

Challenges and Preparedness for Emerging Zoonotic Diseases

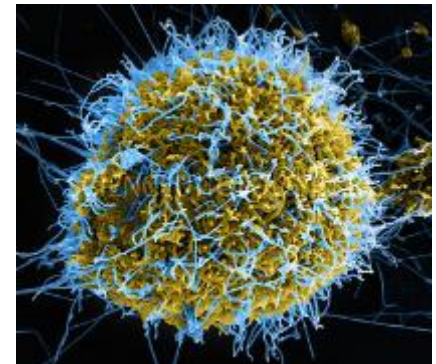


SESSION VII - Emergency Management of Infectious Disease Outbreaks

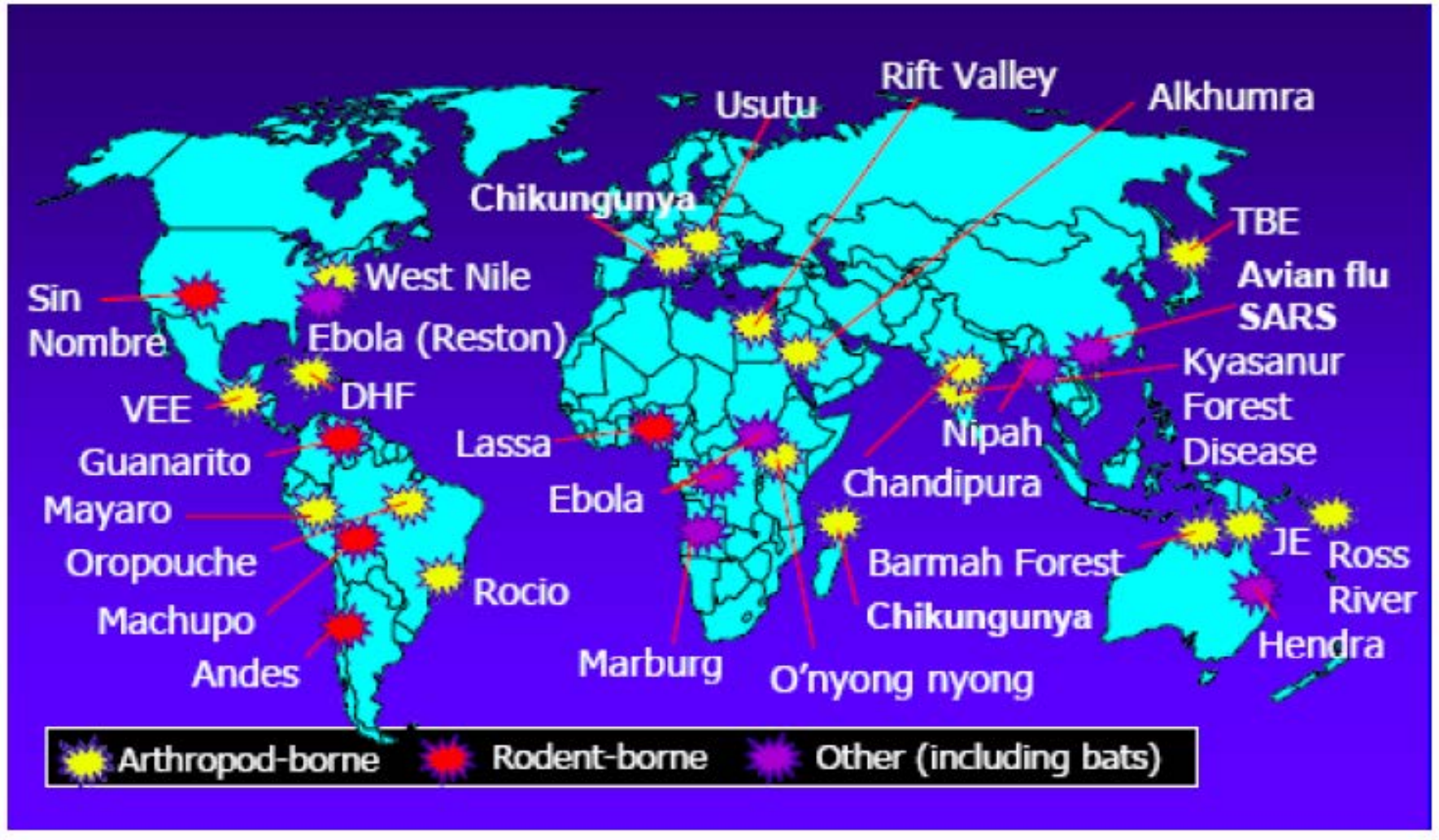
“Disaster and Emergency Management in the Health Care Sector”

