

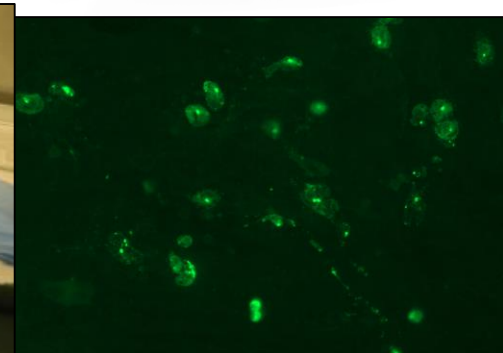
Role of the OIE Reference Laboratories in emergency preparedness

David Williams

OIE Sub-Regional Workshop on Emergency Preparedness

AUSTRALIAN ANIMAL HEALTH LABORATORY (AAHL)
www.csiro.au

27th-28th August, 2019, Bangkok, Thailand



Australian Animal Health Laboratory, Geelong (“AAHL”)

- An advanced high containment laboratory*
- *High risk group pathogens*
 - *High consequence and foreign animal diseases*



AAHL: International Reference Laboratory Designations

- OIE Collaborating Centre for New and Emerging Diseases
- OIE Collaborating Centre for Veterinary Laboratory Capacity Building
- OIE Collaborating Centre for Diagnostic Test Validation Science
- OIE Reference laboratory for:
 - Avian Influenza (AI)
 - Newcastle Disease (ND)
 - Bluetongue Viruses
 - Hendra and Nipah Virus Diseases
 - Epizootic Haematopietic Necrosis
 - Yellowhead Disease
 - Infection with Abalone Herpes-like Virus
 - Infection with Ranavirus
- **FAO Reference Centre for Animal Influenza and Newcastle disease**
- **FAO Reference Centre for laboratory biological risk management**



Roles of Reference Laboratories in Emergency Preparedness

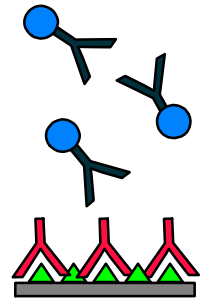
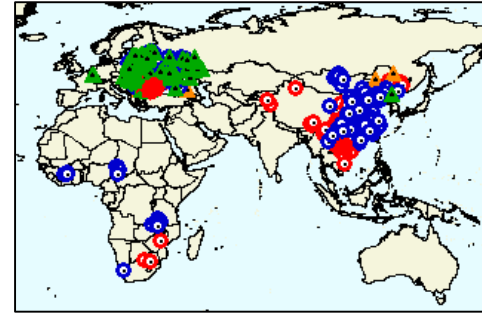
- Laboratory expertise
- Quality assurance
- Training and lab capacity building

→ *Support veterinary disease laboratories of member countries*

Maintaining laboratory expertise: domain knowledge

- Expertise in diagnostic methods/strategies, epidemiology and control of relevant disease(s)
 - Led by designated expert and other scientific staff
 - Capability to produce reagents (e.g. PCR kits, antibodies, IQC)
 - *In vivo* capability (pathobiology, clinical specimens)
- Research and development
 - Test evaluation (e.g. commercial, pen-side)
 - Use and evaluation of cutting-edge methods (e.g. sequencing tech.)
 - Involvement in relevant research activities (e.g. test development, vaccine development, pathogenesis)

