World Health Organization

Pathogen X

29-30 August 2022

11:00-18:00 Central European Time CET

DRAFT Agenda

R&DBlueprint

Powering research
to prevent epidemics

OBJECTIVES

The WHO R&D Blueprint is organizing a consultation to apply scientific lessons learned during the SARS-CoV-2 global pandemic and other recent outbreak to address the research needs for unknown agents capable of future pandemics – Pathogen X.

Main discussion points include the following, with reference to research and development leading to safe and effective vaccines and therapeutics:

Review of previous pandemics with an emphasis on COVID-19

- What relevant scientific information did we have before the pandemic?
- What scientific strategies were successful?
- What scientific strategies could be improved?
- What will the next pandemic look like?

What research will facilitate identification of the next pandemic?

- What needs to be done to prepare for possible pathogens, including unexpected or re-emerging pathogens (e.g., AMR)?
- What can be done in advance of the next pandemic?
- What are the scientific and research gaps? And how can they be met?
- How can scientific and research findings facilitate vaccine and therapeutic development?
- How can other approaches facilitate response to a future pandemic?

EXPECTED OUTCOMES

An outline list of scientific gaps and priority research questions to prepare for pathogens with epidemic and pandemic potential.

WHO Health Emergencies programme
Meeting on Pathogen X

Chairpersons: Linfa Wang (Duke NUS) and Helen Rees (Wits RHI South Africa)

Day 1: 29 August 2022

Time	Topic	Speakers
11:00 – 11:10	Welcome address	Dr Soumya Swaminathan (Chief Scientist, WHO) Dr Michael J Ryan (Executive Director Health Emergencies programme, WHO)
11:10 – 11:20	Objectives of the meeting	Chairpersons
Session 1. Looking backwards: A tale of outbreaks past (including COVID-19)		
11:20 – 11:30	Did we learn? What did we learn? (summarize briefly key learnings from Ebola, SARS, flu, COVID, monkeypox, etc)	Samba Sow (Center for Vaccine Development, Mali)
11:30 – 12:00	Every ocean is a drop in the universe <u>What are the actions moving forward and what did we do after previous epidemics?</u> Innovative scientific solutions? Research preparedness? Better health systems? Greater investments in bioscience sector? State level actions?	Panel discussion moderated by Gabriel M Leung (University of Hong Kong) Marian Nkansah (KNUST, Ghana) Frank Snowden (Yale University, US) Sanjoy Bhattacharya (Univ of Leeds, UK)
12:00 – 12:20	What relevant knowledge did we have before the COVID-19 pandemic? - Virology & Vaccines - Epidemiology & Control of other coronaviruses	Bart Haagmans (Erasmus, Netherlands) George Gao (China)
12:20 – 12:30	COVID-19: What turned out to be the most important research priorities? (Characteristics, transmission, complications epidemiology, etc)?	Soumya Swaminathan (WHO)
12:30 – 12:40	Diagnostic Approaches for COVID-19: lessons learned and the path forward (Viral tests [antigens and nucleic acid] and serology)	Amadou Sall (Inst Pasteur, Senegal)
12:40 – 12:50	How a global forum of scientists working on assays contributed to the control of COVID-19?	William Dowling (CEPI)
12:50 – 13:00	What did we learn about in vitro models for COVID-19 that made a difference?	Simon Funnell (UKHSA)
13:00 – 13:10	Animal Models – what are the major outcomes of X discussions among X scientists?	Cesar Muñoz-Fontela (Bernhard Nocht Int for Tropical Medicine, Germany)
13:10 – 13:20	Human challenge models – what is needed for them to make a greater contribution?	Myron M Levine (University of Maryland, US)
13:20 – 14:00	Lunch Break	

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Session 2. Looking forward: Can someone really predict the future?		
14:00 –14:10	Can we identify pathogens with future pandemic potential?	Barney Graham (US)
14:10 – 14:20	Ongoing efforts to identify pathogens that have the greatest pandemic potential?	Ana Maria Henao-Restrepo (WHO)
14:20 – 14:30	Human pathogenic RNA viruses establish noncompeting lineages by occupying independent niches	Nash Rochman (NIH, US)
14:30 – 14:40	Future pandemics might be caused by bacteria and not viruses	Loice Achieng (University of Nairobi)
14:40 – 14:50	Early identification of an outbreak of a novel infectious disease is critical to generating a timely response- but how we can do that?	Hub for Pandemic and Epidemic Intelligence **TBC**
14:50 –15:00	Early warning diagnostics for emerging infectious diseases	Saurabh Meta (Cornell University, US)
15:00 –15:10	Pathogen discovery and surveillance	Ian Lipkin (Columbia Univ, US)
15:10 – 15:20	Real-time metagenomic analysis (improvements in genome-sequencing techniques have they made open-ended searches for new pathogens possible?)	Christian Happi (Redeemer's University, Nigeria)
15:20 – 15:30	Evolutionary analysis of the dynamics of viral infectious disease – where are we? (to further develop analytic methods that combine genetic and epidemiological data to reconstruct epidemic history and to predict future trends)	Andrew Rambaut (University of Edinburgh)
15:30 – 15:40	A tool for predicting the future? Researchers design a user-friendly interface that helps nonexperts make forecasts using data collected over time	Devavrat Shah (MIT, US)
15:40 – 16:10	Predicting the future from the past (*The future cannot be predicted, but futures can be invented.* Dennis Gabor (Nobel Prize in Physics), 1963) o What are the challenges of predicting random events? o Predicting the risk using past data? o How to reduce the uncertainty of our predictions? o How can we detect pandemic threats earlier than we have done in the past?	Panel discussion moderated by Anurag Agrawal (Inst of Genomics and Integrative Biology, India) Amanda Rees (University of York, UK) **TBC** Alvar Agusti (University of Barcelona, Spain) Teodoro Alamo (Universidad de Sevilla, Spain) **TBC** Kanta Subbarao (University of Melbourne, Australia)
16:10 – 16:20	Coffee Break	

