spread. The routes of zoonotic transmission remain unclear. While >70% of MERS coronavirus (MERS-CoV) infected dromedaries are found in Africa, zoonotic human disease has not been reported in Africa. Reasons for this remain unclear and possible explanations include the lack of awareness of MERS as a disease threat, lack of diagnostics, differences in exposure patterns and virus characteristics. It is becoming clear that prior infection of camels and serum antibody does not protect from re-infection but the correlates of protection from transmission within camel herds and zoonotic transmission remain unknown. These are relevant to considerations of the potential use of camel vaccines now in development. It is now clear that mild and asymptomatic human infection occurs but whether asymptomatic infection may lead to transmission is uncertain, as is the basis for "super-spreading events" that are the drivers of human outbreaks. The relative role of contaminated fomites, large respiratory droplets and fine aerosols in transmission remain to be elucidated. The effectiveness of antiviral therapy and the potential for effective vaccines remains uncertain.

SUMMARY OF PRESENTATIONS

Session 5 | Closing the knowledge gaps to advance prevention and control measures of MERS and other emerging respiratory infections

Wenqing Zhang

Manager, Global Influenza Program, Influenza Preparedness and Response, Infectious Hazard Management, WHO Health Emergency Program, WHO/HQ

WHO Global RSV surveillance – an update

RSV has long been recognized as an important respiratory pathogen that often causes severe disease and mortality, particularly in very young children. Although there were multiple big studies to understand disease burden associated with RSV, there was no RSV surveillance running to address many public health questions essential to national policies e.g. use of vaccines when available.

Over a period of 3 years (2016-18), with support from the Bill & Melinda Gates Foundation and countries, RSV surveillance using GISRS platform were established and evaluated in the RSV surveillance pilot. Important outcomes from the pilot include using extended SARI and ARI case definition for RSV detection, laboratory protocols and capacity in country, seasonality of RSV epidemics in pilot countries, and feasibility of leveraging GISRS for RSV surveillance with marginal incremental costs without any significant adverse impact on influenza surveillance.

The 3-year output finalize a solid RSV surveillance strategy with evidence-based standards and a tested mechanism for RSV surveillance based on the GISRS. Now the project is in a 3-year extension phase (Nov 2018 – Oct 2021) with the aim to consolidate the achievements of the original investment and proposes to (a) enhance the surveillance in infants and young children, (b) focus on the more severe disease requiring hospitalization, (c) expand virologic monitoring to differentiate virus types and to identify genetic groups, and (d) generate a robust understanding of the seasonality, risk groups and disease burden particularly in LMICs representative in all WHO Regions. To achieve these objectives, a small number of countries will join the extension phase, preparations in laboratories and sentinel sites are ongoing, other issues e.g. genetic sequencing data sharing are being discussed.

SUMMARY OF PRESENTATIONS

Session 6 | Curbing influenza burden through promoting vaccination of high-risk groups

Joseph Bressee

Associate Director for Global Health, Influenza Division, Centers for Disease Control and Prevention (CDC), Atlanta, United States

Expanding Influenza Vaccination in the Eastern Mediterranean Region: challenges, opportunities and lessons learned

MERS remains a major threat to global public health. The source of zoonotic infection is the dromedary camel but transmission between humans can contribute to major outbreaks, especially within health care potential for effective vaccines remains uncertain. Influenza vaccination remains the best tool for influenza prevention during seasonal epidemics and a key tool for pandemic response. Expanded use of influenza vaccines in the Eastern Mediterranean region would serve both to reduce influenza mortality and morbidity in the region, and also allow all countries to establish processes for improved pandemic vaccine preparedness and national and regional health security. Expansion of existing influenza vaccine programs and initiation of new programs in countries where vaccines are not currently widely or routinely used will face several challenges. These include technical and programmatic challenges related to the need for annual vaccination among risk groups that are not routinely targeted for childhood immunization programs, economic challenges to in countries with competing public health priorities, ensuring vaccine access issues related to national licensure of a growing number of vaccine formulations, and increasing vaccine hesitancy related to all vaccines. This presentation will review these, and other issues related to decisions regarding implementation of influenza vaccination programs, and review opportunities and mechanisms of support to address these challenges. During his presentation, existing collaborations and partnerships will be highlighted that have been recently established to support influenza vaccination programs in low and middle-income countries and include lessons from recent vaccine programs introductions and evaluations in the region.

Abdullah Assiri

Assistant Deputy Minister for Preventive Health, Ministry of Health of Saudi Arabia

Improving influenza vaccine introduction and uptake for Hajj and Umrah visitors: successes and challenges

Influenza poses a special health challenge during Hajj. Published data indicate that influenza virus infection was a common cause of severe respiratory illness in pilgrims returning from Hajj.
Hajj pilgrimage follows the lunar calendar and may or may not coincide with wintertime in Saudi Arabia. Pilgrims performing hajj, however, come from both northern and southern hemisphere and therefore a portion of them comes from areas with active transmission of seasonal influenza.
The benefit of influenza vaccination in preparation for Hajj extends beyond the protection of Hajjis themselves during their rituals. Close contact with individuals coming from different climatic zones exposes Hajjis to different strains of influenza viruses and may trigger outbreaks when hajjis go back to their home countries.
We will present data on influenza vaccine introduction for local pilgrims.

SUMMARY OF PRESENTATIONS

Session 6 | Curbing influenza burden through promoting vaccination of high-risk groups

Sonja Olsen

Technical Officer, High Threat Pathogens Team, Division of Health Emergencies and Communicable Diseases, Infectious Hazard Management, WHO Regional Office for Europe

Tailoring influenza immunization programs to improve vaccine coverage: examples from the WHO European Region

WHO recommends seasonal influenza vaccination of persons at high risk for severe disease and health care workers. However, in many countries, vaccine uptake remains low. The WHO Regional Office for Europe proposed an approach, tailoring immunization programmes for seasonal influenza (TIP FLU), to design evidence-informed solutions to increase uptake of seasonal influenza vaccine. TIP FLU is grounded in behaviour change theories and health programme planning models and provides tools for designing SIV programmes tailored to specific contexts. The approach offers a step by step guide so that policymakers and programme managers can understand and apply the approach, by conducting formative research, designing programmatic interventions and evaluating programmes. We have focused efforts on the approach in health care workers and pregnant women. This talk will describe the approach we have used to increase influenza vaccine coverage in countries and provide examples.

Hassan Zaraket

Assistant Professor, Department of Experimental Pathology, Immunology & Microbiology, Member of Center for Infectious Diseases Research, Faculty of Medicine, American University of Beirut, Beirut, Lebanon

Implementing successful seasonal influenza vaccine among HCW: lessons learned and challenges

Annual influenza outbreaks constitute a major burden on global health and economy. Pandemics are usually associated with a heavier impact. Vaccination remains the cornerstone of controlling influenza. Seasonal vaccination coverage remains very low in many parts of the world, including the Eastern Mediterranean Region (EMR). The reasons underlying the low demand for seasonal influenza vaccination can be partially attributed to hesitancy. Vaccination hesitancy has been declared by the World Health Organization (WHO) as one of the top ten threats to global health in 2019. Healthcare workers (HCWs) play an important role in vaccine acceptance and advocacy among their patients and communities. Thus, the influence of HCWs own confidence and vaccination behavior on their vaccination recommendations and practices cannot be underestimated. Studies from several EMR countries reported low vaccination coverage among HCWs and attributed this to various factors, including accessibility, lack of knowledge, misconceptions, and fear of adverse events. In places were interventions were implemented to educate the HCWs, enhance their vaccine accessibility, and incentivize vaccination, significant improvements in vaccination coverage were reported. An overview of such interventions and their outcomes will be presented.

SUMMARY OF PRESENTATIONS

Session 6 | Curbing influenza burden through promoting vaccination of high-risk groups

Fatma Al-Yaqoubi

Head of National TB and Acute Respiratory Disease Section, Department of Communicable Diseases, Ministry of Health, Oman

PRESENTATIONS

Strategies to increase seasonal influenza vaccine uptake and utilization: Oman experience

Influenza is believed to be an important cause of morbidity and mortality worldwide. It is a vaccine-preventable disease that annually affects 5%-10% of the population globally, causes ~ 1 million influenza-associated hospitalizations among children younger < 5 years and 500 000 deaths among all age groups.
Influenza is associated with a substantial proportion of SARI in Oman. The seasonality follows northern hemisphere, with major peaks in September to December and a lesser peak around March-May.
A recent estimation has found that the incidence of influenza-associated hospitalization 2012-2015 was 20.6 (95% CI: 19.9-21.3) per 100 000 population which were the highest among infants. People aged ≥65 years had the highest annual incidence of influenza-associated in-hospital death with an overall rate of 0.9 (0.7-1.0) per 100,000 population.

The vaccine programme has potential to make a substantial impact on the disease burden. The World Health Organization (WHO) has identified children less than 59 month, pregnant women, persons with chronic medical conditions, and persons >65 years as being at risk for severe influenza disease therefore to be considered for influenza vaccination.

In Oman influenza vaccination has begun in 2005 planned to cover the above-mentioned risk groups in addition to pilgrims. Unfortunately, implementation was mainly in the latest group with poor advocacy to the other groups at risk. Subsequently various rates of uptake were reported from all the governorates.
In order to understand the situation first estimation of the burden has been reported for the period 2008-2013 which highlight age influenza associated hospitalization and different at-risk groups, seasonality.
To further understand situation national systematic WHO modified method has been conducted to estimate the rate of influenza associated hospitalization and mortality across age groups and years for the period 2012-2015 Which clearly highlight the clear burden for <5 years for hospitalization and >65 years for the mortality.

Surveillance has been upgraded to be electronic as notification in order to have timely statistics that can be used for action starting 2017. Other strategies were also explored including the increase in vaccine stock, upgrading the documentation of consumption, planning to include children for the 2017-2018 budget, and conducting economic burden and cost effectiveness estimations to provide real estimation and budget allocation for the vaccine and health promotion activity.

SUMMARY OF PRESENTATIONS

Session 7 | The evolving global landscape of biosafety and biosecurity: where we stand as a region

Uzma Bashir

Technical Officer Laboratory, WHO Country Office Pakistan

The revised WHO laboratory biosafety manual: a new direction

Laboratory biosafety and biosecurity are part of the International Health Regulations (IHR, 2005) core capacity 8 for laboratory. Biosafety is fundamental to controlling exposure to pathogens, protecting the laboratory workforce and the wider community against inadvertent exposures or releases. Over the years, the WHO Laboratory Biosafety Manual (LBM) has encouraged countries to implement basic concepts in biological safety and to develop national standards for the safe handling of pathogenic microorganisms in laboratories. The LBM has a global audience and has to cater to diverse settings; ranging from limited capacity to resource rich. In the upcoming fourth revision of the LBM, we propose a shift in focus to a risk-based, technology-neutral, and cost-effective approach to biosafety, ensuring that laboratory facilities, safety equipment, and work practices are locally relevant, proportionate, and sustainable. In other words, there will be a new direction, away from direct relationship between risk group and biosafety level with more focus on a practical, risk- and evidence-based approach. This will allow more flexibility in laboratory design, reduce focus on pathogen risk groups and biosafety levels as the de facto starting point of laboratory considerations, and emphasize investment on human factors and worker training. There will be a set of core requirements as a minimum for safe working during majority of laboratory procedures with additional control measures as the risk increases. Implications of this new direction at country and individual laboratory levels will be discussed during this session.

Aamer Ikram

Executive Director, National Institute of Health, Islamabad, Pakistan

Pakistan experience in establishing an effective biosafety and biosecurity system in the context of global health security

Life sciences research is rapidly surging in institutions across urban and rural Pakistan. Government considers implementation of IHR 2005 and Global Health Security Agenda as priority. The GHSA signifies the need of expert training in biorisk practices. National Action Plan for Health Security has been developed with "One Health" approach. National Institute of Health (NIH) is the national hub for IHR, GHSA and Biosafety. It is in process of strengthening event-based surveillance. The network of disease surveillance and response units is being expanded.

National policies for health laboratories and biosafety, biosecurity, AMR have been developed along with strategic plans and national laboratory standards. NIH is also providing support for capacity building of Point of Entries and enhancing its research capabilities. All hazards Emergency Operation Center and IT hub for sustainable disease surveillance system have been established. National Guidelines as Code of Conduct for Life Scientists were developed in 2010 under Ministry of Foreign Affairs and now being updated.

Pakistan Biological Safety Association was established to propagate biorisk training. Collaboration with Fogarty International Center since 2013 has boosted efforts to train professionals in BRM protocols. Academia and research institutions are being engaged in biorisk training. Specialized workshops include hands-on training, TOTs, ISO 35001, IBCs, HROs. We plan to establish a state-of-the-art national biorisk training center.

We remain committed to implement the National Action Plan for Health Security to strengthen the public health system in Pakistan and contribute towards a safer world.

SUMMARY OF PRESENTATIONS

Session 8 | The human-animal interface: the continuing threat from influenza and other emerging zoonotic diseases at the human-animal interface

Ghazi Kayali

Chief Executive Officer, Human Link, Adjunct Assistant Professor, University of Texas Health Sciences Center, Department of Epidemiology, Human Genetics, and Environmental Sciences, Houston, Texas

One Health Framework: progress and challenges for the future in Eastern Mediterranean Region

Zoonotic diseases and emerging pathogens are the primary infectious disease threats of modern times. In the last two decades, influenza, MERS, Zika, and Ebola were examples of how such threats can manifest in severe consequences. Preparedness and response for such threats necessitates multidisciplinary collaboration and coordination. Hence adopting the One Health approach becomes of utmost importance.

Countries of the WHO Eastern Mediterranean Region face this threat as any other region. However, the challenges in this region are high given the lack of resources, poor systems, and political factors. Hence, adopting the One Health approach in this region becomes urgent. To assist the countries of this region, a framework for action towards implementing the One Health Approach was developed given the very sparse One Health activities currently ongoing in the Eastern Mediterranean Region.

Additionally, a One Health Research Translation Framework was developed and implemented in Egypt. The aim here was to bring researchers and policy makers closer in order to translate research into policy generating evidence-based policies within a One Health framework.

Finalizing the One Health Framework and broadening the use of the One Health Translation Framework will help push One Health forward in our region.

Nicola Lewis

Associate Professor in Infectious Diseases and Co-ordinator of the Livestock Production and Health research program; Deputy Director of the OIE/FAO International Reference Laboratory for avian influenza, swine influenza and Newcastle Disease at APHA-Weybridge, UK

Lessons learnt from influenza surveillance in animals and implications on human health

Influenza A viruses are the causative agents of one of the most important viral respiratory diseases in both animals and humans. Influenza A viruses circulating in animals, particularly in pigs and poultry, can cross host species barriers to infect humans, potentially causing epidemics and even pandemics. To determine the public health risk of circulating and emerging influenza viruses in animals and to address pandemic preparedness it is essential to undertake surveillance in these hosts. Many countries in the region still face substantial challenges with endemic disease in their poultry flocks, and little characterization of the key factors associated with diffusion and maintenance in these populations. Such gaps in scientific understanding limit potential control measures. Here we discuss approaches to influenza surveillance within a 'One Health' framework and highlight lessons learnt.

