OIE Collaborating Centres Reports Activities

Activities in 2018

This report has been submitted : 2019-01-16 08:18:44

Title of collaborating centre:	Diagnostic Test Validation Science in the Asia-Pacific Region
Address of Collaborating Centre:	Australian Animal Health Laboratory, CSIRO 5 Portarlington Road Newcomb, Victoria 3219 AUSTRALIA
Tel.:	+61-3 5227 5000
Fax:	+61-3 5227 5555
E-mail address:	axel.colling@csiro.au
Website:	www.csiro.au/en/research/facilities/aahl
Name of Director of Institute (Responsible Official):	Prof. Trevor Drew, Director
Name (including Title and Position) of Head of the Collaborating Centre (formally OIE Contact Point):	Dr Axel Colling, Veterinary Diagnostic Scientist
Name of writer:	Dr Axel Colling

ToR: To provide services to the OIE, in particular within the region, in the designated specialty, in support of the implementation of OIE policies and, where required, seek for collaboration with OIE Reference Laboratories

ToR: To identify and maintain existing expertise, in particular within its region

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

Other (Name the category)	
Title of activity	**Scope**
Collaborative Centre for diagnostic test validation science Asia Pacific.	The Collaborative Centre is an international, scientific consortium consisting of AAHL, University of Melbourne and EpiCentre, Massey University, New Zealand that combines expertise in diagnostic testing, epidemiology, statistics and modelling.
International collaboration and networking through scientific visits.	- Dr Ian Gardner (UPEI, Canada) visited AAHL twice in 2018 to interact with the DSR group on test validation in both aquatic and terrestrial animals and discussions with University of Melbourne collaborators (Drs. Firestone and Stevenson)

International harmonization of diagnostic test validation.	-National workshop for diagnostic test validation at the National Institute of Animal Health (NIAH as part of OIE Twinning project AAHL – Thailand. (>39 participants, 3 instructors AAHL, Bangkok 11 to 16 June 2018) -Ongoing participation in research coordination project on early detection of transboundary animal diseases to facilitate prevention and control through a veterinary diagnostic laboratory network, (Vetlab Joint FAO IAEA, Vienna). Production of reference standards, proficiency testing, establishing quality systems. (35+ international participants and agreement holders, Vienna - Austria, 3 to 17 August 2018. -10th National Conference on Veterinary Diagnosis, Brazilian College of Animal Pathology 1 - 4 October, 2018, Recife, Brazil. Introduce OIE principles and methods for diagnostic test validation. -Post ISVEE workshop: “Interpretation and Validation of Diagnostic Tests in Veterinary Science”, Chiang Mai Thailand, 17 to 19 November 2018 (25 participants from 12 countries, 6 instructors from CC). -New Zealand Ministry of Primary Industries (12 participants): Epidemiology Professional Development Pilot training online course, June-Dec 2018, including specific components on diagnostic test interpretation and validation science.

ToR : To propose or develop methods and procedures that facilitate harmonisation of international standards and guidelines applicable to the designated specialty

2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the surveillance and control of animal diseases, food safety or animal welfare

Proposal title	Scope/Content	Applicable area

OIE electronic ad hoc group for development and validation of diagnostic tests for TiLV	To coordinate the development and validation of molecular tests for the diagnosis of TiLV by obtaining isolates and producing reference material for the comparison of suitable tests and interlaboratory comparison studies.	☒Surveillance and control of animal diseases ☐Food safety ☐Animal welfare
Diagnostic Validation Science: a key element for effective detection and control of infectious animal diseases	Co-ordination of a series of papers about test validation science for a special issue of the OIE Scientific and Technical Review scheduled for 2021.	☒Surveillance and control of animal diseases ☐Food safety ☐Animal welfare
Special Issue in Preventive Veterinary Medicine	Design, statistical analysis and reporting standards for test accuracy studies for infectious diseases in animals: progress, challenges and recommendations.	☒Surveillance and control of animal diseases ☐Food safety ☐Animal welfare
Special Issue in Journal of Veterinary Diagnostic Investigations	Diagnostic sensitivity and specificity of tests for infectious diseases in wild mammals: review of published validation studies and recommendations for design, analysis and reporting improvements.	☒Surveillance and control of animal diseases ☐Food safety ☐Animal welfare
"Epi in the valley", 18-22 March 2019, Melbourne	Workshop about interpretation and validation of diagnostic tests in the absence of a perfect reference standard	☒Surveillance and control of animal diseases ☐Food safety ☐Animal welfare

