







ABSTRACT BOOK SPECIAL TECHNICAL SESSION

BUILDING A RESILIENT BIOMEDICAL DISASTER RESPONSE: LEARNING FROM THE COVID-19 PANDEMIC



Session on 24th November, 2021

PANDEMIC: LESSONS LEARNED AND FUTURE CHALLENGES HEALTH EMERGENCY PREPAREDNESS GLOBAL PARTNERSHIPS ON BIOSECURITY

PREFACE

The fifth World Congress on Disaster Management (WCDM-2021) is being organised jointly by the Government of Delhi, Indian Institute of Technology (IIT) Delhi and Disaster Management Initiatives and Convergence Society (DMICS), Hyderabad. Major collaborators in the initiative include the National Disaster Management Authority (NDMA), National Institute of Disaster Management (NIDM), Defence Research & Development Organisation (DRDO) and the Indian Council of Medical Research (ICMR).

WCDM is bringing academicians, researchers, policy makers and practitioners from around the world on the aforementioned platform to discuss issues around disaster risk management. The mission of WCDM is to promote linkages between science, policy and practices to enhance understanding of risks, advance actions to reduce them and build resilience to mitigate the impact of disasters. Since the first WCDM held in Hyderabad in 2008, the Congress has evolved to be the largest global conference on disaster management outside the UN system.

This time ICMR has been invited by WCDM to be the knowledge partner for a Special Technical Session entitled 'Building a resilient biomedical disaster response: learning from the COVID-19 pandemic'. This session is slated on 24th November 2021 at 2 pm and will witness participation from a good mix of academics and diplomats, from within India and abroad. The speakers have shared their thoughts on various aspects of how to build a resilient biomedical disaster response framework under four broad sessions, each chaired by prominent personalities with a wide range of expertise.

This abstract book is a compilation of the abstracts received from various speakers participating in the session organized by ICMR at the WCDM and also includes their brief biography. We hope the document will serve as a good reference for understanding the Indian and global perspectives on detection, preparedness and response systems for biomedical disasters, and can be used as a compendium of thoughts and lessons we gathered from the COVID-19 pandemic.

Organising Committee, Special Technical Session ICMR, New Delhi







भारतीय आयुर्विज्ञान अनुसंधान परिषद स्वास्थ्य अनुसंधान विभाग स्वास्थ्य एवं परिवार कल्याण मंत्रालय भारत सरकार वी. रामलिंगस्वामी भवन, अंसारी नगर

स्वास्थ्य एवं परिवार कल्याण मंत्रालय एवं महानिदेशक, आई सी एम आर

Prof. (Dr.) Balram Bhargava, Padma Shri

MD, DM, FRCP (Glasg.), FRCP (Edin.), FACC, FAHA, FAMS, FNASc, FASc, FNA, DSc

Secretary to the Government of India

Department of Health Research Ministry of Health & Family Welfare & **Director-General, ICMR**

नई दिल्ली - 110 029

Indian Council of Medical Research

Department of Health Research Ministry of Health & Family Welfare Government of India V. Ramalingaswami Bhawan, Ansari Nagar New Delhi - 110 029

FOREWORD

The COVID-19 pandemic was a health and humanitarian emergency in India and other nations, where a serious whole of government approach was necessary to overcome the crisis. The pandemic mandated a calibrated, science-driven approach towards which the Indian Council of Medical Research (ICMR) played a significant role as an autonomous government agency. In the process ICMR has been identified as the nodal agency for research on management of biological disasters in India as mandated by the National Disaster Management Authority (NDMA).

COVID-19 vaccines have turned out to be one of the most promising tools in the global response to mitigate the impact of the pandemic. ICMR played a key role in this area as well; development of a fully indigenously vaccine witnessed involvement of in-country scientists and a fruitful public - private partnership. The recent prequalification from WHO for this indigenous vaccine COVAXIN has validated achievement of Indian science as per with that of other developed countries. The Government of India is now committed to establish a National Institute of One Health at Nagpur, jointly by ICMR and Indian Council of Agricultural Research (ICAR) to advance research in preventing future zoonoses. These portfolios exemplify ICMR's commitment to better India's Health and its growing demands for scientific advances. Our country is now well positioned to provide comprehensive solutions to national health emergencies under 'Self-reliant India Initiative' (Atmanirbhar Bharat).

Against this backdrop, I am delighted to share with you that ICMR is taking the lead as Knowledge Partner at the 5th World Congress on Disaster Management (WCDM) to put together a Special Technical Session themed "Building A Resilient Biomedical Disaster Response: Learning From The COVID-19 Pandemic" on 24th November, 2021. The wide range

of experts speaking at this event undoubtedly would bring home the message of importance of multi-lateral cooperation. I am hoping we will all have some opportunities to learn at this event.

Balran Bhargava)

Tele.: 26588204, 26589620, Fax (Off.) : 91-11-26588662, E-mail: secy-dg@icmr.gov.in



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Biography of Chairpersons

Dr Velu Nair Dr Samiran Panda Dr Rajeev Sadanandan

Prof. Sachin Chaturvedi



Lt Gen (Dr) Velu Nair





PVSM, AVSM, VSM**, (Retd) MD(Med), FRCP (London), FRCP (Glasgow), FACP (USA), FICP, FAMS, FIACM, FUICC (UK), FISHTM

Lt Gen (Dr) Velu Nair, is presently the Group Head- Medical Services & Chief Consultant – Haemato-Oncology & Bone Marrow Transplant of Apollo-Comprehensive Blood & Cancer Care

Gen Nair is an alumnus of Armed Forces Medical College. A Gold Medalist in MBBS and MD (Medicine) from Pune University. He went on to obtain Postdoctoral Fellowship in Hematology & Bone Marrow Transplantation from Christian Medical College, Vellore and completed two UICC fellowships from King's College & Hospital, London, and Stanford Medical Centre and Stanford University, USA. He is a Clinical Hematologist and Bone Marrow Transplant Physician who has pioneered the setting up of a network of seven centres in the Armed Forces which is the largest in the country. Avid Researcher who has conducted significant clinical trials on stem cells, hospital infections, thrombosis and hematological malignancies. He has over 250 publications, abstracts and chapters in international and national journals. He has also authored three textbooks in Medicine.

Presently, he is the Chair of Nuclear Accident Management Committee of Asia Pacific Blood and Marrow Transplantation Group; Chair, Scientific Advisory Committee, National Institute of Virology, Pune & National Institute of Immunohaematology, Mumbai. He is an Elected Council Member of National Academy of Medical Sciences.

Prior to his present appointment, Gen Nair had served over 39 years in the Indian Armed Forces holding several prestigious appointments such as, Presidents Honorary Surgeon; Director General of Medical Services, Army; Dean, Armed Forces Medical College, Pune; Army College of Medical Sciences, New Delhi and Professor & HOD,Department of Internal Medicine, Haematology and Bone Marrow Transplant at Armed Forces Medical College, Pune & Army Hospital (Research & Referral), New Delhi. He was the past President of the Indian Society of hematology

and transfusion medicine.

In his illustrious career in the Armed Forces, he has been conferred with four Presidential awards including the prestigious, Param Vishisht Seva Medal, AtiVishisht Seva Medal and Vishisht Seva Medal twice. A teacher of eminence with over 25 years of teaching experience, he received the Teacher award for Excellence in Medical Education from National Board of Examination. He has also received several other prestigious national awards including, Maj Gen Amir Chand Award & Oration, by National Academy of Medical Sciences; Rabindranath Tagore Oration by the Association Physicians of India; Manorama Sapre Oration & Award by Indian Society of hematology and transfusion medicine; JB Chatterjea Oration Award by Indian Society of hematology and transfusion medicine; Dr. LK Bhutani Oration Award by All India Institute of Medical Sciences, New Delhi, besides 14 other awards.



