



COVID-19

WHO Guideline Development Group for Clinical Management of COVID-19 (V3)

18 May 2020



Members of the WHO Guideline Development Group for Clinical Management of COVID-19 (V3)



Neill Adhikari is an intensivist at Sunnybrook Health Sciences Centre and appointed to the Interdepartmental Division of Critical Care Medicine and Institute for Health Policy, Management and Evaluation at the University of Toronto. His research interests include critical care delivery in under-resourced settings and clinical trials. He is co-PI of trials of vitamin C for sepsis, and blood pressure targets for vasodilatory shock. He co-leads the Toronto-Addis Ababa Academic Collaboration in critical care medicine.



Dr John Adabie Appiah is a senior specialist, Paediatric Critical Care and Head of the Paediatric Intensive Care Unit of the Komfo Anokye Teaching Hospital, Ghana. He is an adjunct lecturer at the Department of Child Health of the Kwame Nkrumah University of Science and Technology and the current President of the Paediatric Society of Ghana. He cares for the critically ill and seriously injured and children with life-threatening conditions. His special interests are in sepsis and quality improvement in the care of seriously ill children, resuscitation, ventilation and management of sepsis in resource-limited countries. He has been instrumental in the introduction and wider utilization of non-invasive ventilation (CPAP) in newborns and infants with respiratory distress in Ghana.



Dr Abdullah Balkhair is Senior Consultant in Infectious Diseases and Head of the Infectious Diseases Unit and Infection Control Department, Sultan Qaboos University, Oman. He has 16 years' experience in the practice of infectious diseases in a referral teaching hospital (SQUH) and many years in academia. His area of interest is emerging and re-emerging infections and infections in the critically ill, and he has authored many publications in peer-reviewed journals and received several research grants. He is currently leading the COVID-19 Task Force Team at Sultan Qaboos University Hospital in Oman.



Corrado Barbui holds a postdoctoral degree in Psychiatry from the University of Verona, Italy, and was trained in epidemiology, clinical psychopharmacology and health services research at the Mario Negri Institute for Pharmacological Research, Milan, and the Institute of Psychiatry in London, where he joined the editorial team of the Cochrane Collaboration Depression Anxiety & Neurosis Group. Returning to Italy, he conducted research in evidence-based mental health and pharmacoepidemiology at the University of Verona. In 2002 he was appointed Lecturer in Psychiatry and, in 2013, became Director of the WHO Collaborating Centre for Research and Training in Mental Health and Service Evaluation of the University of Verona. Under the leadership of WHO, he was involved in the development of the mhGAP programme as an expert methodologist. In 2015, he was appointed Full Professor of Psychiatry. In 2017, he founded Cochrane Global Mental Health, a Cochrane network that supports the production, dissemination and implementation of systematic reviews relevant to mental health in low- and middle-income countries. He has published nearly 400 scientific articles in international peer-reviewed journals.



Professor Lucille Blumberg is Deputy Director at the National Institute for Communicable Diseases (NICD), of the National Health Laboratory Service, and founding Head of the Division of Public Health Surveillance and Response, South Africa. She is currently Medical Consultant to the Division for Outbreak Preparedness and Response (including the Travel Medicine Unit) and the Centre for Emerging, Zoonotic and Parasitic Diseases, where her major focus is on malaria, rabies and zoonotic diseases, and travel-related infections. She has worked on a number of outbreaks, including rabies, avian influenza, cholera, typhoid and the Lujo virus. She is a medical graduate of the University of the Witwatersrand, an Associate Professor in the Department of Medical Microbiology at the University of Stellenbosch, and Lecturer in the Faculty of Veterinary Medicine, University of Pretoria. She has specialist qualifications in clinical microbiology, travel medicine and infectious diseases. In 2010, she established the laboratory surveillance programme for the 2010 FIFA World Cup in South Africa and set up the Mass Gatherings Unit at the NICD, which became part of the WHO Mass Gatherings global network. She has been an advisor on the prevention, detection and response to communicable disease risks to a number of African countries hosting large international sporting events. She is a member of the South African expert advisory groups on rabies and malaria; and of the advisory groups to the WHO on yellow fever risks in travellers (Chairperson); the R&D Blueprint for research in diagnostics, vaccines and therapeutics for epidemic-prone (mainly zoonotic) diseases; and the 2018 WHO rabies guidelines for prevention of rabies in humans.



