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Independent Task Force on COVID-19 and Other Pandemics: Origins, Prevention, and Response

The Independent Task Force on COVID-19 and other Pandemics announced that their report “Pandemic Origins and a One Health Approach to Preparedness and Prevention: Solutions Based on SARS-CoV-2 and Other RNA Viruses” has been published in the [Proceedings of the National Academy of Sciences](#).

Independent Task Force chair, Dr Gerald T. Keusch of the National Emerging Infectious Diseases Laboratory and Center for Emerging Infectious Diseases Policy and Research at Boston University said that “The world has largely failed to meet the challenge to be better prepared to prevent or respond adequately enough to the next pandemic, whatever the etiology. Our Task Force believes that the best way to address risk factors for future pandemics is a One Health approach that balances and optimises the health of people, animals, and ecosystems.”

The Independent Task Force focused on scientific findings before and during the pandemic, and a historical review of multiple previous RNA virus outbreaks to identify critical intervention points to interrupt zoonotic transmission and translates this knowledge into recommendations based on a One Health approach to prevent or mitigate an outbreak, and if necessary, to respond rapidly to prevent epidemic or pandemic spread.

The Royal Melbourne Hospital’s Dr Danielle Anderson, a Research Scientist at the Victorian Infectious Diseases Reference Laboratory (VIDRL) at the Peter Doherty Institute for Immunity and Infection (Doherty Institute), is a member of the Independent Task Force.

Dr Anderson explained that the COVID-19 pandemic introduced or highlighted scientific disciplines, such as virology and epidemiology, to the broader community.

“Although the ‘lessons learned’ are certainly not new to scientists, it is our responsibility to ensure that these lessons and our recommendations are better understood and are more readily embraced and acted upon to protect communities, animals and ecosystems now and in the future,” Dr Anderson said.

Background of the Task Force

The emergence of animal-origin (zoonotic) RNA viruses like SARS-CoV-2, whether from wildlife, livestock, or domestic animals, is an urgent and growing threat to public health. Understanding how SARS-CoV-2 and other RNA virus outbreaks originate can guide how we can more effectively prevent, mitigate, or respond to future emerging infectious diseases (EIDs).

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Increasing outbreaks in recent decades have been driven by many factors, including human and livestock population growth coupled with expanding human-animal-environment interfaces, changing patterns of land use, climate change, globalised travel, and trade. These outbreaks have common characteristics, including zoonotic spillover from an animal reservoir host to humans, with or without involvement of another animal transmission host.

These events highlight the importance of a One Health approach to design relevant, feasible, and implementable solutions to prevent, mitigate, and respond rapidly to future outbreaks.

The Independent Task Force is a group of internationally renowned scientists with diverse disciplinary expertise in human, animal, and public health, virology, epidemiology, wildlife biology, ecology, and EIDs. Twelve members were convened in June 2020 as a Task Force within the Lancet COVID-19 Commission. In November 2021, with the addition of two new expert members, they formed the Independent Task Force to assess available evidence on what drove the origins and early spread of COVID-19 and provide evidence-based recommendations to reduce the impact of and improve responses to outbreaks.

A critical review of the literature, interviews with other scientists, and extensive discussions culminated in the present [PNAS report](#).

Key Findings

The Independent Task Force Report shows that:

- **Animal RNA viruses, including coronaviruses, have a long history of crossing species barriers to humans.** The report provides a historic timeline of estimated origin dates for major coronavirus outbreaks affecting people or livestock and highlights coronaviruses that represent a growing risk to both human and animal health.
- **The risk of pandemics emerging increases when people and animals interact closely in new settings driven by land use and climate change, environmental degradation, the wildlife trade, population growth, and economic pressure.** Evidence indicates that most new zoonotic outbreaks have wildlife or livestock origins. The report provides recommendations that target high-risk animal-human interfaces to prevent or mitigate the risk of future spillovers. An important strategy is 'Smart Surveillance' and sampling programs which have proven helpful for disease outbreak forecasting and to guide strategies to reduce risks at the source.

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- **Substantial newly published scientific evidence reviewed in the PNAS Perspective report strongly indicates that COVID-19 originated via a pathway similar to SARS-CoV, involving spillover from bats to intermediate animal hosts, then to people within the wildlife trade, leading to the first known cluster of COVID-19 in the Huanan Seafood Market in Wuhan, China, in December 2019.** The Task Force finds no verifiable or credible evidence to support the possibility that SARS-CoV-2 was created in or released from a laboratory (**See Table S.6.** in Supporting Information: <http://www.pnas.org/lookup/suppl/doi:10.1073/pnas.2202871119/-/DCSupplemental>)
- **Efforts to control and respond to the COVID-19 pandemic were hindered in many countries by politics, misinformation and disinformation, and a growing anti-science/anti-vaccine movement.**
- **The importance of critically evaluating the potential of a zoonotic link to wildlife is that it leads to implementable One Health-oriented changes in policy and practice that can reduce the likelihood of similar occurrences in the future.** Importantly, this presents no conflict with continuous efforts to improve laboratory and field biosafety and biosecurity.