Dr Samiran Panda







Dr Samiran Panda, Head of the Epidemiology & Communicable Diseases Division of Indian Council of Medical Research (ICMR) is an astute clinician researcher of 30 years standing. He also serves as the Director of one of the premier Institutes of ICMR named the National AIDS Research Institute (ICMR-NARI) located in Pune. As head of the Division and Institute, Dr Panda leads a large team of investigators pursuing applied and basic research in the field of outbreak investigation, and synthesizing evidence to inform policy.

Engaging communities in developing public health intervention and training grass-root level workers as part of community empowerment has all along been his forte. Dr Panda has many scientific articles and book chapters in his credit. Reducing infectious disease related stigma, addressing vaccine hesitancy and breaking myths and misconceptions around diseases are some of the interest areas Dr Samiran Panda. Currently he is focusing on climate change and interface between communicable and non-communicable diseases.

Responses to two pandemics – the one caused by HIV and the current one due to the COVID-19 have witnessed active leadership of Dr Panda for their containments. Dr Panda, a recipient of ICMR Award in 1995, and Fogarty International Award was elected as a Fellow of the West Bengal Academy of Science & Technology (WAST) for the year 2020.



Dr Rajeev Sadanandan







Rajeev Sadanandan is the CEO of Health System Transformation Platform, a think tank on Health Policy and Systems. He has worked as health secretary of Kerala state, CEO of Rashtriy Swasthya Bima Yojana (RSBY), India's national social health insurance programme in addition to holding many other positions in state and central governments. Rajeev worked for a brief stint in UNAIDS and has been a member of technical committees set up by UNAIDS and WHO. He was a member of the external Editorial Committee of the WHO Report on Cancer and is currently one of the Commissioners on the Lancet Global Health Commission on Financing Primary Health Care.



Prof. Sachin Chaturvedi







Prof. Sachin Chaturvedi is currently Director General at the Research and Information System for Developing Countries (RIS), a New Delhi-based Think-Tank. He works on issues related to development economics, involving development finance, SDGs and South - South Cooperation, apart from trade, investment and innovation linkages with special focus on WTO. Currently he is Vice Chairman of Madhya Pradesh State Policy and Planning Commission andVice Chairman, Atal Bihari Vajpayee Institute of Good Governance and Policy Analysis; and Member, Board of Governors, Reserve Bank of India. He was Global Justice Fellow at the MacMillan Center for International Affairs at Yale University; Developing Country Fellow at the University of Amsterdam (1996); Visiting Fellow at the Institute (2007). He has served as a Visiting Professor at the Jawaharlal Nehru University (JNU) and has been closely associated with the UN Food and Agricultural Organization, World Bank, UN-ESCAP, UNESCO, OECD and many other agencies. He is on the Editorial Advisory Board of IDS Bulletin, Sussex, UK.

His book "The Logic of Sharing – Indian Approach to South-South Cooperation" has been acclaimed internationally as one of the best volumes on international development cooperation. Apart from this he has authored/edited 21 other books, apart from contributing several chapters in the edited volumes and publishing several research articles in prestigious journals.



SESSION 1:

Approaches to pathogen outbreaks

1. GAPP: A Vision for a Global Immune System

2. The Restless Tide : Emergence and Re-emergence of Infectious Diseases Caused by Environmental Pathogens

3. Biosurveillance past, present and future in relation to disease out

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GAPP: A Vision for a Global Immune System

Dr W. Ian Lipkin

Columbia University, Center for Infection and Immunity

Abstract

COVID-19 has exposed our vulnerability to pandemic risk and the urgency of addressing the challenges of climate change, food security, and the viral dissemination of misinformation. New molecular diagnostic platforms, investments in wildlife, domestic animal, and human microbial surveillance, and the advent of social media tools that mine the world wide web for clues to outbreaks of infectious disease are all proving invaluable in early recognition of threats to public health. However, inequities in the distribution of resources required for diagnostics and discovery, and lack of trust and transparency remain threats to biosecurity. To address these challenges, we are establishing a global public health consortium comprising of ministries of health and academic institutions. This collaborative global program will focus on creating an infectious disease epidemiology network and has three main objectives: (1) develop a model realizing and extending the goals of the International Health Regulations established by the WHO in 2005 by providing inexpensive, rapid tools for diagnosis discovery, and surveillance of infectious diseases, (2) identify and prioritize infectious agents based on pandemic risk, and (3) share data and build the infrastructure needed to produce, validate and implement drugs and vaccines to reduce morbidity and mortality.



Biography



W. Ian Lipkin is the Director of the Center for Solutions for ME/CFS, the John Snow Professor of Epidemiology at the Columbia University Vagelos College of Physicians and Surgeons, and the Director for theCenter of Infection and Immunity with the Mailman School of Public Health at Columbia University.

He is internationally recognized for his contributions to global public health by being at the forefront of outbreak response and through the innovative methods he developed for infectious diseases diagnosis, surveillance, and discovery. These advances have been critical in replacing culture-dependent methods of global health management by creating new criteria for disease causation and de-linking spurious associations between putative agents and diseases. Such examples include refuting the MMR vaccine having a role in autism and XMRV in ME/CFS.

Some of his most prestigious honors include Pew Scholar (Biomedical Sciences), Walter Reed Distinguished Lecturer, the Drexel Prize in Translational Medicine, the Mendel Medal (Villanova University), the International Science and Technology Cooperation Award of the Peoples Republic of China, and recipient of an award of appreciation given by the Chinese government in the 70th anniversary of the People's Republic of China for his service to the country during the SARS epidemic along with the subsequent scientific support he has given since.

Lipkin consulted on testing and site safety protocols for the 2020 Democratic National Convention and the 2021 Academy Awards. He promotes public health awareness via print and broadcast media and served as scientific advisor to the 2011 Soderbergh film "Contagion".

E mail:wil2001@columbia.eduLinkedin id:https://www.linkedin.com/in/ian-lipkin-b6574b162Contact address:722 West 168th Street, New York, NY 10032, USA



The Restless Tide : Emergence and Re-emergence of Infectious Diseases Caused by Environmental Pathogens

Dr Amit Ghosh

IMCR-National Institute of Cholera & Enteric Diseases, Kolkata - 700010

Emergence and re-emergence of infectious diseases remain one of the greatest public health hazards even today. Many of these diseases are caused by pathogens which have the ability to survive and proliferate in the environment. Many such pathogens, collectively called 'environment pathogens', often exist in the environment in a non-pathogenic state. However, under 'appropriate' conditions they can become infective and can cause disease in humans after gaining entry into the human body. While many such environmental pathogens known to humanity are responsible for the re-emergence of known diseases in new locales or after long gaps, there also exists in the environment other 'unrecognised' pathogens whose presence become known only after the emergence of a new disease. For the known pathogens, it is possible (not always though) to anticipate an outbreak and adopt measures to control/combat it based on the past experience. Thus, for example, strategies to combat outbreaks/spread of cholera, which has been considered to be a re-emerging disease because of its re-appearance in many parts of the world after long gaps or its emergence in places which had no previous history of the disease, can be devised by ensuring supply of safe drinking water, improved sanitary measures or by simple application of the ORT. In contrast, a newly emerging disease caused by a yet unknown pathogen poses far more formidable challenges as the recent Covid-19 pandemic has shown.

Virbio Cholerae the causative agent of the disease cholera, which has been responsible for many devastating pandemics in human history, provides a good example of how an environmental pathogen, primarily a resident of the estuarine and brackish water, can cause pandemics when the conditions become 'right' for it. In its natural habitat Vibrio Cholerae can remain culturally for years in association with other aquatic organisms, switching from planktonic form to become a part of a biofilm or it can survive by switching to what is known as viable but non-culturable (VBNC) form. Although what ecological and environmental factors, that could be responsible for triggering an outbreak are not clearly known or fully understood, the roles of human induced behaviour that could aid in causing an outbreak are understood much more clearly

- lack of supply of safe drinking water, inadequate or unsatisfactory sanitary conditions, disruption in healthcare systems and/or administrative machinery, due to disasters, natural or man made, all aid in their emergence and spread of the disease. For example, the rapid spread of cholera epidemic in Yemen in the recent years was caused by the unavailability of safe water and destruction of sewerage and sanitation systems there because of the raging civil warin the country. The cholera story in short, reveals dramatically how an environmental pathogen has the capacity to cause devastating epidemics if the conditions are "right" for it to do so.





