

# WOAH Collaborative Centre Reports Activities 2022

## Activities in 2022

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### Centre Information

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<b>Name Director of Institute (Responsible Official):</b>	Trevor Drew - Director Australian Animal Health Laboratory
<b>Name (including Title and Position) of Head of the Collaborating Centre (WOAH Contact Point):</b>	Debbie Eagles - Deputy Director Australian Animal Health Laboratory
<b>Name of the writer:</b>	Debbie Eagles

### TOR1 AND 2: SERVICES PROVIDED

1. Activities as a centre of research, expertise, standardisation and dissemination of techniques within the remit of the mandate given by WOA

Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
	Testing was conducted on surveillance samples from the Australian mainland, Torres Strait Islands, Papua New Guinea,

Northern Australia Surveillance Strategy and Pre-Border Testing	Timor-Leste and Solomon Islands for target diseases – Aujeszky’s Disease, Avian Influenza, Bluetongue, CSF, ASF, Ehrlichia, FMD, Japanese Encephalitis, Murray Valley Encephalitis, Kunjin virus, Lumpy Skin Disease, African Horse Sickness, Newcastle Disease, Nipah, PRRS, TGE, Swine Vesicular Disease, VSV and Surra
Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
Enhanced next-generation surveillance of Bluetongue virus	Development of a Nextstrain-based platform for genome tracking of Australian Bluetongue virus gene segments and application of support vector machine technology to whole genome analyses for improved bluetongue virus characterization and disease risk assessment
Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
African Horse Sickness – identification of potential vectors	Identification of horse feeding Culicoides in Australia and assessment of competency as vectors for AHS
Training, capacity building	
Title of activity	Scope
Lumpy Skin Disease Capacity Building in the LEADDR Network	This project will enable the establishment of first molecular, and later serological, test capability in all interested Laboratories for Emergency Animal Disease Diagnosis and Response (LEADDR) network laboratories.
Training, capacity building	
Title of activity	Scope
LSD Diagnostic support to Timor-Leste	Provision of training and support to develop PCR testing capability for FMD and LSD in Timor-Leste.
Zoonoses	
Title of activity	Scope
Henipavirus genetic diversity	This project will look at the differences between Hendra virus genotypes 1 and 2, and the differences between Nipah virus-Bangladesh and Nipah virus-Malaysia
Zoonoses	
Title of activity	Scope

Research activities on SARS-CoV-2	A suite of activities including pre-clinical vaccine evaluation, assessment of virus survivability on common surfaces, genomics, evaluation of therapeutics and diagnostics, in silico modelling, and diagnostic preparedness
Zoonoses	
Title of activity	Scope
Recombinant tools for investigation of rabies pathogenesis	Produce cell lines and plasmids to generate recombinant rabies virus and proteins suitable to study novel mechanisms associated with rabies pathogenesis in cultures of human and mouse neurons.
Zoonoses	
Title of activity	Scope
Monitoring of avian influenza viruses in Australian avifauna (ongoing)	ACDP functions as the national reference laboratory for the characterization of H5 and H7 avian influenza viruses detected in Australian wild birds by surveillance and tests specimens from unexplained mortalities in wild birds for AI infection. ACDP also performs monitoring and characterization of non-H5/H7 LPAI subtypes from the national avifauna surveillance program.
Avian diseases	
Title of activity	Scope
Genotyping of Australian influenza viruses (ongoing)	Genotyping of Australian influenza viruses (ongoing)
Avian diseases	
Title of activity	Scope
Whole genome sequencing using NGS and genome wide	Whole genome sequencing using NGS and genome wide
Aquatic animal diseases	
Title of activity	Scope
Evaluation of Point of Care (POC) Tests for White Spot Syndrome Virus (WSSV)	To determine the analytical and diagnostic performance characteristics (analytical sensitivity and specificity, diagnostic sensitivity and specificity, repeatability and applicability) of five commercially available WSSV POC test kits for the detection of WSSV in clinically affected prawns
Aquatic animal diseases	
Title of activity	Scope

Determine the susceptibility of <i>P. monodon</i> and <i>P. merguensis</i> to newly identified YHV genotypes	Determine the susceptibility of <i>P. monodon</i> and <i>P. merguensis</i> to newly identified YHV genotypes
Aquatic animal diseases	
Title of activity	Scope
Diagnostic Detection of aquatic pathogens using real-time next generation sequencing	Evaluate the performance of the MinION using existing diagnostic extraction techniques and produce robust methods and protocols for sample preparation, sequencing and data analysis. Compare the applicability of MinION to standard molecular assays for identification of pathogens in diagnostic samples.
Wildlife	
Title of activity	Scope
EID Surveillance Indonesia	Surveillance at livestock-human-wildlife interfaces for diseases of pandemic potential using a targeted and metagenomic next generation sequencing approach.
Diagnosis, biotechnology and laboratory	
Title of activity	Scope
Developing immunohistochemistry test for lumpy skin diseases virus	The project is to develop and characterise an immunohistochemistry (IHC) test for the diagnosis and investigation of lumpy skin disease virus (LSDV), which will allow detection of viral antigen in formalin-fixed tissue.
Diagnosis, biotechnology and laboratory	
Title of activity	Scope
Developing lumpy skin disease and African horse sickness whole genome sequencing workflows	The project will develop robust whole genome sequencing procedures for LSD and AHS. Whole genome sequencing pipelines for LSD and AHS are critically important for rapid and thorough virus characterisation, including assessment of recombination events, differentiation of vaccine and wild-type strains, and to inform phylodynamic assessment of virus transmission pathways.
Diagnosis, biotechnology and laboratory	
Title of activity	Scope
Developing Japanese encephalitis virus whole genome sequencing workflows	Different next generation sequencing methodologies were designed and evaluated for sequencing whole genomes of JEV from clinical materials. These methods underpinned ACDP's role in investigating the molecular epidemiology of JEV during the national response to the JE outbreak.

Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
Molecular epidemiology of the Australian outbreak of Japanese encephalitis virus	A One Health and collaborative approach with public and veterinary health laboratories to undertake comprehensive molecular epidemiology and virus evolution studies using whole genome sequences of JEV detected in animals, mosquitoes and humans during the 2022 outbreak

### TOR3: HARMONISATION OF STANDARDS

2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the main focus area for which you were designated

Proposal title	Scope/Content	Applicable area
To develop validation templates	Hamonization of vailidation and approval of diagnostic tests, including POC, based on WOAHS templates	Laboratory expertise
Interlaboratory comparability testing for OIE ad hoc Group for Tilapia Lake Virus (TiLV)	Through the OIE ad hoc Group for TiLV, organise an interlaboratory comparability trial to provide information to the OIE AAHSC regarding robust diagnostic tests for the detection of TiLV	Laboratory expertise
Diagnostic validation science: a key element for effective detection and control of infectious animal diseases	Review of Chapter 1.1.6	Laboratory expertise

4. Did your Collaborating Centre maintain a network with other WOAHS Collaborating Centres (CC), Reference Laboratories (RL), or organisations designated for the same speciality, to coordinate scientific and technical studies?

No

### TOR4 AND 5: NETWORKING AND COLLABORATION

5. Did your Collaborating Centre maintain a network with other WOAHS Collaborating Centres, Reference laboratories, or organisations in other disciplines, to coordinate scientific and technical studies?

Yes

Name of OIE CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
			To establish and sustain

Global African Swine Fever Disease Research Alliance	Global	Africa Americas Asia and Pasific Europe MiddleEast	global research partnerships that will generate scientific knowledge and tools to contribute to the successful prevention, control and where feasible eradication of ASF
OIE Aquatic Animal Health Standards Commission	Global	Africa Americas Asia and Pasific Europe MiddleEast	Collaboration to ensure the Aquatic animal health code and Manual of Diagnostic Tests for Aquatic Animals reflect current scientific information
Global Foot-and-Mouth Disease Research Alliance	Global	Africa Americas Asia and Pasific Europe MiddleEast	A coordinated global alliance of scientists producing evidence and innovation that enables the progressive control and eradication of FMD
EVAg	Global	Africa Americas Asia and Pasific Europe MiddleEast	A coordinated global network that mobilises expertise in virology to amplify, characterize, standardize, authenticate, distribute, track, collect viruses and derived products
VetBioNet	Global	Africa Americas Asia and Pasific Europe MiddleEast	A network of facilities researching animal and zoonotic diseases in secure facilities. The network aims to standardize protocols, identify best practice and develop new technologies
STAR-IDAZ	Global	Africa Americas Asia and Pasific Europe MiddleEast	The overall objective of the network is to coordinate research at the international level to contribute to new and improved animal health strategies for at least 30 priority diseases/infectious/issues.

## TOR6: EXPERT CONSULTANTS

6. Did your Collaborating Centre place expert consultants at the disposal of WOA?

Yes

NAME OF EXPERT	KIND OF CONSULTANCY	SUBJECT
Professor Trevor Drew	Member	Scientific Committee for Animal Diseases
Professor Trevor Drew	Invited Participant/Member	ASF Reference Laboratory Network Meetings WOAH Standing Group of Experts for African Swine Fever
Dr David Williams	Invited Participant	WOAH Pacific partners meeting
Dr Frank Wong	Invited Participant/Member	OFFLU

## TOR7: SCIENTIFIC AND TECHNICAL TRAINING

7. Did your Collaborating Centre provide advice/services to requests from Members in your main focus area?

Yes

*Member of FAO Emergency Disease Response (LSD) Mission to Pakistan, May 2022*

*Coordinated the delivery of diagnostic reagents (PCR, ELISA and POCTs) for FMD, LSD, ASF and brucellosis to Timor-Leste and PNG. (supported by DAFF)*

*Advice on JEV diagnostic testing (PCR, serology) to the United States of America and United Kingdom.*

*Advice on laboratory and field diagnostics and surveillance for ASF to Hong Kong and Papua New Guinea.*

*Training and SOPs for rapid antigen testing for Samoa and Papua New Guinea.*

8. Did your Collaborating Centre provide scientific and technical training, within the remit of the mandate given by WOA, to personnel from WOA Members?