Recommendations

The Independent Task Force Report makes the following recommendations:

(1) 'Smart Surveillance' to identify high-threat potential pathogens.

Targeting surveillance to people, wildlife, and domestic animals within emerging disease hot spots; improving methodologies for safe surveillance; and innovating a risk assessment framework to provide early warning of pathogens most likely to emerge. The benefits of Smart Surveillance conducted by trained personnel using rigorous protocols to maximise safety and security far outweigh risks and provide critical data for research and development of vaccines, therapeutics, diagnostics and better early warning systems, and inform One Health strategies for prevention and response.

(2) Preparedness and translational research.

Investing in R&D for innovative and broad-spectrum diagnostics, antiviral and vaccine strategies for priority pathogens based on data from 'Smart Surveillance'; streamlining approaches to build capacity for clinical trials, licensure, and manufacture of medical countermeasures; and understanding the pathogenesis of potential high-threat pathogens to guide new therapeutic strategies.

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(3) Reduce the drivers for spillover risk and spread.

Working with communities and countries on the frontline of disease emergence to understand epidemiological, value chain, and behavioural drivers of EID emergence; implementing risk reduction strategies; developing incentives to minimise human-wildlife contact at interfaces in rural areas and commercial markets; and strengthening awareness of the emerging disease-linked health impacts and costs of land use and climate change to provide incentives for sustainable development.

(4) Counter misinformation and disinformation about the prevention and control of emerging diseases.

Interdisciplinary research on what drives the emergence, spread and public acceptance of misinformation and disinformation in order to develop robust counter-mechanisms; develop strategies to counter distrust of science and expert advice, including creating organisations to support scientists under threat arising from disinformation and politically-motivated attacks; designing and promoting programs to improve public understanding of the scientific method and where to find trusted evidence-based scientific information.

(5) Strengthen One Health governance and science.

Creating an inclusive, multi-stakeholder One Health-based governance framework at local, regional, national and international levels for pandemic preparedness and response; increasing funding for cross-disciplinary, collaborative One Health research; learning from indigenous knowledge; participation of civil society and engagement of public and private sector expertise; and efforts to educate new generations concerning the scientific method and reliable sources of information.

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Notes to Editors:

(1) DOI: 10.1073/pnas.22028711119 (<https://doi.org/10.1073/pnas.22028711119>)

(2) Available for interview: Royal Melbourne Hospital's Dr Danielle Anderson, a Research Scientist at the Victorian Infectious Diseases Reference Laboratory (VIDRL) at the Doherty Institute

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(3) List of Independent Task Force members:

Dr Gerald Keusch MD (Chair) is Associate Director of the National Emerging Infectious Diseases Laboratories and a core faculty member of the Center for Emerging Infectious Disease Policy and Research at Boston University, Boston Massachusetts, USA. His research has focused on pathogenesis and control of emerging bacterial, protozoal and viral diseases through collaborative basic laboratory, field and clinical research. He is the former Director of the Fogarty International Center of the U.S. National Institutes of Health and is a member of the U.S. National Academy of Medicine.

Dr John Amuasi MBChB Ph.D. is the head of Global Health at the School of Public Health, Kwame Nkrumah University of Science and Technology, and is Group Leader of the Global Health and Infectious Diseases Research Group at the Kumasi Centre for Collaborative Research in Tropical Medicine, Accra Ghana and the Bernhard Nocht Institute of Tropical Medicine, Hamburg, Germany. He has extensive experience in One Health approaches to emerging zoonotic diseases.

Dr Danielle Anderson Ph.D. is a Research Scientist at the Victorian Infectious Diseases Reference Laboratory at The Peter Doherty Institute for Infection and Immunity, Melbourne, Australia. She is a virologist investigating pathogenesis of high consequence emerging viruses.

Dr Peter Daszak, Chair Ph.D. is the President of EcoHealth Alliance, New York, NY, USA. He is a member of the U.S. National Academy of Medicine and chairs its Forum on Microbial Threats. He is an expert in ecology, surveillance, and field research of emerging zoonotic viruses such as SARS-CoV, MERS-CoV, and SARS-CoV-2.