Dr. Amit Ghosh, J.C. Bose Chair Professor of NASI and a former Director of CSIR-Institute of Miciobial Technology, Chandigarh, did his PhD in Physics from the University of Calcutta and later switched to Molecular Biology. Dr. Ghosh's primary research interest had initially been on virus-

es and bacteria. Later on he shifted to research on enteric pathogens and vaccine development. To date he has published 108 papers. He has in collaboration with IICB and ICMR-NICED developed an oral recombinant vaccine for cholera using a novel strategy which in a randomized placebo controlled trial elicited \geq 4 fold increase in 66% of the volunteers after a single dose. In contrast Shancol achieves only 53% seroconvertion after two doses. This vaccine the first of its kind to be developed anywhere in the world outside USA is patented in the USA and PCT countries. After his PhD, Dr. Ghosh spent several years in the University of Wisconsin, Madison, USA as a Post-Docrotal Fellow. Subsequent to his return to India, he joined CSIR-Indian Institute of Chemical Biology, Kolkata as a scientiest and then later move to CSIR-Institute of Microbial Technology, Chandigarh. In between he had spent two years at the National Institute of Health, USA, as a visiting scientist. Dr. Ghosh is a fellow of all three National Academies in India and also the Biotechnology Research Society of India. He is a member of Sigma-Xi, the scientific research society of America. He is receipient of many awards which include Ranbaxy award, Lifetime Acheivement Award of the Microbiological Soceity of India, Lifetime Acheivement Award of the Biotechnolgy Research Soceity of India, BK Bachawat Memorial Lecture Medal of NASI etc. Currently he is the Vice-Preseident of the Indian National Science Academy of India, New Delhi. Prof. Amit Ghosh

has expertise in enteric pathogens and vaccine development, Vibrio Cholerae in particular.

E mail:amitghosh24@yahoo.comLinkedin id:linkedin.com/in/amit-ghosh-50074224Contact address:ICMR-National Institute of Cholera and Enteric DiseasesP-33, C.I.T. Road, Scheme XM, Beleghata, Kolkata 700 010



Biosurveillance past, present and future in relation to disease outbreaks

Dr DT Selvam

Abstract

Dr. D.T. Selvam, Scientist, Defense Research & Development Establishment (DRDE), DRDO, Gwalior 474 002, Madhya Pradesh.

In the current scenario that is related to emergence of number disease outbreaks, Biosurveillance or gathering and interpretation of information related to prevalence of diseases of human and animal health gains high level of importance. The biosurveillance in the period of rapid globalization plays vital role in biosecurity and biosafety. Several components of biosurveillance that include detecting new cases, evaluating the impact of cases on health system, modeling the future spread, evaluation of available control measures, stragetic prevention planning and contribution to the effective disease management. Biosurveillance is defined as process that monitors the occurance of bacteria, viruses and other disease causing agents among the human, animal and plants. The biosurveillance is a concept that is multidimentional, multi discilipinary, multi organizational and highly data incentive. The whole concept of biosurveillance is highly complex and time and knowledge intensive. The resources that are invested by a country in a robust biosurveillance program for biological agents will decide on the effective management of any disease outbreaks as a efficient biosurveillance will help in rapid identification and containment. Bioterrorism/Biowarfare is emerging as the most important global threat of the new millennium. There is a need for on-site automatic sensing system for the detection and identification of airborne biological agents to mitigate any biological attack. Detection remains the mainstay for identification of biologicals and availability of automated detection systems will contribute immensely for effective biosurveillance programs.







Dr. D.T. Selvam is currently serving as Senior Scienctist, at Defence Research & Development Establishment, Gwalior. He has completed his M.Sc and Ph.D in Microbiology. He has joined DRDO in 1998 as Scientist and specializes in the field of Detection, Protection and Decontamination of bacterial Biological Warfare agents. His research interests include, Development of detection systems for bacterial biological warfare agents, MALDI Based bacterial identification, Development of decontamination formulations and its evaluation, and evaluation of drug targets for antimicrobial and anti-malarial properties Dr. D.T. Selvam represents India on behalf of DRDO, Ministry of Defence in the United Nations as Expert in the Biological Weapons Convention (BWC) and he is also expert member and represents India in the Australian Group (AG) on export control. He has served as member of different task forces and expert groups in Department of Biotechnology (DBT), Department of Science & Technology (DST), ICMR, and National Disaster Management Authority (NDMA). He has been a senior faculty DRDO in most of the senior level NBC courses for army, navy, airforce and other paramilitary services.

He has been awarded with several awards and honors and has several research papers in international and national journals in addition to national and international patents to his credit.

Presently he is heading the Biodetector development program of DRDO as Project Director at DRDE, DRDO, Gwalior.

E mail: dtselvam@drde.drdo.in



SESSION 2:

Pandemics: Lessons learned and future challenges

1. People Centered Response in Preparedness for Biomedical Disaster

2. One Health and reduction of public health risks from poultry

3. COVID-19 and Indian perspective

4. What does it take to make a multisectorial partnership work for disaster preparedness?

5. Pandemics: Lessons learned and future challenges



People Centered Response in Preparedness for Biomedical Disaster

Dr Swarup Sarkar

Abhijit Chowdhury1, Sarah Nabia2, Rajeev Sadanandan3, Sayantan Banerjee4, Samiran Panda5, Swarup Sarkar6

1 Clinical Director, Liver Foundation, & Mentor, COVID Care Network .Kolkata

2 Student, Bloomberg School of Public Health, Johns Hopkins University

3 Former Additional Chief Secretary, Government of Kerala CEO, Health Systems HSTP

4 Senior Consultant, Infectious Diseases, Infectious Diseases & BG Hospital, Kolkata

5 Head, Epidemiology & communicable Disease &Director, National AIDS Research Institute ICMR

6 Former Director, Communicable Diseases, WHO-SEARO

Abstract

One of the challenges of ending old communicable diseases by 2030 as endorsed by the Sustainable Development Goal (SDG) summit is the inability to involve affected community in program design, implementation and monitoring. As a result, eliminable diseases like AIDS, TB, Malariaetc. are unlikely to meet SDG goals in time. COVID-19 has underscored the need for active involvement of the community acutely in preparation of a pandemic response. Solutions that were neither realistic nor people-centered such as home quarantine albeit appeared successful in short term, witnessed a

protracted course of infection spreading in the community.

The lessons and experiences in COVID-19 control involving community based organizations (CBOs) of affected people have had positive impact, including early detection of COVID-19 cases, quick transfer to CBO-run quarantine facilities and hospitals, and prompt mitigation of incidents of COVID-19 associated stigma and discrimination. Community engagement in certain parts of India also helped

in reducing COVID-19 vaccine hesitancy. As seen in the HIV experience, pandemic response is meaningful if not transformative when solutions are people centered, evidence-driven, transparent in information sharing and decentralized in decisionmaking based on local data. Central to successful HIV response was the creation of an enabling environment where affected and infected people were not isolated and discriminated against and CBOs played key roles both in responding to the immediate needs of the community and advocating for and achieving longer term solutions. Such community-based movements even paved the path for newer regulations and laws; cases in consideration being control of spread of infection in healthcare settings, endorsement of harm reduction interventions and legalized rights to service for marginalized people. In NIPAH response in Kerala, people received transparent information to risk and solutions, thousands of people could be contact traced and isolated voluntarily without discrimination and food provided at home. On the other hand, Ebola response in some settings of Africa experienced extreme distrust on health care professionals when communities were not prepared and was seen only as beneficiaries of services.

