



Case control study of lumpy skin disease

Date: 2 Dec 2021

Country: Singapore

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How to investigate the outbreak?

Verify potential outbreak is happening

- Clustering of cases vs. single case of significance
- Review past incidence in the affected population and premises (if any), recent changes in surveillance strategy – e.g. passive surveillance data, reports by farm workers and government officers

Verify diagnosis

- Government vets will visit farm to perform clinical exam and collect relevant samples for confirmatory diagnosis by the laboratory

Develop case definition

- Interview farm staff to obtain relevant epidemiological information
- Age skin lesions



Animal & Veterinary Service (AVS)
JEM Office Tower
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Please send your report to:

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For urgent reporting between 6pm to 8am, please contact 1800 476 1600		

NOTIFICATION OF SUSPECTED/CONFIRMED OUTBREAKS OF DISEASES LISTED ON THE ANIMALS AND BIRDS (DISEASE) NOTIFICATION (Annex A)

SUBMISSION DETAILS

Name of submitter			
Name of organization			
Date of submission	Click here to enter a date.		
Contact number	(O)	(HP)	
Email address			

DISEASE DETAILS

Name of disease			
Causal agent			
Nature of detection	Choose an item.		
Affected species(s)			
Start date of the disease	Click here to enter a date.	Date of first confirmation of the disease	Click here to enter a date.
Date of previous occurrence (if any)	Click here to enter a date.		
Source of infection			
Name and address of diagnostic laboratory			
*Please attach lab test results			
Location of animals			
Number of cases, total number of susceptible animals, number destroyed, number died			
Details of treatment and control measures applied (if any)			
Details of vaccination (if any)			
Other comments			

[Continued overleaf]

OWNER INFORMATION

Name (in full)	
Address	
Contact number	

ANIMAL DETAILS

Name:		Species:	
Age:		Breed:	
Sex:	Male ☐ / Female ☐ Entire ☐ / Sterilised ☐	Microchip number (if any)	
Address (only if different from owner's address)			
History and presenting signs			

Case definition and define controls

Clinical criteria

- Skin nodules
- Enlargement of lymph nodes

Epidemiological criteria

- Time – Onset of symptoms within last 5 weeks of index case
- Place – Established epidemiological link with existing case(s)
- Population – Species susceptible to LSD

Controls

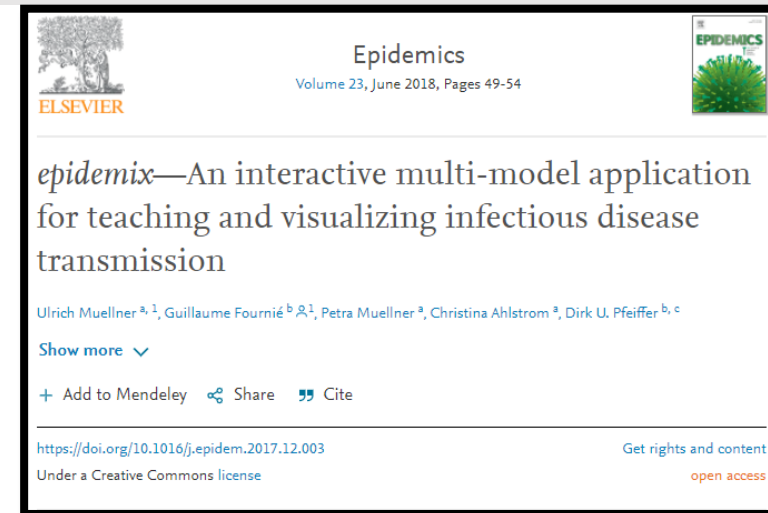
- Susceptible species matched by (1) age, (2) gender and (3) herd size but no epidemiological link
- Stratification based on susceptible population distribution
- Bio-segregation (no transfer of animals or possible fomites)

Stakeholder involved

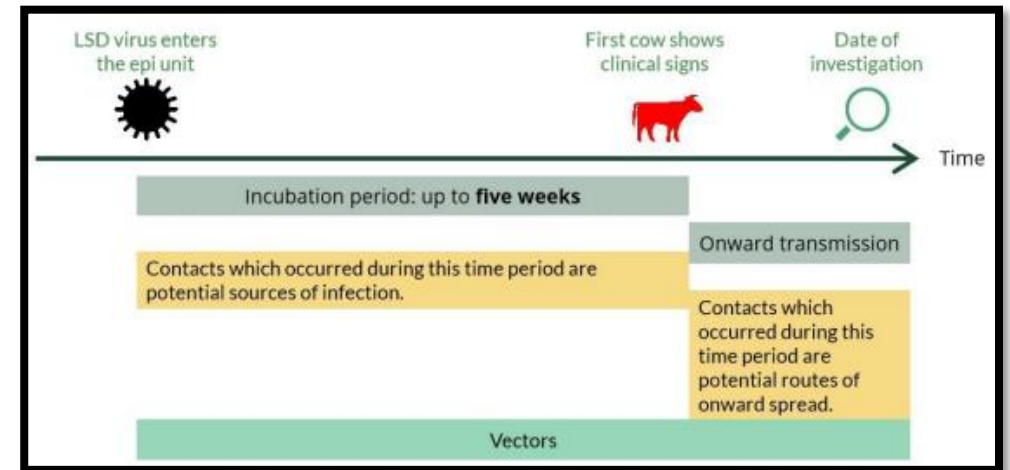
- Farmers
- Veterinarians
- Government officials
 - Food safety agency (farm licensing authority)
 - Environment agency (vector control and surveillance)
- Laboratory
- OIE (for disease notifications)
- Media

Source and transmission

- Contact tracing
 - Obtain history on animal movement
 - Possible in contact animals in last 5 weeks
 - Visitors to farms
 - Presence of vectors
- Plot cases on a map, build an epi curve – to determine spatio-temporal pattern of disease spread, and analyse risk factors
- Case-control study to determine odd ratio and exposure risk factors



Source: <https://www.sciencedirect.com/science/article/pii/S1755436517300270>



Source: FAO, European Commission for the Control of Foot and Mouth Disease.

Evaluation

Impact to animal health and production

- Decrease in milk production
- Loss of hide value
- Infertility and abortions
- Loss of draught power
- Secondary infections

Study size

- Depends on the size of outbreak
 - Estimate 30 cases since there have been 28 cases since Aug 2021
- Case : control ratio
 - Should be 1:1 to 1:5 = 30 to 150 cases

Discussion

- Reduction of bias
 - Case matching
 - Stratification based on herd size and distribution of susceptible species
- Outbreak investigation and analysis of disease dynamics
 - Epidemix
 - A teaching tool to teach non-specialists about key concepts of disease dynamics
 - Available via the Internet using a standard browser
 - Step-by-step specification of model structure and parameters
 - From deterministic, homogeneous-mixing to stochastic and spatially explicit models
 - Graphics and animations capturing changing outputs as model settings are modified.



[About](#)



epidemix

Epidemix is a free web application that allows users from different backgrounds to improve their understanding of mathematical disease modelling. Use Epidemix to explore key concepts of disease dynamics and control, and to explore how different types of models can be used to examine the spread of diseases in different populations.

[Access Epidemix](#)

Thank You