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NATIONAL ACADEMIES Sciences Engineering Medicine

Advancing Research Priorities for Highly Pathogenic Avian Influenza H5N1 Through International Collaboration

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Tamiru Alkie is a research scientist at the National Centre for Foreign Animal Disease (NCFAD), CFIA, Winnipeg. He is working on highly pathogenic avian influenza virus, vaccines and pathogenesis in different animal model.

Anna Bellos manages the Emerging Sciences team within the Science and Policy Integration Branch at the Public Health Agency of Canada. She and her team support the Chief Science Officer and PHAC programs to advance federal horizontal science actions, including science leadership and coordination, evidence syntheses, science advice mechanisms and research prioritization toward achieving preparedness and response goals and objectives for emerging public health issues.

Yohannes Berhane is Head of the avian diseases laboratory and WOAH reference laboratory at Canadian Food Inspection Agency (CFIA). His work involves development, harmonization and application of modern diagnostic testing to WOAH standards. His research interest includes pathogenicity, vaccine efficacy testing, disease transmission and infection dynamics studies in relation to the control of avian influenza. He also works on risk assessment of emerging/novel influenza A viruses in different animal models under the "One Health" concept.

Elizabeth Billington, Research Scientist, Animal and Plant Health Agency

Juliette Blais-Savoie is a PhD candidate at the University of Toronto department of Laboratory Medicine and Pathobiology and Sunnybrook Research Institute co-supervised by Dr. Samira Mubareka (LMP/SRI) and Dr. Nicole Mideo (UofT Ecology & Evolutionary Bio). Her thesis focuses on the evolution of seasonal and avian influenza viruses. She is currently investigating how H1N1 seasonal and H5N1 HPAI candidate vaccine viruses evolve in different propagation systems used for vaccine production, as well as environmental contamination and spread of AIVs on poultry farm premises.

Andrew Bowman holds DVM, master's, and Ph.D. degrees from The Ohio State University, where he is a Professor in the Department of Veterinary Preventive Medicine. An expert in viral infectious diseases, veterinary public health, and epidemiology, Dr. Bowman oversees a research team focused on infectious diseases in animal populations. He leads applied field research projects investigating the epidemiology of influenza in animal populations and zoonotic influenza transmission across the animal-human interface.

Rick Bright, Founder, Bright Global Health

Joseph Cavallari joined the CIHR Institute of Infection and Immunity in February 2021 to support the COVID-19 research response, just as the first variants of concern emerged globally. His role has since expanded to include leadership of files such as inflammation, vaccines, the microbiome, and the Research Excellence, Diversity, and Independence (REDI) Early Career Transition Award. Joseph holds a PhD in Biochemistry from McMaster University, where he studied the intersection of microbiology and innate immunity in the context of metabolic disease.

Marisa Creatore is CIHR's Executive Director of the Centre for Research on Pandemic Preparedness and Health Emergencies (CRPPHE). Marisa was held a variety of leadership positions in government, academia and in the private sector. In addition to her current role, this includes being the Associate Scientific Director of the CIHR Institute of Population and Public Health, the inaugural Director of Research and Analytics at BlueDot, a company focused on delivering insights to governments on global infectious disease outbreaks, and various research-management positions at both the Institute for Clinical Evaluative Sciences (ICES) and St. Michael's Hospital in Toronto. She is an epidemiologist by training with a MSc from Queen's University and a PhD from the University of Toronto, where she holds an Assistant Professor status appointment in Epidemiology at the Dalla Lana School of Public Health.

Emily Denstedt is a Canadian veterinarian and the Regional Technical Advisor for the WCS Health Program across Africa (and previously Southeast Asia). Based out of Rwanda, she is supporting projects and partnerships across multiple countries, working at key human-wildlife interfaces and nature strongholds. With a background in One Health, she has extensive experience working on the ground, in communities, and at the frontlines of where wildlife disease outbreaks and spillover events occur.