In conclusion, despite millions of infections and deaths in recent times, we are not prepared for another epidemic response. Unless communities are in charge of the response at local level, solutions are identified in consultation with the communities and information is evidence based and delivered in a transparent fashion, a resilient public health response will remain as a distant dream. This is not easy and requires a long-termapproach and policy level commitment.





Dr Swarup Sarkar has expertise in epidemiology, global health and local governance. He is known for his work in the field of Infectious Diseases and HIV/AIDS in particular. He retired as the Director of Communicable diseases at the World Health Organization, South East Asia regional Office (WHO SEARO) in November 2018. Dr Sarkar has been awarded for his contribution in Public Health by WHO in 2018. Prior to his role in WHO, he served as the Head of South Asia and Regional Advisor of the Asia Pacific region of the UNAIDS and Director of Asia Pacific Country Programs of The Global Fund. Dr Sarkar is an alumnus of the AIDS International Research and Training Program from the UCLA Fielding School of Public Health, University of California, Los Angeles (UCLA).

E mail: swarup.sarkar@gu.se Contact address: School of Public Health and Community Medicine, University of Gothenburg, Sweden



One Health and reduction of public health risks from poultry

Prof Fiona Tomley

The Royal Veterinary College, University of London, UK *Representing (1) GCRF One Health Poultry Hub https://www.onehealthpoultry.org/ and (2) Community Engagement for AMR Cluster https://ce4amr.leeds.ac.uk/

Former:

Chair of Experimental Parasitology, Royal Veterinary College, London and Director of the GCRF One Health Poultry Hub.



COVID-19 has shown the critical importance of research into zoonotic disease emergence, public health risks and the safety of animal source food systems. Chicken meat and eggs are major contributors to food security, providing bioavailable nutrients that are especially critical for women, children and the under-nourished. Global consumption increases year-on-year, with growth significantly outpacing that of other livestock. Since ~ 2000 the fastest expansion of poultry farming is in South Asia, including India which ranks fifth globally for chicken meat production (after USA, Brazil, EU and China) and third globally for eggs (after China and USA).

This increasing demand for animal source foods must be met in a safe and sustainable way. Much growth in poultry has been achieved by structured commercialization, integration and concentration of broiler and layer farms. In addition to environmentalconcerns (changed land use, pollution, emissions), rapid intensification comes with increased zoonotic risks to public health that include bacterial food poisoning, diseases with pandemic potential including avian influenza, and antimicrobial resistance (AMR).

The GCRF One Health Poultry Hub is an interdisciplinary network with several partners in India. We use interdisciplinary and intersectoral One Health approaches to 1) determine how poultry intensification increases zoonotic risk, 2) identify structures, processes and human



behaviors that are most risky, 3) test interventions that target systemic, high-risk nodes of chicken production and distribution networks. We combine molecular tracking of viruses, microbial populations and AMR genes with ethnographic and economic analyses to understand how microbes amplify, mix and mutate as they transmit through chicken production systems, and to identify so-cio-economic and cultural factors linked to high epidemiological risk.

Research activities generate robust evidence to guide decisions of policymakers and regulators, but long-lasting impacts require active participation, engagement and consent of intersectoral stake-holder communities. A key need is to identify practical and equitable approaches to implementing health/nutrition security that incorporate ethical principles and justice across human, animal and environmental health. In support of this aim, we are developing a One Health Roadmap that focuses on the future of poultry, people and planet, and working across networks to place community engagement methods at the forefront of AMR research.





Chair of Experimental Parasitology, Royal Veterinary College, London and Director of the GCRF One Health Poultry Hub.

Fiona trained in Microbiology (BSc) and Virology (PhD) at the University of Manchester and conducted postdoctoral research in avian virology (influenza, infectious bronchitis and fowlpox viruses). Since then she has worked extensively on parasitic diseases and gut health of chickens.

For the past decade Fiona has championed the One Health approach – a perspective that recognises intrinsic connections and dependencies between the health of people, animals, plants and the environment. Since 2019 she has been Director of the GCRF One Health Poultry Hub, an impact-driven programme of interdisciplinary research and stakeholder interactions that seeks to understand, detect and reduce the transmission of zoonotic diseases and antimicrobial resistance from chickens to humans.

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Email:	ftomley@rvc.ac.uk
Mob/WhatsApp:	+44 (0)7795166338
Twitter:	@FionaTomley
Web:	www.onehealthpoultry.or

COVID-19 and Indian perspective

Dr Saumitra Das

Ph.D. FNA, FASC FNASC DIRECTOR National Institute of Biomedical Genomics Kalyani 741251, India

Former :

Sir J.C. Bose National Fellow & Professor (on deputation) Department of Microbiology & Cell Biology Indian Institute of Science, Bangalore

Abstract

Earlier, to understand the spread of virus in India, a Pan-India 1000 SARS-CoV-2 RNA genome sequencing project was initiated. Sequence analysis indicated that multiple lineages of SARS-CoV-2 circulating in India in 2020, probably introduced by travel from Europe, USA and East Asia. A2a (20A/B/C) was found to be predominant, along with few parental haplotypes 19A/B. Specific mutations characteristic of the A2a clade were detected in most of the sequences, which included the P314L in RNA dependent RNA polymerase and D614G in the Spike glycoprotein. Moving forward, Indian SARS-CoV-2 Genomics Consortium (INSACOG) of 10 National laboratories was jointly established by DBT, MoHF&W, ICMR and CSIR in January 2021. The initial focus of India was on restricting spread of global variants of concern – Alpha (B.1.1.7), Beta (B.1.351) and Gamma(P.1), which had high transmission and varying degree of immune escape. The entry of these variants was carefully tracked. INSACOG investigations of outbreaks in Maharashtra led to identification of a novel variant characterized by mutations L452R, E484Q and P681R. This was referred to as double or triple mutant until it received a lineage B.1.617 (Delta). Detailed phylogenetic analysis aided to understand the gradual emergence of mutants at different regions of the country and its possible impact on the disease management. In response to managing the pandemic INSACOG further expanded the consortium to a network of 38 laboratories to upgrade India's sequencing capacity and developed Integrated Health information Platform to facilitate quick reporting for Public health measures. Additionally, there is scope to undertake studies related to functional assays of the mutations of concern through site-directed mutagenesis, reverse genetics and Virus Like Particle constructs. Further, basic research in these areas will contribute to better understanding of the Biology and Pathogenesis of the virus and develop new vaccine platforms in the likelihood of emergence of new variants.



Biography





Dr. Das was briefly trained in the area of Plant Physiology and Biochemistry at the Bose Institute as a Junior Research Fellow in the Botany department. Then obtained his Ph.D. degree from University of Calcutta in 1992, working at the Indian Institute of Chemical Biology. He has studied host pathogen interaction in Leishmania donovani, which causes the dreaded tropical disease Kala-azar. As a postdoctoral fellow, he worked on host-virus interactions at the University of California, Los Angeles (UCLA). Later, he has served the same department as an Assistant Research Virologist (1994-1998). During this period, he discovered a small RNA molecule (I-RNA) from Saccharomyces cerevisiae and showed its selective antiviral activity against polio and hepatitis C virus (HCV). His discovery led to foundation of a company (Virasim) at UCLA for commercialization of antiviral agents.

Dr. Das joined IISc in October 1998. His group has been studying the molecular basis of translational control of viral and cellular mRNAs. Much of his work has focused on internal initiation of translation of Hepatitis C virus and Coxsackievirus B3 RNA and lately extended to cellular RNA using p53 as model system. He has pioneered the Molecular Virology research and initiated a Molecular Virology group in the country.