ToR: To establish and maintain a network with other OIE Collaborating Centres designated for the same specialty, and should the need arise, with Collaborating Centres in other disciplines

ToR: To carry out and/or coordinate scientific and technical studies in collaboration with other centres, laboratories or organisations

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

Yes

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

The CC is an international scientific consortium consisting of AAHL, Uni Melbourne and EpiCentre at Massey University, NZ and combines expertise in diagnostic testing, epidemiology, statistics and modelling	Geelong, Melbourne, Palmerston North	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	The Centre’s mission is to generate new knowledge and techniques that improve the use and interpretation of diagnostic tests used in human and animal health and to promote dissemination of that knowledge to the wider medical and veterinary communities
Faculty of Veterinary and Agricultural Sciences (FVAS), The University of Melbourne URL: http://fvas.unimelb.edu.au	Melbourne	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Veterinary epidemiology, modelling and test validation
EpiCentre, Institute of Veterinary and Biomedical Sciences, Massey University URL: http://epicentre.massey.ac.nz	Palmerston North	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Veterinary epidemiology, statistics and test validation
ELISA and Molecular Techniques in Animal Disease Diagnosis FAO/IAEA Animal Production and Health Laboratory, Animal Production and Health Laboratory, Agriculture and Biotechnology Laboratory, IAEA Laboratories	Vienna	☒Africa ☒Americas ☒Asia and Pacific ☒Europe ☒Middle East	Development and validation of diagnostic tests, reference material and proficiency testing (Vetlab)
Canada Excellence Research Chair - Aquatic Epidemiology Atlantic Veterinary College	Charlottetwon	☐Africa ☒Americas ☒Asia and Pacific ☐Europe ☐Middle East	Development and validation of diagnostic tests and epidemiology of infectious aquatic diseases

Friedrich Loffler Institute (FLI)	Insel Riems	☒Africa ☒Americas ☒Asia and Pacific ☒Europe ☒Middle East	Development and validation of diagnostic tests and epidemiology of infectious diseases
National Institute of Animal Health (NIAH), Japan	Tsukuba, Ibaraki, Prefecture, Japan	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Diagnosis and epidemiology of foot and mouth disease virus based on genome sequencing data
Ministry for Primary Industries, New Zealand	Upper Hutt, New Zealand	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Diagnosis and epidemiology of Q fever and Mycobacterium bovis
The University of Queensland, School of Veterinary Science	The University of Queensland, Gatton Campus, Australia	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Diagnosis and epidemiology of Q fever and Mycobacterium bovis
Australian Rickettsial Reference Laboratory	Barwon Health, Geelong, Australia	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Diagnosis and epidemiology of Q fever
Agriculture Victoria	Attwood, Victoria, Australia	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Specificity of a loop-mediated isothermal amplification (LAMP) test for foot and mouth disease virus
New Zealand Ministry of Primary Industries	Ministry of Primary Industries, NZ	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Mycoplasma bovis Transmission Network Modelling

New Zealand Ministry of Primary Industries	Ministry of Primary Industries, NZ	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Mycoplasma bovis Technical Advisory Group
Queensland Department of Agriculture and Fisheries	Department of Agriculture and Fisheries, Queensland, Australia	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Epidemiology Review of the White Spot Disease incursion in South East Queensland
Department of Agriculture and Water Resources	Canberra, Australia	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Emergency Animal Diseases training materials for veterinarians
Victorian Department of Health and Human Services	Victoria, Australia	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Ross River virus risk prediction modelling
New Zealand Ministry of Primary Industries	New Zealand	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Epidemiology Professional Development Pilot training course

Determine performance characteristics for diagnostic tests used for Northern Australia Surveillance Strategy	Australia	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Testing was conducted on surveillance samples from the Australian mainland, , Torres Strait Islands, Papua New Guinea and Timor-Leste for target diseases – Aujeszky's, Avian Influenza, Bluetongue, Classical Swine Fever, African Swine Fever, Ehrlichia, Foot-and- mouth disease, Infectious Bursal Disease, Japanese encephalitis, Newcastle Disease, Nipah, Porcine Reproductive and Respiratory Syndrome, Rabies, Surra, Brucella, Avian Metapneumovirus and Transmissible Gastroenteritis.Samples were submitted from pigs, cattle, water buffalo, sheep, goats, poultry, wild birds and dogs.
Rapid detection and epidemiology surveillance of African Swine Fever using oral fluid	Australia US	☐Africa ☒Americas ☒Asia and Pacific ☐Europe ☐Middle East	A partnership with Kansas State University to compare the diagnostic performance of available ASFV RT-PCR and ELISAs, including commercial kits. Compare diagnostic performance as a function of the diagnostic specimen tested. The findings will guide sample selection under specific testing circumstances

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

No

ToR: To place expert consultants at the disposal of the OIE.