Dr Isabella Eckerle MD is Associate professor, physician-scientist, and Head of the Centre for Emerging Viral Diseases at the University Hospitals of Geneva. She has led extensive clinical, epidemiological, and pathogenesis research on endemic coronaviruses, MERS-CoV, and SARS-CoV-2.

Dr Hume Field DVM Ph.D is Adjunct Professor in the School of Veterinary Science at the University of Queensland, Australia and a science and policy advisor to Ecohealth Alliance. He has made expertise in field studies and surveillance of bat-origin emerging viruses such as Hendra, Nipah, SARS-CoV and SARS-CoV-2.

Dr Marion Koopmans DVM Ph.D. is Head of the Dept. of Viroscience, Erasmus Medical Center and Pandemic and Disaster Preparedness Center, Rotterdam, Netherlands. Her research focus is to understand the modes of transmission of viruses among animals and between animals and humans, explore the potential of next generation sequencing techniques and other types of data on drivers for emergence for outbreak prediction, detection and tracking. She is a member of the WHO-WOAH-FAO-UNEP One Health High Level Expert Panel, and a member of the Royal Dutch Academy of Sciences.

Dr Dato' Sai Kit (Ken) Lam Ph.D. is Professor Emeritus at the University of Malaya, and Senior Fellow of the Malaysian Academy of Sciences. He is an expert in vector borne viral diseases such as dengue and a co-discoverer of Nipah virus in Malaysia, for which he has received the 2001 Prince Mahidol Award for Public Health in 2001 and the Merdeka Award for Outstanding Scholastic Achievement in 2013.

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Dr Carlos das Neves DVM Ph.D. Dipl.ECZM is the Director for Research and Internationalisation at the Norwegian Veterinary Institute, past President of the International Wildlife Disease Association, member of the IUCN SSC-Wildlife Health Specialist Group, and Chair of the Wildlife Population Health Specialty at the European College of Zoological Medicine. He is an expert in zoonotic wildlife viral infections and One Health approaches to contain and control spillovers.

Dr Malik Peiris MBBS DPhil FRS is a physician-scientist and Tam Wah-Ching Professor in Medical Science and Chair of Virology, Division of Public Health Laboratory Sciences at the School of Public Health, University of Hong Kong. His research focuses on the pathogenesis, innate immune responses, transmission, ecology and epidemiology of human and animal (poultry, swine, wild birds) influenza viruses, and emerging coronaviruses, including the first isolation of SARS-CoV, and studies of MERS and SARS-CoV-2 leading to evidence-based options for their control.

Dr Stanley Perlman MD Ph.D. is Professor of Microbiology and Immunology, Professor of Paediatrics, and University of Iowa Distinguished Chair, Iowa City Iowa in the U.S. He is a physician-scientist involved in studies of the pathogenesis of respiratory coronaviruses including SARS-CoV, MERS-CoV, and SARS-CoV-2.

Dr Supaporn Wacharapluesadee Ph.D. is the Senior Research Scientist at the Emerging Infectious

Diseases Clinical Center, King Chulalongkorn Memorial Hospital, Thai Red Cross Society and Chula School of Global Health, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand. Dr Wacharapluesadee's team detected the first MERS-CoV case in Thailand in 2015, and the first to positively identify a human COVID-19 infection outside of China.

Su Yadana, MPH. is a Research Scientist and Project Coordinator at EcoHealth Alliance in New York, NY, USA, and a team member of the EcoHealth Alliance collaborative research network in Southeast Asia to study the spillover of viral pathogens from wildlife to humans. Her research interests focus on identifying risk factors for spillover of animal viruses to humans and development of evidence-based strategies to reduce these risks and improve population health.

Dr Linda J. Saif Ph.D. is Distinguished University Professor, Center for Food Animal Health, Departments of Animal Sciences (CFAES, OARDC) and Veterinary Preventive Medicine (CVM), Wooster Ohio, and Co-Director of the Viruses and Emerging Pathogens Program of the Infectious Diseases Institute, The Ohio State University, Columbus, Ohio, USA. Her expertise is in virology, pathogenesis, immunology, and epidemiology of animal coronaviruses resulting in consequential animal diseases and spillovers and spillbacks between animals and humans. She is a member of the U.S. National Academy of Sciences.

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About the Peter Doherty Institute for Infection and Immunity

Finding solutions to prevent, treat and cure infectious diseases and understanding the complexities of the immune system requires innovative approaches and concentrated effort. This is why The University of Melbourne – a world leader in education, teaching and research excellence – and The Royal Melbourne Hospital – an internationally renowned institution providing outstanding care, treatment and medical research – have partnered to create the Peter Doherty Institute for Infection and Immunity (Doherty Institute); a centre of excellence where leading scientists and clinicians collaborate to improve human health globally.

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