Dr. Das has been coordinating the 'Centre of Excellence for Research on Hepatitis C virus', an interdisciplinary centre (now in phase II) of the Department of Biotechnology, Government of India, involving 8 other laboratories across our country. He has successfully demonstrated his ability to transform fundamental research to translational product. Several antivirals and a VLP based HCV-vaccine candidate is in the pipeline for commercialization. His innovative and translational research is reflected in as many as 10 patent applications. Many of them are approved and up for preclinical trials.

He has been awarded National Bioscience Award for Career Development-2005 from Department of Biotechnology, NASI-Raliance Platinum Jubilee Award for Innovation in Application Oriented Research in Biological Sciences 2010, Ranbaxy Research Award in the field of Medical Sciences 2012 and Sir J.C. Bose National Fellowship from Department of Science and Technology 2014. His research work is well acclaimed internationally. He is elected member of the American Society of Virology and American Society of Microbiology and fellow of all three National Academy of Sciences in India. Since September 2018 he is heading the National Institute of Biomedical Genomic, Kalyani as Director.

Email : sdas@nibmg.ac.in



What does it take to make a multisectorial partnership work for disaster preparedness?

Prof (Dr) Rajib Dasgupta

Former:

Chairperson, Centre of Social Medicine & Community Health, Jawaharlal Nehru University, New Delhi

Abstract

Disasters have assumed a new significance on account of diverse threats and events that include pandemics, natural disasters and acute climate related events. At the same time, COVID-19 with its unique features has led to the recognition and emergence of the notion of 'slow disasters': an atypical type of damage, more gradual, prolonged and silent than the traditional image of a disaster. These have led to a renewed emphasis on not just disaster preparedness and response but multisectoral engagements and partnerships too.

While multisectoral partnerships are a recent rage, it is a tough mandate to "promote multi-sectoral, transdisciplinary collaboration and cooperation". This talk shall focus on what is takes to make multisectoral partnerships work. Critical to initiating such an engagement is articulation or framing of the problem and the extent to which this resonates with high-level political agendas. Multisectoral engagements need to deal with both technical domains and governance domains. It is also imperative that diverse sectors collaborate to produce joint or 'co-benefits' and maximize outcomes. Such engagements thus need to begin with a strategic plan that entails inclusion of a range of professionals.

The success of multisectoral groups is shaped by a range of factors: Individual, organizational

and network. Finally, leadership models are critical to the success of any multisectoral engagement, including in disaster situations.



Biography





Dr. Rajib Dasgupta, MBBS, MPH, PhD served a decade (1993-2003) with the Epidemiology Division of the Municipal Corporation of Delhi and joined JNU in 2003 where he is currently Professor and Chairperson at the Center of Social Medicine & Community Health. He was Fulbright Senior Research Fellow and Visiting Associate Professor at Johns Hopkins Bloomberg School of Public Health during 2010-11 and Visiting Professor at the University of Technology Sydney (2016). He is closely engaged with the Indian Council of Medical Research (ICMR), the National Certification Committee for Polio Eradication (NCCPE) and the National Health Mission as well as several other key national health programs and evaluations. Widely published in national and international journals, he was Managing Editor of the Indian Journal of Community Medicine during 2012 to 2014 and currently the Managing Editor of the Indian Journal of Public Health. He is a regular commentator on public health matters in national and international electronic and print media.

Email: dasgupta.jnu@gmail.com rdasgupta@mail.jnu.ac.in

Contact address: Centre of Social Medicine & Community Health, Jawaharlal Nehru University, New Delhi, INDIA



Pandemics: Lessons learned and future challenges

Prof (Dr) Peter Singer

Former: Special Advisor to the Director General at World Health Organization

Abstract

The pandemic is the worst global health crisis in a century and it has painfully reminded us that health is the foundation of our societies, economies and national security. More than 250 million cases and 5 million deaths have been reported to WHO. Although 7 billion vaccines have been distributed, we face an outrageous vaccine injustice: in Africa, less than 10% are fully vaccinated, compared with 60-70% in high income countries. In this talk I will address current and key issues in pandemic preparedness and response including vaccine equity and justice; principles for assessing pandemic preparedness and response initiatives; and ways to accelerate and equitable and resilient recovery to the Sustainable Development Goals. Most fundamentally, I will argue that leadership is the ultimate 'vaccine' against the pandemic and the other global challenges we face.



Biography





Dr Peter Singer is Special Advisor to the Director General, Dr Tedros Adhanom Ghebreyesus, and Assistant Director General of the World Health Organization. He supports the Director General to transform WHO into an Organization sharply focused on impact at the country level. Dr Singer co-chaired the transition team; was the architect of WHO's strategy and its "triple billion" target; and supports strategy implementation of WHO's programme budget, results framework, delivery stock-takes, investment case, innovation framework, innovative finance initiatives, brand strategy, and multilateral partnerships through the SDG3 Global Action Plan. During the pandemic, he has been a passionate advocate for vaccine justice.

Before joining WHO, Dr. Peter Singer co-founded two innovative, results driven, social impact organizations. From 2008-2018 Singer was Chief Executive Officer of Grand Challenges Canada. He is also Adjunct Professor of Medicine at University of Toronto.

In 2007, Dr. Singer received the Michael Smith Prize as Canada's Health Researcher of the Year in Population Health and Health Services. In 2011, Singer was appointed Officer of the Order of Canada for his contributions to health research and bioethics, and for his dedication to improving the health of people in developing countries. He is a Fellow of the Royal Society of Canada, the Canadian Academy of Health Sciences (where he was Foreign Secretary), U.S. National Academy of Medicine, and The Academy of Sciences for the Developing World (TWAS).As a researcher, Dr. Singer published over 300 articles, received over \$50 million in research grants, and mentored hundreds of students. He studied internal medicine at University of Toronto, medical ethics at University of Chicago, public health at Yale University, and management at Harvard Business School. He served his community as Board Chair of Branksome Hall, an internationally minded school for girls

E mail: singerp@who.int Contact address: Geneva Metropolitan Area, Switzerland



SESSION 3:

Health Emergency Preparedness

1. Decreased zoonotic disease, increased food safety: the multiple benefits of a One Health approach to Public Health Emergency Preparedness

2. Zoonoses, Disasters and One Health

3. Many Hosts of SARS-CoV-2 and the case for One Health Biosurveillance

4. Humanitarian standards for disaster preparedness and resilience

5.PrioritiesfordomesticmeasuresandInternationalcooperationinhandling the biothreats triggered health emergencies



Decreased zoonotic disease, increased food safety: the multiple benefits of a One Health approach to Public Health Emergency Preparedness

Prof Robyn Alders

Former:

Development Policy Centre and Institute for Climate, Energy and Disaster Solutions, Australian National University, Canberra, Australia Global Health Programme, Chatham House, London, UK

Abstract

The 21st century has witnessed an increased frequency of public health emergencies, including climate change-induced extreme weather events, infectious disease pandemics, the rise of the non-communicable disease pandemic and increased chemical pollution. Trying to respond to each of these issues one by one is no longer an effective option. Rather, an 'all hazards' approach that reduces the likelihood of their occurrence and increases effectiveness of their control is the way forward. We must explore the factors driving these negative trajectories and seek solutions that simultaneously address multiple threats.

In relation to zoonotic disease, cooperation among interdisciplinary and multisectoral teams is needed to safeguard livestock production and public health from boundary-crossing diseases and to ensure that people have access to safe, nutritious and healthy food. By increasing sustainable, welfare-oriented livestock management practices in association with improving the overall health and wellbeing of humans, animals and the environment, the One Health approach can be transformative. As animal-source food plays a crucial role in nourishing people efficiently, especially women and children, animal health and allied health professionals must engage in actions contributing to the transformation of food systems while simultaneously reducing the negative impact of livestock production on Earth systems. Low carbon, sustainable livestock production systems that simultaneously facilitate nutrient cycling andreduce risk of the emergence and spread of infectious disease will be key elements of future livestock circular bioeconomies.