Time	Topic	Speakers
Session 3. Identifying overlaps in diagnostic development needs across different priority pathogens		
16:20 – 16:30	The importance of diagnostics in epidemics preparedness and response	Rosanna Peeling (LSHTM, UK)
16:30 – 16:40	Are crosscutting initiatives the way forward for diagnostics and assays? (What is possible now and what scientific developments are needed?)	Dan Bausch (FIND)
16:40 – 17:05	Early detection and monitoring to save lives	Laura Lechuga (Institute of Nanoscience and Nanotechnology of Catalonia, Spain) Keith Pardee (Univ Toronto, Canada) **TBC** Dacheng Wei (Fudan Univ, China) **TBC** Hao Yin (Wuhan Univ, China) Yi Sun (University of Denmark) **TBC**
17:05 – 17:35	Frugal innovations or newly developed products? o Diagnostics as a global good? o Crosscutting approaches? o A totally new approach?	Panel discussion moderated by Noel Tordo (Institut Pasteur, Guinea) Lorenz Meinel (University of Wurzburg, Germany) Oyewale Tomori (Redeemer's University, Nigeria) Madhukar Pai (McGill University, Canada) Kamini Walia (Indian Council of Medical Research, India) Michael K. Mansour (Harvard, US)
17:35 – 17:45	Key messages from Day 1	Chairpersons
17:45	ADJOURN	
18:00	Reception for In-persons guests at WHO HQ	

Chairpersons: Patricia Bozza (FIOCRUZ, Brazil) and Peter Figueroa (Univ of West Indies)

Day 2: 30 August 2022

Time	Topic	Speakers
Session 4. What are the critical research needs early in an outbreak to pave the way for timely development and evaluation of therapeutics?		
11:00 – 11:10	How to better anticipate the desired effect of treatments in a pandemic? (What research data are needed to decide on optimal use of antiviral therapeutics?)	Mark Denison (Vanderbilt, US)
11:10 – 11:20	Can repurposing drugs really help find outbreak treatments faster ? (if yes, how can we prepare better? Rapid evidence assessment of candidates?)	Steven Kern (Bill & Melinda Gates Foundation)
11:20 – 11:30	Accelerating understanding of the clinical course of the disease and opportunities for treatment	William Fischer II (University of North Carolina, US)
11:30 – 11:40	Antibody-based therapeutics: What criteria for efficacy, and how can they stay relevant if the virus evolves?	Rupert Beale (Crick Inst, UK)
11:40 – 11:50	The road to effective and accessible antibody therapies against filoviruses	Gary Kobinger (UTMB, US)
11:50 – 12:00	Convalescent Plasma: Therapeutic Clarity, Efficacy & Lessons Learned During the SARS-CoV-2-Pandemic.	Michael Joyner (Mayo Clinic, US)
12:00 – 12:10	The challenges (and potential solutions) to developing therapeutic monoclonal antibodies for outbreaks	Anne Ljungars (Technical University of Denmark)
12:10 – 12:40	Can innovation help? Post-Pandemic Drug Discovery and Development: Facing Present and Future Challenges Pandemic Preparedness: Acceleration Drug Discovery through Open Science AI-Powered Target Discovery *[TITLE]*	 Bruno O. Villoutreix (Inserm, France) Paul Willis (Medicines for Malaria Ventures) Alpha Lee (Cambridge Univ, UK) David McIlwain (Stanford, US) **TBC**
12:40 – 12:50	Strengthening the knowledge and evidence base for Anti-Microbial Resistance	Cesar Arias (Univ of Texas, US)
12:50 – 13:00	Strengthening the knowledge and evidence base for Anti-viral Resistance	Jun Wang (Rutgers University, US)
13:00 – 13:30	Lunch Break	
13:30 – 13:50	Can major regulatory principles be laid out in advance? - Only preclinical animal data? What are the policy issues and needs for additional data? - A new methodological framework for clinical evaluation of drugs?	Panel discussion moderated by Lindsey Baden (Harvard) John Farley (FDA, US) Hisashi Koike (Japan) **TBC** Mimi Darko (Ghana) **TBC** James McBlane (UK)