SUMMARY OF PRESENTATIONS

Session 8 | The human-animal interface: the continuing threat from influenza and other emerging zoonotic diseases at the human-animal interface

Salah AlAwaidy

Senior Consultant Medical Epidemiologist Communicable Diseases Adviser to Health Affairs, Ministry of Health, Oman

Prioritization of zoonotic diseases towards addressing "One Health" issues

Zoonotic diseases are diseases spread between animals and humans. Most known human infectious diseases and about three-quarters of newly emerging infections originate from animals. Effectively addressing zoonotic disease requires collaboration between human, animal and environmental health sectors as well as other relevant partners. One Health recognizes that the health of the people is connected to the health of animals and the environment. In order to effectively and efficiently prevent and control zoonotic diseases, a multi-sectoral, One Health approach is needed. The U.S. Centers for Disease Control and Prevention (CDC) One Health Office developed the One Health Zoonotic Disease Prioritization process which utilizes a multi-sectoral, One Health approach to prioritize zoonotic diseases of greatest concern for One Health collaboration. The The One Health Zoonotic Disease Prioritization (OHZDP) process utilizes mixed methods, approaches, is scalable to use at sub-national, national, and regional levels, and is locally adaptable. The OHZDP process enables a country or region to bring together representatives from human, animal, and environmental health sectors and other relevant partners to prioritize zoonotic diseases of greatest concern that should be jointly addressed by human, animal, and environmental health sectors.
Additionally, next steps and action plans for addressing the priority zoonotic diseases will be developed jointly across all sectors using a multi-sectoral, One Health approach.

Gina Samaan

Team Leader, PIP, Infectious Hazard Manager, Department of Health Emergencies, WHO/HQ

Progress PIP Framework PC implementation

The Pandemic Influenza Preparedness (PIP) Framework is an innovative international instrument to improve pandemic influenza preparedness for an effective and equitable future pandemic response. Under the Framework, manufacturers who use the Global Influenza Surveillance and Response System (GISRS) provide to the World Health Organization (WHO) an annual Partnership Contribution (PC) that WHO uses to strengthen country and global readiness for the next influenza pandemic. Progress made in 2014-2018 is presented.
PC funds focus on six areas: laboratory and surveillance; burden of disease; regulatory capacity building; risk communications and community engagement; planning for pandemic product deployment; and influenza pandemic preparedness planning. Activities are implemented globally, regionally and in PC recipient countries. Achievements included an increase in the proportion of countries sharing epidemiological and virological data with WHO (83% and 21% increase respectively), and with timely sharing of influenza viruses with GISRS (46% increase). Eight countries estimated influenza burden with the support of PC funds, and 20 countries signed up for the regulatory collaborative registration procedure to facilitate regulatory preparedness. The OpenWHO learning platform was launched and now hosts 14 pandemic influenza relevant courses.
Thanks to the commitment of countries and leveraging partner investments, country pandemic influenza preparedness improved in 2014-2018. Each gain is an important building block for a timely and appropriate response at the time of the next pandemic. Global health security will be enhanced, and more lives will be saved.

SUMMARY OF PRESENTATIONS

Session 8 | The human-animal interface: the continuing threat from influenza and other emerging zoonotic diseases at the human-animal interface

Alice Wimmer

Migration Health Officer, Health Systems Strengthening and Health Emergencies, International Organization of Migration (IOM), Geneva

Pandemic Influenza threat among Refugees and Displaced Persons

Influenza pandemics are perennial global health security threats. Novel viruses such as influenza A(H7N9) continue to emerge, posing zoonotic and potential pandemic threats. Many countries have developed pandemic influenza preparedness plans (PIPPs) aimed at guiding actions and investments to respond to such outbreak events. Migrant and mobile population groups—such as migrant workers, cross-border frontier workers, refugees, asylum seekers, and other non-citizen categories residing within national boundaries—may be disproportionately affected in the event of health emergencies, with irregular/undocumented migrants experiencing even greater vulnerabilities. We sought to explore the extent to which migrant and mobile population groups have been included in national PIPPs for selected countries within the Asia-Pacific region. A framework analysis of each PIPP was undertaken by two of this paper's authors, who independently reviewed each plan to identify the extent to which it described migration and mobility dynamics. A data-abstraction instrument was designed based on key search terms. We found only three countries (Thailand, Papua New Guinea, and the Maldives) that identified at least one migrant group within their respective national plans. Furthermore, we found that most countries (18 of 21) specified health control measures along their borders, such as point-of-entry screening strategies for inbound travelers. Asylum seekers, itinerant migrant workers, and other undocumented migrants are often exposed to high-risk working and living environments, yet they remain marginalized within national health systems.

Stephen S Morse

Professor of Epidemiology, Director of the Infectious Disease Epidemiology certificate, at Columbia University Mailman School of Public Health; Chair of the Columbia University Institutional Biosafety, Committee, Columbia University, New York, US

Can We Get Pandemic Preparedness "Right"?

Continuing improvement in surveillance, as is being done in this Region and globally, remains a key strategy. However, despite improvements in surveillance, pandemics remain unpredictable in both timing and severity. This leads to the major dilemma for pandemic preparedness: how to define and implement the appropriate level of preparedness in advance of a pandemic. Robust and comprehensive preparedness efforts may seem excessive if the pandemic that eventually arrives is perceived by the public as not very severe, as may have happened in 2009, causing the public to lose faith in preparedness measures. This requires continual public education efforts. However, why have we apparently never succeeded in stopping any major flu epidemic? Mathematical modeling and epidemiologic studies indicate the influenza (including pandemic flu) "basic reproductive rate" (R0, essentially transmission rate) 2 . This suggests that reducing transmission by ~50-60% should stop the epidemic, but we have never achieved this goal. Explanations for this have varied, but with the variety of measures we now have available, it should not be impossible. Could we be starting too late? In the 2009 pandemic, journalists even claimed to retrospectively identify an early (possibly the first) case in Mexico (where we believe that pandemic originated). It may not even be essential to stop the pandemic at the source. Stopping transmission would seem to require identifying and isolating the early cases (treating them if necessary), and identifying contacts whenever possible: a challenging task, but potentially achievable. Success depends on continued strengthening of the surveillance system, down to local level, and global capacity for response, including vaccine improvements.

SUMMARY OF PRESENTATIONS

Session 8 | The human-animal interface: the continuing threat from influenza and other emerging zoonotic diseases at the human-animal interface

Hamad Al Romaihi

Manager of Health Protection and Communicable Diseases, Public Health Department, Ministry of Health, Qatar

Influenza Readiness Capacity in lead up to World Cup 2022 in Qatar

Mass gathering sport events are hosted regularly both at global as well as regional levels. They range from the ever-popular FIFA world cup, Olympics, World Athletic championships to regional championships hosted by individual nations. Such huge events pose a great challenge to the hosting nations or bodies in terms of the management and logistics associated for a successful event. The Public Health hazards associated with such large-scale events can be unpredictable and complicated.

The State of Qatar is honored to host the FIFA World cup in 2022, the first ever in any Middle East country. Qatar expects a staggering 1.5 million visitors to arrive in the country for watching the world cup in 2022. The International Health Regulations (IHR) 2005 provides ample scope for countries hosting sporting events to use the proposed framework as a guiding principle for the smooth conduct of mass gathering events in addition to the completeness and timeliness in reporting of notifiable communicable diseases is crucial for prompt response and effective intervention.

Examples of communicable diseases that could lead to be a threat to public health challenge to the health care professionals in terms of response could range from pandemic influenza preparedness, measles outbreaks, food poisoning, meningitis, and vector borne diseases for those visitors traveling from endemic countries.

Richard Webby

Director, WHO Collaborating Center for Studies on the Ecology of Influenza in Animals and Birds, United States

Pandemic influenza vaccine development

The efficacy of influenza vaccines depends on a good match between the vaccine and the ever-evolving circulating viruses. In response to this need for human vaccines, the World Health Organization developed a global monitoring system, now called the Global Influenza Surveillance and Response System (GISRS). This network collects and characterizes hundreds of thousands of virus samples every year using genetic, antigenic, and human serology data to ensure that the virus antigens that go into the vaccines are as closely matched to circulating viruses as possible. Although the process is conceptually simple, the system for vaccine strain selection has a number of challenges linked to virologic, epidemiologic, and practical factors. In response to the reemergence of A(H5N1) viruses in 2005, GISRS now also develops candidate vaccine viruses to zoonotic influenza viruses in collaboration with partners in veterinary health, including OFFLU. This one health approach is designed to track the evolution of emerging influenza viruses in animal populations with a view to providing some degree of preparedness. Other WHO-led initiatives such as the Tool for Influenza Pandemic Risk Assessment have also been developed to aid in the prioritization of limited preparedness resources.

SUMMARY OF PRESENTATIONS

Session 8 | The human-animal interface: the continuing threat from influenza and other emerging zoonotic diseases at the human-animal interface

Magdi Samaan

Technical Officer, Global Influenza Program, WHO HQ

Assess the "potential" to cause a pandemic of a zoonotic influenza virus using TIPRA

Influenza pandemics are unpredictable but recurring events that can have consequences on human health and economic well-being worldwide. Advance planning and preparedness are critical to help mitigate the impact of a pandemic. The Tool for Influenza Pandemic Risk Assessment (TIPRA) was developed to provide a standardized and transparent approach to support the risk assessment of influenza viruses with pandemic potential. TIPRA enables identification of gaps in knowledge so that attention and resources can be dedicated to address those needs. It considers the likelihood and impact of a non-seasonal influenza virus spreading efficiently between people. Advance planning and preparedness are critical to help mitigate the impact of a pandemic. Pandemic risk assessments are critical to decide, clarify and justify public health preparedness, response and recovery actions. TIPRA does not tell which virus will cause a pandemic or when the pandemic will occur. TIPRA compare the relative risk of different viruses for comparison and to prioritize public health actions and prevention/control policies. The tool was launched in 2016. The presentation will cover several aspects on TIPRA including; mandates, objective, design, implementation and revision.

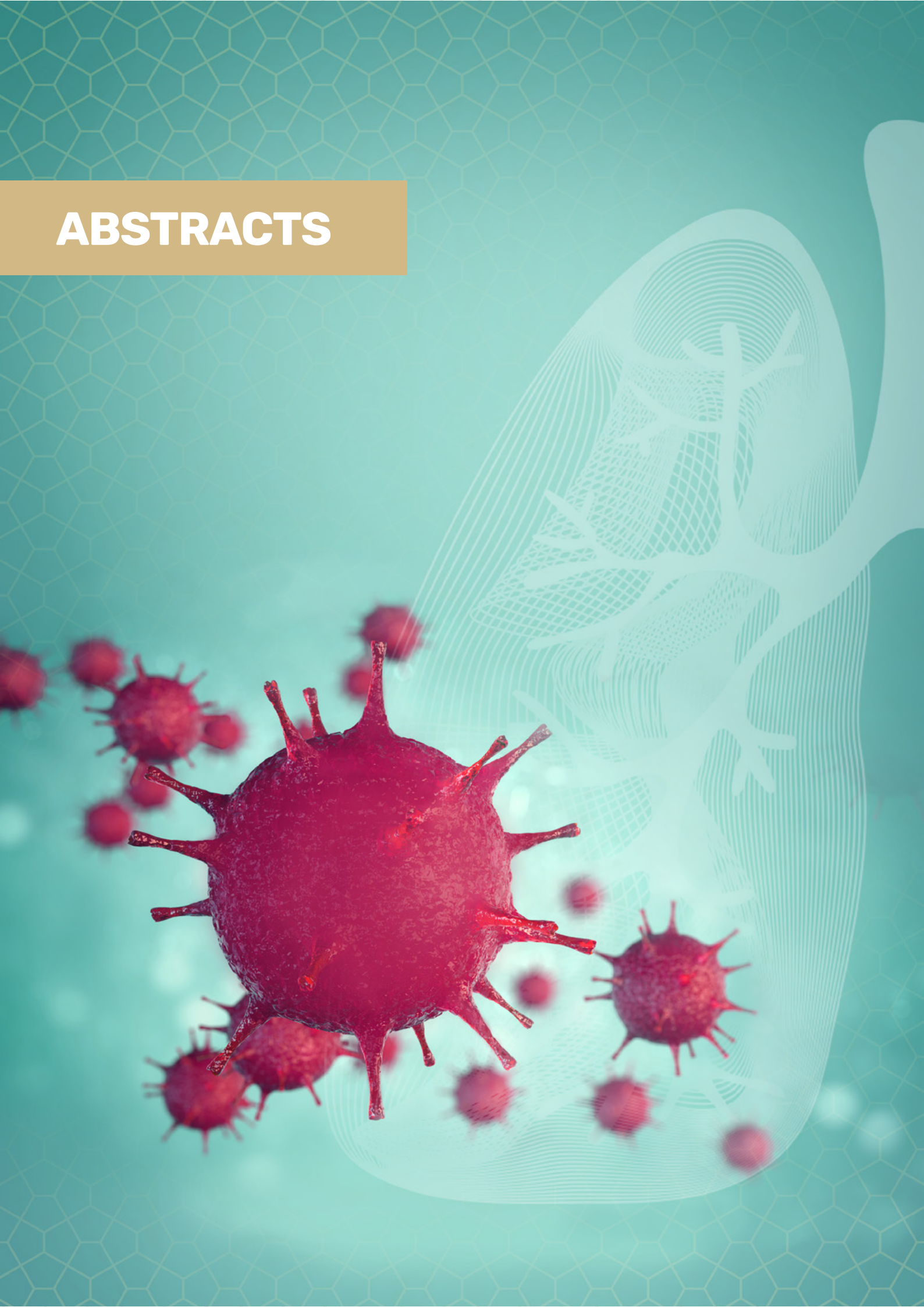
Patrick Drury

Manager, Acute Events Management, Emergency Medical Operations, World Health Emergencies Programmme, WHO HQ

GOARN: INTERNATIONAL NETWORK FOR READINESS, RESPONSE AND RESEARCH IN INFECTIOUS DISEASE EPIDEMICS IN THE 21ST CENTURY

GOARN is a network to improve alert, international coordination and response at local, regional and global levels; providing access to technical support and expert teams throughout the world who can deploy rapidly and work effectively in the field in a highly coordinated response. Partners have agreed a "GOARN2.0 strategy" for the holistic multifaceted development and operations of the network in 4 areas of work: 1) alert and risk assessment; 2) rapid response capacity; 3) outbreak response training; and 4) response research. Each area of work is shaped by the Network guiding principles, placing the needs of the country and community at the center of the response; with strengthened governance to ensure the highest performance of the network.
Over two decades, GOARN has provided technical support to over 90 countries deploying over 2900 multidisciplinary experts to ensure that over 140 epidemics were swiftly controlled, and preventable morbidity and mortality minimized. GOARN has provided an operational framework for partners to respond to major outbreaks of emerging and reemerging diseases – including cholera, Ebola virus disease, meningitis, MERS and most recently, the HIV response in Pakistan.
The main objectives of the network now are to provide technical support to countries for targeted readiness activities; outbreak risk assessments; field investigations and response, including response research. GOARN provides a clear roadmap for international collaboration to save the health of populations from current and emerging disease threats, against the backdrop of worsening humanitarian crises, and increasing environmental challenges.

ABSTRACTS



Abstracts

Oral Presentations

1. Respiratory disease epidemiological surveillance

FACTORS ASSOCIATED WITH LOWER RESPIRATORY TRACT INFECTIONS AMONG CHILDREN IN A TERTIARY CARE HOSPITAL RAWALPINDI, PAKISTAN, 2018-19 – A CASE CONTROL STUDY

A. Minallah[1]

[1] *FELTP Pakistan, Government, Islamabad, Pakistan*

Background and Aims:
Lower respiratory tract infections (LRTI) is leading cause of childhood morbidity and mortality worldwide. The aim of this study is to evaluate factors leading to LRTI among children and recommend preventive measures.