Effective interdisciplinary and intersect oral communication will remain central to achieving effective and efficient One Health emergency preparedness. Designing and resourcing organizational infrastructure that facilitates the timely and respectful exchange and analysis of information is key. While One Health covers human, animal and environmental health, it is vital to remember that it is human activity that is exacerbating most threats and it is humans who must work together to reverse this trend. And do so with urgency.

Biography



Robyn Alders AO is an Honorary Professor with the Development Policy Centre and the Institute for Climate, Energy and Disaster Solutions within the Australian National University, a Senior Consulting Fellow with the Chatham House Centre for Universal Health, and an Adjunct Professor in the Veterinary Department of Infectious Disease and Global Health, Tufts University. Her applied research focuses on infectious disease prevention and control in animals in support of food and nutrition security through a One Health lens.

E mail: robyn.alders@anu.edu.au Linkedin id: https://www.linkedin.com/in/robyn-alders-32b0b616/ Contact address: Development Policy Centre Crawford School of Public Policy ANU College of Asia and the Pacific J.G. Crawford Building (Bldg #132) Lennox Crossing The Australian National University Canberra, ACT 2601 Australia



Zoonoses, Disasters and One Health

Dr Rajesh Bhatia

Former:

Director National Institute of Biologicals, MoHFW, Govt of India, NOIDA Director, Communicable Diseases, WHO Region for South-East Asia, New Delhi Consultant / advisor with WHO, FAO, UNEP and EcoHealth Alliance, NY, USA.

Abstract

Zoonoses (diseases originating from animals) are endemic, epidemic-prone and every few years strike as public health emergencies of international concern. Few zoonoses are known but many remain unknown and unpredictable. Zoonoses cause huge morbidity, mortality, economic loss and social chaos leading to a setback to ongoing efforts towards human development. Of 1415 pathogens causing infections in humans, 61% have arisen from animals. Around 1 billion cases of zoonotic diseases with 1 million deaths are estimated every year. WHO estimates that each year worldwide, unsafe food causes 600 million cases of food borne diseases and 4,20,000 deaths.

Almost all pandemics of the current millennium have originated from wildlife. These numbers are not constant. Wildlife is home to more than 850,000 viruses of which ~20,000 are corona viruses. The ongoing COVID-19 pandemic is due to just one corona virus. COVID-19 is neither the first nor the last pandemic. Next pandemic is imminent and will soon arise from animals.

Management of zoo noses requires One Health approach. One Health does not imply creating a new or a vertical program. It calls for enhancing capacity of each of existing sectors to fight infectious diseases and more importantly breaking silos to ensure a collective fight to understand, predict, prevent, detect and respond to infectious diseases through collaboration, communication, cooperation, coordination and commitment between various sectors for efficient use of resources and collective expertise. India is already on its way to conceptualize and implement One Health approach under the leadership of the Indian Council of Medical Research.

Biography





Dr Rajesh Bhatia is a medical doctor with experience exceeding 40 years in communicable diseases. He has worked for 15 years at the National Centre for Disease Control and two years at Central Research Institute Kasauli. He was Director of National Institute of Biologicals during 2000. Subsequently he joined WHO from where he retired in 2015 as Director of Communicable Diseases. Dr Bhatia is author of 18 books, 150 scientific papers and various chapters and editorials. He has been awarded Gold medals by three different organizations for his contribution to communicable diseases.

E mail: drrajesh.bhatia1953@gmail.com Contact address: Dehradun, Uttarakhand, India



Many Hosts of SARS-CoV-2 and the case for One Health Biosurveillance

Dr Vivek Kapur

Vivek Kapur, BVSc, PhD. The Pennsylvania State University, USA. vkapur@psu.edu

Abstract

During this presentation, I will share our recent results suggest that SARS-CoV-2 may have spilled over from human hosts to free-living White-Tailed deer in North America. I will also shareevidence that deer are transmitting the virus amongst themselves at astonishing levels. These findings suggest that deer are potential reservoir hosts for SARS-CoV-2, where the virus may evolve, spillover to other free-living susceptible animals including through spillback to humans. Taken together, these findings have important implications for the long-term trajectory of the current pandemic and highlight an urgent need for a fundamentally different "One Health" approach to infectious disease surveillance to better predict, prevent, or control the current and future pandemics.





Vivek Kapur is Professor of Microbiology and Infectious Diseases in the Department of Animal Science and Huck Distinguished Chair in Global Health. He is also Associate Director for strategic initiatives at the Huck Institutes of the Life Sciences at Penn State. He is alsoappointed as Professor of Infectious Diseases and Global Health at the Nelson Mandela African Institute of Science and Technology in Tanzania and serves as an advisor to the Bill and Melinda Gates Foundation. As an early adopter in the field of microbial genomics, Prof. Kapur' team has led the complete genome sequencing of some of the most important pathogens that cause diseases in animals and humans andconducted related investigations in infectious diseases and genomics. These studies have led to key insights on the evolution, physiology, and mechanisms of pathogenesis of these ed related inconduct organisms, as well as the identification of numerous targets for diagnostic test development andvaccines. Dr. Kapur has been the recipient of over \$170m in competitive research funding as PI or co-PI, and his current research is supported by competitive awards from the USDA, NIH, DoD, and the Bill and Melinda Gates Foundation, on topics ranging from basic molecular mechanisms of pathogenesis to helping build global biosurveillance and biosecurity capabilities and has helped with the development and launch of Penn State's new Applied Bilogical Research Laboratory. Prof. Kapur has co-authored over 180 peer-reviewed publications, including in high profile journals such as PNAS, Science, and Nature. He has an H-index of above 70, several issued and licensed US and international patents, and is a co-founder of start-up companies in the areas of vaccines and diagnostics. His publications have been cited more than 20,000 times, and he is the recipient of numerous awards and honors including the Merck Agvet Award for teaching, the Pfizer Research Award, the Schofield medal, the Pasteur Veterinary Award. He has served as a charter member and chair of several NIH and USDA study sections. Prof. Kapur trained in veterinary medicine at the University of Agricultural Sciences in Bangalore, India, received a Ph.D. in Veterinary Sciences from Penn State, and conducted post-doctoral research at the Baylor College of Medicine in Houston. He has previously held faculty and leadership positions at Baylor College of Medicine, the University of Minnesota College of Veterinary Medicine and Medical School, where he served as Director of the Biomedical Genomics Center. Professor Kapur is best contacted via

E mail: vkapur@psu.edu



Humanitarian standards for disaster preparedness and resilience

Dr Balwant Singh

Former :

Executive Director, Sphere

Abstract

Humanitarian standards are based on core humanitarian principles of humanity, impartiality, independence and neutrality, in accordance with international humanitarian law and underpin humanitarian responses. As the scale, duration and complexity of crises keep increasing, it is vital to continue to build the existing capacity of local communities and humanitarian actors to respond promptly and effectively.

Just as we are able to predict the impact of humanitarian crises with increasing precision, Sphere standards provide a well known, reliable and predictable framework for preparedness and anticipatory action before crises hit. They uphold the rights of affected people, save lives, reduce suffering and maximise the impact of interventions.

Sphere standards are the most widely known and commonly used set of humanitarian standards and they promote quality and accountability. Developed collaboratively through extensive global consultations, they form a legitimate and evidence-informed currency for building humanitarian resilience. While they focus on the disaster response phase, they are integrated in prevention, preparedness, mitigation and recovery activities. They provide a basis for strengthening national humanitarian systems and policies.

Sphere recommends the adoption and inclusion of Sphere and other humanitarian standards by all governments, UN agencies and local humanitarian actors in global and national humanitarian policies, plans and programme cycles.



Biography



Dr Singh has more than 27 years of leadership experiencein philanthropy, international development and humanitarian initiatives across Asia, Africa, Europe and the USA. He has been leading Sphere since 2019.