Yes

a) Technical visit : 5

b) Seminars : 0

c) Hands-on training courses: 163

d) Internships (>1 month) : 0

TYPE OF TECHNICAL TRAINING PROVIDED (A, B, C OR D)	CONTENT	COUNTRY OF ORIGIN OF THE EXPERT(S) PROVIDED WITH TRAINING	NO. PARTICIPANTS FROM THE CORRESPONDING COUNTRY
c) Hands-on training courses	Regional Proficiency Testing Provider Training, 21-25 February 2022 (Virtual)	China, Vietnam, Thailand, Malaysia, South Korea, Japan, Indonesia, India	14

c) Hands-on training courses	NGS Wet-Lab Protocols for RNA (AIV) and DNA (ASF) viruses Workshop, 21-23 March 2022 (Virtual)	Indonesia	13
c) Hands-on training courses	Laboratory Refresher Proficiency Test Workshop, Denpasar, Indonesia 4 – 6 July 2022	Indonesia	20
c) Hands-on training courses	Refresher Proficiency Test Workshop, Yogyakarta, Indonesia, 26-27 July 2022	Indonesia	16
c) Hands-on training courses	Validation and Verification Workshop, Yogyakarta, Indonesia, 12-16 September 2022	Indonesia	22
c) Hands-on training courses	Pathology and Histology Training, Geelong, Australia, 24 October -4 November 2022	Indonesia	2
c) Hands-on training courses	Sequencing and Bioinformatics Training, Geelong, Australia, 24 October -4 November 2022	Indonesia	1
c) Hands-on training courses	Serology Classical Swine Fever (CSF)/Porcine Epidemic Diarrhoea (PEDV)/Porcine Circovirus Type 2 (PCV-2) and Virus Isolation PEDV/PCV2 Training, Geelong, Australia, 7-18 November 2022	Vietnam	4
c) Hands-on training courses	Virus isolation and serology for swine diseases technical training, HCMC, Vietnam, 5-9 December 2022	Vietnam	6
c) Hands-on training courses	Field Diagnostic Training ASF POCTs	Papua New Guinea	25
a) Technical visit	Technical Training on LSD & FMD PCR	Timor-Leste	5
	Practical training for ASF Antigen Rapid Test (virtual), organised by		

c) Hands-on training courses	Pacific Horticultural & Agricultural Market Access Plus Program (PHAMA Plus) and the Pacific Community (SPC)	Samoa	12
c) Hands-on training courses	Veterinary Field Diagnostic Training for ASF, CSF, anthrax, FMD, LSD, AI and NDV (disease, epidemiology, sampling, laboratory and field diagnosis, & post-mortem examination); practical training for ASF rapid antigen test	Papua New Guinea	28

## TOR8: SCIENTIFIC MEETINGS

9. Did your Collaborating Centre organise or participate in the organisation of scientific meetings related to your main focus area on behalf of WOA?H?

Yes

NATIONAL/INTERNATIONAL	TITLE OF EVENT	CO-ORGANISER	DATE (MM/YY)	LOCATION	NO. PARTICIPANTS
International	Regional Network meeting for Poultry and Swine Diseases	WOAH, Australian Department of Agriculture	2022-10-30	Geelong, Australia	100

## TOR9: DATA AND INFORMATION DISSEMINATION

10. Publication and dissemination of any information within the remit of the mandate given by WOA?H that may be useful to Members of WOA?H

a) Articles published in peer-reviewed journals:

1. Au, G.G., Marsh, G.A., McAuley, A.J., Lowther, S., Trinidad, L., Edwards, S., Todd, S., Barr, J., Bruce, M.P., Poole, T.B., Brown, S., Layton, R., Riddell, S., Rowe, B., Soldani, E., Suen, W.W., Bergfeld, J., Bingham, J., Payne, J., Durr, P.A., Drew, T.W., Vasan, S.S., 2022. Characterisation and natural progression of SARS-CoV-2 infection in ferrets. *Sci Rep.* 2022 Apr 5;12(1):5680.
2. Balkema-Buschmann, A., Fischer, K., McNabb, L., Diederich, S., Singanallur, N.B., Ziegler, U., Keil, G.M., Kirkland, P.D., Penning, M., Sadeghi, B., Marsh, G., Barr, J., Colling, A., 2022. Serological Hendra Virus Diagnostics Using an Indirect ELISA-Based DIVA Approach with Recombinant Hendra G and N Proteins. *Microorganisms* 10.
3. Barbosa, A.D., Long, M., Lee, W., Austen, J.M., Cunneen, M., Ratchford, A., Burns, B., Kumarasinghe, P., Ben-Othman, R., Kollmann, T.R., Stewart, C.R., Beaman, M., Parry, R., Hall, R., Tabor, A., O'Donovan, J., Faddy, H.M., Collins, M., Cheng, A.C., Stenos, J., Graves, S., Oskam, C.L., Ryan, U.M., Irwin, P.J., 2022. The Troublesome Ticks Research Protocol: Developing a Comprehensive, Multidiscipline Research Plan for Investigating Human Tick-Associated Disease in Australia. *Pathogens* 11.
4. Barr, J., Boyd, V., Todd, S., Smith, I., Prada, D., O'Dea, M., Jackson, B., Pearce, L., Adams, T.E., Vanderduys, E., Westcott, D., McKeown, A., Baker, M.L., Marsh, G.A., 2022. Detection of filovirus-reactive antibodies in Australian bat species. *J Gen Virol* 103.
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6. Challagulla, A., Shi, S., Nair, K., O'Neil, T.E., Morris, K.R., Wise, T.G., Cahill, D.M., Tizard, M.L., Doran, T.J., Jenkins, K.A., 2022. Marker counter-selection via CRISPR/Cas9 co-targeting for efficient generation of genome edited avian cell lines and germ cells. *Anim Biotechnol* 33, 1235-1245.
7. Challagulla, A., Tizard, M.L., Doran, T.J., Cahill, D.M., Jenkins, K.A., 2022. Harnessing Intronic microRNA Structures to Improve Tolerance and Expression of shRNAs in Animal Cells. *Methods Protoc.* 2022 Feb 10;5(1):18.
8. Chen, Q., Langenbach, S., Li, M., Xia, Y.C., Gao, X., Gartner, M.J., Pharo, E.A., Williams, S.M., Todd, S., Clarke, N., Ranganathan, S., Baker,