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Communicable Diseases, QLD Dept of Health

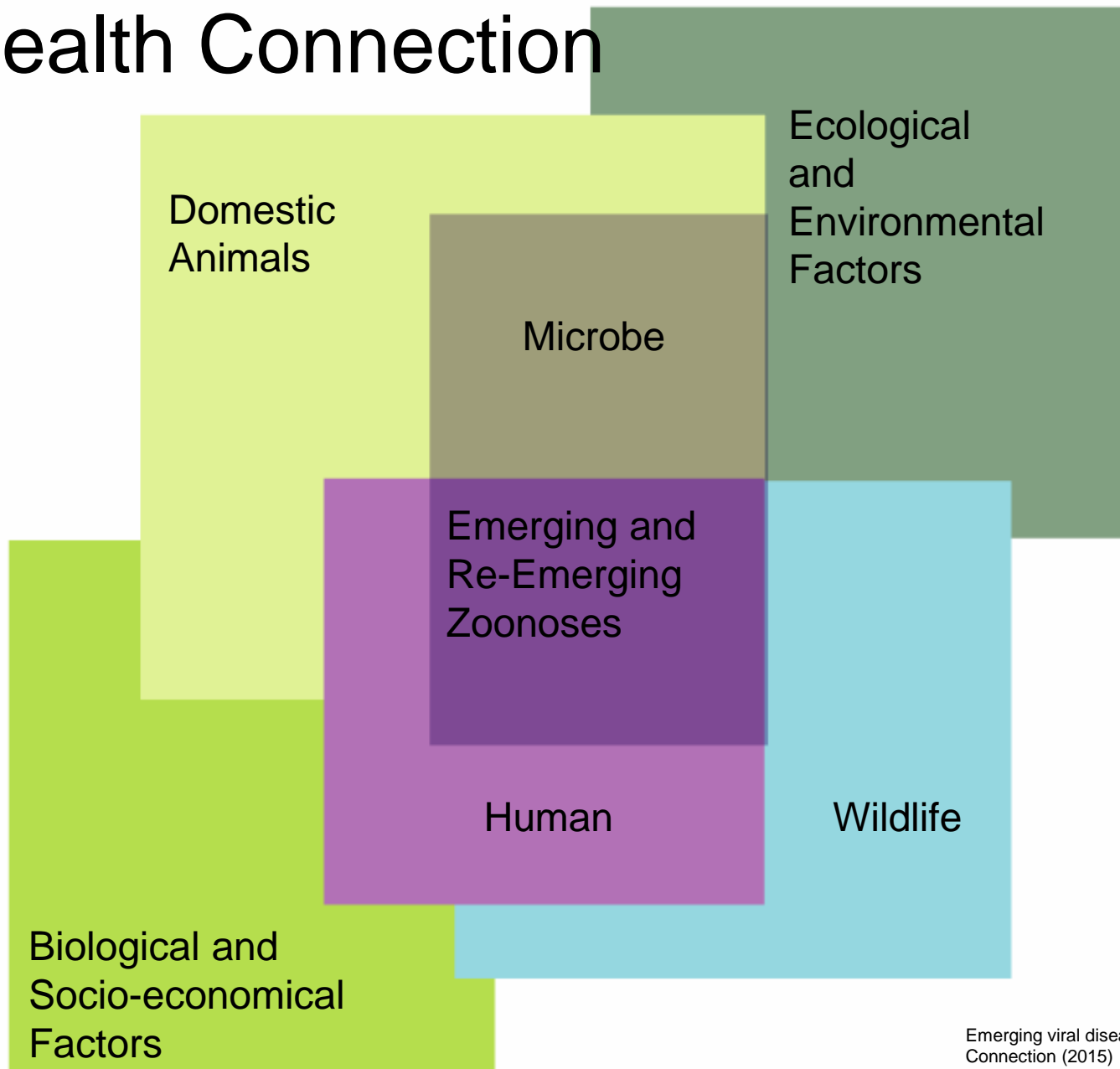
23 Feb 2016



One Health and Communicable Disease



One Health Connection



Factors that underlie disease emergence and reemergence

The Microbial Agent	The Human Host	Ecological/Environmental
Genetic adaptation and change	Human susceptibility to infection	Climate and weather
Poly-microbial diseases	Human demographics and behaviour	Changing ecosystems
	International trade and travel	Economic development and land use
	Bioterrorism – intent to harm	Technology and industry
	Occupational exposures	Poverty and social inequalities
	Inappropriate use of antibiotics	Lack of public health infrastructure and services
		Animal populations
		War and famine
		Political will

Management of Communicable Diseases in Queensland

POLICY

Public Health Units (local)

- Communicable Disease
- Environmental Health

Communicable Disease Branch (State)

Communicable Disease Network of

Australia

- National Arbovirus & Malaria Advisory Committee
- National Immunisation Committee
- National TB Advisory Committee

RESPONSE

Surveillance

Case management (local)

Outbreak response (local/State)

Incident Management Team (State)

Multi-agency response or Multi-agency

Threat Assessment Team (MATAT)

- Comprised of relevant State agencies

National Incident Room (Commonwealth)

PHEIC - WHO DG

Mosquito borne diseases in Queensland

Vectors of importance