Previously he was CEO of a philanthropic foundation; Global Director of an initiative seeking innovative solutions to maternal, newborn and child mortality across Africa and Asia; Regional Director for South and Central Asia at Save the Children; and Executive Director of Doctors of the World USA. Director of Doctors of the World USA. His earlier experiences include leading the International HIV/AIDS Alliance in India, directing International Family Health's global programmes, and managing the global relief organisation Project HOPE's work in Russia. Balwant is professionally a physician with a master's degree in business administration and speaks several languages.

E mail: balwant.singh@spherestandards.org

Linkedin id:https://www.linkedin.com/in/balwantContact address:Sphere, Route de Ferney 150, 1211 Geneva 2, SwitzerlandWebsite:www.spherestandards.org



Priorities for domestic measures and International cooperation in handling the biothreats triggered health emergencies

Dr C D Doo

Dr J.K.Kau

Former:

Vice-President, Sri Balaji Vidyapeeth University, Puducherry, India; Former Senior Advisor, Department of Biotechnology, M/o S&T GOI and Co-Founder –The Global Alliance for Pandemic Preparedness & Response (APAR).

Abstract

COVID-19 pandemic challenged public health systems, supply chains, technology from bench to bed side, medical regulations, trade, economy and international relations. Future biothreats causaed health emergencies can be due to man made changes in environment and domestication and dual- use potential of new generation technologies. In response to Covid 19, there were predictions for new world order. Also, transboundary/transnational cooperation is imperative for management of epidemics or pandemics.

On the contrary , many countries responded to Covid 19 pandemic by closing their borders and export controls (including medical goods) in supply chain. Thus, domestic politics and policies influence nature of diplomacy for international cooperation. For effective knowledge and health security certain domestic measures such as: (a)mapping of national priorities from lessons learnt for Covid-19 pandemic;(b)legislating National Pandemic Prevention And Mitigation Act to empower: (i) formulating of a National biodefense strategy, (ii) create a special cadre of multi-professional biothreat management human resource; (iii) repurposing certain National Laboratories with

special funds for centres of research and development of relevance to pandemics management; and (v)establishment of regional strategic National stockpile of medical counter measures.

International cooperation amplifies individual countries' efforts. Fostering international cooperation involves : (a) revisiting the classical protocols of cooperation in Science and



Technology to include broad ranging knowledge based multi-stakeholder collaborations; (b) accelerate globally coordinated mechanisms for Improved preparedness for futurepandemics and risks;(c) joint development, technology transfer and validation new generation technologies;(d) continued surveillance to detect emerging and re-emerging pathogens; harmonize measurement methodologies and standards for data sharing; (e) strengthening mechanisms for monetary and trade & supply chains and policies cooperation: (f) promote track 2 bilateral, regional and multilateral dialogues involving key stakeholders for free flow of information; promote bilateral joint table top exercises on pandemic preparedness with selective countries; and (g) Promote selective international / multilateral think tanks.

Biography



He was former Senior Advisor to Government of India is currently, the is Vice President of Sri Balaji Vidyapeeth a health care University in Pondicherry. During 30 years of his service in the Government of India he gained expertise and knowledge in R&D promotion in across disciplines; planning, budget and technical coordination; biotechnology regulations; establishment of high-end facilities; capacity building universities for interdisciplinary Research; worked modalities for accessing major international facilities; forging international collaboration with developing and developed countries; public private Partnerships; IPR, Patent facilitation. Dealt with biodiversity and bio-security issues and negotiating in international conventions such as Convention on Biological Diversity (CBD). Biological Weapons Convention (BWC) through inter-ministerial participation. He was convener of series of Indo-US Biosecurity dialogues 2016-2019 and expert in negotiations with Australian group (AG) an informal forum of countries for the harmonization of export controls; convener of The Global Alliance for Pandemic Preparedness & Response (APAR) advancing Global Health Security through South-South & North-South Collaboration (www.aparweb.org). He has published 55 research papers in national/international Journals including four strategic reviews in high impact journals on preparedness and COVID 19 pandemic. He has visited more than 80 countries on scientific and official matters and made more than 100 scientific and technical presentations in cutting edge area of biological sciences.

E mail: vp@sbvu.ac.in Phone: +919818541897

SESSION 4:

Global partnership on biosecurity

1. Role of the Biological Weapons Convention

2. International Health Security: Challenges and future direction

3. The Global Mass Vaccination Site

4. Need for continued and strengthened collaboration on Global Health Security and Pandemic Preparedness

Role of the Biological Weapons Convention

Dr Jenifer Mackby

Senior Fellow, Federation of American Scientists

Abstract

The COVID-19 pandemic has clearly pointed to the need for international cooperation. Yet, amid all the discussion about the pandemic, none of it has featured the Biological Weapons Convention. However, the experience of the global pandemic should point to the significance of the Convention. It should mobilize the states parties to enhance the BWC regime, especially those features dealing with international cooperation, response, and the provision of assistance, and international coordination to detect and monitor unusual outbreaks of disease.

The Biological Weapons Convention (BWC) bans the development of biological agents and toxins "of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes. " It entered into force in 1975, and is the first multilateral treaty that banned an entire category of weapons of mass destruction. Although COVID is not considered a biological weapon, it has brought to the fore and made people think about the connection between naturally occurring events and deliberate events in the bio field. The rapid advances in technology, the increased global capability to create and engineer pathogens that could cause a pandemic, and the interest of influential actors—both states and non-state actors- in biological weapons have increased the risk of a catastrophic biological event. The BWC also commits States Parties to provide assistance to others that have been attacked using biological weapons. In recent years BWC Meetings of Experts have focused on, among other things, assistance, response and preparedness

for a biological event. This has included how States Parties might contribute to strengthening international response capabilities for infectious disease outbreaks, whether natural or deliberate in origin; exploration of means to prepare for and respond in case of the hostile use of biological agents and toxins against agriculture, livestock and the

environment; promotion of capacity building through international cooperation in biosafety and biosecurity; establishment of an assistance database to improve

the prompt response to a request

Biography

Jenifer Mackby has worked on non-proliferation and

international security issues at the Federation of American Scientists, Partnership for a Secure America, Center for Strategic and International Studies, and the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO). She served as Secretary of the Biological Weapons Convention Review Conference; the negotiations on the CTBT; the Group of Scientific Experts; the Verification Working Group at the CTBTO; and a committee of the NPT Review Conference. She has led projects on a Russian-European study on bioterrorism, U.S.-U.K. nuclear cooperation, Asian Trilateral Nuclear Dialogues, Strengthening the IAEA, and is currently leading a project on establishing a scientific advisory body for the Biological Weapons Convention. Ms. Mackby has written extensively on these issues and

spoken at conferences around the world.

Ms. Jenifer Mackby has expertise in International Security, nuclear and biological non-proliferation, arms control, international organizations.

E mail : jmackby@fas.org Contact address : Senior Fellow, Federation of American Scientist Senior Adviser, Partnership for Secure America Phone : +1 571 309 0440

International Health Security: Challenges and future direction

Prof Atanu Basu

ICMR National Institute of Virology Pune

Abstract

The impact of climate change, rapid urbanization, changing ecology and unpredictable emerging infectious diseases has exponentially enhanced the risk of public health emergencies and biological disasters. The impact of such an event leaves shock waves in multiple dimensions from economics to security. As the world grapples with the COVID-19 pandemic the United Nations and other international organizations are realigning and restructuring multiple existing conventions and frameworks of global health security with an objective to identify the gaps, evolve better risk assessment frameworks and introduce new legally binding internationally treaties and strengthening existing ones. Several examples being the One Health concept, Global Health Security Agenda, International Health Regulations, Biological Weapons Convention creation of the SAGO and Pandemic insurance initiative of the World Bank. Further, biological disaster management approaches are also being strengthened at a national and international level. The Sendai framework is valuable instrument for disaster management under the UN and

current events have accelerated the need to recognize biorisk, biosecurity and bio-disaster management as prioritized agenda in national health agenda of state to reduce risk and build resilient health systems. The talk will discuss these different challenges and way head in the complex arena of biological disasters from risk assessment to governance and mitigation.