5. Did your Collaborating Centre place expert consultants at the disposal of the OIE?

Yes

Name of expert	Kind of consultancy	Subject
Axel Colling	Chair of ad hoc group for registration of a diagnostic kit	FMD NSP ELISA kit
Axel Colling	Chair of ad hoc group to assess a dossier for the application of a diagnostic kit	Check&Trace test for Salmonella

Axel Colling	Chair of ad hoc group to assess a dossier for the application of a diagnostic kit	Salmonella abortusovis antibody ELISA
Axel Colling	Chair of ad hoc group to assess a dossier for the application of a diagnostic kit	Bovine TB ELISA
Axel Colling	Chair of electronic ad hoc group on Tilapia lake virus (8 experts)	The OIE electronic ad hoc Group on tilapia lake virus (TiLV) evaluates published and unpublished methods for detection of TiLV, describes the level of validation of each method and determines additional validation requirements, recommends any additional assays that may need to be developed and facilitates the sourcing and distribution of well-characterised positive control material for method evaluation, implementation and inter-laboratory comparability studies
Axel Colling	Chair of ad hoc group	Develop a roadmap for international validation of a serological test and test algorithms for glanders
Ian Gardner and Nick Moody	OIE expert consultation meeting on aquatic animal disease diagnosis in Bangkok, Thailand on November 15-16 2018	OIE expert consultation meeting on aquatic animal disease diagnosis

ToR: To provide, within the designated specialty, scientific and technical training to personnel from OIE Member Countries

6. Did your Collaborating Centre provide scientific and technical training, within the remit of the mandate given by the OIE, to personnel from OIE Member Countries?

Yes
a) Technical visits: 2
b) Seminars: 3
c) Hands-on training courses: 5
d) Internships (>1 month): 4

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
b	Diagnostic test validation at AAHL	Australia	30

c	2-days national workshop for diagnostic test validation at the National Institute of Animal Health (NIAH), Bangkok as part of OIE Twinning project AAHL – Thailand	Thailand	39
c	3-days Post ISVEE international workshop: “Interpretation and Validation of Diagnostic Tests in Veterinary Science”, Chiang Mai Thailand	12 countries Australia, Brazil, Canada, China, Denmark, France, Myanmar, New Zealand, Rwanda, Thailand, UAE, USA	25
d	4+ internships at AAHL, data analysis and test validation (one week each)	Australia and trainees from overseas	4
c	New Zealand Ministry of Primary Industries: Epidemiology Professional Development Pilot training online course, June-Dec 2018, including specific components on diagnostic test interpretation and validation science.	New Zealand	12
a	Field and laboratory visit AAHL (Bovine brucellosis, diagnosis and epidemiology)	Korea	3
a	Chilean Ministry of Public Health - Delegation for Q Fever outbreak response capacity development including diagnostic test interpretation	Chile	3
c	Epidemiology Professional Development Pilot training online course: diagnostic test interpretation and validation science	New Zealand	12
c	Selection and interpretation of lab tests in outbreaks (Master course vet public health, Uni Melbourne/AAHL)	Australia and overseas	27
d	Highly pathogenic avian influenza spatiotemporal and phylogenetic/phylodynamic analysis from Vietnam, Uni Melbourne/AAHL)	Vietnam	1
b	Dr Nguyen Thanh Lam, Dr Simon Firestone, Prof Mark Stevenson: WHO Collaborating Centre for Reference and Research on Influenza (VIDRL, Melbourne)	Australia	20
b	One-day workshop (September 2) on diagnostic test validation at the 8th International Symposium on Aquatic Animal Health in Charlottetown, Prince Edward Island	Canada	20
d	Evaluation and comparison of 4 PCRs for infection with RSIV (Red seabream Iridovirus) and Megalocitivirus for use in preclinical animals.	Japan	1
d	Development and validation of 2 PCRs for detection of Ostreid herpes virus type 1) OHSV1 in apparently healthy animals	Australia	1

ToR: To organise and participate in scientific meetings and other activities on behalf of the OIE

7. Did your Collaborating Centre organise or participate in the organisation of scientific meetings on behalf of the OIE?