Aedes aegypti



Aedes albopictus



Drivers of arbovirus emergence/re-emergence

- Growth in international air travel
- Genetic changes in viruses
- Increased urbanisation particularly in coastal areas
- Environmental and meteorological events
- Pesticide resistance
- Drug resistance
- Human behaviour



Mosquito-borne diseases in Queensland

Common MBD

Dengue serotypes:1,2,3,4

Ross River virus

Barmah Forest virus

Less common MBD

Chikungunya virus

Zika virus (**declared PHEIC – 1 Feb 2016**)

Murray Valley encephalitis virus

West Nile virus Kunjin subtype

Japanese encephalitis virus

Malaria

Current response to mosquito-borne diseases in Queensland

- Queensland Health has a state-wide Mosquito-borne Disease Prevention and Control Program
- Emerging Infectious Disease Committee
- Undertakes case surveillance and follow-up
- Queensland Health works in partnership with:
 - Local government municipal councils
 - Commonwealth Department of Agriculture and Water Resource's

Queensland Health Response to Zika

- Work collaboratively with Local, State and Commonwealth Government with regards vector surveillance and control
- Revised health advice for travellers (in consultation with national body CDNA, NAMAC)
- Development of local response guidelines
- Draft public communication & education campaign
- Increase Pathology Queensland capacity

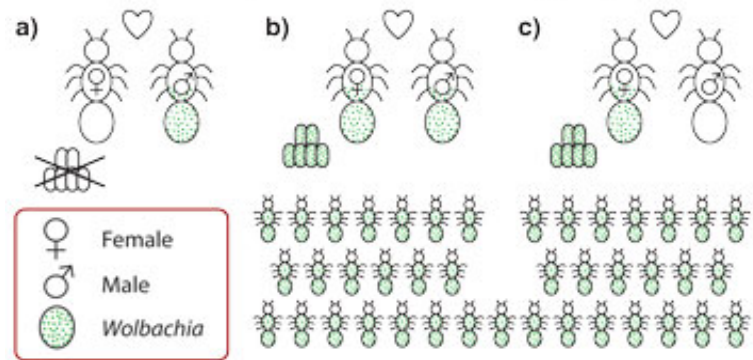


Eliminate Dengue Program

(<http://www.eliminatedengue.com>)