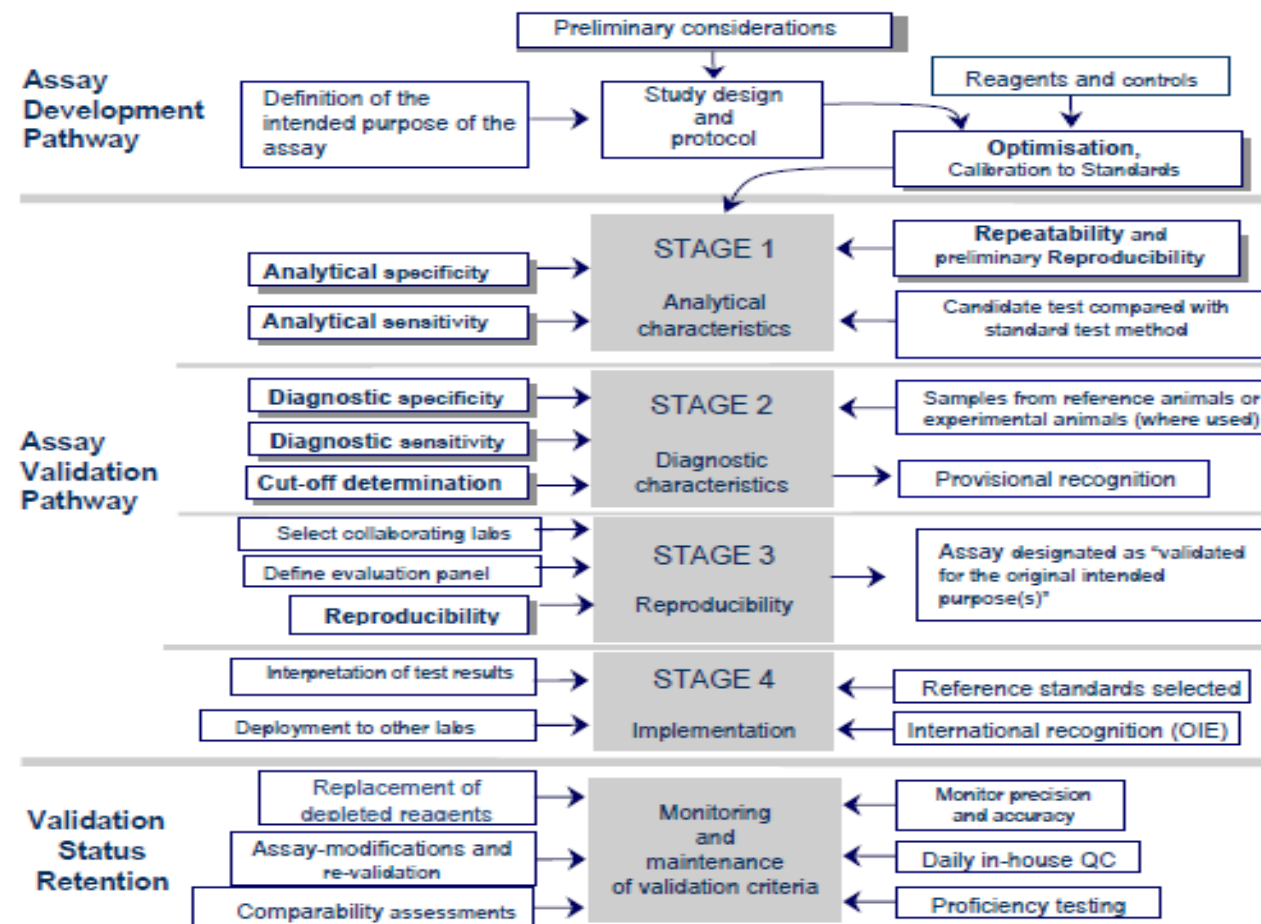
→ *Provide advice on tests, sampling, testing strategies, test algorithms*



Expertise in test validation

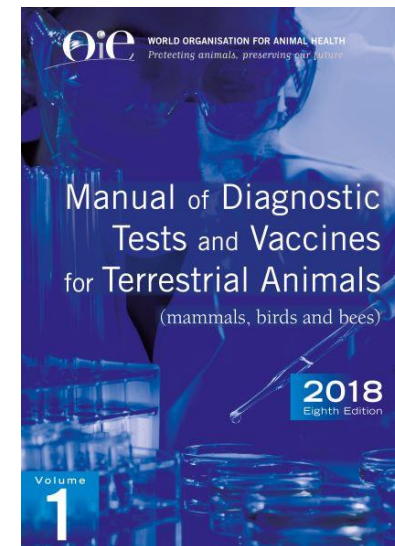
- Experience in test validation using OIE pathway for test development and validation
- Staged process to determine the fitness of an assay
 - Properly developed, optimised and standardised, for intended purpose (e.g. screening, confirmatory etc)

→ Assist Regional Laboratories for their own validation activities



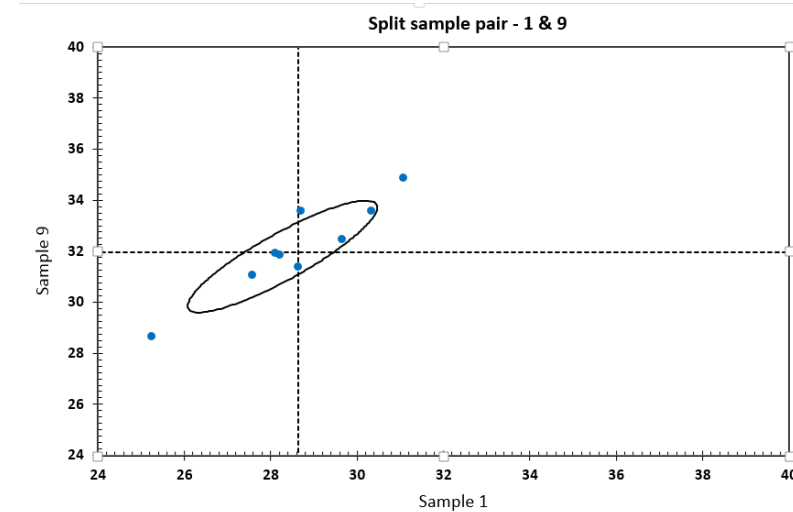
Quality Assurance in Reference Laboratories:

- Accreditation for diagnostic testing to ISO/IEC 17025 standards
 - Quality assurance system in place
 - Relevant tests are within scope of accreditation (ideally)
 - Regular audits (internal and external)
- OIE tests used for OIE-listed diseases
 - Frequently used
 - Cover the breadth of testing required
 - PCR, sequencing, serology, virus isolation
- Proficiency testing undertaken annually for reference diseases
 - Corrective actions for test failures
- Staff training undertaken regularly to ensure competency



External Quality Assurance Role

- Targeted support for strengthening diagnostic capacity and laboratory management
 - Establishment of QA systems to support best practice
 - Diagnostic testing for multiple diseases
 - Standardization of protocols
- Proficiency testing for priority diseases selected by the region
 - Provision of test panels and quality controls to laboratories, who report results, which are assessed and compared
 - Helps to provide confidence in results and processes, identify and enable areas for improvement
 - Comparison of performance of different diagnostic assays
 - Maintains and improve analytical quality & inter-laboratory agreement



Laboratory ‘backstopping’

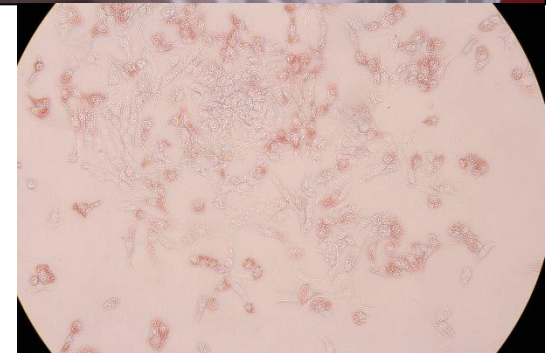
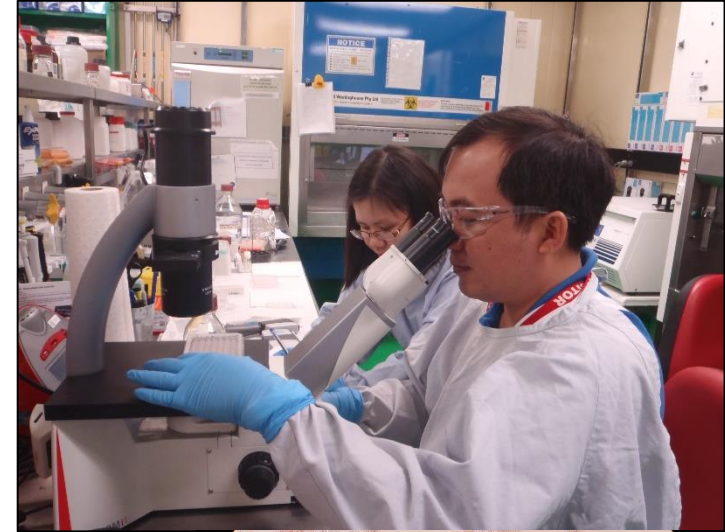
- Aims to complement the PT programs delivered into the SEA region
- Scientists with expertise in a range of diagnostic techniques travel to participating laboratories to:
 - Review and troubleshoot PT results
 - Provide technical advice in a range of other areas
 - Assess laboratory practices (e.g. biosafety, QA)
- Long-term goals are:
 - Assist laboratories in their transition to accreditation
 - Enable regional centres of excellence to conduct PT for their own satellite laboratories and for the region
 - Preparedness for outbreaks



Laboratory Twinning

- To establish and enhance laboratory capacity for the diagnosis and characterization of priority emerging infectious diseases
 - Laboratory training at host Reference lab
 - E.g. Lab-based diagnostics, bioinformatics, pathology
 - Transfer of diagnostic test capability
 - Reagents, SOPs
 - In-country laboratory backstopping
 - Training to be proficiency testing provider