Dr Bin Cao is Vice President of the China-Japan Friendship Hospital, Director of the Department of Pulmonary and Critical Care Medicine, China-Japan Friendship Hospital; Vice President of the Institute of Respiratory Medicine, Chinese Academy of Medical Sciences; Professor of the Capital Medical University; and Professor of Tsinghua University-Peking University Joint Center for Life Sciences. His research includes: epidemiology, clinical characteristics, and treatment of viral pneumonia; molecular and cellular basis of the pathogenesis of influenza viruses; diagnosis and treatment strategy and drug resistance of drug-resistant pathogens. He is also the President-elect of the Chinese Thoracic Society; Deputy Director of the Respiratory and Infectious Disease branch of the Chinese Society of Respiratory Disease; Associate Editor of the *Clinical Respiratory Journal*, and a committee member of the Antiviral Group of the International Society for Influenza and other Respiratory Virus Diseases. He received the Distinguished Respiratory Academic Contribution Award in 2018, the National Award for Science and Technology Progress (Grand Prize) in 2017, the Yangtze River Distinguished Professor of the Ministry of Education in 2015 and the Wu JiePing-Paul Janssen Medical-Pharmaceutical Award in 2014. He has published 124 original peer-reviewed articles and reviews, including representative papers in the *Lancet* and *New England Journal of Medicine*. He has been intensively engaged in frontline clinical work in Wuhan since the COVID-19 outbreak and in drafting the first and second edition of the COVID-19 Diagnosis and Treatment Guideline of China. He reported clinical characteristics of COVID-19 (Huang C, et al, *Lancet*. 2020. PMID: 31986264) and risk factors for severe disease (Zhou F, et al, *Lancet*. 2020. PMID: 32171076). He is also currently in charge of several antiviral clinical trials in China, including Remdesivir (ongoing) and lopinavir-ritonavir (Cao B, et al. *N Engl J Med*. 2020. PMID: 32187464).



Maurizio Cecconi is an anaesthesiologist and intensive care specialist and Chair of the Department of Anesthesia and Intensive Care Units at Humanitas Research Hospital, Milan, Italy. He is Professor of Anesthesia and Intensive Care and Vice President of the MEDTEC School at Humanitas University, Milan. Previous to his current appointments, he worked for 14 years as an NHS Consultant at St George's Hospital, London, UK. His research focus is on improving outcomes in perioperative care, as well data science and the physiology of shock, acute respiratory failure and sepsis. He is the President-elect of the European Society of Intensive Care Medicine and part of the Executive Committee of the Surviving Sepsis Campaign.



Dr Bronwen Connolly is a critical care physiotherapist, and Senior Lecturer in Critical Care at Queen's University Belfast, UK. The recipient of three previous National Institute for Health Research (NIHR) Fellowships (Doctoral, Postdoctoral, Clinical Trials), her research interests focus on acute respiratory and rehabilitation physiotherapy; the recovery, long-term outcome and survivorship of post-critical illness patients; and clinical trial methodology around complex rehabilitation interventions. Her current work includes development of a core outcome set for trials of physical rehabilitation in critical illness, and leading a multiprofessional team developing a randomized controlled trial investigating the effectiveness of mucoactive drugs in acute respiratory failure. She is involved with a number of major national and international research organizations, including the NIHR Critical Care Specialty Group, the UK Critical Care Research Group, and the International Forum for Acute Care Trialists.



Vu Quoc Dat is a lecturer at the Department of Infectious Diseases, Hanoi Medical University, Viet Nam and an intensivist at the National Hospital for Tropical Diseases, a tertiary referral hospital for infectious diseases in northern Viet Nam. He completed the Career Development Fellowship with the WHO Special Programme for Research and Training in Tropical Diseases and undertook his PhD training at the Oxford University Clinical Research Unit in Viet Nam. He has expertise in clinical management of severe or life-threatening infections, zoonotic diseases, and emerging and re-emerging infectious diseases in resource-constrained settings. His research interests focus on interventions to emerging health issues related to infectious diseases, particularly in critical care settings, and on the capacity of health care systems in response to sepsis and severe acute respiratory infection. He served as a member of the national technical working groups for the development of national guidelines for the management of infectious diseases.



Dr Jake Dunning is Head of Emerging Infections and Zoonoses at Public Health England (PHE). His clinical infectious diseases practice is at the Royal Free Hospital, London. His clinical and laboratory research interests include influenza, respiratory and enteric viral diseases, emerging and zoonotic infections, and contact and airborne high-consequence infectious diseases, including Ebola virus disease, avian influenza, MERS and monkeypox. He conducts research on the clinical characterization and mechanisms of disease, as well as clinical trials of experimental treatments, at PHE and the University of Oxford, Imperial College London and University College London. Since January 2020, he has been part of PHE's National Incident Management Team for COVID-19 and contributes to national and international guidance. He is an active researcher within the International Severe Acute Respiratory and Emerging Infection Consortium.