Meagan Dewar, Federation University Australia

Lori Engler-Todd joined the Government of Canada in 2000 to focus on science policy and has worked on initiatives such as the Canadian Biotechnology Strategy, nanotechnology, bioethics, and infectious disease outbreaks such as Ebola and Zika, among other. Since 2020, Lori has been providing support to Canada's Chief Science Advisor on health science related topics, notably the recently released report entitled "Managing Avian Flu: A science roadmap and action plan", the Chief Science Advisor COVID-19 Expert Panel, and Task Force on Post-COVID-19 Condition.

Ron Fouchier is professor in Molecular Virology at Erasmus MC Rotterdam and deputy head of the Viroscience department. His team contributed substantially to the identification and characterization of various "new" viruses, such as human metapneumovirus, human coronavirus NL63, SARS coronavirus, MERS coronavirus, and influenza A virus subtype H16. Currently, his research is focused on respiratory viruses of humans and animals, antigenic drift, and influenza virus zoonoses, transmission and pandemics.

Alice Fusaro has a master degree in biotechnology for food products (University of Padua, 2006) and a PhD in veterinary sciences (University of Padua, 2014). She is currently a biologist director at the Viral Genomics and Transcriptomics Laboratory. Her current research focuses on the evolutionary genetics of RNA viruses responsible of animal infections, with special emphasis on the major mechanisms of virus evolution, the molecular epidemiology of important emerging pathogens and the roles played by mutations, natural selection, recombination, and gene flow in shaping patterns of genetic diversity on RNA viruses.

Jolene Giacinti (BHSc, DVM, PhD) is a veterinarian and research scientist with Environment and Climate Change Canada, the federal department responsible for migratory bird and species at risk conservation. Her work focuses on wildlife health surveillance, disease ecology, and epidemiology, with an emphasis on emerging zoonotic threats at the human–animal–environment interface. Dr. Giacinti currently serves as a national lead for avian influenza surveillance in wild birds in Canada and plays an active role in interagency coordination, data integration, analysis, and the translation of scientific findings into decision-making contexts.

Murray Gillies, Atlantic Veterinary College

Amy Greer is an Associate Professor in the Department of Biology at Trent University and is an elected member of the College of the Royal Society of Canada. Dr. Greer's research program explores the introduction, spread, dynamics, and control of infectious diseases in populations. Dr. Greer has led and advised on the frontlines of Canadian pandemic preparedness for more than 15 years. She is currently a member of the Board of Directors of the National Collaborating Centre for Infectious Diseases (NCCID) and serves on the National Advisory Committee on Immunization (NACI) - influenza working group.

Jean-Luc Guérin, DVM, PhD, Dipl. ECPVS, is full professor in poultry medicine at the National Veterinary College of Toulouse, France and Director of the "host-pathogens interactions" joint research unit (INRAE-ENVT), in a One Health perspective. His own research is focused on viruses of poultry and mostly, highly pathogenic avian influenza. A priority is the development of innovative approaches of viral detection, including from environmental samples and at the wild birds/poultry interface. Since 2016, his research has been very much directed toward the emergence of H5 HPAI and recently, to the scientific support of the National vaccination plan implemented in France.

Gordon Hickman is head of exotic disease control in Department for Environment, Food and Rural Affairs in UK, where he is responsible for policy and legislation for exotic notifiable diseases of animals, new and emerging animal disease threats and surveillance policy. This includes policy preparedness and response to disease outbreaks such as bluetongue, foot and mouth disease and avian influenza.

Sarah Hill is a Lecturer in Genomics and Infectious Disease at the Royal Veterinary College, UK. Her research investigates the epidemiology and ecology of zoonotic and animal viruses, combining the generation of genomic data with phylodynamic and computational analyses. Her work aims to reconstruct viral outbreak spatiotemporal dynamics and quantify factors that enhance viral spread.

Chelsea Himsworth (DVM, MVetSc, Dipl ACVP PhD) is a veterinary pathologist and epidemiologist who is the Deputy Chief Veterinarian for the Province of British Columbia, Canada, the British Columbia Regional Director for the Canadian Wildlife Health Cooperative, and an Associate Clinical Professor in the School of Population and Public Health at the University of British Columbia. Her research and practice is centered around One Health-based transdisciplinary approaches to the surveillance and management of health issues at the human-animal interface.