- M.L., Subbarao, K., Stewart, A.G., 2022. ACE2 Expression in Organotypic Human Airway Epithelial Cultures and Airway Biopsies. *Front Pharmacol.* 2022 Mar 11;13:813087.
9. Diggles, B.K., Bass, D., Bateman, K.S., Chong, R., Daumich, C., Hawkins, K.A., Hazelgrove, R., Kerr, R., Moody, N.J.G., Ross, S., Stentiford, G.D., 2022. Haplosporidium acetes n. sp. infecting the hepatopancreas of jelly prawns *Acetes sibogae australis* from Moreton Bay, Australia. *J Invertebr Pathol* 190, 107751.
10. Elfekih, S., Metcalfe, S., Walsh, T.K., Cox, T.E., Strive, T., 2022. Genomic insights into a population of introduced European rabbits *Oryctolagus cuniculus* in Australia and the development of genetic resistance to rabbit hemorrhagic disease virus. *Transbound Emerg Dis.* 2022 Mar;69(2):895-902.
11. El-Hage, C., Hartley, C., Savage, C., Watson, J., Gilkerson, J., Paillot, R., 2022. Assessment of Humoral and Long-Term Cell-Mediated Immune Responses to Recombinant Canarypox-Vectored Equine Influenza Virus Vaccination in Horses Using Conventional and Accelerated Regimens Respectively. *Vaccines (Basel)* 10.
12. Farr, R.J., Rootes, C.L., Stenos, J., Foo, C.H., Cowled, C., Stewart, C.R., 2022. Detection of SARS-CoV-2 infection by microRNA profiling of the upper respiratory tract. *PLoS One.* 2022 Apr 5;17(4):e0265670.
13. Fourie, I., Snyman, J., Williams, J., Ismail, A., Jansen van Vuren, P., Venter, M., 2022. Epidemiological and Genomic Characterisation of Middelburg and Sindbis Alphaviruses Identified in Horses with Febrile and Neurological Infections, South Africa (2014–2018). *Viruses* 14.
14. Fourie, I., Williams, J., Ismail, A., Jansen van Vuren, P., Stoltz, A., Venter, M., 2022. Detection and genome characterization of Middelburg virus strains isolated from CSF and whole blood samples of humans with neurological manifestations in South Africa. *PLoS Negl Trop Dis* 16, e0010020.
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16. Gofton, A.W., Blasdel, K.R., Taylor, C., Banks, P.B., Michie, M., Roy-Dufresne, E., Poldy, J., Wang, J., Dunn, M., Tachedjian, M., Smith, I., 2022. Metatranscriptomic profiling reveals diverse tick-borne bacteria, protozoans and viruses in ticks and wildlife from Australia. *Transbound Emerg Dis* 69, e2389-e2407.
17. Goi, J., Koinari, M., Muker, S., Vinit, R., Pomat, W., Williams, D.T., Karl, S., 2022. Comparison of Different Mosquito Traps for Zoonotic Arbovirus Vectors in Papua New Guinea. *Am J Trop Med Hyg.* 2022 Jan 17;106(3):823-827.
18. Horsington, J., Singanallur Balasubramanian, N., Nfon, C.K., Bittner, H., Vosloo, W., 2022. Investigation into the protective ability of monovalent and bivalent A Malaysia 97 and A(22) Iraq 64 vaccine strains against infection with an A/Asia/SEA-97 variant in pigs. *Front Vet Sci* 9, 1027556.
19. Jansen van Vuren, P., McAuley, A.J., Kuiper, M.J., Singanallur, N.B., Bruce, M.P., Riddell, S., Goldie, S., Mangalaganesh, S., Chahal, S., Drew, T.W., Blasdel, K.R., Tachedjian, M., Caly, L., Druce, J.D., Ahmed, S., Khan, M.S., Malladi, S.K., Singh, R., Pandey, S., Varadarajan, R., Vasan, S.S., 2022. Highly Thermotolerant SARS-CoV-2 Vaccine Elicits Neutralising Antibodies against Delta and Omicron in Mice. *Viruses.* 2022 Apr 13;14(4):800.
20. Jansen van Vuren, P., Singanallur, N.B., Keck, H., Eschbaumer, M., Vosloo, W., 2022. Chemical inactivation of foot-and-mouth disease virus in bovine tongue epithelium for safe transport and downstream processing. *J Virol Methods.* 2022 Jul;305:114539.
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30. Manyweathers, J., Hayes, L., Xie, G., Gardner, H., Maru, Y., Woodgate, R., Hernandez-Jover, M., 2022. On-farm evaluation of a predictive model for Australian beef and sheep producers' vulnerability to an outbreak of foot and mouth disease. *Prev Vet Med* 204, 105656.
31. Marsh, G.A., McAuley, A.J., Brown, S., Pharo, E.A., Cramer, S., Au, G.G., Baker, M.L., Barr, J.A., Bergfeld, J., Bruce, M.P., Burkett, K., Durr, P.A., Holmes, C., Izzard, L., Layton, R., Lowther, S., Neave, M.J., Poole, T., Riddell, S.J., Rowe, B., Soldani, E., Stevens, V., Suen, W.W., Sundaramoorthy, V., Tachedjian, M., Todd, S., Trinidad, L., Williams, S.M., Druce, J.D., Drew, T.W., Vasan, S.S., 2022. In vitro characterisation of SARS-CoV-2 and susceptibility of domestic ferrets (*Mustela putorius furo*). *Transbound Emerg Dis*. 2022 Mar;69(2):297-307.
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b) International conferences:

1. Durr, P.A. and Graham, K. "Big challenges with using Big data for animal health surveillance". 4th International Conference on Animal Health Surveillance; 3-5 May 2022, Copenhagen, Denmark,
2. Williams, David. "Arbovirus Surveillance in Australia: Pivoting to JEV" The symposium Japanese Encephalitis Virus: Emerging Global Threat to Humans & Livestock; October 17th – 19th 2022; University of Georgia, USA; Delivered online.
3. Williams, David. Combatting African swine fever in the Pacific. In: 6th Congress of The European Association of Veterinary Laboratory Diagnosticians (EAVLD) 24-26 Oct 2022; Seville Spain; Delivered online
4. Stanger, Kelly. Lumpy Skin Disease - The Australian perspective. LSD workshop (Bill and Melinda Gates Foundation and GALVMed sponsored event); 17 Nov 2022; Dubai UAE
5. Singanallur Balasubramani, Nagendra. "WO(AH)W Gold is not precious anymore in diagnostic test development". In: Global Foot and Mouth Disease Research Alliance (GFRA) Webinar Series: 28 Sep 2022; Online Webinar
6. Singanallur Balasubramani, Nagendra. "Biosafety Measures for the Transport of Dangerous Biological Goods." In: Biorisk Management Workshop for Research Institutions with BSL-3 Laboratories; 19-20 Nov 2022, India, Delivered online.
7. Singanallur Balasubramani, Nagendra. CSIRO - Update and Vaccine efficacy studies. In: WOA/FAO FMD Reference Laboratories Network Annual Meeting; 29 Nov 2022 - 01 Dec 2022; Wageningen BioVeterinary Research, Lelystad, The Netherlands.
8. Moody, Nick. Preparing for transboundary aquatic animal diseases: The importance of appropriately evaluated and validated diagnostic assays and establishing effective laboratory networks. In: 14th Aquaculture Association of Southern Africa Conference, Keynote address; 11-14 Jul 2022; Stellenbosch University, South Africa. Delivered Online.
9. Riddell, Shane. SARS-CoV-2 decontamination - is it plane and simple? In: Swiss Biosafety Network 16th Applied Biosafety Meeting; 25-26 August 2022. Geneva, Switzerland
10. Vasan, Vasan. Some Perspectives on Data Science and Coronaviruses. In: FDA professional development webinar; 09 Jun 2022 USA Online Webinar
11. Waugh, Caryll. Proficiency testing and its role in supporting laboratory capability. In: WOA/Regional Expert Group meeting for diseases of poultry in Asian and Pacific region; 31 Oct 2022 - 2 Nov 2022; Geelong Australia.
12. Coggon, Amelia and Wong, Frank. OFFLU contributions to WHO VCM on zoonotic influenza. In: WOA/Regional Expert Group meeting for diseases of poultry in Asian and Pacific region; 31 Oct 2022 - 2 Nov 2022; Geelong Australia.
13. Wong Frank, Pavade Gounalan, and Coggon Amelia. Overview of the global and regional networks, data bases and information sharing platforms, including WAHIS and OFFLU. In: WOA/Regional Expert Group meeting for diseases of poultry in Asian and Pacific region; 31 Oct 2022 - 2 Nov 2022; Geelong Australia.
14. Singanallur Balasubramani, Nagendra. Validation principals for new tests and technologies. In: WOA/Regional Expert Group meeting for diseases of poultry in Asian and Pacific region; 31 Oct 2022 - 2 Nov 2022; Geelong Australia.
15. Williams, David. PoC testing guide. WOA/Regional Laboratory Expert Meeting for African Swine Fever in Asia & the Pacific; 02 -04 Nov 2022; Geelong Australia.
16. Williams, David. Updating the Asia-Pacific laboratory algorithm. WOA/Regional Laboratory Expert Meeting for African Swine Fever in Asia & the Pacific; 02 -04 Nov 2022; Geelong Australia.
17. Neave, Matthew. African swine fever virus: Genomics and sequencing. In: WOA/Regional Laboratory Expert Meeting for African Swine Fever in Asia & the Pacific; 02 -04 Nov 2022; Geelong Australia.
18. Au, Gough. Characterisation of SARS-CoV-2 delta variant infection in a human ACE2 knock-in mouse model. In: CSIRO-FDA-UK-ICN Cutting Edge Virtual Symposium on Coronaviruses with "Disease X" Potential; 28-30 Sep 2022; Delivered Online.
19. Pharo, Elizabeth. Using ex vivo human lung models to characterise the innate immune responses of normal, asthma and COPD