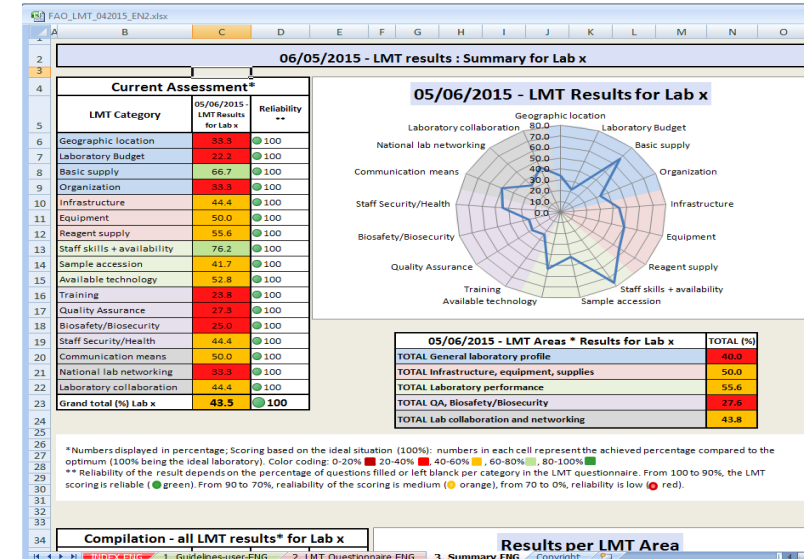
→ *Directly supports laboratory preparedness and networking*



ASF IPX

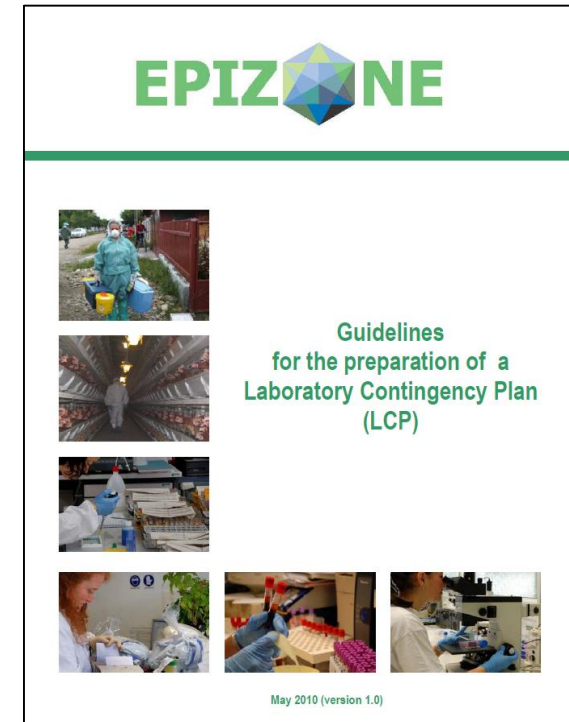
Laboratory Mapping Tool

- Standardized metric to assess laboratory capacity and infrastructure
- Identifies gaps (opportunities for funding)
- KPIs for annual assessments
- Reference Labs can assist with and foster use of LMT
- Google: FAO LMT to find the tool
- http://www.fao.org/ag/againfo/programmes/en/empres/news_130514.html



Laboratory Contingency Planning

- Intended to mitigate the risk of system breakdown and unacceptable service unavailability in case of a crisis (EPIZONE, 2010).
- A means to ensure that the laboratory is able to operate effectively and without excessive interruption or delay during an outbreak
 - Includes information on disease, how it fits within national Emergency Preparedness plan, information on laboratory (additional space, staff, outbreak management, stockpiles of supplies and reagents required, equipment needs), sample collection and shipment etc
 - LCP will be unique to each lab
- Reference laboratories can play an important role in assisting and advising on LCPs



Other contributions of Reference Labs

- Contribute or lead reviews of relevant chapters of the Terrestrial and Aquatic Disease Manuals, Technical Disease cards, Scientific and Technical Review articles
- Consultation:
 - Consultative meetings (e.g. ASF Risk Reduction and Preparedness)
 - FAO Emergency Preparedness Missions
 - OIE Standing Group of Experts (SGE)
 - OIE Training workshops
 - FAO Laboratory Technical Advisory Groups (Lab-TAG)
 - *Ad hoc* requests for advice from VDLs



Final thoughts

- There are various elements of emergency disease preparedness that Reference labs can contribute to, underpinned by diagnostic and technical expertise, and inter-laboratory activities
 - E.g., Laboratory capacity building for both general practices (QA, biosafety) and specific agent testing (via PT, backstopping, Twinning, LMT, advice etc)
- Adopting sustainable approaches and continuity should be the goal to maintain and improve capacity and preparedness
 - Effective and regular communication, ongoing collaborations with Regional labs
 - Coordination of ongoing EQA programs + backstopping and Twinning projects
 - Promote best practice with alignment to regional and international frameworks and expectations (e.g. OIE, FAO)

Thank you

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CSIRO, AUSTRALIAN ANIMAL HEALTH LABORATORY