Methods:
A case control study was conducted from Oct 2018 to March 2019 in a tertiary care hospital Rawalpindi. 150 hospitalized children of age < 60 months fulfilling the operational definition of LRTI were included via Consecutive sampling. Nasopharyngeal aspirates from cases were taken for virus identification. Age and sex-matched controls were taken from other depts in 1:1. A structured questionnaire was used to collect information from parents of both cases and controls. Frequencies were calculated and odd ratios were determined at 95% confidence interval with p value <0.05.

Results:
Out of 150 cases, male to female ratio was 1.4:1 with median age of 32 months (range 5 to 58 months). Parainfluenza 3, Influenza A, RSV and Influenza B virus was detected in 32 (21%), 33 (22%), 21 (14%) and 7 (5%) children respectively. Among the cases, 88 had no immunization against Influenza (OR=3.9, 95%CI=2.5-6.0), 84 children's parents were smokers (OR=2.5, 95%CI=1.6-3.8) while 79 children were left in day care daily by parents (OR=2.3, CI=1.5-3.6).

Conclusions:
Lack of immunization against Influenza was significantly associated with LRTIs in children followed by parental smoking and unhygienic care giving in day care. Four health education sessions were imparted at Pediatric dept among parents and care givers regarding importance of Influenza vaccination, hazards of passive smoking and health & hygienic care giving.

Abstracts

INFLUENZA MORBIDITY AND MORTALITY IN TUNISIA, 2017-2018

H. Bouguerra[1], L. Bouabid 11, R. Yazidi 2[2], N. Abdeddaiem 3[3], L. Maazaoui 33, W. Zaatour 11, S. Abid 4[4], A. El Moussi 44, M. Zorraga 33, M. Sakly 33, A. Slim 44, A. Ben Salah 22, N. Ben Alaya 11

[1]National Observatory of New and Emerging Diseases, Public Health, Tunis, Tunisia;
[2]Pasteur Institute of Tunis, Epidemiology, Tunis, Tunisia;
[3]Primary Healthcare Direction, Public Health, Tunis, Tunisia;
[4]Charles Nicole Laboratory, Microbiology, Tunis, Tunisia

Background and Aims:

Background: Morbidity and mortality associated to influenza vary with the season and the circulating virus strains, as well as the preventive and control measures in place.
Aims: Ours objectives were to describe the severity of 2017-2018 influenza season in Tunisia, and to identify the associated risk factors.

Methods:

The study was a retrospective descriptive and analytical study from 1st October 2017 to 30th April 2018 in Tunisia. Data were provided by the SARI (Severe acute respiratory infection) Sentinel Sites and the National Influenza Center. SARI cases were defined as the WHO case definition. Data entry and analysis was using SPSS-20.

Results:

The total number of notified hospitalized severe cases was 1636, of which 839 (50.7%) and 114 deaths (13.5%) were from the 6 nominated SARI sites. Most of SARI cases had co-morbidities (69.8%) and 43% were hospitalized in Intensive Care Unit (ICU). Only 5% of the cases were vaccinated. Antivirals were used in 7.5% before the admission and 57.4% during hospitalization. Influenza severity was significantly associated with age, region, asthma and other respiratory diseases. Type A (H1N1) pmd09 and A(H3N2) were identified in 76.4% and 10% respectively.

Conclusions:

The 2017-2018 influenza season in Tunisia was considered severe with high number of deaths and hospitalized SARI cases in ICU. The predominant circulation of A(H1N1) pmd09 virus may explain these results. Assessing influenza severity is essential in all countries. The next steps are to implement Pandemic Influenza Severity Assessment (PISA) for routine assessments in Tunisia for better results and sustainability.

Abstracts

INFLUENZA EPIDEMIC WITH HIGH MORTALITY DURING WINTER MONTHS - YEMEN, 2018-2019

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[2]Yemen Ministry of Health, Influenza program, Sana'a, Yemen

Background:

Influenza follow a seasonal pattern in Yemen. However, the winter season Novembe-2018 to February-2019 brought two folds higher incidence of influenza than previous year. The aims are to describe the epidemiology, magnitude of influenza and recommend control preventive measures for upcoming epidemic.

Method:

A descriptive analytical study was used. Surveillance staff used investigation form for influenza to collect data from patients who meet the WHO case definition. Nasopharyngeal samples were sent to the national public health laboratory to be examined by polymerase chain reaction. Proportions was calculated and Chi-square test with P value < 0.05 was the cut point of significance.

Result:

A total of 470 cases were reported in 65% (15/23) of Yemeni governorates. The majority 81% (379) were from cold climate areas. The first case was in week-45 of 2018 and the highest peak was in week-3 of 2019. Almost 71% (334) were males, 30% (139) ≥ 65 years, 28% (131) < 5 years and 20% (96) had chronic diseases. Influenza viruses were isolated from 55% (126/230) of tested samples (44% type A (H1N1) and 11% type B). The overall fatality rate was 22%, significantly higher among patients ≥45 years (30% vs 16%, P <0.001), patients with influenza B (52% vs 26%, p <0.007), influenza A (46% vs 15%, p <0.001), compared with patients negative to the same pathogens.

Conclusion:

Influenza epidemic with high mortality rate had occurred during winter season. Pre epidemic preparedness by strengthening lab capacity for early diagnosis and early provision of anti-influenza drug for case management are recommended.

Abstracts

QUANTITATIVE ASSESSMENT OF SEVERE ACUTE RESPIRATORY INFECTION SURVEILLANCE DATABASE, LEBANON, 2018

N. Ghosn[1], P. Mrad[2], N. Haddad[1], M. Beaini[3], A. Rady[2], W. Ammar[4]
[1] Ministry of Public Health, Epidemiological Surveillance Program, Beirut, Lebanon;
[2] World Health Organization, Country Office, Beirut, Lebanon;
[3] Rafik Hariri University Hospital, National Influenza Center, Beirut, Lebanon;
[4] Ministry of Public Health, General Directorate, Beirut, Lebanon

Background and Aims:

Influenza surveillance was initiated in Lebanon in 2015 using sentinel severe acute respiratory infection surveillance SARI. In April 2019, following WHO workshop, an evaluation protocol was developed for SARI surveillance, including 6 components of which quantitative assessment of SARI database. The objective of the quantitative assessment is to measure SARI database quality and to identify gaps for corrective measures.

Methods:

SARI cases were entered at the source using the offline epidata for the period 2015-2017 and the online DHIS2 platform since 2018.
The target quantitative attributes reflect data quality and completeness, and timeliness.
Using the DHIS2 platform, indicators were defined and specific evaluation dashboard was established presenting automatic updates on selected indicators. Dashboard was accessible at hospital level and national level.

Results:

Results are presented for year 2018 including 892 cases. Completeness for core variables (age, sex, fever, cough, date onset, admission date, specimen collection, ward, residence) was 61%. Completeness of preexisting conditions, antiviral treatment and influenza vaccination were respectively 100%, 100% and 34%. Cases with information respecting the case definition was 76%. Completeness of specimen collection and laboratory results were respectively 89% and 93%. Positive predictive value was 15%. As for timeliness indicators, timely specimen referral (within 7 days of collection) and specimen testing (within 7 days of reception) were both 99%.

Conclusions:

In June 2019, the evaluation dashboard was presented to SARI focal persons as tool for assessing the quality of case detection, data entry and specimen testing. Such tool will be used to monitor and enhance SARI database quality.

Abstracts

Epidemiology of Influenza among patients with influenza-like illness and severe acute respiratory illness in Pakistan: a 10-year surveillance study 2008-17

N. Nisar[1]

[1] *National Institute of Health- Islamabad Pakistan, Public Health Laboratories Division, Islamabad, Pakistan*

Background and Aims:

In Pakistan, the burden of influenza was largely undetermined as no formal surveillance system was in place. In 2008, an influenza surveillance system was set up in eight sentinel sites. This study describes the epidemiology of influenza virus using a 10-year surveillance data from 2008-2017.

Methods:

Nasopharyngeal or throat swabs were collected from patients with Influenza Like Illness (ILI) and Severe Acute Respiratory Illness (SARI) along with relevant epidemiological information. The samples were tested using real time Reverse Transcriptase-Polymerase Chain Reaction for detection and characterization of influenza viruses.

Results:

A total of 17209 samples were tested for influenza, of which 3552 (20.6%) were positive; 2151/11239 (19.1%) were patients with ILI whereas 1401/5970 (23.5%) came from patients with SARI. Nearly 82.3% (n=2922) of cases were identified from Islamabad site. Influenza A/H1N1pdm09 was the predominant strain with 40.6% (n=1442) followed by influenza B (936, 26.4%). Seasonality was observed with peaks during the winter months of December-February along with sporadic activity round the year. Influenza A/H1N1pdm09 was predominant among the children (5-14 years) and adults (15-64 years) accounting for nearly half of all cases in those age groups. Nearly 48% and 37% of all cases among the elderly (>65 years) and children aged (2-4 years) were Influenza B strain. Shortness of breath was significantly associated with influenza positivity.

Conclusions:

This 10-year surveillance data provides evidence of influenza activity in the country throughout the year with seasonal winter peaks. The results could be used to strengthen epidemic preparedness and response plan.

Abstracts

Oral Presentations

2. Respiratory disease virological surveillance

Genetic characterization of influenza viruses circulated in Oman during 2018-2019 winter season

H. Al Kindi[1], D. Rodney[2], A. Al-Jardani MD1, J. McCauley[2], S. Al Mahruqi[1], S. Alkharusi1, A. AlAmri[1], I. Alshukri[1], L. Whittaker[2], B. Ermetal[2]

[1]Central Public Health Laboratories- MOH - Oman, Virology, Muscat, Oman;

[2]WHO Collaborating Centre for Reference and Research on Influenza The Francis Crick Institute, virology, London, United Kingdom

Background and Aims:

The winter 2018-19 season in Oman started around week 35/2018 and peaked in week 47/2018, with higher than usual numbers of influenza infections detected. Given the high numbers occurring before the late seasonal start in Europe, a significant number of influenza positive clinical specimens were shared with WIC London (a WHO CC for influenza) for further characterization.

Methods:

subset of clinical specimens (n=383: 120A(H1N1) pdm09, 248A(H3N2), 5B/Victoria, 10B/Yamagata) collected in weeks 26-47/2018 from all over Oman were selected. All were screened by Next Generation Sequencing and a selection of those yielding complete HA gene sequences were characterized further by virus isolation, antigenic characterization (HI assay) and phenotypic assessment of drug susceptibility.

Results:

All 52 A(H1N1) pdm09 HA sequences fell in clade 6B.1A (~52% and ~24% in subclades 6B.1A5 and 6B.1A6 respectively). All H1N1 (n=30) recognized by the current vaccine (A/Michigan/45/2015). 101 A(H3N2) fell in subclade 3C.2a1b, themost common globally. 30 H3N2 recovered, only 5 could be analyzed by HI, all poorly recognized by antisera against the vaccine viruses (VVS) A/Singapore/INFIMH-16-0019/2016. 5 B/Victoria fell in clade 1A and lacked amino acid deletions and poorly recognized by antisera against 2018-19 VVS (B/Colorado/06/201-aΔ162-163). All Ten B/Yamagata clustering in clade 3 (B/Phuket/3073/2013 VVS) .

Conclusions:

The genetic and antigenic characteristics of viruses circulating in Oman in the winter of 2018-19 matched what was seen subsequently in Europe. This early indicator from countries like Oman can provide a level of forecasting for what might emerge in Europe and the northern hemisphere generally and providing early clinical specimens for candidate vaccine.

Abstracts

DETECTION OF NON-INFLUENZA RELATED VIRAL RESPIRATORY INFECTIONS AMONG RETURNING HAJJ PILGRIMS, IRAN 2017

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Background and Aims:

Pilgrims returning from the Hajj are prone to augment the international spreading of viral respiratory infections. In this study, the prevalence of non-influenza viral infection as a common infection in pilgrims returning from the Hajj was investigated.

Methods:

one hundred twenty pilgrims returning from the Hajj were participated in a cross sectional study. Nasal and throat swab specimens were obtained from patients that were hospitalized for respiratory complications and were negative for influenza virus test. All samples were examined for Adenovirus using nested-PCR, Boca virus using PCR, and Rhinovirus using nested-RT-PCR, as well as RSV, HCov-229E, HCov-0C43, HCov-HKU1, HCov-NL63, and HMPV using Real-time RT-PCR.

Results:

Over 44%(n=53) of participants were shown symptoms related to the virus. Common viruses being detected in participants are listed as follows: Adenovirus (n=24, 20%); Rhinovirus (n=19, 15.8%); HCov-0C43(n=3, 2.5%), which was detected for the first time at Iran; HCov-229E (n=2, 1.6%); and Boca virus (n=1, 0.8%). Other respiratory infections (RSV, HMPV, HCov-NL63 and HCov-HKU1) were not detected. In addition, co-infection was diagnosed in six participants (5%).

Conclusions:

Hajj as an annual ritual is held at least for 5 days, which over three million people participate from both hemispheres with various medical and cultural backgrounds. Because the antiviral and vaccine are only available for influenza, to prevention of transmission of other respiratory infections, healthcare education during or prior to Hajj ritual using alcohol-based hand scrubs and mask are highly recommended.

Abstracts

Contribution of non- influenza respiratory viruses during influenza epidemic using Influenza Surveillance Platform: Experience from Pakistan

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Background and Aims:

Besides the influenza virus (IV), the non-influenza RNA respiratory viruses (NIRVs), represent a considerable global health burden. Since 2007, Pakistan National Institute of Health had laboratory-based influenza-like illness (ILI) / severe acute respiratory infection (SARI) surveillance for Influenza which includes eight sentinel sites across country. This study determined the frequency of non-Influenza respiratory virus infections through existing surveillance system.

Methods:

Throat and nasal swabs collected from ILI and SARI of children under 5 years of age were processed for detection of influenza and non Influenza viruses (RSV, Adeno, HMPV, ADV, PIV, Rhino) according to CDC Real-Time PCR protocol during Dec, 2017-Oct, 2018.

Results:

Among the children enrolled a total of 508 specimens were analyzed; 56 % (285/508) were found positive for IV and NIRVs. out of which 40% (114/285) were influenza viruses, and subtype H1N1 Pdm,09 virus was the major outbreak strain. However, nearly 60% of cases were positive for non-influenza pathogens. Human respiratory syncytial virus was the most commonly detected 49% followed by rhinovirus 18.3%, metapneumovirus 15.4%, adenovirus 8.4% and PIV-3, 6%. The risk of developing influenza infection was greater in children >3 years, who had higher risk of NIRVs infection.

Conclusions:

This report highlights the significance of NIRVs as a dominant viral etiologic agent among pediatric ARIs. This may lead to increased rate of diagnosis of viral infections and improved patient outcomes, in particular to reduction in overuse of antibiotics and antivirals. This will also enrich national epidemiological data with respect to infections caused by these viruses.

Abstracts

Detection and characterization of influenza virus from influenza-like illness cases in the private and public sentinel networks during the 2016-2019 influenza seasons in Morocco

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Background and Aims:

Trend of flu virus circulation among influenza-like illness (ILI) in out-patient in Morocco is based on the input of a public sentinel network of 8 healthcare centers and a private network of 30 practitioners.
This study aims to characterize and compare patterns of influenza virus infection among ILI patients in public and private settings.