Rob Fowler is critical care physician and Professor of Medicine at the University of Toronto and Chief of the Trauma, Emergency and Critical Care Program at Sunnybrook Health Sciences Centre. He is the Director of the Dalla Lana School of Public Health's Institute of Health Policy, Management and Evaluation Clinical Epidemiology Graduate Training Program and the Chair of the Canadian Critical Care Trials Group. His clinical and academic focus includes access and outcomes of care for critically ill patients and infection-related critical illness. He has assisted or worked with the WHO during the SARS, pandemic, avian influenza and MERS outbreaks, and the Ebola outbreaks in Guinea, Liberia, Sierra Leone and the Democratic Republic of the Congo, and the COVID-19 pandemic.



Heike Geduld is Associate Professor and Head of the Division of Emergency Medicine at Stellenbosch University in Cape Town, South Africa. She is President of the College of Emergency Medicine of South Africa and Immediate Past President of the African Federation for Emergency Medicine.



Professor Charles Gomersall, Department of Anaesthesia and Intensive Care, Chinese University of Hong Kong, Hong Kong SAR, China. His academic interests include respiratory protection against infectious diseases, weaning mechanical ventilation, ICU admission triage and large-scale critical care training.



Rumina Hasan is a consultant clinical microbiologist and Professor in the Department of Pathology and Laboratory Medicine at the Aga Khan University, Karachi and an Honorary Professor in the Department of Infectious and Tropical Diseases, London School of Hygiene and Tropical Medicine, UK. Her areas of interest include tuberculosis and antimicrobial resistance. She has served as Vice Chair of the Global Laboratory Initiative (2012–2014) and member of the New Diagnostic Working Group (2011–2014). She is currently the Chairperson of the WHO Eastern Mediterranean Regional Green Light Committee. She also serves on the WHO Strategic Technical Advisory Group on Antimicrobial Resistance.



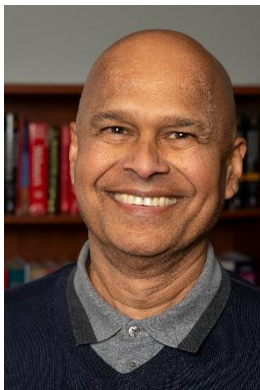
Manai Hela is an emergency doctor at the Emergency Medical Service Tunis, Tunisia, with a number of years of solid practice experience. Since 2016, she has co-led the simulation unit within the Emergency Medical Service Tunis and teaches medical students and residents at the Faculty of Medicine, Tunis. She has been involved in several research projects and international workshops in the field of emergency medicine.



Professor David S Hui is the Chairman of Department of Medicine and Therapeutics in addition to being the Stanley Ho Professor of Respiratory Medicine and Director of the Stanley Ho Centre for Emerging Infectious Diseases, Chinese University of Hong Kong, Hong Kong SAR, China. Since 2004, he has frequently served as an advisor to the WHO on the clinical management of emerging severe acute respiratory infections.



Professor Yae-Jean Kim is a paediatric infectious diseases specialist and Professor in the Department of Pediatrics, Sungkyunkwan University School of Medicine, Samsung Medical Center, Seoul, Republic of Korea. She is a board member of the Korean Society of Infectious Diseases, the Korean Society of Pediatric Infectious Diseases, and the Asia Pacific Society for Immunodeficiencies. She is also the co-lead for the Asian Network for Surveillance of Resistant Pathogens Pediatric Group. Her area of special interest is respiratory viral infection and infection in high-risk patients. She is the co-author of a chapter on coronaviruses in Feigin and Cherry's *Textbook of Pediatric Infectious Diseases*, 8th edition, 2018. Since 2015, having experienced the MERS outbreak in the Republic of Korea, she has been a frequent advisor on coronavirus infection to WHO and international societies.



Niranjan Kissoon is Professor, BC Children's Hospital and UBC Global Child Health, Department of Paediatrics and Emergency Medicine, University of British Columbia (UBC), Vancouver, Canada. He is Past President of the World Federation of Pediatric Intensive and Critical Care Societies; and Professor, Pediatric and Surgery at UBC. He is Vice-Chair of the Global Alliance for Sepsis, Co-Chair World Sepsis Day, and Vice-Chair of the International Pediatric Sepsis Initiative and the Pediatric Surviving Sepsis Campaign Guideline Committee.



Dr Arthur Kwizera is a Senior Lecturer in Anaesthesia and Intensive Care at Makerere University College of Health Sciences and a staff intensivist at the Mulago National Referral Hospital ICU, Uganda. After completing his specialist anaesthesia and intensive care training in Uganda, he received further training from the University of British Columbia in Canada and an interventional pulmonology fellowship in Venice, Italy. He is part of international collaborations looking at acute care in resource-limited settings with particular emphasis on respiratory failure sepsis management and anaesthesia/intensive care education. He has authored/co-authored a number of publications in this field. He is a member of the Surviving Sepsis Campaign guidelines taskforce. His research work is centred on epidemiology, pathophysiology and management of acute organ dysfunction and corresponding life support interventions in low-resource settings. He is a Cambridge THRiVE PhD fellow and his focus is on acute lung disease with a particular emphasis on acute respiratory failure and acute respiratory distress syndrome, and a focus on novel low-cost strategies to manage acute respiratory failure in the low-resource African acute care settings.