Yes

National/International	Title of event	Co-organiser	Date (mm/yy)	Location	No. Participants
International	OIE regional expert consultation meeting on aquatic animal disease diagnosis and control	Nick Moody and Ian Gardner	11/18	Bangkok, Thailand	20
International	OIE Regional Seminar for OIE National Focal Points	Jennifer N. Lasley	10/18	Abu Dhabi, UAE	20

ToR: To collect, process, analyse, publish and disseminate data and information relevant to the designated specialty

8. Publication and dissemination of any information within the remit of the mandate given by the OIE that may be useful to Member Countries of the OIE

a) Articles published in peer-reviewed journals: 13

Jia B, Colling A, Garner IA, Stallknecht DE, Blehert D, Bingham J, Crossley B. Diagnostic sensitivity and specificity of tests for infectious diseases in wild mammals: review of published validation studies and recommendations for design, analysis and reporting improvements. Submitted for publication to Journal of Veterinary Diagnostic Investigations

Gardner I, Colling A, Greiner M. Design, statistical analysis and reporting standards for test accuracy studies for infectious diseases in animals: progress, challenges and recommendations. Prev. Vet. Med. (2018), https://doi.org/10.1016/j.prevetmed.2018.20.023

Laurin E, Thakur KK , Gardner IA, Hick P, Moody NJ, Crane MSJ, Ernst I. Design standards for experimental and field studies to evaluate diagnostic accuracy of tests for infectious diseases in aquatic animals. Journal of Fish Diseases 2018; 41(5):729-749.

Colling A, Lunt R, Bergfeld J, Halpin K, McNabb L, Juzva S, Newberry K, Morrissy C, Hlaing Loh M, Carlile G, Waugh C, Wright L, Watson J, McCullough S, Eagles D, Loomes C, Warner S, Diallo I, Kirkland P, Broder C, Zuelke K, McCullough S and Daniels P (2018). A network approach for provisional assay recognition of a Hendra virus antibody ELISA: test validation with low sample numbers from infected horses. J. Vet. Diag .Invest., 1-8. https://doi.org/10.1177/1040638718760102

Certoma A, Lunt RA, Vosloo W, Smith I, Colling A, Williams DT, Tran T, Blacksell SD (2018) Assessment of a Rabies Virus Rapid Diagnostic Test for the Detection of Australian Bat Lyssavirus, Trop. Med. Infect. Dis.3, 109

Moody N., Mohr P., Williams L., Hoad J., Cummins D., Slater J., Colling A., Singanallur N.B., Crane M.- Validation of real-time polymerase chain reactions for the detection of WSSV in clinically diseased or sub-clinically infected prawns via the OIE template. Diseases of aquatic organisms. In preparation

Bond, K.A., Franklin, L., Sutton, B., Stevenson, M.A., Firestone, S.M., 2018. A review of 20 years of human acute Q Fever notifications in Victoria, 1994-2013. Aust. Vet. J. 96, 223-230.

Canevari, J., Firestone, S.M., Vincent, G., Campbell, A., Tan, T., Muleme, M., Cameron, A., Stevenson, M., 2018. The prevalence of Coxiella burnetii shedding in dairy goats at the time of parturition in an endemically infected herd and associated milk yield losses. BMC Vet. Res.

Crabb, H.K., Allen, J.L., Devlin, J.M., Firestone, S.M., Wilks, C., Gilkerson, J.R., 2018. Salmonella spp. transmission in a vertically integrated poultry operation: Clustering and diversity analysis using phenotyping (serotyping, phage typing) and genotyping (MLVA). PLoS One.

Death, C., Coulson, G., Kierdorf, U., Kierdorf, H., Ploeg, R., Firestone, S.M., Dohoo, I., Hufschmid, J., 2018. Chronic excess fluoride uptake contributes to degenerative joint disease: evidence from six marsupial species. Ecotoxicol. Environ. Saf. 162, 383-390.

Dandrieux, J.R., Archer, T.M., Narayanan, L., Firestone, S.M., Mansfield, C.S., in press. Effect of immune-suppressive drugs on cytokine production in canine whole-blood stimulated with lipopolysaccharide or a combination ionomycin and phorbol 12-myristate 13-acetate. Vet. Med. Sci.

Dandrieux, J.R., Martinez, L., Andrew, S., Jergens, A., Allenspach, K., Nowell, C.J., Firestone, S.M., Kimpton, W., Mansfield, C.S., 2018. Changes in duodenal CD163 positive cells in dogs with chronic enteropathy after successful treatment. Innate Immun.