Methods:

A total of 2435 ILI were recruited, 35,6%(n=867) from a private network, and 64,4% (n=1568) from public sentinel sites.
qPCR-based assay was used to detect and subtype influenza viruses. Data were tested for associations with influenza using chi-squared tests and logistic regression.

Results:

Of 2435 ILI patients, 872 were tested positive for influenza, yielding a global positivity rate to 35,8%. ILIs both networks met the case definition criteria to an extend of 92%. Influenza positive rates was significantly higher among ILIs (54%) of the private network, compared to the public sentinel one (26 %IC 95%, p< 0.0001). ILI from private settings accounted only for 35,6% of all samples, but could bring 53,44% of viral strains. Of the influenzaA isolates, A/H3N2 was the most prevalent (14,83%, n=361), followed by A/H1N1-pdm09 at (11,54% n= 281) and Influenza BYam at (9,45%n=230).Clinical predictors for infection with measured fever (≥38 °C) were more strongly associated with influenzaA (AOR: 1.58; 95% CI: 1.10, 2.8).

Conclusions:

Virological surveillance of ILI in Morocco is more efficient in private network. Broadening surveillance of ILI to additional public sentinel sites requires more special attention to the quality assurance process and also to team's compliance with criteria for recruiting and specimens shipping.

Abstracts

Frequent Detection of Enterovirus D68 and Rhinovirus Type C in Children With Acute Respiratory Tract Infections

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Background and Aims:
This study aimed to evaluate the prevalence of HRVs and possible emergence of EV-D68 in children with acute respiratory tract infections.

Methods:
A total of 322 nasopharyngeal swab samples were provided from children with initial diagnosis of lower respiratory tract infections (RTIs). Viral detection was performed by both Real-Time RT-PCR and nested RT-PCR. In addition, Phylogenetic trees were constructed to determine the circulating genotypes.

Results:
Thirty-four (10.5%) and 70 (21.7%) cases were positive for EV-D68 and HRV, respectively. Furthermore, 47.1% of EV-D68 patients and 50% of HRV cases displayed mild respiratory symptoms and 52.9% of EV-D68 patients and 50% of HRV cases had severe respiratory symptoms. The phylogenetic analysis revealed that the clade Fermon-like and subclade B3 are the prevalent genotypes for EV-D68 and the HRV-positive samples belong to three types including HRV-A (37.1%), HRV-B (17.1%), and HRV-C (45.8%). Moreover, the results showed the high prevalence of HRV and EV-D68 in the winter.

Conclusions:
The results of this study showed that EV-D68 is circulating in Iran, and can cause severe clinical symptoms, in addition to other circulating viruses that have already been determined. Children with acute respiratory infection should be investigated in terms of infection with the mentioned viruses to make the suitable decisions for treatment.

Abstracts

Oral Presentations

3. Influenza Disease Burden

ESTIMATION PROPORTION OF SARI CASES ATTRIBUTABLE TO INFLUENZA, JORDAN, FROM 2015 SARI SENTINEL SITES DATA

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Background and Aims:
Influenza is an underappreciated contributor to global mortality and morbidity and has significant economic consequences, the burden of Influenza is not well known in Jordan
Aim to estimate the proportion of SARI cases attributable to influenza from 2015 data

Methods:
Reviewing SARI data 2015 to calculate death rate for SARI and fatality rate for influenza
Estimating disease burden using WHO manual from sentinel using 2015data

Results:
The median proportional contribution of influenza associated with SARI from sentinel sites was 2/100; 95% Confidential Interval 1.44 – 2.72
The total number of admissions at MOH hospitals in 2015 was 369538; Proportion of SARI cases from total hospital admission was 9.5/1000, it was estimated that 3510 SARI cases were admitted in MOH hospitals. Proportion of Influenza cases from total hospital admission was 1.9/1000; it was estimated that 702 of Influenza cases were admitted in MOH hospitals. proportion Influenza from total SARI cases was 20%.
The median death rate among SARI cases among the period 2010-2018 was 3.5%. The influenza cause fatality rate was 6.2.
Taking in consideration that public hospitals representing 60% of total health services in Jordan,it is expected that 5850 SARI cases were admitted in 2015 with 204 deaths attributed to respiratory diseases and and 1170 Influenza cases with 72 deaths attributable to Influenza at national level.

Conclusions:
Although of limited available data the WHO manual for estimating disease burden associated with seasonal influenza was used successfully to estimate Influenza burden and calculate the Proportion of SARI cases and deaths linked with SARI at national level.

Abstracts

INFLUENZA EPIDEMIOLOGY AND RISK FACTORS FOR SEVERE ACUTE RESPIRATORY INFECTION IN MOROCCO, 2014-2019

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Background and Aims:

In order to implement an influenza vaccination program for high-risk-groups in Morocco, as recommended by the World Health Organization, an epidemiological study indicating the influenza virus effect in the development of complicated influenza for subjects with co-morbidity was required. The present study aims to identify the risk factors for Severe Acute Respiratory Infections caused by influenza in risk groups in Morocco during the last 5 influenza seasons.

Methods:

We conducted a retrospective case series study with descriptive and analytical purpose. The cases were Influenza-like illness and Severe Acute Respiratory Infections collected as part of the epidemiological and virological surveillance in Morocco, from surveillance target population, during the last 5 influenza seasons. Only the cases confirmed by the laboratory were included. We used WHO case definition and severity was based on the hospitalization. The information was collected on all risk groups as defined by WHO.

Results:

The total number of positive cases for the influenza virus was 1323 including 552 Severe Acute Respiratory Infections. The influenza positivity rate has increased globally and specifically by age group, clinical service and co-morbidity. The subtype A (H1N1) pdm09 was predominant during the seasons 2015-2016 (70.9%) and 2018-2019 (70.6%). The risk factors for Severe Acute Respiratory Infections caused by influenza identified by multivariate logistic regression was pregnant women (ORadjusted=8.7), chronic respiratory disease or asthma (ORadjusted=4.5), chronic renal failure (ORadjusted=3.8), age > 65 years (ORadjusted=2.2), diabetes (ORadjusted=1.8).

Conclusions:

The risk assessment of influenza-associated Severe Acute Respiratory Infections in high-risk groups revealed national epidemiological findings, particularly for pregnant women, patients with chronic disease and the elderly. An influenza vaccination program for these groups becomes much recommended in Morocco.

Abstracts

INFLUENZA A (H1N1) AND INFLUENZA B AMONG PILGRIMS ATTENDING AL-MASHAER HOSPITALS IN THE HAJJ PERIOD OF 1440 (2019)

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Background and Aims:

Around 2-3 million pilgrims gather annually in Makkah, Saudi Arabia. The overcrowding imposes great risks of transmissions of respiratory infections. Published data show acute respiratory infections (ARIs) are the commonest diseases transmitted during Hajj. Influenza viruses are among the commonest pathogens that cause ARIs, however, almost all published studies on Influenza were conducted post-Hajj among returning pilgrims of certain nationalities or groups. Our aim was to investigate the prevalence of Influenza A and Influenza B and their associated factors among all ARIs patients attending Makkah and Al Mashaer hospitals during Hajj period.

Methods:

We conducted a cross-sectional study among Pilgrims with ARIs attending Makkah and Al-Mashaer hospitals during Hajj period 1440 (from 19 July to 16 August 2019). All cases meeting the criteria of acute onset of fever (≥38°C) and cough within the previous ten days be included and nasopharyngeal swabs collected for reverse transcription PCR (RT-PCR) for Influenza A and Influenza B. Cases identified from the Makkah Preventive Medicine Department and Health Electronic Surveillance system (HESN). Descriptive statistics used to present distributions, comparisons, and associations.

Results:

Our results give estimate of the prevalence of Influenza A and Influenza B among all ARIs and will describe sociodemographic factors, clinical features, and other epidemiological information such as caseload, specific mortality, bed occupancy, and other factors.

Conclusions:

Our results are expected to generate new information that could help understand the problem, guide authorities and researchers in determining optimal control strategies and modelling the disease pattern.

Abstracts

Oral Presentations

4. Outbreak Investigation and Response

MERS-COV OUTBREAK IN WADI ALDAWASIR GENERAL HOSPITAL'S RENAL DAYALISIS UNIT, 2017

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Background and Aims:
On 1 March 2017, Wadi Al-Dawasir General Hospital's (WDGH) emergency department received a patient on hemodialysis from a rehabilitation facility, with severe pneumonia symptoms. On 2 March, he tested positive for Middle East Respiratory Syndrome Coronavirus (MERS-CoV). On 9 March, 6 additional laboratory-confirmed MERS-CoV cases were reported from WDGH. We sought to describe the scope of the outbreak and identify risk factors that lead to transmission of MERS-COV in this outbreak.

Methods:
Using PCR, we screened all dialysis patients, relatives of cases, and all WDGH staff to identify additional MERS-CoV cases. We interviewed renal dialysis unit staff about infection control practices. We interviewed cases or their relatives for possible sources of MERS-CoV infection. We reviewed cases' medical records using a standard chart abstraction form to collect information on symptoms and course of illness.

Results:
We identified 10 laboratory confirmed MERS-CoV cases and 1 probable case (epidemiologically linked) between 15 February to 15 March, 2017. Six cases were asymptomatic when they were identified. Patients on hemodialysis were significantly more likely to develop symptoms ($p<0.05$). Symptomatic cases were significantly older than asymptomatic cases ($p<0.05$). All (5) symptomatic cases sought medical help from at least one emergency department. Only one case was identified on initial presentation, and one case was identified after multiple visits.

Conclusions:
Many cases were not diagnosed when they sought care, highlighting the continued importance of considering MERS-CoV infection among patients with respiratory illness in Saudi Arabia. Rapid identification and isolation of MERS-CoV cases is essential to preventing healthcare associated infections.

Abstracts

Oral Presentations

5. MERS-CoV and other Emerging Respiratory Infections

SURVEILLANCE AND TESTING FOR MIDDLE EAST RESPIRATORY SYNDROME CORONAVIRUS (MERS-COV), SAUDI ARABIA, MARCH 2016–MARCH 2019

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Background and Aims:
Middle East respiratory syndrome coronavirus (MERS-CoV) causes severe respiratory illness. The majority of cases worldwide have been reported by Saudi Arabia. Clinicians and health authorities in Saudi Arabia are required to report all suspected MERS-CoV cases to the Health Electronic Surveillance Network (HESN), a national electronic surveillance platform. We aimed to describe trends in MERS-CoV surveillance and laboratory testing in Saudi Arabia during a 3-year period.

Methods:
Demographic information and laboratory results were collected for all suspected MERS-CoV cases reported to HESN during March 1, 2016–March 20, 2019. We analyzed demographic and laboratory data for suspected and confirmed cases. Data were stratified by local Health Affairs Directorate (HAD). Population estimates were obtained from the Ministry of Health.

Results:
During the study period, 200,937 suspected MERS-CoV cases were reported to HESN; MERS-CoV was detected in 698 (0.3%; 0.7 per 100,000 population per year). The majority of suspected cases were male (54.3%) and Saudi nationals (72.8%). Among the confirmed cases, 517 (74.1%) were male, 501 (71.8%) were Saudi nationals, and the median age was 54 years (interquartile range: 40 years–65 years). No MERS-CoV cases were identified among Hajj pilgrims. Percent positivity varied by region, with the highest percentage in Hafer Al-Baten HAD (1.2%), followed by Najran HAD (1.1%).

Conclusions:
Saudi Arabia continues to perform extensive surveillance for MERS-CoV, with an average of ~5400 suspected cases identified and tested per month. Continued surveillance is needed to better understand transmission and to monitor testing practices.

Abstracts

EVIDENCE OF ZOONOTIC MERS-COV INFECTION AMONG A HIGH-RISK POPULATION IN MOROCCO

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Background and Aims:
The Middle East Respiratory Syndrome Coronavirus (MERS-CoV) caused recurrent spillovers from dromedaries into human population since its emergence, and still a concern for global public health. All known zoonotic MERS disease has occurred in the Arabian Peninsula with none reported in Africa. Our study assesses a zoonotic MERS-CoV infection in presumed high-risk population of Morocco in close contact with dromedaries.

Methods:
This study adapted a WHO MERS-CoV protocol to assess the seroprevalence of MERS-CoV and the risk factors of infection among a high-risk population in three study sites in the south of Morocco with high-density of dromedaries. Demographic and camel exposure data was obtained using a questionnaire for the three set study groups; general population, slaughterhouse workers and camel herders. Human sera samples were tested for anti MERS-CoV IgG antibodies through ELISA, pseudoparticule Neutralisation and plaque reduction neutralisation assay.

Results:
479 participants were enrolled in this study by donating a blood sample collected from November 2017 through January 2018. Our results highlight the first evidence of human primary cases of MERS-CoV infections with documented close direct exposure to dromedaries in Africa. 3 of 137 slaughterhouse workers and 1 of 186 from general population group yielded neutralizing MERS-CoV antibody.

Conclusions:
This is the first study in Morocco focusing on MERS-CoV transmission risk factors through a seroprevalence study among high-risk population and providing evidence of zoonotic transmission, which greatly enhance the need for exhaustive investigation of human ARI in likely areas for evidence of MERS circulation.

Abstracts

MERS-COV OUTBREAK WITHIN HEALTH CARE SETUP THE FIRST REPORT OF NOSOCOMIAL TRANSMISSION IN OMAN

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Background and Aims:

The first confirmed case of MERS in Oman was reported in 2013. This report describes nosocomial spread of MERS-CoV in two regional hospitals in Oman (2019) for the first time involving two HCWs and highlight opportunities for rapid containment in the future

Methods:

Outbreak epidemiological description and analysis of contributing factors. Infection prevention and control challenges highlighted. The transmission map was created to trace hospital contacts. Symptomatic contacts were screened using (RT-PCR). Environment decontamination was carried out. Awareness programs with training and education were augmented and IPC guidelines for prevention and management was revised especially part related to implementation of risk assessment for contact screening

Results:

Results: Between 23rd January and 16th February 2019, 13 confirmed cases were reported from two hospitals. 7/13 were secondary transmitted cases including two HCWs 2(28%). Symptoms included fever in 6(46%) patients, respiratory symptoms 6(46%), and gastrointestinal symptoms 4(31%). 4/13 patients died. High traffic in affected wards, poor adherence to infection control measures, lack of awareness, delay diagnosis of primary cases, and lack of terminal cleaning were identified opportunities in this outbreak. Both affected HCWs and two of secondary patients were missed to be screened as contact.

Conclusions:

Conclusion: Lapses in implementation of infection control measures within a facility can create setup for nosocomial transmission of MERS-CoV. There is need to revise the risk assessment tools for the contacts within hospitals to be more sensitive so that positive cases can be detected earlier.

Abstracts

QATAR EXPERIENCE ON ONE HEALTH APPROACH FOR MIDDLE-EAST RESPIRATORY SYNDROME CORONAVIRUS, 2012–2017: A VIEWPOINT

E. Farag Elmoubasher[1], M. Nour[1], M. Islam[2], A. Mustafa[1], M. Khalid[1], R. Sikkema[3], F. Alhajri[2], A. Bu-Sayaa[2], H. Mohamed[1], M. Van Kerkhove4, A. Elkholy[5], S.M. Malik[5], C. Reusken[3], M. Koopmans[3], M. AlHajri[1]

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[5]Infectious Hazard Management- Department of Health Emergency,World Health Organization- Eastern Mediterranean Regional Office, Cairo, Egypt

Background and Aims:

The emergence of the Middle East Respiratory Syndrome Corona Virus (MERS-CoV) in the Middle East in 2012 was associated with an overwhelming uncertainty about its epidemiological and clinical characteristics. Once dromedary camels (Camelus dromedarius) was found to be the natural reservoir of the virus, the public health systems across the Arabian Peninsula encountered an unprecedented pressure to control its transmission. This viewpoint describes how the One-Health approach was used in Qatar to manage the MERS-CoV outbreak during the period 2012-2017.