		Martin O'Kane (UK) Marco Cavaleri (EMA)
13:50 – 14:10	What have we learned about evaluating interventions during outbreaks? - Should we use a flexible approach in the context of moving targets? - Why are we still debating the role of randomised trials? - How can innovation accelerate the process?	Panel discussion moderated by Alexandra Calmy (Univ Geneva, Switzerland) Tripti Shrivastava (THSTI, India) Sabue Mulangu (National de Recherche Biomédicale, DRC) Ira Longini (University of Florida, US) IFPMA (Rep) **TBC**
Session 5. What are the critical research needs early in an outbreak to pave the way for timely development and evaluation of vaccines?		
14:10 – 14:20	How to better anticipate the desired effect of vaccines during outbreaks? (What research data are needed to decide on optimal use of vaccines, not only for COVID, beyond COVID?)	Alejandro Cravioto (Universidad Nacional Automona de Mexico)
14:20 – 14:30	What are the critical preclinical challenges and how could they be addressed for future candidates before the next pandemic?	Marco Cavaleri (EMA)
14:30 – 14:40	What are the vaccine development innovations being considered?	Rebecca Farkas (CEPI)
14:40 – 15:10	Can innovation help? How can development of new vaccine platforms be encouraged (e.g, mucosal vaccines, other technologies)?	Akiko Iwasaki (Yale University, US) Diego Orzaez (CSIC, Spain) Nikolai Petrovksy (Flinders University) Barry Buckland (University of Delaware, US) **TBC**
15:10 – 15:40	What defines an efficacious vaccine against an epidemic pathogen? Can we develop vaccines and against pathogen X? o What are critical aspects of a Pathogen X vaccine TPP? o What can be done to further speed up preclinical development? o How can development of new vaccine platforms be encouraged (e.g, mucosal vaccines, other technologies)?	Panel discussion moderated by Phil Krause Alan D T Barrett (UTMB, US) Stanley Plotkin (USA) Andrea Carfi (Moderna on behalf of IFPMA) Sai D. Prasad (Bharat Biotech International Ltd., India and DCVMN – Co Chair) Marta Tufet (GAVI)
15:40 – 15:50	Coffee Break	
Session 6. How should we prepare for the future?		
15:50 –16:00	The WHO Scientific Advisory Group on the Origins of Novel Pathogens (SAGO) An opportunity to better guide studies that specifically investigate high-threat pathogens	Marietjie Venter (University of Pretoria, South Africa)
16:00 –16:20	Understanding the risks associated with bacteria evolution using the example of Bordetella Pertussis and Yersinia Pestis	Andrew Preston (University of Bath, UK) Javier Pizarro-Cerdá (Institut, Pasteur, France)
16:20 –16:30	Lessons learned from the Infection Prevention Control Perspective	Benedetta Allegranzi /Alessadro Cassini (WHO)
16:30 –16:40	One Health, "Disease X" & the challenge of "Unknown" Unknowns	Pranab Chatterjee (Johns Hopkins University, US)

16:40 –16:50	ONE HEALTH – scientific lessons for pandemic prevention	William Karesh (EcoHealth Alliance, US)
16:50 –17:00	Navigating facilitated regulatory pathways during a disease X pandemic	Murray Lumpkin (BMGF)
17:00 – 17:10	What should a pathogen X antiviral TPP look like? – A clinician's perspective What antiviral screening can be done in advance?	**TBC**
17:10 – 17:20	Immunobridging: scientific findings to include importance of different arms of the immune system in protection	Galit Alter (Harvard, US)
17:20 – 17:30	Developing scientifically appropriate immunobridging criteria	Dean Smith (Health Canada)
17:30 – 17:40	Designing trials during outbreaks- what tools we have so far?	Thomas Fleming (University of Washington)
17:40 – 17:50	Innovation in vaccine manufacturing process – where are we?	Subhash Kapre (Inventprise, US)
17:50 – 18:20	Tips to prepare for the future? o What are the key scientific lessons learned? o How to accelerate additional innovations o What are the critical research and innovation actions?	Panel discussion moderated by Helen Rees (Wits RHI South Africa) Shibo Jiang (Fudan University, China) Idefayo Adetifa (Nigeria CDC) K Srinath Reddy (Public Health Foundation of India) Christian Drosten (Charite, Germany) William Karesh (EcoHealth Alliance, US) Speakers from innovations from vaccines and therapeutics and diagnostics
Session 7. Meeting Conclusions		
18:20 – 18:30	Main conclusions	Chairperson
18:30 – 18:35	Next steps	WHO
18:35	**END OF MEETING**	