Martinez-Anton, L., Marenda, M., Firestone, S.M., Bushell, R.N., Child, G., Hamilton, A.I., Long, S.N., Le Chevoir, M.A.R., 2018. Investigation of the Role of Campylobacter Infection in Suspected Acute Polyradiculoneuritis in Dogs. J. Vet. Intern. Med.

b) International conferences: 4
Colling, Axel (invited speaker). 3rd FAO/IAEA Coordinated Research Project Meeting: “Early Detection of Transboundary Animal Diseases (TADs) to Facilitate Prevention and Control through a Veterinary Diagnostic Laboratory Network (VETLAB Network)”, 6-10 August 2018, IAEA Headquarters, Vienna, Austria.

Colling, Axel (invited speaker). In X National Conference of Veterinary Diagnosticians (ENDIVET), 1-4 October 2018, Recife, Brazil.

Tan, T, Firestone, S.M., Larsen, J., Stevenson, M.A., 2018 “A pilot study of the prevalence of Q fever in cattle, sheep and goats in Victoria” International Society for Veterinary Epidemiology and Economics 15th international conference, Chiang Mai, Thailand, 12 – 16 November, 2018.

Firestone, S.M., Hayama, Y., Bradhurst, R., Yamamoto, T., Tsutsui, T., Stevenson, M.A., 2018 “Reconstructing foot-and-mouth disease outbreaks: a methods comparison of transmission network models” International Society for Veterinary Epidemiology and Economics 15th international conference, Chiang Mai, Thailand, 12 – 16 November, 2018.

c) National conferences: 6
Firestone, S.M., 2018. “Q-fever: Australia’s silent rural burden; separating the facts from fiction.” Farmsafe Conference 2018, Townsville, Queensland (Invited keynote speaker).

Tan, T, Stevenson, M.A., Larsen, J., Firestone, S.M., 2018. “The seroprevalence of Q Fever in cattle, sheep and goats in Victoria” Farmsafe Conference 2018, Townsville, Queensland.

Firestone, S.M., 2018. “Forecasting Ross River virus (RRV) notifications in the face of climate change.” Australian Medical Students’ Association Global Health Conference 2018, Melbourne (Invited plenary speaker).

Firestone, S.M., Bond, K., Vincent, G., Wilks, C., Segal, Y., Stevenson, M., Stenos, J., 2018. “Victorian Q fever dairy goat farm outbreak: key outbreak investigation findings.” 2018 Australian Veterinary Association Sheep Camelid and Goat Veterinarians Special Interest Group Annual Conference, Melbourne (Invited speaker).

Firestone, S.M., Hayama, Y., Bradhurst, R., Yamamoto, T., Tsutsui, T., Stevenson, M., 2018. “Modelling who infected whom in outbreaks.” In, Proceedings of the 2018 Australian Veterinary Association Annual Conference, Brisbane, QLD (Invited speaker).

Martinez-Anton, L., Marenda, M., Firestone, S.M., Bushell, R.N., Child, G., Hamilton, A.I., Long, S.N., Le Chevoir, M.A.R., 2018. “Raw chicken consumption, campylobacter infection and acute polyradiculoneuritis in dogs.” In, Proceedings of the 2018 Australian Veterinary Association Annual Conference, Brisbane, QLD (Invited speaker).

Ian Gardner presented a one-day workshop (2 September, 2108) on diagnostic test validation at the 8th International Symposium on Aquatic Animal Health in Charlottetown, Prince Edward Island – 20 attendees

d) Other
(Provide website address or link to appropriate information): 5
Webpage for OIE Collaborative Centre for Test Validation Science South Pacific:
http://fvas.unimelb.edu.au/research/research-centres/oie-dx/contact

Webpage for epidemiology teaching tools, including Beta buster, sample size estimator and other tools for diagnostic test evaluation studies.
http://fvas.unimelb.edu.au/research/research-areas/veterinary-epidemiology-melbourne/resources

epiR statistical library for the R statistical package, including functions for epidemiological calculations such as those required for or diagnostic test evaluation studies: https://cran.r-project.org/web/packages/epiR/index.html

http://252s-weblive.vet.unimelb.edu.au:3838/users/epi/epi.predvals/

http://www.massey.ac.nz/massey/learning/departments/centres-research/epicentre/post-graduate-study/teaching-tools/teaching-tools_home.cfm