Ariful Islam, Epidemiologist, Gulbali Institute, Charles Sturt University

Marcel Klaassen developed broad research interests including theoretical, experimental and observational studies on numerous animal, plant and microbe taxa. Throughout this, his focus has primarily been on migration, population dynamics, nutritional ecology and disease ecology in birds and adopting an integrative approach (e.g. https://hpairisk.deakin.edu.au). Regarding avian influenza, his studies have concentrated on disease dynamics within host communities in contrasting ecological settings (Australia, Bangladesh, Europe, North America; wildlife and wildlife-livestock boundaries).

Keith Klugman, Director, Pneumonia | Bill & Melinda Gates Foundation

Mahesh Kumar began his career with Maine Biological Labs developing vaccines for avian species later moving to Fort Dodge Animal Health, Pfizer and its spinoff Zoetis. He currently serves as the Senior Vice President of Global Biologics R&D responsible for the development of biologics for all species. Over his 35 year career, he has developed several novel vaccines including the first gene deleted bacterial Salmonella and E. coli vaccines. He has developed several low path and high path avian influenza vaccines among others. With a focus on emerging infectious diseases, recent vaccines licensed include one for Covid-19 and now a contemporary HPAI vaccine for chickens and dairy cattle.

Andrew Lang received a BSc (Honours) in Biochemistry from Brock University in 1994 followed by a PhD in Microbiology from the University of British Columbia in 2000. After post-doctoral research positions at UBC and the University of Alaska Fairbanks, they joined the Department of Biology at Memorial University of Newfoundland in 2006. Their research lab studies a variety of topics within microbiology, including studying avian influenza viruses in wildlife.

Jasmina Luczo, CSIRO Australian Centre for Disease Preparedness

Katharine Magor's lab studies innate immune signalling in ducks, the reservoir host of influenza. They focus on RIG-I, and innate immune signalling pathway and inhibition by influenza viral proteins, especially from H5N1 strains in both human and avian cells.

Finlay Maguire is an Assistant Professor jointly appointed in Computer Science and Community Health & Epidemiology at Dalhousie University and the Pathogenomics Bioinformatics Lead for Toronto's Shared Hospital Laboratory. His research primarily focuses on the development and application of novel computational approaches in the genomic epidemiology of antimicrobial resistance and emerging zoonoses across applied clinical and public health contexts.

Angela McLaughlin is a Postdoc studying genetic features associated with H5Nx host specificity, and has recently worked for Environment and Climate Change Canada to evaluate the distribution and determinants of avian influenza virus infections and exposure in wild birds. She completed her PhD in Bioinformatics and MSc in Public Health at University of British Columbia, during which she studied SARS-CoV-2 and HIV-1 transmission and migration dynamics using phylogenetic models to inform interventions' effectiveness.

Christine Middlemiss is the UK's Chief Veterinary Officer, a role she has held since March 1, 2018. In this role she has led the UK's response to multiple Avian Influenza outbreaks, the incursion of Bluetongue Virus and to new diseases when in animals such as Covid-19 and Seneca Valley A, as well as 'older' diseases such as Tuberculosis in cattle and BSE. She represents and provides assurance of the UK's animal health status internationally, opening and maintaining markets for UK goods. Dr Middlemiss is one of the 9 Council members of the World Organisation of Animal Health the 'keeper' on international standards on animal health. She also sits on the Executive Committee of EUFMD, and on the Anti-Microbial Resistance Multi-Stakeholder Partnership Platform Steering Committee, where she leads the One Health Government cluster. She recently Chaired the QUADS Alliance – the Chief Veterinary Officer and animal health forum of US, Canada, Australia and New Zealand.