Pisake Lumbiganon is Professor of Obstetrics and Gynecology, Convenor of Cochrane Thailand, and Director of the WHO Collaborating Centre on Research Synthesis in Reproductive Health based at the Faculty of Medicine, Khon Kaen University, Thailand. He is currently the President-elect of the Asia & Oceania Federation of Obstetrics and Gynaecology. He has published more than 150 papers, including many Cochrane reviews in various international journals. Formerly, Dean of the Faculty of Medicine at Khon Kaen University from 2009 to 2013 and the President of the Royal Thai College of Obstetricians and Gynaecologists from 2016 to 2018, in 2019 he received an Honorable Fellowship from the Royal College of Obstetricians and Gynaecologists. His main areas of interest include maternal and perinatal health, evidence-based practices, systematic review and meta-analysis.



Srinivas Murthy is Associate Professor at the University of British Columbia in Vancouver, Canada. He is a paediatric infectious diseases and paediatric critical care physician and clinical epidemiologist. He has served as an advisor to WHO, Public Health Agency of Canada, and other public health agencies around the world since 2014. He holds research grant support from the Canadian Institutes of Health Research, the Wellcome Trust and the Gates Foundation, and his academic and clinical focus is on severe and emerging respiratory infections.



Saniya Sabzwari is an Associate Professor in the Department of Family Medicine at the Aga Khan University, Karachi, Pakistan. She is a Fellow of the American Academy of Family Physicians. Her area of special interest is geriatrics. She established the first outpatient geriatric service in Pakistan, and developed geriatric undergraduate and postgraduate training programmes at the Aga Khan University in 2008. Her research focuses on community geriatrics, on which she has published several papers. She is also part of the Geriatric Special Interest Group for the World Organization of Family Doctors.



Professor Rohit Sarin is Director of the National Center of Excellence TB Reference Laboratory, New Delhi, India; and Principal Consultant of the National Institute of Tuberculosis and Respiratory Diseases, and Technical Advisor for the National Tuberculosis Elimination Program, for the Government of India. He is a fellow of the National College of Chest Physicians; executive member of the Tuberculosis Association of India; and member of the Delhi Tuberculosis Association, Association of Bronchology, and Indian Medical Association. Widely published at national and international level, he has received several awards, including, the national Dr PV Benjamin Memorial Oration Award given by the TB Association of Telangana, Hyderabad, 2019; the international Karel Styblo Public Health Prize, 2017; and the Dr PK Sen Gold Medal – the highest award given by the TB Association of India, 2012.



Yinzhong Shen is Chief Physician, Associate Professor of the Shanghai Public Health Clinical Center, Fudan University, and a member of the Standing Committee for the Tropical and Parasitic Diseases branch of the Chinese Medical Association. With experience of working at WHO headquarters in 2014 and 2016, he has been invited by WHO Western Pacific Region to share China's experience of COVID-19 clinical management with Pacific Island countries. His work focuses on clinical management and research in the field of infectious diseases.



Dr Maria Asuncion Silvestre is a neonatologist and founder of the non-profit, Kalusugan ng Mag-ina Inc ("health of mother and child") in 2010, dedicated to the health of the mother-child dyad, emphasizing non-separation. With WHO Philippines, she collaborated on implementation of the Essential Intrapartum and Newborn Care (*unang yakap* – first embrace) Initiative in 2008. She is a member of the Independent Review Group for Early Essential Newborn Care of the WHO Western Pacific Region. She participated in WHO guidelines on *Optimal feeding of low-birth-weight*, 2006; *Acceptable medical reasons for supplementation* annex to the revised Mother and Baby-Friendly Health Initiative, 2007; and *Counselling of women to improve breastfeeding outcomes*, 2019. With the Asia-Pacific Center for Evidence-Based Healthcare, she co-authored *Painless evidence-based medicine*, 2008 and 2017.



João Paulo Souza is Professor of Public Health at the Department of Social Medicine, Ribeirão Preto Medical School, University of São Paulo, Brazil. With a clinical background in obstetrics and gynaecology and intensive care, Professor Souza worked for several years at WHO headquarters on global maternal and perinatal health issues. His current work focuses on the interface of health and social development, particularly on strategies for achieving an ecologically and socially sustainable healthier future.

Additional members of the Guideline Development Group are: Florence Baingana, Research Fellow, Makerere University, Kampala, Uganda; Flavia Machado, Anesthesiology, Pain and Intensive Care Department, Federal University of São Paulo, Brazil.