- Funded by Bill Gates Foundation, Research bodies, Qld govt
- Wolbachia is a bacteria present in up to 60% of all insects - including some biting mosquitoes
- Not naturally present in *Aedes Aegypti*
- Blocks dengue replication/transmission
- Cytoplasmic Incompatibility - releasing a limited number of mosquitoes with Wolbachia to breed with wild mosquitoes, over a small number of generations, will result in all the mosquitoes having Wolbachia
- Community engagement required

How *Wolbachia* spreads in the wild mosquito population



Australian Bat Lyssavirus (ABLV)

- Rabies virus, ABLV, and other lyssaviruses such as European bat lyssavirus (EBLV) 1 and EBLV 2, are members of the Rhabdoviridae family, genus Lyssavirus.
- first identified in Australia in 1996 from the brain of a black flying fox
- infection has been documented in several species of flying foxes (also known as fruit bats) and insectivorous microbats
- it is assumed that **all** Australian bat species have the potential to carry and transmit ABLV

Transmission

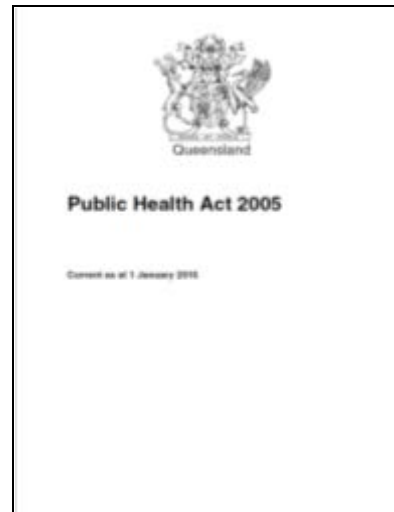
From the virus-laden saliva or neural tissue of an infected bat:

- to humans through direct contact from the bat through a bite or scratch (resulting in broken skin) or
- through contamination of mucous membranes (e.g. mouth), conjunctiva or broken skin




Notification

- Under Queensland's *Public Health Act 2005*, potential exposure to ABLV is a notifiable condition requiring immediate notification by telephone call, email or facsimile to the local public health unit.



Bat testing

- QH performs testing for ABLV on bats that are the source of exposure and are available for testing
 - 398 bats were tested over the 5 year period 2009-2014
 - 20 (5%) had ABLV detected in 5 different species
 - Bat testing guides post exposure management of the person potentially exposed
- 

ABLV and Animal Cases

- 2 horses tested positive for ABLV in 2013
- Both horses were euthanatised following 4 – 5 day illness
- Sequencing of target gene of the ABLV detected in the horses was consistent with other sequences isolated from yellow belly sheath tail bats
- there is no evidence that ABLV is transmitted from horses to humans

Hendra Virus: A new challenge



Photography: G B Baker
© Australian Museum

Source: Baker GB. From Tang KL, Divljan A. Australian Museum: Australian *Pteropus* species fact sheet, version 1.1 [internet]. Australian Museum 2013 [cited October 2014]. Available from URL: <http://aawhg.org/assets/News/Science-and-Research/Australian-Pteropus-species-fact-sheets-v1.1.pdf>

- Discovered in Queensland 1994
- **Reservoir host:** *Pteropus* bats (20-50% sero-positive)
- **Intermediate host:** horses
- **Human infection** linked with exposure to infected horses.
- **High case fatality**

Equivac[®] HeV

- Since **2012**
- **International collaboration**
- Effective way of **reducing infection** in horses
- **One Health:** reduces human infection