Methods:

One-Health focuses on the association between the human, animals and environment sectors for total health and wellbeing of these three sectors. To manage the MERS outbreak in Qatar through a One-Health approach, the Qatar National Outbreak Control Taskforce (OCT) was reactivated in November 2012. The animal health sector was invited to join the OCT. Later on, technical expertise was requested from the WHO, FAO, CDC, EMC, and PHE. Subsequently, a comprehensive One-Health roadmap was delivered through leadership and coordination; surveillance and investigation; epidemiological studies and increase of local diagnostic capacity.

Results:

The joint OCT, once trained, had easy access to allocated resources and high risk areas to provide more evidence on the potential source of the virus and to investigate all reported cases within 24-48 hours. Lack of sufficient technical guidance on veterinary surveillance and poor risk perception among the vulnerable population constituted major obstacles to maintain systematic One-Health performance.

Conclusions:

The One-Health approach has been essential for generating evidence and implementing control measures to restrain MERS-CoV and other zoonotic diseases.

Abstracts

Oral Presentations

6. Influenza Vaccination

SEASONAL INFLUENZA VACCINATION COVERAGE AMONG HEALTHCARE WORKERS IN THE EASTERN MEDITERRANEAN REGION: META-ANALYSIS

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Background and Aims:
The World Health Organization (WHO) recommends annual influenza vaccination for Healthcare Workers (HCWs). Several cross-sectional studies have shown low influenza vaccination coverage rates among HCWs. The aim of the study is to pool the prevalence/frequency of seasonal influenza vaccination coverage rates among HCWs in the Eastern Mediterranean Region (EMR) and compare with other WHO Regions.

Methods:
We conducted a comprehensive search of PubMed/MEDLINE, Scopus, Google Scholar, previous reviews and cited reference sources. We also reached out to and discussed with several experts. The prevalence/frequency and its 95% confidence interval (CI) were calculated or estimated whenever possible.

Results:
We identified 197 publications, 23 of which were original researches that investigated seasonal influenza vaccination coverage rates among HCWs in the EMR. The 23 studies were published between 2007 and 2019 and included 19,089 HCWs. These studies were conducted in the following EMR countries: Saudi Arabia, United Arab Emirates, Kuwait, Oman, Morocco, Qatar, Jordan, Iran, Tunisia, and Pakistan. The overall pooled coverage rate among HCWs in the EMR was 27.3% (95% CI: 26.7% - 29%). The 3 main reasons identified for the poor vaccination uptake rates were: lack of time on the part of HCWs, unawareness of vaccine availability and doubts about vaccine efficacy. We plan to compare coverage rates among HCWs in different WHO Regions.

Conclusions:
Seasonal influenza vaccination coverage among HCWs in the EMR is relatively low. Institutional and national programs are needed to increase HCWs uptake of seasonal influenza vaccination.

Abstracts

INFLUENZA VACCINATION AMONG HEALTHCARE WORKERS: VACCINE COVERAGE AND REASONS FOR NON-COMPLIANCE TO VACCINATION , EL MAHALLA EL KUBRA,GHARBIA GOVERNORATE , EGYPT 2018

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Background and Aims:

Influenza virus is a major cause of morbidity and mortality worldwide, causing 3-5 million severe illnesses and half-million deaths every year. Healthcare workers are most liable to infection and spreading influenza virus at their facilities. Vaccination remains the most effective measure for prevention and control of influenza in healthcare settings. Study objectives are to measure influenza vaccine coverage and identify causes of non-compliance to vaccination among HCWs in three hospitals (chest, general, and infectious disease) in Mahalla district.

Methods:

Hospitals were visited, and self-administered questionnaire was delivered to HCWs to collect their demographic characteristics, influenza vaccination status and reasons for compliance and non-compliance to vaccination. Statistical analysis was conducted using a descriptive and multivariate analysis.

Results:

Overall 384 HCWs filled the questionnaire, their mean age was (34±8.66), and 11.7% were males. Overall influenza vaccine coverage was 61.9%, it was non-significantly higher in males than females (71.1% vs 60.7%) and in nurses than physicians (64.5% vs 54.1%). Vaccination rate was significantly higher in the chest and general hospitals compared to fever hospital (68.7% and 63.9% vs 44.5%, $p<0.001$). The main reasons for compliance were disease prevention (63.0%) and prevention of transmission to others (44.5%). The main causes of non-compliance were concern about side effects (43.1%) and preferring natural immunity over vaccination (23.2%).

Conclusions:

Study highlights the need for augmenting influenza vaccination coverage among HCWs especially physicians and infectious diseases hospitals. Improving HCWs knowledge regarding vaccine benefits and side effects could increase vaccine coverage and prevent influenza outbreaks in healthcare settings.

Abstracts

SEASONAL INFLUENZA VACCINATION: KNOWLEDGE, ATTITUDES AND BEHAVIORS IN PREGNANT WOMEN - MOROCCO, 2018

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Background and Aims:

According to the WHO, pregnant women (PW) are considered as the highest priority group in the countries considering initiating or expanding their influenza vaccine program [1-3]. The objective of the study was to assess the acceptability of seasonal influenza vaccine (SIV) and to identify its determinants among PW in Morocco.

Methods:

We conducted a cross-sectional study in a convenience sample of PW at 31 primary health centers within 3 provinces of Morocco. Data were collected using a structured questionnaire. Univariate and multivariate logistic regression were done using Epi info 7 to identify factors associated with the acceptability of PW to receive the SIV. The statistical significance level was set at $p < 0.05$.

Results:

The total number of PW included in the analysis was 1152. The percentage of PW who would accept to receive the SIV during pregnancy was 70.87%. Analytical statistics revealed that associated factors supporting the acceptance of PW to receive the SIV were the availability of safety information on SIV (OR = 1.96, 95% CI: 0.99-3.89), the health care professional (HCP) as source of this information (OR = 2.55, 95% CI: 1.61-4.04) and the fact that the SIV is recommended by a HCP (OR = 3.17, 95% CI: 2.12-4.74). Adverse events following influenza immunization were a barrier to receive the SIV for PW (OR = 0.38, 95% CI 0.19-0.78).

Conclusions:

For optimal vaccination coverage among PW, a tailored SIV national communication strategy should consider determinants identified to make PW adhere to the SIV.

Abstracts

EVOLUTIONARY ANALYSIS OF INFLUENZA B LINEAGES IN PAKISTAN 2011–2019; SURVEILLANCE TO EVALUATE VACCINE EFFECTIVENESS

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Background and Aims:

Evolutionary dynamics of human Influenza B viruses resulted into two distinct lineages B/Yamagata/ and B/Victoria viruses based on haemagglutinin (HA) divergence. In this study we have analyzed genetic diversity of Influenza B viruses circulating in Pakistan from 2011-19 and their compatibility with vaccine strain.

Methods:

Throat, nasal swabs collected from ILI and SARI patients were processed for detection of influenza viruses according to CDC protocol. Phylogenetic analysis of HA and NA genes was carried out using MEGA 6.0. SPSS version 17 was used for statistical analyses.

Results:

Out of 18685, 14% samples were positive for Influenza A or B. Influenza A was detected in 78% while Influenza B was 22%. Among influenza B viruses, 40% were B/Victoria while 60% identified as B/Yamagata. Mean age was higher for B/Yamagata; 24 ± 22 years as compared to B/Victoria at 19 ± 16 years. Phylogenetic analysis revealed HA and NA genes of influenza B viruses clustered with global strains. B/Yamagata-like strains clustered within Clade 2 and 3 showing signature amino acid markers in HA gene: N181 (Clade 2), P187 (Clade 3). B/Victoria-like isolates grouped in Clade 1 during 2013-2019. During 2018'a Victoria lineage virus carrying HA deletions at residues K162 and N163 of HA1(1A(Δ2). Analysis of HA and NA showed Yamagata-Victoria inter-lineage reassortment during 2013–2014.

Conclusions:

This is first report on molecular evolution of Influenza B viruses from Pakistan. Antigen characteristics of circulating influenza B were different to recommended vaccine strains. Regular characterization of Influenza B is important to include representative B-lineage strain in annual Influenza vaccine.

Abstracts

Oral Presentations

6. Influenza Vaccination

ASSESSMENT OF THE COMPLIANCE OF THE NATIONAL INFLUENZA CENTER (MOROCCO) TO THE BIORISK MANAGEMENT STANDARDS OF THE CWA 15793 :2011

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Background and Aims:
Handling dangerous pathogens, chemicals and toxins always involves a degree of risk that needs to be identified and mitigated. Therefore, the implementation of a biological risk management according to the recommendations of CWA 15793: 2011 is the guarantee that the work is done in a structured way.
National Influenza Center (NIC) of Morocco, had implemented several measures enabling the mitigation of biorisks in the laboratory.
The aim of this study is to evaluate the degree of compliance of the NIC to the requirements of the CWA 15793, and to identify the related gaps.

Methods:
The assessment of the Biorisk Management implementation status in the NIC was administered by an external auditor from the Robert Kokh Institute (Germany) using a structured evaluation questionnaire covering the 16 requirements of the CWA 15793.

Results:
Findings pointed out 80% of compliance of the NIC to the CWA 15793 requirements. However, some gaps were identified, namely the need to review the role of the biosafety officer to fit with his assignment and to define an appropriate tool for assessing the biorisks during internal audits according to the CWA 15793. Moreover, a lack of specific continuous training on biosafety was highlighted and need to be addressed.

Conclusions:
The management requirements of the of CWA 15793 were shown to be compatible with our quality management system according to the ISO 9001:2015 and all the WHO manuals, guidance and SOPs used by the NIC over years. The fulfillment of the identified gaps was scheduled in the action plan of the NIC.

Abstracts

THE ROLE OF BIORISK DEPARTMENT IN IMPROVING BIOSAFETY AND BIOSECURITY IN DEPARTMENT DEALING WITH INFECTIOUS DISEASE

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Background and Aims:

Sudan is large country in Africa suffering from many challenges in the field of infectious disease and out breaks which is major threats affecting the world , therefore National public health laboratory (NPHL) in the Sudanese ministry of health dealing with wide range of pathogens like influenza , Hepatitis B virus , Mycobacterium tuberculosis etc., which need implementing effective Biorisk management system (BRM) The importance of building strong biosafety and biosecurity system it is critical needs to safe people whom dealing with highly pathogenic agents.
The biosafety and biosecurity department established in 2014 at NPHL for managing risk all over Sudan laboratories. NPHL Adopted CWA 15793:2011 as standard for the biorisk management system for 17 departments through the fixed strong system contain polices, principles, documents, technologies and practice and training with Top management commitment.
This study aims to reflect the step by step approach in implementation of BRM through detecting prioritizing elements depending on gap analysis and measure the performance.

Methods:

Laboratory assessment by using gap analysis for implementation of CWA 15793:2011 tool
Audit checklist CWA 15793- national public health laboratory, Sudan

Results:

Number of measures were assigned on the basis of16 elements CWA 15793 – 2011
Institutional policy in place
Risk assessment procedure well Established
Good documentation and communication
Good microbiological practice and procedure improved
Training and awareness of laboratory staff increased
Urgently there is need for implementing biosecurity measures

Conclusions:

Biorisk department at NPHL have prominent role in protecting laboratory staff dealing with highly infectious agents.

Abstracts

ESTABLISHING A BIOSAFETY LEVEL III LABORATORY IN ABU DHABI, UAE (REFERENCE LABORATORY FOR INFECTIOUS DISEASES- SKMC-ABU DHABI)

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Background and Aims:

To deal with highly infectious and pathogenic organisms and the occurrence of outbreaks due to rapidly spreading respiratory causing viruses has caused the Abu Dhabi Department of Health (DOH) to establish a safe laboratory environment. Especially in a time where new emerging pathogen like Viral Hemorrhagic Fevers become more common, a laboratory which is safe and with experienced staff was established. The laboratory was designed and built by an American company in a modular fashion where the container modules were pre-manufactured and then shipped to Abu Dhabi and assembled here.

Methods:

The concept of developing such laboratories resides within the principles of biosafety and biosecurity. Biosafety is achieved by implementing various degrees of laboratory control and containment, through laboratory design and access restrictions, professional expertise and training, use of containment equipment, and safe methods of managing infectious materials in a laboratory setting. On the other hand, biosecurity involves "securing" or limiting access to the facilities, research materials and information.

Results:

Procedures which are performed in the Biosafety Level 3 Laboratory (RLID) are PCRs for highly contagious infectious diseases (i.e. Viral Hemorrhagic Fever Viruses), PCRs for various respiratory pathogens and cell culturing, especially for Influenza, Measles and Rubella Viruses.

Conclusions:

The laboratory is the National Reference Lab for Influenza and is the designated National Reference Lab for Measles and Rubella.

Abstracts

Oral Presentations

8. Influenza at the human-animal interface

IDENTIFY INAPPROPRIATE PRACTICES ASSOCIATED WITH HIGHLY PATHOGENIC AVIAN INFLUENZA SPREAD AMONG BACKYARD POULTRY FLOCKS USING PARTICIPATORY METHOD AS NEW APPROACH IN EGYPT, 2014-2017

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Background and Aims:
The study aimed is to identify inappropriate practices associated with HPAI transmission in backyard poultry to help disease prevention and control in Egypt that done through participatory epidemiology (PE)as new approach at surveillance of HPAI in Egypt applied by community animal health outreach teams(CAHO)

Methods:
During 2014-2017, CAHO Teams visited (2600) villages all over Egypt Depending on the presence of rumors about poultry disease and They conducted (11,000) focus group discussions and interviewed (55,000) poultry keepers using semi structured questionnaire that included practices for handling poultry flocks. Information verified using PE tools. Samples from poultry that have the symptoms Match with case definition were collected and tested for HPAI by RT-PCR to identify positive foci. Practices for dealing with backyard poultry in villages with positive HPAI foci were compared to those with no foci to identify practices associated with spread of infection.

Results:
The teams were detected positive foci in 413(15.9%) villages and they reach to the source of infection in(85%) of these positive villages. Practices found to be significantly associated with HPAI included: introduction of new poultry(without segregate for ten day)to existing flocks(OR=3.6,95%CI:1.9-5.2),slaughtering sick birds at rearing area(OR=3.0,95%CI:2.2-6.8),purchasing poultry from peddlers(OR:2.3,95%CI:1.3-5.5),using inedible viscera wastes for poultry feeding(OR=2.1,95%CI:1.5-4.2),breeding(Sudani)ducks(OR=2.0,95%CI:1.6-3.2)and scavenging(OR=1.7,95%CI:1.1-3.2)

Conclusions:
Poultry keepers play significant role in HPAI spread among backyard poultry flocks in Egypt. CAHO teams help for educating poultry keepers the appropriate methods for handling flock chicken and reduce the incidence of HPAI in household sector also a strategic plan should be designed to address nursery farms, this will represent a mitigation measures for a factor representing around(51%)of the identified sources of HPAI outbreaks in household sector

Abstracts

MOLECULAR EVOLUTION OF LOW PATHOGENIC H9N2 INFLUENZA VIRUSES IN POULTRY IN NORTH AFRICA

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Background and Aims:

H9N2 low pathogenic avian influenza viruses (LPAIV) have been first detected in Morocco early 2016 and in Algeria in 2017. The H9N2 viruses have since considerably spread causing severe economic losses to the poultry industry. The viruses have recently also spread to West Africa.
H9N2 influenza viruses have caused Human infections in Asia (no Human case reported to date in North Africa). Consequently, H9N2 influenza viruses monitoring is extremely important to identify putative pandemic strains at very early stages. We aimed at charactering LPAIV H9N2 poultry viruses from Morocco and Algeria in the 2016-2019 period thus filling a gap in understanding H9N2 epidemiology in North Africa.