Biography

Prof Basu is a Scientist G and Head of Pathology & Electron Microscopy, ICMR-National Institute of Virology. He graduated with Hons in Physiology from Presidency college Kolkata and completed his Masters in Biophysics and Molecular Biology from Calcutta University and subsequent doctoral work from the college of Medicine University of Florida Gainesville. His postgraduate research and subsequent scientific work was carried out at the National Institutes of Health Bethesda USA.

Dr.Basu's major research interest is in the area of virus discovery, pathogenesis public health emergencies and Biosecurity. He has contributed and represented India in several UN disarmament conventions. He is a Fogarty Fellow of the NIH USA and has several major national and international accolades to his credit. He is currently a member of several national and international task forces on infectious and emerging diseases. Besides research, scientific diplomacy Dr Basuhas an active academic interest inteaching and increasing a wareness of science to masses.

The Global Mass Vaccination Site

Dr Eric Goralnick

Former:

Associate Faculty, Ariadne Labs Associate Professor of Emergency Medicine, Harvard Medical School

Abstract

In December 2020, the speed of the development and evaluation of SARS-CoV-2 vaccines far exceeded expectations, and many leaders faced ongoing uncertainty in ensuring the delivery of the vaccines with speed, scale, and equity.

Mass vaccination sites—like stadiums, arenas, and convention centers proved to be essential and scalable, able to safely deliver thousands of vaccines in a single day.

Mass vaccination site leaders have encountered various challenges, including information system platforms, insurance reimbursements, logistics, patient flow, and indoor vs. outdoor considerations. Lower vaccine confidence and significant inequity in vaccine distribution affecting people of color and other communities that have been disproportionately affected by COVID-19. These challenges continue to plague vaccine delivery. Our community involved mass vaccination site operators and policy makers representing over 25 sites from the US, India and Canada. We conducted weekly live group sessions, a running blog of shared lessons learned, peer to peer learning, crowd sourcing platforms and document sharing. I will describe the structure, lessons learned and future directions as we are rapidly scaling to support low middle income country vaccine deployment.

Biography

Eric Goralnick, MD, MS serves as Medical Director, Access and Network Development, Brigham and Women's Hospital. During the COVID 19 Pandemic, he has worked clinically in the Emergency Department, serves as Co-Lead of The Mass General Brigham System Wide Capacity Task Force and Medical Director for multiple Vaccination Sites including Gillette Stadium, the Reggie Lewis Center, and the Hynes Convention Center. He is also the Principal Investigator for the Ariadne Labs Global Mass Vaccination Site Collaborative, a joint center for health systems innovation at Brigham and Women's Hospital and the Harvard TH Chan School of Public Health.

He is an Associate Professor of Emergency Medicine at Harvard Medical School. He is the faculty lead for the Harvard Medical School Civilian Military Collaborative, the Brigham and Women's Center For Surgery and Public Health emergency medicine initiatives, Medical Director, Gillette Stadium, an Ariadne Labs Associate Faculty Member and a US Navy veteran.

 E mail: EGORALNICK@BWH.HARVARD.EDU
Contact address: Brigham and Women's Hospital , 75 Francis Street, Boston, MA 02115
Phone No. : 617-525-8495

Ariadne Labs is a joint center for health systems innovation at Brigham & Women's Hospital and the Harvard T.H. Chan School of Public Health. With a mission to save lives and reduce suffering, our vision is that health systems equitably deliver the best possible care for every patient, everywhere, every time. We use human centered design, health systems implementation science, public health expertise, and frontline clinical care experience to design, test and spread scalable systems-level solutions to some of health

care's biggest problems. From developing checklists and conversation guides to fostering international collaborations and establishing global standards of measurement, our work has been accessed in more than 165 countries, touching hundreds of millions of lives. Visit ariadnelabs.org to learn more and covid19.ariadnelabs.org to learn about Ariadne Labs' response to COVID-19.

Need for continued and strengthened collaboration on Global Health Security and Pandemic Preparedness

Dr Preetha Rajaraman

U.S. Department of Health and Human Services

Abstract

Collaboration to address global health challenges has been one of the longest and most successful aspects of the relationship between the United States and India. Together, we have worked towards the elimination of smallpox, combatting HIV/AIDS, eradicating polio, and development of the first indigenous vaccine in India, protecting against Rotavirus. Our current partnership in COVID-19 response builds strongly on our existing platform of activities, and ranges from cooperation on building surveillance systems and support in the field, to the development of innovative solutions and restoring and securing global supply chains.

Cooperation is robust in both the public and private sectors; Indian laboratories and companies have been an integral part of global efforts to develop, test, and manufacture potential vaccine and treatment candidates. Continuing our long history of tackling global health security issues, the Biden-Harris Administration is committed to working with global partners to end the COVID-19 pandemic and build back better health security by strengthening country capacities to prevent, detect, and respond to health threats; establishing a sustainable health security financing facility, and ensuring that we have the necessary political leadership and support to back these goals. The U.S. is also working with global partners to expand the production, procurement, and

delivery of safe and effective vaccines. For example, last month the U.S. Development Finance Corporation signed an agreement with Hyderabad Vaccine Manufacturer Biological E Ltd., to finance increased capacity to support production of at least 1 billion doses of FDA-EUA or approved and/or WHO-Emergency Use Listed COVID-19 vaccines by the end of 2022. Going forward, we need to continue to invest in the latest vaccine, therapeutic, and diagnostic technologies and expand global manufacturing capacity, both for final products and critical raw materials; enhance our genomic surveillance and reporting of SARS-CoV-2 variants and other emerging threats; create a bridge between human health, animal health, and environment sectors in terms of robust surveillance, data sharing, and analysis; and consider the power of digital health information technologies and artificial intelligence to accelerate our knowledge and decision making capabilities.

Development Finance Corporation signed an agreement with Hyderabad Vaccine Manufacturer Biological E Ltd., to finance increased capacity to support production of at least 1 billion doses of FDA-EUA or approved and or WHO-Emergency Use Listed COVID-19 vaccines by the end of 2022. Going forward, we need to continue to invest in the ltest vaccine, therapeutic, and diagnostic technologies and expand global manufacturing capacity, both for final products and critical raw materials; enhance our genomic surveillance and reporting of SARS-CoV-2 variants and other emerging threats; create a bridge between human health, animal health, and environment sectors in terms of robust surveillance, data sharing, and analysis; and consider the power of digital health information technologies and artificial intelligence to accelerate our knowledge and decision making capabilities.

Biography

Health Attaché and South Asia Regional Representative for the U.S. Department of Health and Human

Services (HHS), serves as a key advisor to t he U.S. Secretary of Health and Human Services and the U.S. Embassy in India on matters involving health and biomedical research in South Asia. She is responsible for in-country representation, monitoring, and coordination of the policy, programs, and interests of all HHS agencies over a broad portfolio spanning health safety and security, health policy, and research and innovation, for communicable and non-communicable disease. Dr. Rajaraman has over twenty years of experience in health research and policy, with more than 140 published articles in these fields. Her previous work at the U.S. National Cancer Institute was recognized by the Director's Award for exceptional leadership in marshaling trans-NCI collaboration to foster cooperation in can-

research between scientists in United States and India. She has served as an expert advisory member for various international bodies including the International Commission of Radiation Protection, the WHO, and the Lancet. She holds a PhD in Epidemiology (Johns Hopkins, Delta Omega), an M Sc in Environmental Health (University of Washington), and a BA in Biology (Reed College, Phi Beta Kappa).

Email : RajaramanP@state.gov

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