Samira Mubareka is an Associate Professor at the University of Toronto in the Department of Laboratory Medicine and Pathobiology and a Clinical Scientist at Sunnybrook Health Sciences. She received her MD from Dalhousie University in 1999 and completed her residency in internal medicine from McGill University in 2002. At the University of Manitoba, she obtained a specialty in medical microbiology and infectious diseases and then she began a research fellowship at the Mount Sinai School of Medicine in New York City, where she created new animal models for the influenza virus and first explored the aerobiology of virus transmission. From 2020 to 2022, she was a member of the Ontario COVID-19 Science Advisory Table and worked to isolate the SARS-CoV-2 virus and sequence its genome with other Canadian researchers. Now, in close collaboration with animal health colleagues, Dr. Mubareka has focused on influenza virus and coronaviruses of animal origin through the Emerging Wildlife Pathogens Initiative, ie Wild EPI.

Mitchell Mumby is a Postdoctoral Associate at Western University, where he is developing and characterizing the efficacy of novel compounds aimed at reversing and exposing latently infected cells to immune recognition in people with HIV. He also serves as a project coordinator within the PRECISE initiative – a program designed to establish a rapid response pipeline for emerging pandemics in Canada. Within PRECISE, he is responsible for developing in vitro and in vivo assays to characterize HPAI pathogenicity, virulence, replication dynamics, and tissue tropism.

Martha Nelson is a computational biologist who uses genomic data to study pathogen evolution at the US National Institutes of Health. Her work aims to use advances in next-generation sequencing technologies and Bayesian phylodynamics to understand pathogen evolution at the human-animal interface and prevent future pandemics.

Steve Ostroff retired as Deputy Commissioner for Foods and Veterinary Medicine at the US FDA in 2019. He also served as Acting FDA Commissioner and Chief Scientist. Before joining FDA, he served as Associate Director and Deputy Director of the National Center for Infectious Diseases at the US CDC and the director of the Bureau of Epidemiology at the Pennsylvania Department of Health

Gounalan Pavade, Senior Scientific Coordinator (Avian influenza), WOAH

Daniel R. Perez is a Georgia Research Alliance Distinguished Investigator and the Caswell S. Eidson Chair in Poultry Medicine at the University of Georgia. With over 30 years of experience in virology, his research focuses on influenza and SARS-CoV-2, particularly virus pathogenesis, interspecies transmission, and the development of vaccines and antivirals. He has published over 200 peer-reviewed articles and was elected to the National Academy of Sciences of the United States of America in 2025

Anne Pohlmann is a Senior Scientist at the Institute of Diagnostic Virology at the Friedrich-Loeffler-Institut, the Federal Research Institute for Animal Health in Germany (FLI). Her scientific focus is the analysis of bacterial and viral genomes. At the FLI, she works as Senior Scientist and Biocurator for viral sequences. She is working on new sequencing methods for rapid genetic characterisation of pathogens. She is particularly interested in sequencing and classification of influenza viruses and their molecular epidemiology. She follows outbreaks of highly pathogenic avian influenza in Germany with molecular epidemiological methods and describes the emergence and spread of novel influenza viruses.

Kerry Robinson is Director General of the Centre for Foodborne, Environmental & Zoonotic Infectious Disease at the Public Health Agency of Canada. Her public health public health experience spans One Health infectious disease functions, the COVID-19 public pandemic response, immunization policy and programs, intergovernmental, Indigenous and partner engagement, and chronic disease prevention. Kerry is PhD trained in health research methods and has worked in public health policy, practice, research and management roles at multiple system levels over the last 25 years in Canada.

Nadine Sicard is a public health and preventive medicine physician working at the Public Health Agency of Canada. She is currently a Senior Medical Advisor cross appointed in the Office of the Chief Science Officer and the Centre for Immunization and Surveillance Programs. Her areas of work are mostly focused on seasonal and avian influenza, and scientific preparedness for pathogens of pandemic potential, including influenza A(H5N1) evidence gaps and research priorities.

