

Disease outbreak interventions in wildlife and livestock

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Contents

- Broad overview of the subject
 - infectious diseases only
 - Various interventions
- Then look at a few specific examples
- Tend to fall back on personal experience
 - Rinderpest
 - Malignant catarrhal fever
 - Tuberculosis(UK!!)
 - Will try to avoid too many viruses
- Interactive!

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Reservoir and Indicator Hosts

- Species which bring infection/disease
 - RESERVOIRS
 - Can be clinically infected
 - Can be sub-clinical carriers
- Species in which disease is seen
 - INDICATORS
 - May transmit (may become reservoirs??)
 - May be dead end hosts

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Ease of intervention

- It is **MUCH** easier to make interventions in domestic animals than in wild ones.
- So plan accordingly

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The wildlife – livestock interface

What is it?

- Interspecies transmission of disease
 - Land use systems
 - Wildlife areas v pastoralism

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How many interfaces are there?(types of infectious cycle)

- One way
 - Domestic to Wild
 - Wild to Domestic
 - Wild to other Wild
 - Man to Wild
 - Wild to Man
- Two or three way
 - Multiple hosts

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Theory of Control Intervention

- Prevent transmission between Species
 - Separate the reservoir and indicator hosts
 - Move the reservoir hosts away
 - Move the indicator hosts away
 - Remove the source of infection
 - Immunize the reservoir hosts
 - Eliminate the reservoir hosts
 - Breed clean reservoir hosts
 - Protect against the infection
 - Immunise the indicator hosts
 - Usually more difficult

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Practise of Control Interventions

- Separation
 - Fencing
 - What distance?? etc
 - Not easy with carnivores
- Remove infection from reservoir
 - Vaccination (easiest in domestic livestock)
 - Viral
 - Bacterial
 - Treatment?
 - Extermination (remove reservoir!)
 - Cull and replace with clean stock
 - Habitat change/destruction

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Practise of control Interventions (continued)

- Protection of indicators (usually we think of wildlife)
 - Anthrax, rinderpest, brucellosis etc.
 - Expensive
 - Minimize vaccine risk (!)

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Domestic to Wild

- Rinderpest
 - Control in which species?
 - Cattle
 - Wildlife
- Rabies
 - Control in which species
 - Domestic dog
 - Wildlife?
- Hydatidosis
 - Control in which species
 - Domestic dog
 - Wildlife

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Wild to Domestic

- Malignant catarrhal fever
 - Wild
 - Domestic
- Theileriosis
 - Wild
 - Domestic

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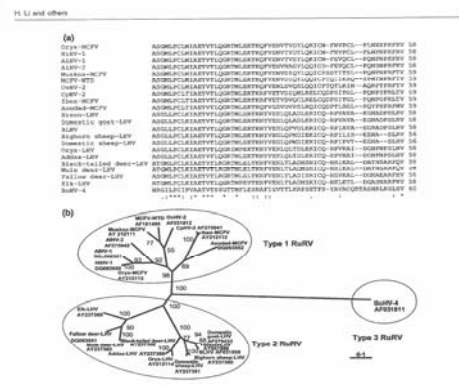
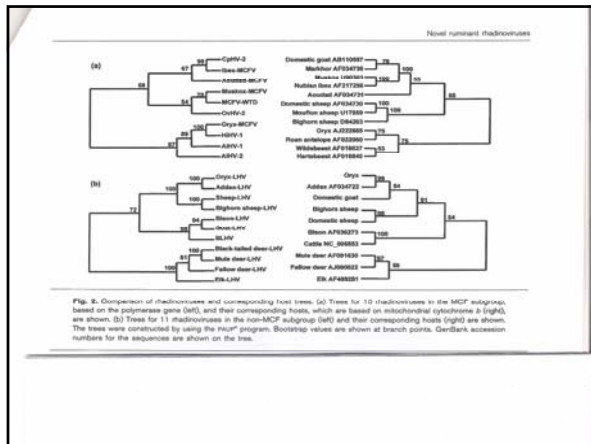


Fig. 1. Alignment (a) and phylogenetic tree (b) of RuPVs based on amino acid sequences of DNA polymerase gene fragments. The sequence alignment was carried out by using the ClustalX alignment program and the phylogenetic tree was constructed by using the PHYLIP program. Bootstrap values are shown at branch points. GenBank accession numbers for the sequences are shown on the tree.



Wild to Wild

- Tuberculosis
- others

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Man to Wild and Wild to Man

15

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Surveillance and Contingency Planning:1 (A major intervention)

- **Be prepared:** What can the wildlife veterinarian do?
 - Knowledge is vital
 - What diseases are around in domestic stock?
 - What new diseases are emerging?
 - What will(can) you do?
 - Keep up to date
 - Keep in close touch with domestic veterinary colleagues
 - **ONE WORLD ONE HEALTH**

16

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Surveillance and Contingency Planning:2 (A major intervention)

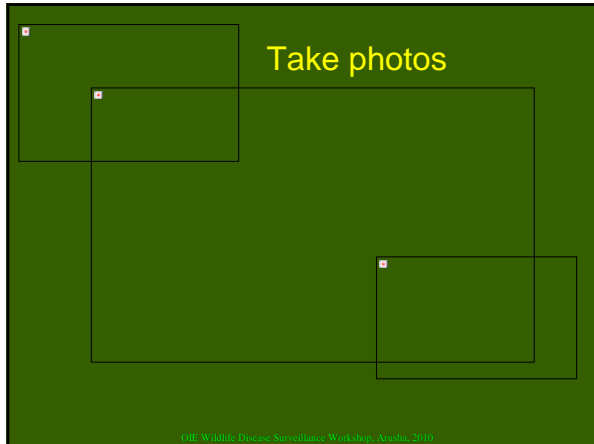
- Epidemiological Surveillance
- Baseline values from healthy indicators
 - Population dynamics
 - Migration patterns
 - Behaviour
 - Serology

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Diagnosis

- Don't assume without good reason!
- Disease investigation
 - Clinical signs if possible **Take photographs**
 - History and epidemiology
 - Full post-mortem examinations **Take photographs**
- Don't forget the basics
 - Histopathology

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- ## When you have a diagnosis Apply chosen control method
- Be prepared!!
 - Vaccines
 - Funds
 - Monitor and assess
 - Modify as required
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- ## Cautions
- Be prepared for a new or emerging disease
 - Be prepared for a zoonotic infection
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- ## In conclusion
- ### Can we intervene to control disease at wildlife/man/domestic livestock interfaces?
- Yes – often, but not always
 - But it takes more effort than with domestic livestock alone
 - Prevention better than cure
 - Knowledge, preparedness planning, field observations, good operating procedures
 - Funds!
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