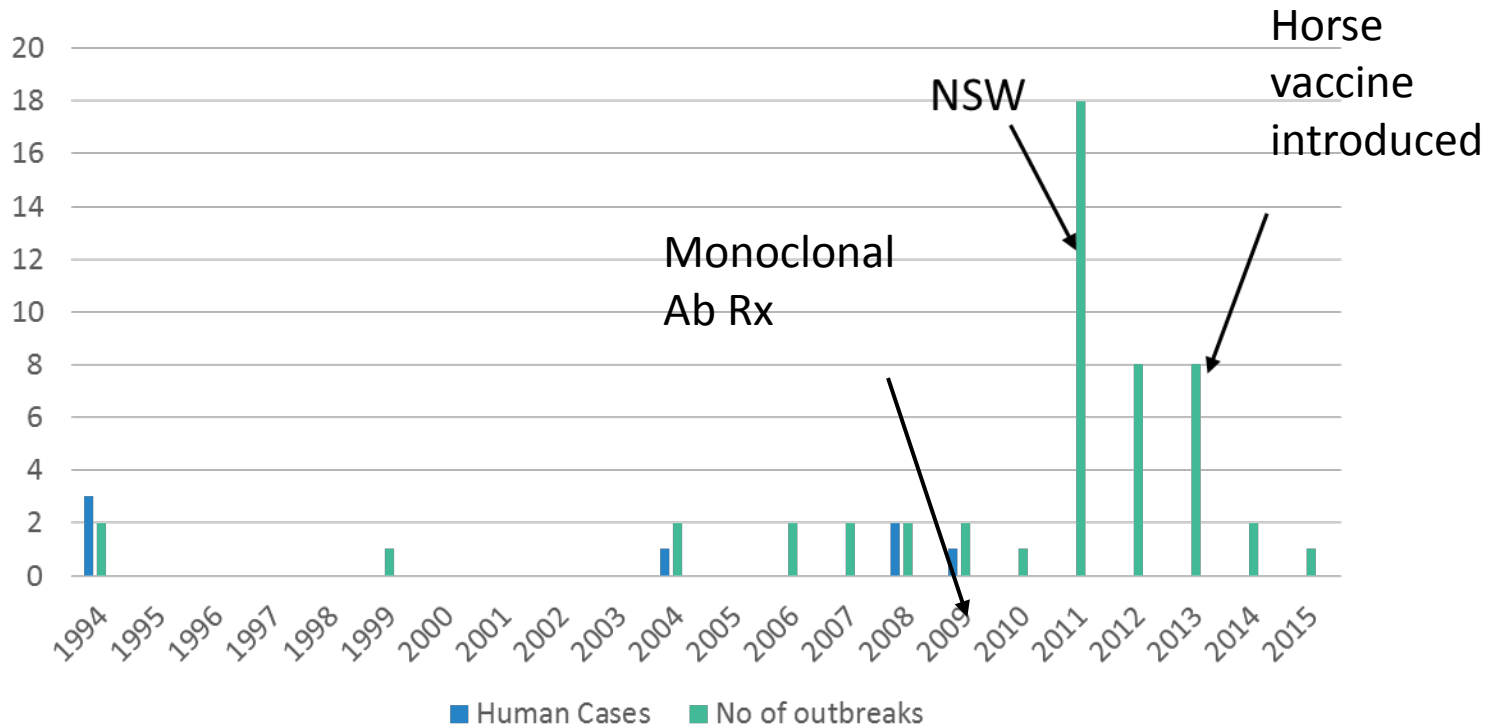


Source: Warren A. Vaccine arrives to boost the frontline fight against Hendra Virus. Csiro News 2012 [cited October 2014]. Available from URL: <http://csironewsblog.com/tag/equine/>

Human monoclonal antibody to treat Hendra Virus

- Successful in animal models
- Considered for **high risk human contacts**
- World first trial of monoclonal antibody:
 - Test safety
 - Collaboration between groups in Queensland, NSW and the United States
 - May save lives

HeV Outbreaks





International Network for Health Promoting Hospitals & Health Services

The Task Force on Health Promoting Hospitals and Environment

Asia-Pacific Regional Symposium 2016

Eco-Friendly Hospitals For a Sustainable World

22-23 February 2016 | Griffith University | Brisbane | Queensland | Australia



Program BOOKLET



AN INTERNATIONAL FORUM ON

“DISASTER and EMERGENCY MANAGEMENT in the HEALTH CARE SECTOR”

TUESDAY, Feb 23rd 2016

Griffith University, Southbank Campus

Hosted by Centre for Environment and Population Health, Griffith University
and co-hosted by Tzu Chi Medical Foundation, Tzu Chi University

Venue: Griffith University South Bank Campus, Griffith Graduate Centre Building (S07) Room 1.23

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