Methods:

H9N2 low pathogenic avian influenza viruses (LPAIV) have been first detected in Morocco early 2016 and in Algeria in 2017. The H9N2 viruses have since considerably spread causing severe economic losses to the poultry industry. The viruses have recently also spread to West Africa.
H9N2 influenza viruses have caused Human infections in Asia (no Human case reported to date in North Africa). Consequently, H9N2 influenza viruses monitoring is extremely important to identify putative pandemic strains at very early stages. We aimed at charactering LPAIV H9N2 poultry viruses from Morocco and Algeria in the 2016-2019 period thus filling a gap in understanding H9N2 epidemiology in North Africa.

Results:

All the Algerian and Moroccan isolates clustered together and belonged to the Middle East group, H9N2 G1-like. However, our isolates were distant from strains detected in the other border countries, namely Tunisia and Libya in 2010-2013. The Algerian and Moroccan H9N2 also shared similar antigenic properties and they cross-reacted with antisera generated against the available H9N2 WHO vaccine candidates.

Conclusions:

The present study contributes with knowledge of avian influenza in poultry in North Africa and would be important in case of a spill over event. The data could be used for risk assessment and should be discussed with public health colleagues working in the region.

Abstracts

EVIDENCE OF H9N2 AVIAN INFLUENZA VIRUS INFECTION IN LEBANESE POULTRY: FINDINGS OF ACTIVE SURVEILLANCE, MARCH THROUGH JUNE 2017

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Background and Aims:

Avian influenza (AI) is one of the most important viral diseases in the poultry industry. Avian Influenza viruses (AIV) caused severe diseases in humans. Therefore, AIV are of great socioeconomic and health concerns. In Lebanon, AIV H9N2 outbreak occurred in 2006 in chickens in different provinces. In 2010, H9N2 was detected in quails and H4 and H11 antibodies were detected in poultry backyard growers in two governorates. An outbreak of highly pathogenic AIV H5N1 occurred in poultry in April 2016 and was cleared out in June 2016. H9N2 vaccination of poultry has been applied since 2016. Here we present the findings of an active surveillance for evidence of AIV at the human-animal interface in a sample of Lebanese poultry and exposed poultry growers, March-June 2017.

Methods:

A total of 1000 cloacal and oropharyngeal swabs were collected from asymptomatic poultry (breeders, broilers, layers) from farms in seven Lebanese governorates, March-June 2017. Swabs were screened for Influenza infection using real-time PCR. Positive samples for M segment underwent additional RT-PCR to determine the HA and NA subtypes. Furthermore, gene segments of positive specimens were cloned and subjected to full length sequencing. In parallel, 69 workers from selected farms were also enrolled in the study. Blood was collected. Serological studies were performed to test sera for antibodies against AIV using microneutralization assay against H9N2 and H5N1 viruses.

Results:

In chickens, six swabs out of 1000 (0.6%) tested positive. AIV-positive samples were all positive for H9N2. Sequences obtained clustered tightly with those of Israeli and Saudi Arabian origin as well as Lebanese H9N2 viruses from 2010 and are related to G1-like viruses. All human samples tested negative. Our findings showed evidence of infection with H9N2 AIV among Lebanese chickens. Sampling was performed over the spring months which may have led to underestimating the incidence of AI among poultry as AI infections are more frequent over the winter months. Lack of antibodies against AIV among exposed humans does not mean that exposed humans are not at risk of infection especially that this study was cross-sectional by design hence providing a slim chance to detect human infection.

Conclusions:

Our results revealed evidence of H9N2 AIV infection among Lebanese poultry suggesting that H9N2 viruses may be enzootic in Lebanon and that genetic drift, and potentially antigenic drift, may be occurring. The presence of H9N2 infection in Lebanese poultry despite the use of vaccine suggests that the protection induced by AI vaccines is attenuated by antigenic changes of the viruses. Thus, regular active surveillance at the human-animal interface using a One Health approach and characterization of circulating influenza viruses in farmed poultry is highly recommended to monitor the evolution of the genetic and antigenic characteristics of influenza viruses. Such programs allow early detection of the virulent strains and obtaining more information on their virulence and antigenic properties and potential spill-over events into humans. Data sharing between researchers, animal health specialists, and public health specialist will aid in Lebanon's preparedness to prevent, detect, and respond to AI.

Abstracts

Oral Presentations

9. Pandemic Preparedness and Response

DEFINING INFLUENZA BASELINE AND THRESHOLD VALUES USING WEEKLY SENTINEL SURVEILLANCE DATA- AFGHANISTAN, 2018/2019

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Background and Aims:
Pandemic influenza severity assessment is needed to select appropriate surveillance parameters and set thresholds for assessment of seasonal influenza severity in the country. The objective of this paper is to define the thresholds values and measure the influenza severity indicators.

Methods:
Influenza sentinel surveillance data (2016-2018) was used to define baseline and measure three pandemic influenza severity indicators (transmissibility, impact, and seriousness of disease). Moving Epidemic Method (MEM) was used to calculate these indicators, then 2018/2019 season data was compared to the thresholds. Number of weekly SARI and ILI cases was used as parameter to define transmissibility. SARI hospitalization out of total hospital admissions is used as a parameter for impact. Due to the unavailability of reliable data seriousness indicator has not been used.

Results:
Based on SARI data, the average epidemic onset is week 48 with average epidemic length of 18 weeks. Goodness of model values for SARI data with the slope parameter of 2.1 are: Sensitivity (0.60), specificity (0.71), Positive Predictive Value (0.39), Negative Predictive value (0.85). Based on the MEM results, Both ILI and SARI associated consultation rate was lower for the 2018-19 season compared to 2017-18 and 2016-17 seasons. During the 2018-19 season, the SARI cases crossed the epidemic threshold on week 50 2018 with 264 cases and gradually declined on week 14 2019 with 217 SARI cases.
Based on ILI consultation per 1000 outpatient consultations, the ILI associated consultation rate was below the threshold and lower for the 2018-19 season compared to 2017-18 and 2016-17 seasons.

Conclusions:
Influenza thresholds based on appropriate parameters have the potential to provide timely information for public health measures in a country where monitoring influenza activity has been challenging. Both ILI and SARI associated consultation rate was lower for the 2018-19 season compared to 2017-18 and 2016-17 seasons

Abstracts

IMPLEMENTATION OF PANDEMIC INFLUENZA SEVERITY ASSESSMENT TOOL IN MOROCCO, 2018-2019

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Background and Aims:

In 2011, the IHR Review Committee on Pandemic Influenza AH1N12009 recommended to develop measures for assessing the severity of every influenza epidemic and the future pandemic.
In 2017, WHO developed a framework on Pandemic Influenza Severity Assessment (PISA), which defines influenza severity regarding three indicators: transmissibility, seriousness and impact.
In the framework of implementation of 2018-2019 Pandemic Influenza Preparedness (PIP) work plan, with support of WHO, Morocco started to implement PISA tool.

Methods:

The method initially based on the national consensual choice of the three PISA indicators parameters. The second step is to measure the thresholds of these parameters, using the Moving Epidemic Method (MEM), in order to compare the activity of current influenza season as compared to previous seasons.

Results:

The transmissibility indicator was implemented in the surveillance system. The measured parameter is the number of ILI divided by the number of consultations in primary health care centers, multiplied by the rate of ILI positivity. For the seriousness indicator, the implementation is in progress. The parameter chosen is the number of influenza SARI case divided by SARI cases hospitalized in Intensive Care Units (ICU) in eight sentinel hospitals. The current stage is about collecting historical data of hospitalizations in these ICUs for at least 3 years to be able to calculate the threshold using the MEM.

Conclusions:

Within the PIP Framework, through the support of WHO/HQ/EMRO/CO, Morocco has made important progress in PISA implementation, especially in term of transmissibility and aim to achieve during 2020-2021 the implementation of Seriousness and impact.

Poster Presentations

Respiratory disease epidemiological surveillance

BOARD 1 | ANALYSIS OF RISK FACTORS FOR INFLUENZA IN SEVERE ACUTE RESPIRATORY INFECTION (SARI) CASES IN TUNISIA, 2015-2018

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[7]Arabian Gulf University AGU,Department of Family and Community Medicine- College of Medicine and Medical Sciences CMMS, Manama, Bahrain

Background and Aims:
Syndromic surveillance of severe acute respiratory infections (SARI) is important to assess seriousness of disease as recommended by WHO for influenza. Tunisia has installed a SARI surveillance system since 2014 based on six university hospital departments. The aim of this study is to describe characteristics of SARI patients and to explore risk factors for a severe outcome in SARI patients.

Methods:
We retrospectively collected data from tow SARI sentinel sites in Tunisia between 2015 and 2018. All samples were tested for influenza viruses using RT-PCR. We investigated the factors associated with ICU admission or death in hospitalized patients with severe influenza.

Results:
During this period, 476 SARI cases were enrolled from two sites implicated in this study. The influenza positivity rate was 28 % (n= 94) with a predominance of influenza A H1N1pdm 2009 (69.2%). 57.6% (n=274) patients were admitted to the intensive care unit, while 50.5% required at least one mode of mechanical ventilation and 23.6% (n=103) of them died. Risk factors associated with ICU admission included previous history of smoking 44% (OR: 1.83; 95% CI: 1.04-3.19). In a multivariate analysis, chronic respiratory disease (OR: 14.7; 95% CI: 6.23-34.5) and presence of complication (OR: 14.7; 95% CI: 79.8-2181.8), were significantly associated with a worse outcome in SARI patients.

Conclusions:
These results identify groups at high-risk for severe influenza who should be considered potential targets for influenza vaccination in Tunisia.

Poster Presentations

Respiratory disease epidemiological surveillance

BOARD 2 | EPIDEMIOLOGY AND ASSOCIATED FACTORS OF SEVERITY OF PNEUMONIA AMONG UNDER FIVE CHILDREN IN NORTH OF AFGHANISTAN 2018 : EXPERIENCES FROM A CHRONIC CONFLICT SETTING

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Background and Aims:

Devastated four decades ongoing conflict and war in Afghanistan lead high maternal and children mortality. Acute respiratory infection is the leading cause of morbidity and mortality among children in Afghanistan. The aim of this study is to present the epidemiology and associated factors of pneumonia severity among children <5 years in North of Afghanistan.

Methods:

Children aged 2–59 months admitted to Balkh Regional Hospital during Jan-Feb 2018 with pneumonia or severe pneumonia were enrolled. Socio-demographic, clinical, lab and anthropometric measurements were collected. The associated factors with pneumonia severity were assessed using Chi Square test at level of significant of 0.05

Results:

We investigated 752 children with pneumonia, 66.5 % had severe disease, and 4.3% died. Factors significantly associated with severe pneumonia were being from rural area (OR: 2.06; 95%CI 1.51–1.80) , distance to health center with more than one hour (OR: 2.2; 95%CI 1.2–4) , use of kitchen with windows (OR :0.37; 95%CI 0.26–0.53), death (OR: 7.9 ; 95% CI 1.8–33) , and age group 2-5 months (OR: 1.44; 95% CI 1.06–1.95) . Increased risk of pneumonia severity was associated with resident in rural area, access to health care, using kitchen without windows, and age less than 6 months.

Conclusions:

Modifiable factors for severe pneumonia included access to health care services and use of improved place for cooking. Improving these factors could reduce the severity of pneumonia cases.

Poster Presentations

Respiratory disease epidemiological surveillance

BOARD 3 | EPIDEMIOLOGY OF INFLUENZA ASSOCIATED LOWER RESPIRATORY TRACT INFECTIONS, 10-YEARS RESULTS OF SENTINEL SEVERE ACUTE RESPIRATORY INFECTIONS SURVEILLANCE, EGYPT, 2010- 2019.

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Background and Aims:

Severe acute respiratory illness (SARI) are leading causes of hospitalization, morbidity, and mortality worldwide. Substantial burden of SARI is attributable to influenza. This study describes epidemiology and trends of SARI due to influenza in Egypt, 2010- 2019.

Methods:

ARI Surveillance was established in 8 hospitals all over Egypt. All hospitalized patients with fever ≥38 C° and cough within 10 days prior to admission are eligible. Oro-Nasopharyngeal swabs are collected from patients and tested for influenza type and subtype by RT-PCR.

Results:

A total of 22,703 patients with SARI were enrolled, their mean age was 31.5 ±24 years, 48.9% were males, 13(0.3%) were vaccinated for influenza, 163(3.7%) admitted to ICU and 86(1.9%) died during hospitalization. Of all SARI patients 4,436(19.5%) were positive for influenza viruses including 1661(37.4%) patients positive for A/H1N1pdm09, 1136(25.6%) A/ H3N2, 1387(31.3%) Flu-B and 252(5.7%) were positive for two influenza viruses. A/H1N1pdm09 has higher CFR (3.6% vs 0.9%), ICU admission (6.6% vs 1.9, $p<0.001$), length of hospital stay (5.7 vs 5.1 days, $p<0.001$) compared to other subtypes, with highest rates reported in coastal and Cairo governorates (9.0%, 6.1% respectively). In 2010, large second wave of A/H1N1pdm09 identified followed by two years of remission, then it re-emerged in subsequent years.

Conclusions:

Surveillance proved that substantial burden of SARI in Egypt is caused by influenza viruses. Surveillance identified several risk factors for severe outcome in influenza-positive SARI patients. This is relevant for targeting and prioritizing the vulnerable population especially with the low vaccination rate and antiviral use in Egypt.

Poster Presentations

Respiratory disease epidemiological surveillance

BOARD 4 | EVALUATION OF SEVERE ACUTE RESPIRATORY INFECTION (SARI) SURVEILLANCE SYSTEM IN KUWAIT

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Background and Aims:

Background: SARI is a significant cause of morbidity and mortality worldwide. It is associated with a large number of different viral and/or bacterial agents. In Keeping with WHO and CDC recommendations. SARI sentinel surveillance was initiated in Kuwait in 2016. It includes representatives from the public and private sectors.

Aims: To evaluate the national SARI sentinel surveillance system in Kuwait.

Methods:

The evaluation of the SARI sentinel surveillance system covers the period between April 2016 and May 2018 at the two active sentinel sites at that period. The CDC guideline for evaluation of the surveillance system was utilized, nine attributes were considered for the evaluation. The score of each attribute was calculated and averaged to calculate the final score value.

Results:

During the evaluation period, 2375 SARI cases were reported from two sentinel sites. We calculated the mean score of the nine considered attributes for the evaluation. The data quality and completeness scored 3, which is a good performance. The system is also performing good at acceptability, stability, sustainability, and utility. However, timeliness, representativeness, simplicity and flexibility scores indicate moderate performance and require some improvements. The overall score is 2.5 representing good performance.

Conclusions:

the SARI surveillance system in Kuwait performs well and provides a reliable data source for public health interventions. To enhance performance, the staff allocated and trained staff at the central level increased; Also, a new sentinel site was added at another district.