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20. Paulley, J.T. *Balancing the Ongoing Operation of an Ageing Biocontainment Facility with Increasing Regulatory Oversight and Evolving Standards*. In: *BSL4ZNet International Conference Session 2*; 16 Sep 2022; Online webinar.
  21. Howard, Rod. *Preparing for the ACDP Part Life Refit*. *International Veterinary Biosafety Workgroup Webinar*; 21-22 Sep 2022; Online Webinar
  22. Williams, David. *ACIAR One Health Surveillance project overview*. *LabCap PNG Project Launch and Inception Workshop*; 29-30 Mar 2022; Papua New Guinea
  23. Williams, David. *LabCap Project Objectives*. In: *PNG Project Launch and Inception Workshop*; 29-30 Mar 2022; Papua New Guinea.
  24. Williams, David. *Update on capacity building activities in the region*. In: *OIE Pacific Partners Meeting*; 31 May 2022; Delivered Online.
  25. Newberry, Kim. *User beware: Is your diagnostic test fit for its intended purpose*. In: *2022 NRL Asian Summit*; 23-24 May 2022; Delivered Online.
  26. Drew, Trevor W. *HP PRRS*. In: *BaseCamp Asia Training Programme, Boehringer Ingelheim GmbH*. Manila, Philippines, 13-24 March 2022; Delivered Online.
  27. Drew, Trevor W. *Aujeszky's disease*. In: *Base Camp Asia Training Programme, Boehringer Ingelheim GmbH*. Manila, Philippines, 13-24 March 2022; Delivered Online.
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  29. Drew, Trevor W. *Foot & mouth disease in pigs*. In: *BaseCamp Asia Training Programme, Boehringer Ingelheim GmbH*. Manila, Philippines, 13-24 March 2022; Delivered Online.
  30. Drew, Trevor W. *African swine fever*. In: *BaseCamp Asia Training Programme, Boehringer Ingelheim GmbH*. Manila Philippines, 13-24 March 2022; Delivered Online.
  31. Drew, Trevor W. *Disease emergence – the drivers and the dogma*. In: *BSL4ZNet Cutting Edge Symposium on Coronaviruses with Disease X potential*. 27-30 September 2022; Delivered Online.
  32. Drew, Trevor W. *Dual use and gain of function: The responsibilities of scientists and institutions*. In: *BSL4Znet International Conference Session 4 – Advances in Biosafety, Biosecurity & Surveillance*. 14 October 2022; Delivered Online.
  33. Eagles, D. *The Importance of a One Health Approach to Preparedness and Response*. In: *ASEAN Defence Ministers' Meeting – Plus Chemical, Biological and Radiological (CBR) Conference*, 12 October 2022.
  34. Wong, Frank. *Genetic and antigenic diversity of H5 and H9 viruses*. In: *Influenza Virus Monitoring Coordination and Management Meeting, FAO-ECTAD and Government of Indonesia Directorate-General Livestock and Animal Health Services (DGLAHS), Jakarta, Indonesia*. 24-25 January 2022; Delivered Online.
  35. Wong, Frank. *PCR related activities in OFFLU 2021/22*. In: *12th WHO Working Group Meeting for the Molecular Detection and Subtyping of Influenza Viruses and the use of Next Generation Sequencing (NGS) in GISRS*. Istanbul, Turkey, 13-15 June 2022; Delivered Online.
  36. Wong, Frank. *Swine Influenza Overview Australia*. In: *OFFLU Swine Influenza Virus Technical Activity Meeting*. World Organization for Animal Health, Paris, France, 16 June 2022; Delivered Online.
  37. Wong, Frank. *Australia country report on avian influenza and update on OFFLU technical activities*. In: *WOAH Subregional Meeting on Avian Diseases in Southeast Asia*. Tokyo, Japan, 18 July 2022; Delivered Online.
  38. Wong, Frank. *Overview of OFFLU avian influenza technical activities 2021/2022*. In: *ASEAN One Health Bioinformatics Training Workshop for ASEAN and ZDAP Countries*. FAO, SMART-ASEAN and Government of Indonesia Directorate-General Livestock and Animal Health Services (DGLAHS), 22-26 August 2022, Yogyakarta, Indonesia.
  39. Wong, Frank. *Update on Avian influenza in Australia*. In: *WOAH Regional Expert Group meeting for diseases of poultry in Asian and Pacific region*; 31 Oct 2022 - 2 Nov 2022; Geelong, Australia.
  40. Amelia Coggon and Wong, Frank. *Overview of the OFFLU Avian Influenza Matching (AIM) activity*. In: *FAO Regional Consultation on Avian Influenza Surveillance in Asia*; 02-04 November 2022; Geelong, Australia.