Anthony Signore, Canadian Science Centre for Human and Animal Health, National Centre for Foreign Animal Disease

Heather Smith, in her current role on the Marine Mammal Science Team at Fisheries and Oceans Canada (DFO) headquarters, identifies and coordinates opportunities for DFO to contribute to HPAI surveillance in marine mammals by leveraging existing field programs. She is a wildlife biologist by training and has conducted research on foraging ecology of belugas, behavioural response of narwhals to shipping traffic, and methods to detect marine mammals at sea.

Clare Stroud, PhD, is Senior Board Director for the Board on Health Sciences Policy at the US National Academies of Sciences, Engineering, and Medicine, where she oversees a program aimed at fostering biomedical and clinical research; addressing the ethical, legal, and social contexts of scientific and technologic advances related to health; and strengthening the preparedness and resilience of communities. Before this, she served as director of the National Academies' Forum on Neuroscience and Nervous System Disorders, which brings together leaders from government, academia, industry, and non-profit organizations. Dr. Stroud received her PhD from the University of Maryland, College Park, and her bachelor's degree from Queen's University in Canada.

Mia Torchetti is the Director of Diagnostic Virology at USDA's National Veterinary Services Laboratories (NVSL). With a veterinary degree and master's in epidemiology from Colorado State University, and PhD and postdoctoral work with ARS in Athens, Georgia, she has both national and international disease and response experience, particularly for avian influenza and Newcastle disease. Since joining NVSL, a national and international reference laboratory for animal influenza and Newcastle disease, there have been ample opportunities to strengthen public and animal health relations and responses including the H5 clade 2.3.4.4 HPAI outbreaks in 2014 and 2022.

Marcela Uhart is a wildlife veterinarian from Argentina focused on the impacts of highly pathogenic avian influenza (HPAI) in wild species in South America and globally. She combines field investigations with international collaboration to address the growing threat of HPAI to wildlife and ecosystems. Uhart serves on the Steering Committee of OFFLU and the WOAH Working Group on Wildlife, and Co-Chairs the IUCN Wildlife Health Specialist Group. Her work takes a One Health approach, emphasizing biodiversity conservation and strengthening global readiness for emerging health threats.

Bryce Warner is a Research Scientist at the Vaccine and Infectious Disease Organization at the University of Saskatchewan and an adjunct professor in the department of Biochemistry, Microbiology, and Immunology. His laboratory studies emerging and re-emerging viruses, with particular focus on high containment respiratory viruses including highly pathogenic avian influenza and Hantaviruses.

Richard Webby received his PhD in virology from the University of Otago, Dunedin New Zealand. He moved to St Jude Children's Research Hospital, Memphis US, in 1999 to work on emerging influenza viruses. Richard has remained at St Jude and is currently a Member in the Department of Host Microbe Interactions where he leads a research program focused on understanding how viruses, particularly influenza viruses, jump between host species and how we can improve our pandemic preparedness and response. He is also the Director of the World Health Organization Collaborating Center for Studies on the Ecology of Influenza and the St Jude Center of Excellence in Influenza Research and Response.

Michelle Wille, Senior Research Fellow, Doherty Institute, The University of Melbourne

Frank Wong is a Senior Research Scientist with the CSIRO Australian Centre for Disease Preparedness (ACDP), where he serves as the science lead for its International Program which supports regional animal health laboratory capacity building, and Emergency Transboundary Animal Disease (ETAD) preparedness and response in Southeast Asian countries and the Indo-Pacific. Frank also contributes to ACDP's national emergency animal disease response activities that advise state and federal government authorities on animal influenza outbreaks in Australia. Frank has served as a WOAH Reference Laboratory Expert for Avian Influenza since 2013; and has been actively involved with OFFLU at both the technical activity and committee levels since 2010.

Yan Zhou is a principal scientist at VIDO. She is a virologist with specialized training in the molecular biology of the influenza virus. Her research investigates the molecular mechanisms behind influenza virus pathogenesis and host adaptation. Her team identifies viral genes linked to disease severity and factors enabling cross-species transmission. They also study how the virus interacts with and evades the host's innate immune system, aiming to uncover insights that support the development of better strategies to combat emerging influenza threats.