Poster Presentations

Respiratory disease epidemiological surveillance

BOARD 5 | EVALUATION OF THE INFLUENZA SENTINEL SURVEILLANCE SYSTEM, MOROCCO, 2007-2019

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Background and Aims:

The Moroccan Ministry of Health set up progressively the influenza sentinel surveillance system through major steps of implementation (1996, 2004, 2007 and 2014) which is now composed of public and private networks and provides clinical, epidemiological and virological data from ILI, ARI and SARI cases.
Under the WHO Pandemic Influenza Preparedness (PIP) Framework, Morocco has developed and implemented an action plan for strengthening the influenza surveillance system specially to implement the PISA tool recommended by WHO. Computerization of the entire surveillance system is underway with support from CDC.
The aim of the current evaluation is to assess the surveillance system ability to meet the requirements of these improvements.

Methods:

It is a comprehensive evaluation using surveillance system attributes in accordance with CDC guidelines (2001), with a protocol developed during a training workshop organized by WHO EMRO and CDC in Tunisia during April 2018 and adapted thereafter to Morocco context.
The evaluation is covering pre and post pandemic period which extends from 2007 to 2019

Results:

Final results of the assessment scores of 9 surveillance system attributes (Data quality and Completeness, Timeliness, Representativeness, Flexibility, Stability, Utility, Simplicity, Acceptability Sustainability) will be presented during the EMARIS workshop in November 2019.

Conclusions:

Evaluation results will be used to strengthen the current surveillance system and prepare it for PISA tool implementation and computerization in order to comply with PIP objectives and IHR recommendations.

Poster Presentations

Respiratory disease epidemiological surveillance

BOARD 6 | INFLUENZA-ASSOCIATED SEVERE ACUTE RESPIRATORY INFECTIONS AMONG CHILDREN UNDER FIVE YEARS OLD IN MOROCCO FROM SEPTEMBER 2017 TO MARCH 2019

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Background and Aims:
Children under 5 years old with severe acute respiratory infections (SARI) are among the groups who have a greater susceptibility to influenza infection as well as those who experience a greater burden of illness. The indication of flu vaccination among such a group needs more evidence from the Moroccan context as requested by the national immunization program.
The present study aims to estimate the influenza infection rate among children under 5 years with SARI.

Methods:
From September 2017 to March 2019, nasopharyngeal swabs were collected from 942 children under 5 years admitted in pediatric services of 8 sentinel hospitals. The molecular investigations were processed at the National influenza Center at the National Institute of Hygiene using a qRT-PCR monoplex assay developed by the CDC.

Results:
The median age of participants was 11 months and 40% was female. A total of 112 samples were positive yielding a frequency of 14.5% (112/768). Among all influenza confirmed cases, 8.17% (77/112), 1.80% (17/112), 1.91% (18/112) were typed as influenza A/H1N1pdm09, A/H3N2 and influenza B B/Yam respectively. 6.9% (n= 53) of the cases were admitted at the intensive care unit, of which 9.23% (n=5) were AH1N1pdm09.

Conclusions:
Our data confirmed that Influenza exact an important burden among children with SARI and raised the possible values of influenza vaccines among children under 5 years. Moreover, our findings highlight that influenza virus is not the only cause of SARI among children under 5 years and suggest that particular attention should be given to the non-flu respiratory viruses.

BOARD 7 | NUTRITIONAL FACTORS OF ACUTE RESPIRATORY INFECTIONS AMONG CHILDREN UNDER FIVE YEARS OF AGE IN RURAL ISLAMABAD

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Background and Aims:

Acute respiratory infections (ARI) is a significant public health problem and also a leading cause of mortality among young children.
Aim: To evaluate nutritional factors of acute respiratory infections (ARI) among children under 5 years of age in rural Islamabad.

Methods:

A case control study was conducted at Federal General Hospital (FGH) Islamabad. A case was defined as sudden onset of fever (>38° C) and cough in a child under 5 years presenting to FGH from 1st Nov 2018 to 28th Feb 2019. A total of 389 cases were selected as sample size and one control (age and sex matched) was selected for each case. Structured questionnaire was used for data collection and odds ratios were calculated with 95% confidence interval.

Results:

Total 778 children were recruited; mean age of the cases were 2.6 months (R=59-1 months) and 54% cases were males while rest were females. Most affected age group was 24 months and below. Among all 53% (206) of cases had upper respiratory tract infections and 47% (183) had lower respiratory tract infections. Significant nutritional factors were inadequate breast feeding (OR 8.1, CI 5.7-11), childhood stunting (OR 7.3, CI 5.2-10), underweight (OR 6.2, CI 4.6-8.5), food allergies (OR 5.9, CI 4.4-8.1), bottle feed (OR 5.1, CI 3.8-6.8), unhygienic feeding practices (OR 3.4, CI 2.6-4.4), undernourished mothers (OR 2.6, CI 2.1-3.3).

Conclusions:

Nutritional factors have significant impact on childhood ARI. Nutritional education and counselling is required at institutional and community level for prevention of ARI. On our recommendations prevention campaigns for ARI were started at FGH.

Poster Presentations

Respiratory disease epidemiological surveillance

BOARD 8 | REVIEW OF SURVEILLANCE SYSTEM FOR INFLUENZA LIKE ILLNESS AND SEVER ACUTE RESPIRATORY INFECTION IN STATE OF PALESTINE FOR INFLUENZA SEASON 2018/ 2019

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Background and Aims:

Influenza can result in serious respiratory disease and surveillance can identify novel strains, detect unusual symptoms, and assess disease burden. outdated case definitions, substandard laboratories for confirming human influenza cases, and little capacity to rapidly respond to outbreaks. Palestinian Influenza surveillance networks were developed in 2009; enhancing epidemiological capacity for disease surveillance; developing laboratory-based surveillance, and training and testing local rapid response teams. This paper describes these surveillance systems in their capacity to detect influenza

Aim:
systematic review of influenza surveillance to identify noval viruses and the effectiveness of ILI and SARI surveillance system

Methods:

Retrospective review of ILI and SARI cases.
Cases are captured in (ILI) and (SARI) surveillance system. Both follow Global Epidemiological Surveillance Standards (World Health Organization, 2014). Other information collected included demographic data, underlying conditions, clinical symptoms, and laboratory test results. The ILI surveillance system catch outpatients whereas the SARI surveillance system can include in-patient cases who visit the hospital asking medical attention .

Results:

From September 2018 through June 2019, 70 ILI and 2868 SARI cases were reported; 964 (32.8%) were influenza positive (24% of ILI and 33% of SARI cases). The most common influenza strain was H1N1 (17% of ILI and 20.8% of SARI cases); followed by A/H3 (0.07% in ILI and 10.7% in SARI system), B strains (0.0% in ILI and 0.0003% in SARI system).

Conclusions:

Identification of groups with higher burden of disease can provide insight to where preventive measures should be targeted, and can contribute to more efficient resource allocation.

Poster Presentations

Respiratory disease epidemiological surveillance

BOARD 9 | SENTINEL SURVEILLANCE OF SEVERE ACUTE RESPIRATORY INFECTIONS (SARI) CAUSED BY INFLUENZA VIRUSES IN QATAR, 2017-2018

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Background and Aims:
Influenza can cause severe respiratory infection leading to hospitalization. The aim of this study was to determine influenza viruses of severe acute respiratory infection (SARI) during the period of 2017 to 2018

Methods:
A retrospective hospital based epidemiological study was conducted. Patients who met the World Health Organization SARI case definition were enrolled. Demographic and epidemiological information as well as respiratory swabs was collected for respiratory virus isolations by RT-PCR.

Results:
For the year 2018, a total sample positivity rate of 44.4% was seen as compared to 37.8% for 2017. Highest positivity was among 16-50 years age group in 2018 and 2017 (P=0.001). In 2018, 23% patients were pregnant as compare 13% in 2017 (P=0.358); about half of patients suffered from chronic medical condition in both years (P=0.106). In 2018, 7.5% were admitted to intensive care unit (ICU) as compared to 6.4% patients in 2017 (P=0.964); 5.2 % patients were ventilated in 2018 as compare to 4.5 % in 2017 (P=0.108); 2 of 692 died in 2018 as compared to 1 of 534 in 2017 (P=0.602); most of patients hospitalized less than 3 days in 2018 and 2017 53.7 %, 64.4% respectively (P=0.025). Out of SARI positive samples in 2018, 59.3% were Influenza A: A(H1N1) pdm09, 22.1% Influenza A: Unsubtyped, 16.0% were influenza B and 2.6% Influenza A seasonal H3N2 as compare to 58.1%, 18.7%, 8.4% and 14.8% in 2017.

Conclusions:
Influenza virus A and B are responsible for high morbidity each year; hence flu vaccination campaign is essential to enhance Influenza vaccine uptake amongst the high-risk groups.

BOARD 10 | SEVERE ACUTE RESPIRATORY INFECTIONS OF VIRAL ORIGIN IN MOROCCAN MEDICAL ICU: INCIDENCE, PREDICTIVE AND PROGNOSTIC FACTORS

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Background and Aims:
Severe acute respiratory infections (SARI) are common in critically ill patients. The aims of this study were to describe the epidemiological characteristics of viral SARI, to identify the predictive and prognostic factors of these infections.

Methods:
A retrospective study was conducted at the Medical Intensive Care Unit over 5 years. 180 adult patients were admitted, and laboratory tested for influenza and other respiratory viruses by PCR. They were included in the study that all patients developed SARI with or without identified viruses. The determination of the predictive factors of viral SARI was obtained by comparing the group with positive and negative viral result. To identify factors associated with mortality, Survivors vs died were compared

Results:
180 patients admitted to ICU during the study period. 55 patients had positive viral specimens at a viral respiratory infection incidence rate of 3, 5 %. The main isolated SARI viruses were influenza A virus (60%). Predictive factors of viral IRAS were: winter season, pneumonia and eosinopenia < 10. The mortality of patients with viral SARI was 37%. Multivariate analysis showed that presence of charlson score 2 (OR=3; 95%CI: 1.4-7.2), CURB 65 score 3 (OR=2.9; 95%CI: 1.1-7.6), more than one organ failure (OR=2.6; 95%CI: 1-6.6), were independently associated with an elevated risk of death.

Conclusions:
The mortality appears to be related to the presence on admission of a charlson score 2, CURB 65 score 3, and finally more than one organ failure

Poster Presentations

Respiratory disease virological surveillance

BOARD 11 | RESPIRATORY DISEASE SURVEILLANCE AND LABORATORY CAPACITY AT NATIONAL INFLUENZA CENTER (NIC), LEBANON, 2015-2019: RESULTS AND ACHIEVEMENTS

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Background and Aims:

Hospital sentinel-based surveillance of severe acute respiratory infection (SARI) in Lebanon was initiated in 2015 with World Health Organization (WHO) support. Main objectives are estimating influenza morbidity; identifying circulating and novel virus and contributing to global influenza surveillance. The following presents the National Influenza Center (NIC) in terms of achievements and identified gaps.

Methods:

NIC was established at Rafik Hariri University Hospital. Case detection, specimen collection and testing are done following national protocol and standard operation procedures set for epidemiological surveillance and laboratory testing.
Naso/orphayngeal swabs collected from SARI cases are referred to NIC, where tested using RT-PCR for A/B Influenza viruses. Three NIC performance indicators are monitored: annual external quality assurance, weekly data sharing to WHO platforms, and timely sharing of Influenza viruses.

Results:

Since 2015W01 till 2019W20, for 5 consecutive Influenza seasons, 4503 cases were reported including 4303 tested (95%). 19% were Influenza positive. The main identified strains were AH3N2 (37%), AH1N1pdm (23%), and B Yamagata (11%). Internal validation of PCR results is done routinely. External validation is conducted with WHO and CDC. Since 2018, 3 proficiency tests were performed with twice 100% success (one pending). Laboratory data sharing with WHO platform reached 100% starting 2017. Influenza isolates sharing with WHO-CCs reached 113 isolates covering the last 2 influenza seasons, thus contributing to two vaccine preparations.

Conclusions:

NIC is an important pillar in SARI surveillance. Current improvements rely on initiating virus culture. Yet, enhancing human capacity is a constant need, particularly during season peaks.

BOARD 12 | CLINICAL PRESENTATION OF INFLUENZA AMONG CHILDREN ADMITTED IN MOHAMMED ALAMIN HAMID PAEDIATRICS HOSPITAL- 2017

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Background and Aims:
This study determined the prevalence and clinical presentation of influenza among children who were admitted to acute respiratory tract infection ward in Mohamed Alamin Hamid Pediatrics Hospital- Omdurman, Sudan From first of February 2017 – last of February 2018.

Methods:
this study is descriptive cross –sectional, hospital based simple random study to patients admitted to acute respiratory tract infection ward with feature of influenza according to influenza like illness case definition. Data analysis: data was analyzed by computer using statistical package for social sciences (SPSS) version 20, and the result obtained being presented in graphs and tables.

Results:
the total number of study population 299, female is 176(59%) and male123(41%). Most of the patients from Khartoum state 84% and only 16% from outside Khartoum state. The prevalence was found 4.7% and all patient not vaccinated against influenza and strain was found H3N2in 78.6% and 21.4% was un type able. most of the infected patients age less than 1year 64.3%, from 1-3 year 14.3%, and from 3-5 year 21.4%. the most common presenting symptoms were fever and nonproductive cough, sore throat and nasal congestion.

Conclusions:
the prevalence of influenza was found 4.7%, the most strain was H3N2 and children affected less than 5 year. We recommended that all children less than five year should be vaccinated against seasonal influenza to decrease mortality and morbidity.

Poster Presentations

Respiratory disease virological surveillance

BOARD 13 | DESCRIPTION OF EPIDEMIC SEVERE INFLUENZA A(H1N1)PDM09 VIRUS CIRCULATED IN TUNISIA IN 2017-2018 SEASON

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Background and Aims:

The constant evolution of Flu Viruses keeps all NIC countries in alert to detect important mutations in the seasonal dominant strains. Thus, we try to explain why the A/H1N1pdm09 viruses caused high mortality in SARI cases during the 2017/2018 season in Tunisia, compared to 2016-2017 and 2018-2019 seasons.

Methods:

3802 respiratory samples were analyzed by real time RT-PCR during three seasons (2016-2019). The detection and subtyping of influenza virus were performed using CDC protocols. The confirmed fatal cases infected with influenza A(H1N1) pdm09 from 2017-2018 season were molecular characterized using Sanger method.

Results:

During the 2017-2018 season, 1915 specimens from SARI cases were tested for influenza, 50% more than in the previous season. 35.66% of the specimens were positive for influenza virus compared to 2016-2017 season (12.82%) and 2018-2019 season (12.82%). Influenza A(H1N1) pdm09 circulated at high levels between weeks 51/2017 and 13/2018. This is longer than in recent seasons and may have contributed to the high severity of the 2017-2018 season. 90% of positive cases detected are severe cases and death was observed of more than 30% of SARI cases due to severe respiratory tract infections. The HA gene of Influenza A(H1N1) pdm09 isolated in 2017-2018 season, were genetically not to close to vaccine strain indeed their clustering with globally circulating strains of genogroup 6B.

Conclusions:

This molecular analysis explain the rise of influenza A(H1N1) pdm09 activity with high rate of morbidity and mortality. The circulation of drifted strains season was related to the high hospitalization rate due to the mismatch with the vaccine strain.