c) National conferences:

1. Singanallur Balasubramani, Nagendra. *'Systems approaches' in studying host-pathogen interactions*. In: *The Australasian Society for Microbiology – Veterinary Microbiology special interest group*; 06 Sep 2022; Online Webinar.
2. Jansen van Vuren, Petrus. *Developing a 'warm' vaccine to combat SARS-CoV-2 variants of concern and address inequity*. In: *9th Australasian Vaccines & Immunotherapeutics Development (AVID) Meeting*; 01-04 Apr 2022; Kingscliff, NSW

3. Edwards, Sarah. *Preclinical evaluation at high containment*. In: *9th Australasian Vaccines & Immunotherapeutics Development (AVID) Meeting*; 01-04 Apr 2022; Kingscliff, NSW
4. Magor, Joshua; *Directional Airflow Versus Differential Pressures – A cautionary tale of misdirection*. In: *Association of Biosafety for Australia and New Zealand (ABSANZ)*; 29 Jun 2022 - 01 Jul 2022; Adelaide SA.
5. Moody, Nick. *Regulatory compliance – a science perspective*. In: *Association of Biosafety for Australia and New Zealand (ABSANZ)*; 29 Jun 2022 - 01 Jul 2022; Adelaide SA.
6. Paulley, J.T. *40 Years in the Making; ACDP's Purpose Built Biocontainment Facility and Lumpy Skin Disease Virus*. In: *Association of Biosafety for Australia and New Zealand (ABSANZ) Annual General Meeting*. 9 Nov 2022; Presented Online.
7. Taylor, Grace. *Establishing a husbandry model for the common ring tail possum*. In: *Australian New Zealand Laboratory Animal Association (ANZLAA)*; 21-23 Sep 2022; Campbelltown, Sydney, NSW.
8. Soldani, Elisha. *COVID Transmission in Ferrets Conducted at BSL4*. In: *Australian New Zealand Laboratory Animal Association (ANZLAA)*; 21-23 Sep 2022; Campbelltown, Sydney, NSW.
9. Jansen van Vuren, Petrus. *Novel molecular platforms for animal disease diagnosis and surveillance*. In: *Australian Pig Veterinarian Conference*; 08-09 Sep 2022; Geelong Novotel.
10. Sunarto, Agus. *Fish Viruses: Friend or Foe?* In: *Royal Society of Victoria*, Melbourne 16 Sep 2022; Melbourne VIC.
11. Sunarto, Agus. *Tilapia Biocontrol: Bioprospecting and Evaluation*. In: *Centre for Invasive Species Solutions (CISS) conference "CISS Celebrations"*; 25-26th October 2022; Canberra ACT.
12. Grimaldi, Sheree. *Non-surgical and reversible chemical castration to control oestrous and behavioural adversities in ferret colonies*. In: *Australian New Zealand Laboratory Animal Association (ANZLAA)*; 21-23 Sep 2022; Campbelltown, Sydney, NSW.
13. Waugh, Caryll. *Proficiency testing and its role in supporting laboratory capability*. In: *DAFF Chief Veterinary Office Forum*; 19 Aug 2022; Online Webinar
14. Waugh, Caryll. *PT and collaboration in supporting laboratory capability and FMD preparedness*. In *Thermo-Fisher APJ (Asia Pacific Japan) Animal Health*; 15 Nov 2022; Online Webinar.
15. McNabb, Leanne; Di Rubbo, Antonio; Cooke, Julie; Bowden, Tim. *An IgM antibody capture ELISA for Japanese Encephalitis virus (JEV) in horses*. In: *Australian Association of Veterinary Laboratory Diagnosticians Conference (AAVLD)*; 17-18 Nov 2022; Launceston, Tasmania. Peter Kirkland; 2022.
16. Reeves, Andrea. *Diagnosis of Bovine Tuberculosis in the laboratory at CSIRO-ACDP*. In: *Australian Association of Veterinary Laboratory Diagnosticians Conference (AAVLD)*; 17-18 Oct 2022; Launceston TAS.
17. Giles, Michelle. *Verification of an African Horse Sickness (AHS) Commercial ELISA for AHS Group Antibody Detection*. In: *Australian Association of Veterinary Laboratory Diagnosticians Conference (AAVLD)*; 17-18 Oct 2022; Launceston TAS.
18. Di Rubbo Antonio. *A Simplified Approach to Serodiagnosis of Zoonotic Flaviviruses*. In: *Australian Association of Veterinary Laboratory Diagnosis (AAVLD)*; 17-18 Oct 2022; Launceston TAS.
19. Klein, Reuben. *mRNA-specific real-time PCR detection of Cyprinid Herpesvirus 3*; In: *Australian Association of Veterinary Laboratory Diagnosis (AAVLD)*; 17-18 Oct 2022; Launceston TAS.
20. Lynch, Stacey *African swine fever virus preparedness: Verifying sample collection workflows and establishing virus isolation methods*. In: *Australian Association of Veterinary Laboratory Diagnosis (AAVLD)*; 17-18 Oct 2022; Launceston TAS.
21. Barr, Jenn. *Detection of filovirus reactive antibodies in Australian bat species*. In: *Australasian Virology Society AVS11 2022 Meeting*; 05-08 Dec 2022; Gold Coast QLD.
22. Edwards, Sarah. *Neuropathogenesis: Mousing around with the henipaviruses*. In: *Australasian Virology Society AVS11 2022 Meeting*; 05-08 Dec 2022; Gold Coast QLD.
23. Donnelly, Camilla. *Structural characterisation of the lyssavirus NOP complex reveals a highly conserved interface*. *Australasian Virology Society AVS11 2022 Meeting*; 05-08 Dec 2022; Gold Coast QLD.
24. Ford, Mark. *Diagnostic Sampling and Testing*. *Emergency Animal Diseases (EAD) conference organised by the Australian Cattle Veterinarians branch of the Australian Veterinary Association*; 01 Dec 2022; Canberra ACT.
25. Lopez-Denman, Adam. *REAPER: mosquito in vivo virus targeting to control viral transmission*. *Victorian infection and immunity network symposium*; 16 Nov 2022; Monash Institute of Pharmaceutical Sciences (MIPS) VIC.
26. Klein, Reuben. *Establishing test capability for Panulirus argus 1 (PaV1)*. *Aquatic Animal Health Technical Health Forum*; 17 Nov 2022; Online Webinar.
27. Williams, David. *Japanese encephalitis Outbreak in Australia 2022*. In: *2nd Australian Biosecurity Symposium*; 03-05 May 2022, Gold Coast QLD.
28. Williams, David. *JEV Monitoring and Surveillance: mosquitoes and vertebrate hosts*. *CSIRO Health and Biosecurity Japanese encephalitis workshop*; 20 Apr 2022; Geelong VIC.
29. Williams, David. *JEV in Australia*. In: *CSIRO Health and Biosecurity Japanese encephalitis workshop*; 20 Apr 2022; Geelong VIC.