Poster Presentations

Outbreak Investigation and Response

BOARD 14 | LINKING BIOINFORMATICS TO EPIDEMIOLOGICAL IN OUTBREAK INVESTIGATION OF INFLUENZA RESPIRATORY INFECTION, INTEGRATING MOLECULAR TECHNOLOGIES INTO PUBLIC HEALTH

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Background and Aims:

to terminating of the cluster of disease and preventing of similar occurrences, we always need understand how such outbreaks originate

Methods:

By Examining sequencing characteristics to the identification of outbreaks, focusing on the application of whole-genome sequencing (WGS) to outbreaks of causative agent. Describing traditional epidemiological analysis and showing how, WGS can be informative at multiple steps in outbreak investigation.

Results:

The studies revealed that, genomic analysis of strains from influenza virus outbreaks, contributed clearly in identifying transmutation chain. Refereeing to bioinformatics data (the Isolate Genome Sequence Database (IGSdb), can be utilized in epidemiological investigations in a clinical and public health environment. Isolates during an outbreak times (and more widely) available through public data can lead to significant achievement and progress in constructing of a phylogenetic tree. A tree, which helps identification of sources of infection or even reservoirs. Furthermore, by linking phylogeny with geography will definitely enable the origins and spread of pandemics and epidemics to be traced. Genomic information, along with estimates from the sequence data of the time since isolates had diverged ('molecular clock' estimates), an allowed them to reconstruct detailed routes of transmission within the region. High-resolution genotypic are simple, quick and cheap enough to fall within average-sized clinical or research laboratory. By linking epidemiology to pathogen biology, using insights into (genome evolution, genome structure and gene content).

Conclusions:

Bioinformatics can make a significant contribution to the investigation of outbreaks. And ensuring the integration with epidemiological investigation, diagnostic assays and antimicrobial susceptibility testing,

BOARD 15 | MIDDLE EAST RESPIRATORY SYNDROME CORONAVIRUS (MERS-COV) TESTING IN QATAR: PRELIMINARY STUDY

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Background and Aims:
MERS-CoV surveillance in Qatar has been guided by WHO recommendations based on an assumption that the virus circulates throughout the gulf region and the need for testing all cases of pneumonia.
The objectives of this study are: to collect and analyze laboratory data on MERS-CoV in humans in Qatar and verify the usefulness of testing respiratory samples for MERS-CoV in all pneumonia cases without considering case definitions.

Methods:
This study is retrospective based on monthly data extracted from the LIS database of the reference laboratory, The Virology and Molecular Biology Section/DLMP in Hamad Medical Corporation. The technique used for MERS-CoV tests is a commercial real-time PCR. The period is from September 2012 to June 2019.

Results:
*The total number of tests for MERS-CoV was 106,315 tests.
*To date, 24 laboratory confirmed MERS-CoV cases have been identified, the last in December 2017.
*The requests for MERS-CoV testing were made for respiratory infections investigation and rarely to target specifically MERS-CoV.
*The number of requests for MERS-CoV testing has peaks with no visible correlation with the number of MERS-CoV cases confirmed in Qatar or in highly prevalent countries but matching with those of Influenza viruses' requests.
*The distribution of Qatari cases was not correlated with the activity in highly prevalent countries.

Conclusions:
This preliminary study suggested that the MERS-CoV is not circulating in human population in Qatar. Nevertheless, it is imperative to collect more detailed data and to consider the results of the epidemiological investigations of this virus in the animal population in order to draw more concrete conclusions.

BOARD 16 | NO MERS-COV BUT HUMAN RHINOVIRUS AND RESPIRATORY SYNCYTIAL VIRUS IN IRANIAN PILGRIMS IN 2015 AND 2017

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Background and Aims:

The pilgrimage to Mecca bring many Muslims to a confined area. Each year more than two million Muslims from 185 countries gather in Mecca to do the pilgrimage. Respiratory viral infections are the most common diseases occurred during mass gatherings in Hajj. The aim of this study was the detection of human rhinovirus (HRV), human respiratory syncytial virus (HRSV), Middle East respiratory syndrome coronavirus (MERS-CoV) infections in the Iranian pilgrims with severe acute respiratory infection (SARI) in 2015 and 2017, for presenting the appropriate data to improve the control and prevention approaches.

Methods:

A total of 451 throat swabs collected from the pilgrims with SARI which were negative for influenza viruses tested for HRV, HRSV and MERS-CoV in 2015 and 2017. Real time RT-PCR method was used for MERS-CoV and HRSV detection. Conventional nested RT-PCR was performed for HRV detection.

Results:

None of the patients had MERS-CoV but HRV was detected totally in 8.4% (38/451) patients with 5.6% (19/338) and 16.8% (19/113) in 2015 and 2017 respectively. One HRSV was detected just in 2015 (1/338).

Conclusions:

In relation to the cases of HRV, HRSV and MERS-CoV infections among Iranian pilgrims, HRV was more common infection in this study. These results can be useful for better current status knowledge, continuing surveillance, infection control and more comprehensive planning. Meanwhile the other respiratory viruses should be tested in negative samples for SARI surveillance in pilgrims.

Poster Presentations

Outbreak Investigation and Response

BOARD 17 | OUTBREAK OF MIDDLE EAST RESPIRATORY SYNDROME IN WADI ALDAWASIR CITY, SAUDI ARABIA, 2019

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Background and Aims:
In 2012, a novel corona virus emerged in Saudi Arabia. Named Middle East Respiratory Syndrome (MERS – CoV), it causes severe lower respiratory infection in human. Between January-April 2019, a MERS-CoV outbreak was identified in Wadi AlDawasir.

Methods:
We identified all laboratory confirmed MERS-CoV cases in Wadi AlDaswasir reported to Saudi Arabian Ministry of Health between 26 January – 5 April 2019. We conducted home interviews with confirmed patients, and reviewed hospital records. We conducted descriptive analyses.

Results:
By April 5, we identified 51 confirmed cases. Cases ranged in age from 23-84 years (mean = 46 years), 38 (74%) were male. Overall, 25 (49%) cases reported camel exposure. Eleven cases were classified as primary cases; all reported camel exposure and 2 (20%) also reported exposure to WDGH prior to symptom onset. Of all 51 cases, 14 (27%) were classified as secondary cases; 24 (47%) were classified as tertiary cases. Two (4%) were classified as sustained human-to-human transmission (quaternary cases). Fourteen (35%) cases worked at WDGH, although 6 (43%) did not provide direct patient care. Seven cases died (case fatality rate=14%).

Conclusions:
The majority of patients in the outbreak had contact with both the hospital and camels. This highlights the need for more precise categorization of cases as either primary or secondary which will be possible by genetic comparison of camel isolates with human isolates.

BOARD 18 | ASSESSMENT OF DISASTER HEALTH MANAGEMENT SYSTEM OF KASSERIN REGIONAL HOSPITAL 2018

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Background and Aims:

The increasing number of disasters in the world raises the problem of the effectiveness of crisis management systems in countries
In addition to the potential damage to infrastructure, disasters can affect the health of the population
It must therefore be a crucial factor in disaster management
The purpose of this study was to evaluate the disaster management of the Kasserine Regional Hospital, the critical structure in the region that supports victims in the minutes and hours following an unexpected event

Methods:

We conducted a study that was both quantitative and qualitative
2 questionnaires were used using the Hospital Safety Index guide
The first was about general hospital informations and the second was about the safe hospital checklist

Results:

The regional hospital of Kasserine is a public structure referring to the Ministry of Health
It is the only specialized structure in the region. This one is confronted with several dangers (terrorism, chemical, accidents of the public way)
The structural, non-structural safety index, the emergency and disaster management capacity were respectively 0.66 (class a), 0.43 (class b) and 0.38 (class b)
The overall safety rating of the Kasserine Regional Hospital was 0.49 (Class B)

Conclusions:

The safety of patients and hospital staff, and the ability to function during and after emergencies and disasters at Kasserine Regional Hospital are potentially at risk
Intervention measures are necessary in the short term
This can provide decision-makers with a starting point for identifying priorities to reduce risks and vulnerability

Poster Presentations
Biosafety and Biosecurity

BOARD 19 | MULTILATERAL COLLABORATION TOWARDS THE IMPLEMENTATION OF BIORISK MANAGEMENT PROGRAM IN LIBYAN UNIVERSITIES: PROMOTING ONE HEALTH CONCEPT

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Background and Aims:
Biosafety is complementary to biosecurity and refers to the implementation of laboratory practices and procedures, specific construction features of laboratory facilities, safety equipment, and appropriate occupational health programs when working with potentially infectious microorganisms and other biological hazards. These measures are designed to reduce the exposure of laboratory personnel, the public, agriculture, and the environment to potentially infectious agents and other biological hazards.

Methods:
A multilateral cooperation was established to develop a BRM project between the national centre for disease control (NCDC) in Libya and world health organization (WHO), biosecurity engagement program (BEP), Sandia national laboratories biological and chemical threat reduction (SNL-IBCTR).

Results:
Component 1: A cascade of training programs was dedicated for laboratory workers focused on a core concept of risk assessment and management
Component 2: Development and implementation plan for training skilled members of university staff to support the course
Component 3: Specialized biorisk management training
Component 4: MENA-BRM twinning program
Component 5: A questionnaire was developed to evaluate the knowledge attitude and the approach of laboratory personnel about BRM
Component 6: Strengthening health security systems across Libya
Component 7: Libyan Universities Biorisk Management Network

Conclusions:
The seven components provided a solid ground for establishing and secure a will trained personnel equipped with knowledge, skills and competency; Strengthening a multilateral cooperation and partnership with all national and international stakeholders

Poster Presentations

Influenza at the human-animal interface

BOARD 20 | CHARACTERIZATION OF AVIAN INFLUENZA VIRUSES IN POULTRY: RESULTS FROM EGYPT EPIDEMIOLOGICAL SURVEILLANCE, 2016-2018

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Background and Aims:
Egypt has become enzootic for influenza A/H5N1 with high number of outbreaks among poultry. At the end of December 2016 H5N8 detected as the new strain. The Co-circulation of high and low pathogenic avian influenza viruses poses concern for potential reassortment in Egypt poultry. The transmission of influenza A/H5N1 to 13 humans in Egypt during the last three years was linked to the large number of epizootics occurred in poultry. Ring vaccination were done around positive foci by 9 Km radius. This study aims to describe the types of avian influenza viruses in Egypt in poultry, 2016-2018 using Egypt National epidemiological surveillance data

Methods:
Poultry suspected for avian influenza from various regions and poultry production backyard and farm were swabbed and tested for avian influenza (11113, 8648and 9094) samples 2016, 2017, 2018 respectively. Types (H5, H9 & H7) and subtypes were confirmed by RT-PCR in Egypt National Laboratories for quality control of poultry production (NLQP). Descriptive and bivariate data analysis was performed using SPSS

Results:
Overall, 28,855 samples were collected and tested, including 1218(4.2%) samples positive for low pathogenic avian influenza H9 and 500(1.7%) for A/H5.2016 was the highest in H9peaked in April while H5 was high in 2017 peaked in April and May. H5 was significantly higher among backyard poultry (OR=27.7,95%CI 21.3-36.1) than farm poultry, in Upper Egypt (OR=3.1,95%CI 2.6-3.7) lower Egypt areas and in duck species (OR=1.26, 95%CI 1.05-1.5)chicken, it peaked during winter season. While A/9 was significantly higher in farm poultry (OR=1.5,95% CI 1.1-1.9) than backyard and in chickens (OR=2.6, 95%CI 2.2-3.0) ducks

Conclusions:
Avian influenza continues to threaten human and animal health in Egypt. Poultry vaccination and health education campaigns should focus on backyard breeders raising duck species and in Upper Egypt region. Avian influenza surveillance is crucial for monitoring avian influenza viruses for developing appropriate prevention and control strategies

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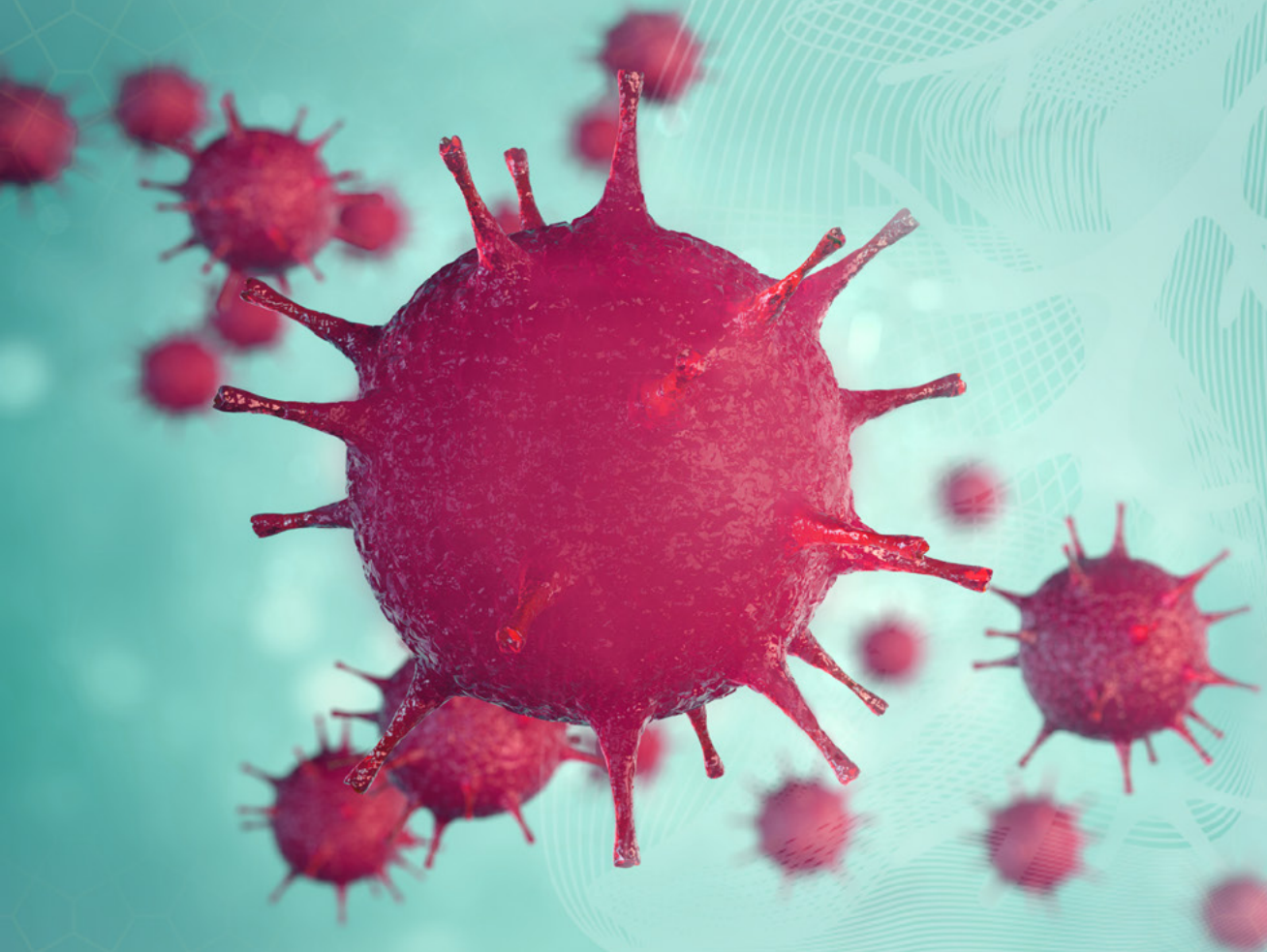

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