30. Lynch, Stacey. *The African swine fever pandemic: on our doorstep needing vaccine solutions*. In: *Australian Society Immunology: Wild and Comparative Immunology Special Interest Group*; 28th Nov 2022. The University of Melbourne VIC.
31. Eagles, D. *Future Focused: How science and technology are paving the way forward*. Keynote Presentation. In: *2nd Australian Biosecurity Symposium*; 03-05 May 2022, Gold Coast QLD.
32. Eagles, D. *Henipavirus Outbreak Investigation in the Philippines – Perspectives from the Field and the Laboratory*. In: *Foreign Animal Disease and Outbreak Preparedness Workshop*, 20 May 2022; Sydney NSW.
33. Wong, Frank. *Avian influenza outbreak in Victoria 2020: Virus genome characterisation and government and industry consultation*. In: *Animal Pathology Standards Program (AAPSP) and Australian Society for Veterinary Pathology (ASVP) Foreign Animal Disease and Outbreak Preparedness Workshop. Davis-Thompson Foundation Webinar Series*, 19 May 2022; Delivered Online.

d) Other (Provide website address or link to appropriate information):

#### Reports

1. David Williams *A one health approach to establish surveillance strategies for Japanese encephalitis and zoonotic arboviruses in Papua New Guinea*. Australian Centre for International Agricultural Research (ACIAR) 02 Nov 2022 FR2022-025 ISBN 978-1-922787-45-3

#### Poster Presentations

1. Edwards, Sarah. *Preclinical evaluation at high containment*. In: *9th Australasian Vaccines & Immunotherapeutics Development Meeting*; 01-04 Apr 2022; Kingscliff, NSW
2. Donnelly, Camilla. *Structural characterisation of the lyssavirus NOP complex reveals a highly conserved interface*. *Australasian Virology Society AVS11 2022 Meeting*; 05-08 Dec 2022; Gold Coast QLD.
3. Edwards, Sarah. *Neuropathogenesis and the mouse model of henipavirus infection*. In: *Australasian Virology Society AVS11 2022 Meeting*; 05-08 Dec 2022; Gold Coast QLD.
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11. What have you done in the past year to advance your area of focus, e.g. updated technology?

ACDP has an annual capital expenditure budget, which is used to purchase the latest models of new scientific equipment. In 2022 this included improvements to PCR and Sequencing capability and Microscopy & Slide Imaging Equipment.

12. Additional comments regarding your report: