The Online R-FETPV 1st Module : Basic Epidemiology and Surveillance Data Analysis

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Department of Livestock Development

Food and Agriculture Organization of the United Nations

R-FETPV Regional Field Epidemiology Training Program for Veterinarian

Part 3 of 4: Goals and foundation of a disease outbreak investigation for animal disease

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Content/Outline

Step in outbreak investigation

1. Preparing for a field outbreak investigation
2. Verifying that you actually have a problem (Confirm outbreak and diagnosis)

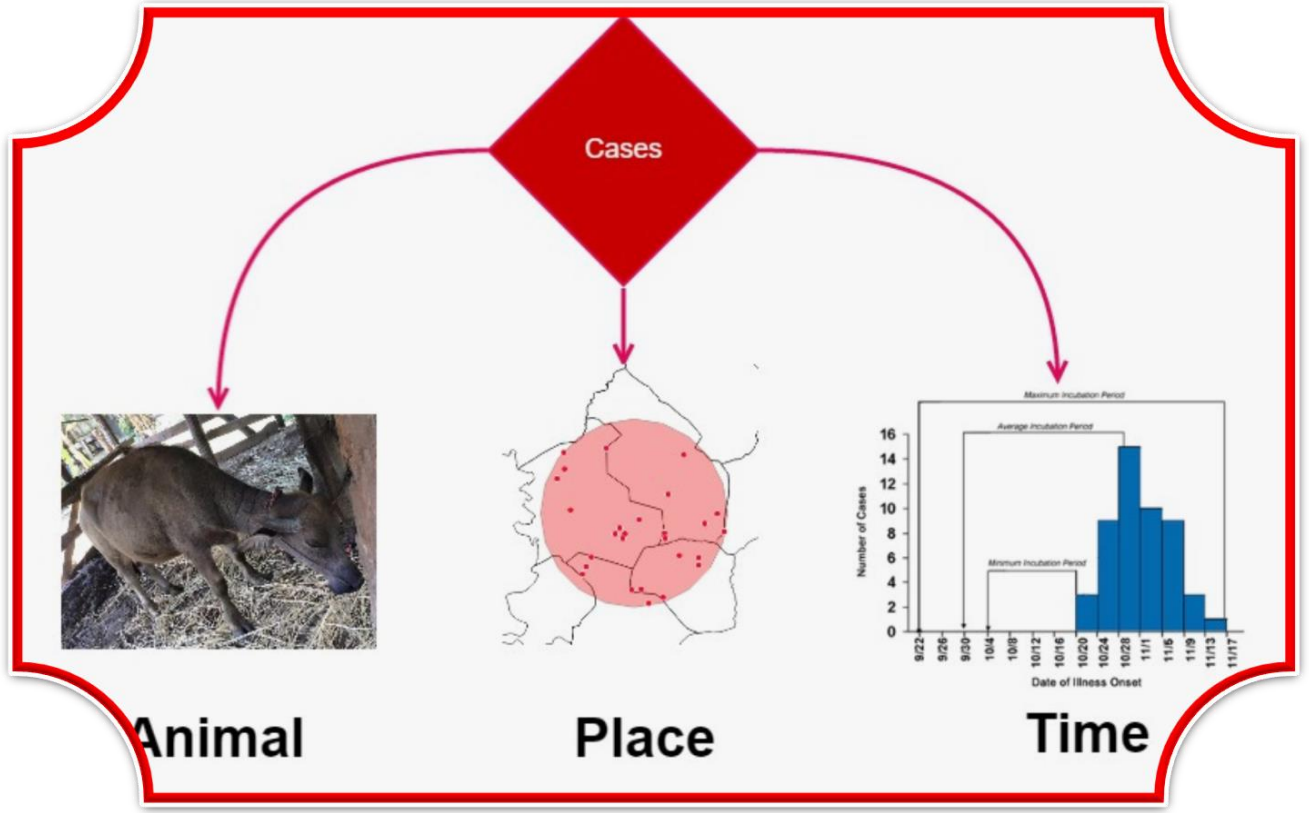
Part 1

3. Define case and start case-finding **Part 2**
4. Descriptive data collection and analysis
5. Develop hypotheses
6. Analytical studies to test hypotheses
7. Special studies, e.g., environmental and laboratory studies
8. Communicate conclusions and recommend control measures
9. Implement control measures
10. Follow-up the control implementations

Part 4

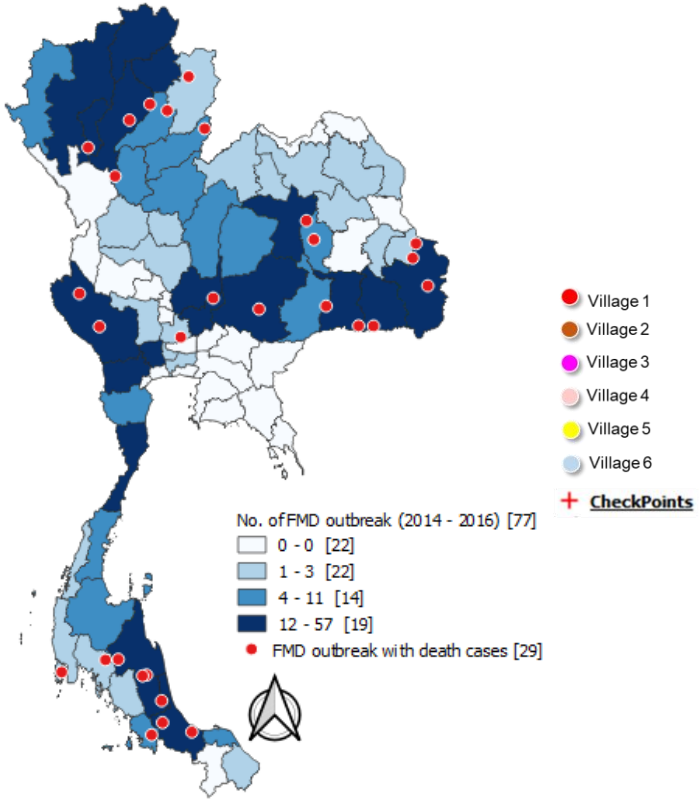
What does the outbreak look like?

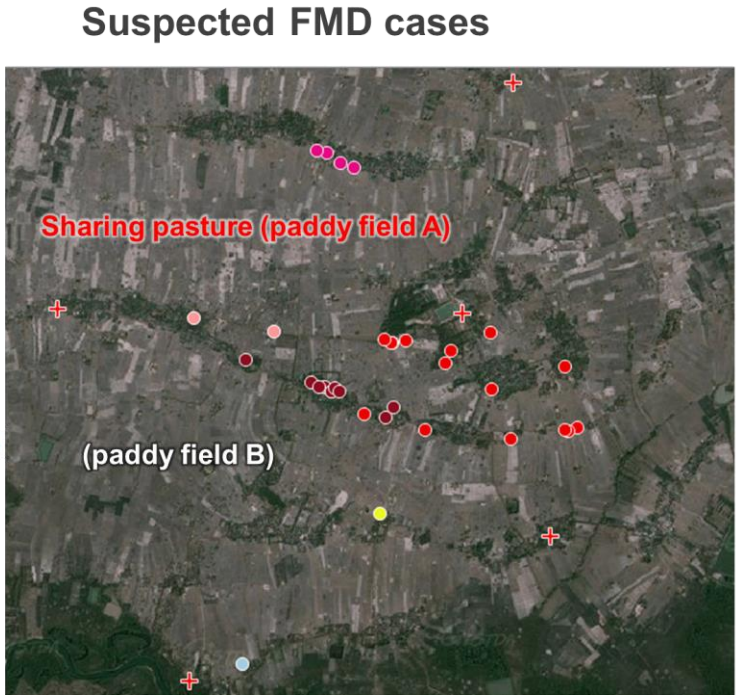
- ✓ Trying to establish
  - Population
  - Place
  - Time
  - Type of outbreak
  - Clinical signs
  - etc.



Place, Spatial pattern

- Sketches a topographic map of the area and the cases within, or of the layout of pens and the cases within
- Inspects the drawing for interrelationships among cases, and between the location of cases and other physical features

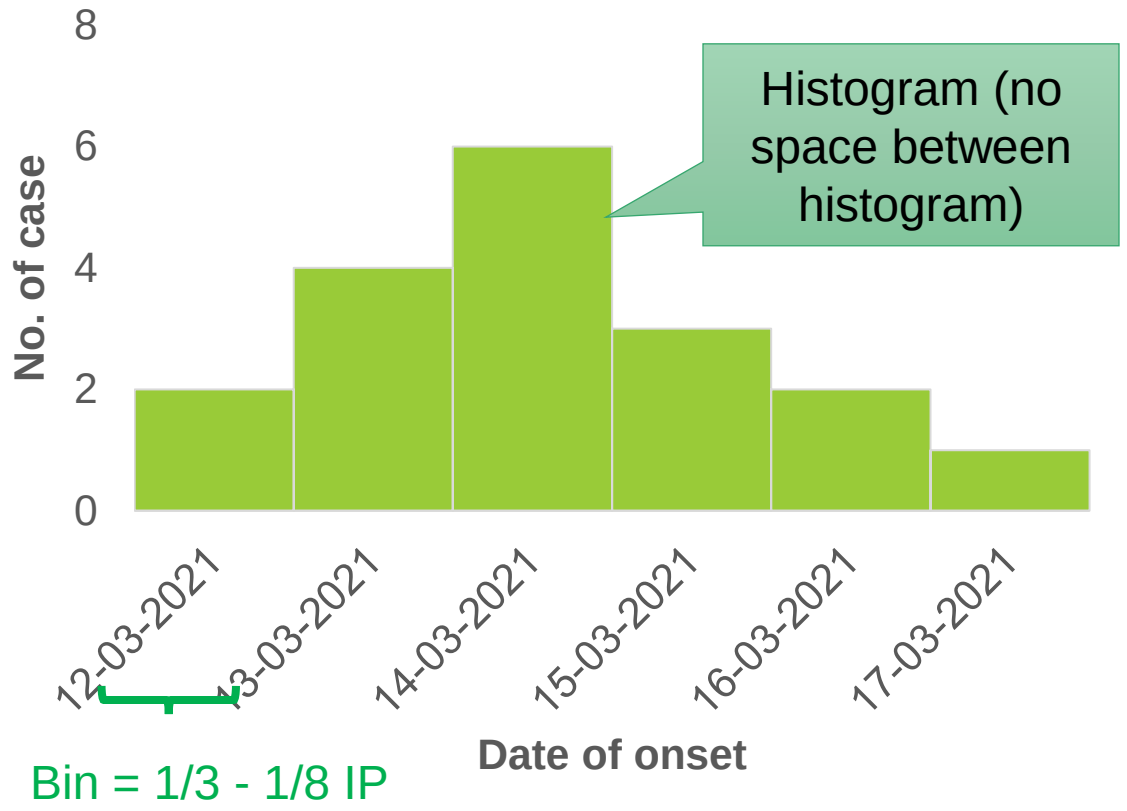




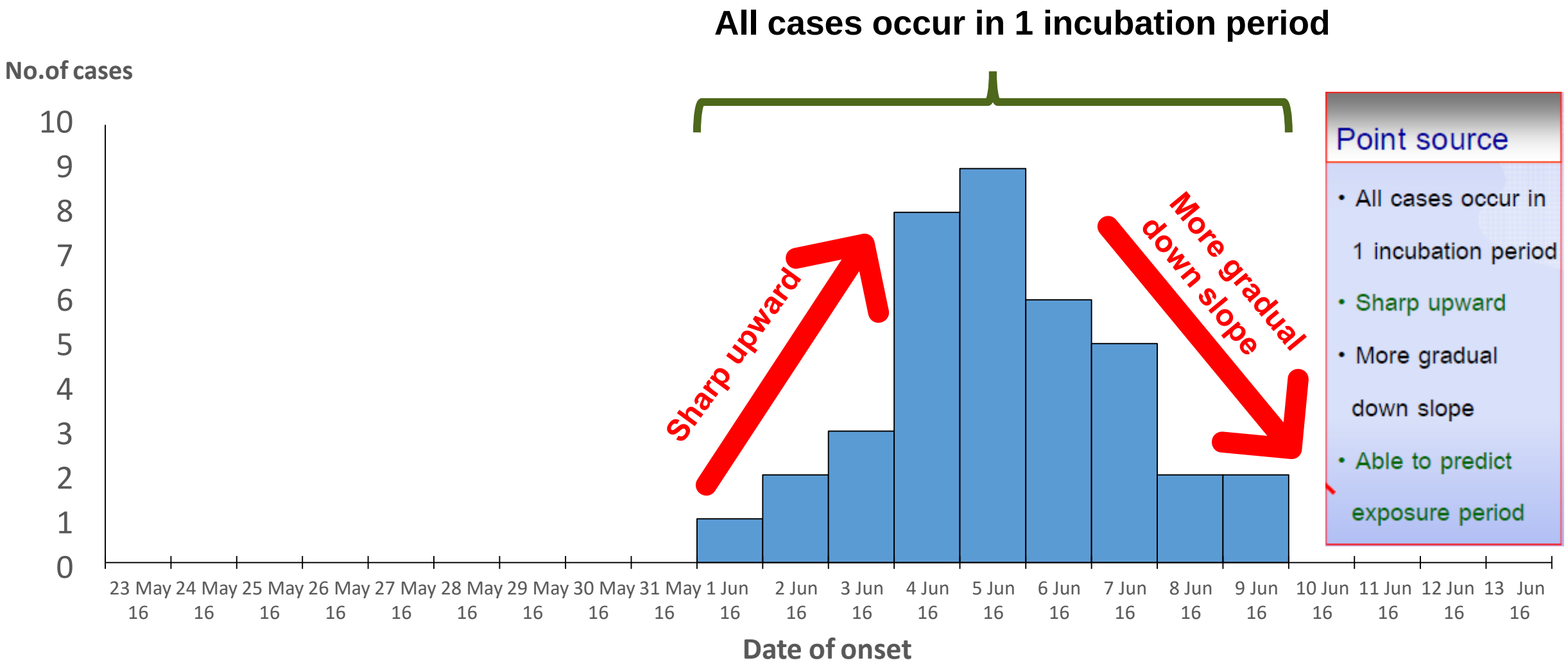
5. Descriptive data collection and analysis:

Temporal pattern

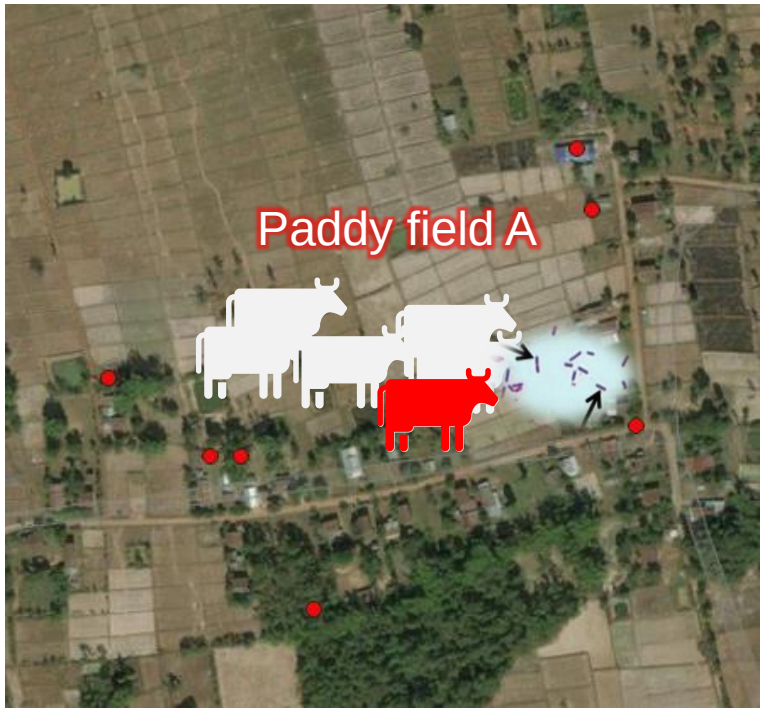
- **Epidemic curve pattern**
  1. Common source
     - Point
     - Intermittent
     - Continuous
  2. Propagated source (person-to-person)
  3. Mixed source



Common source outbreak: Point source



Example of point common source in animal disease



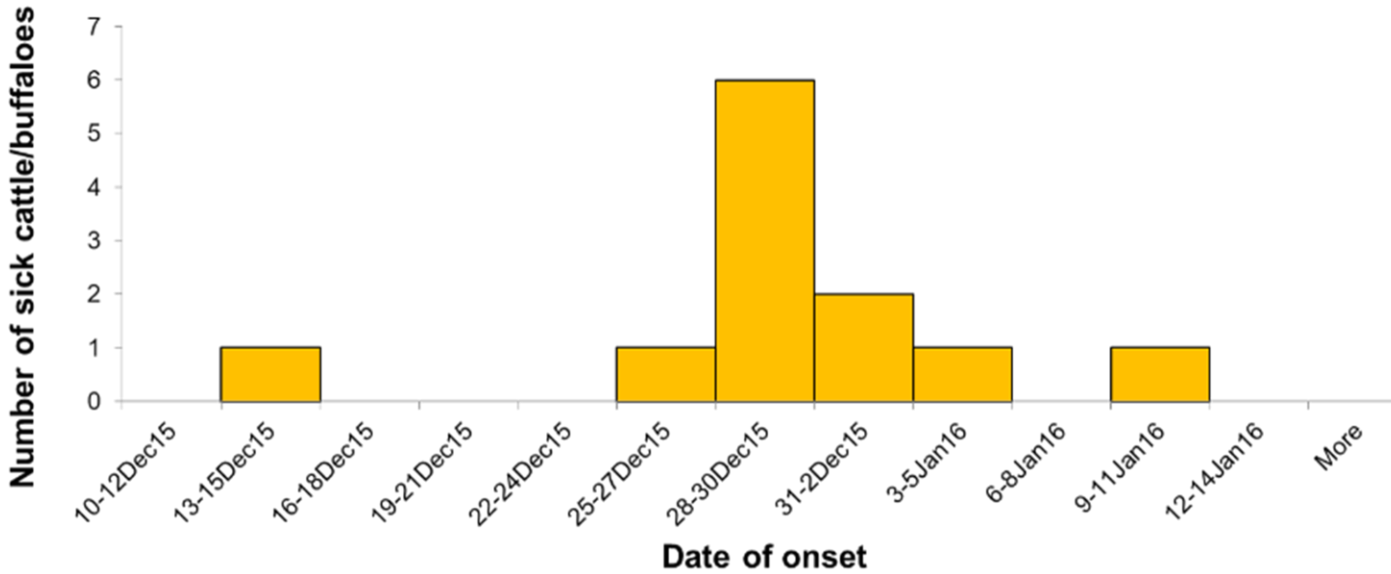
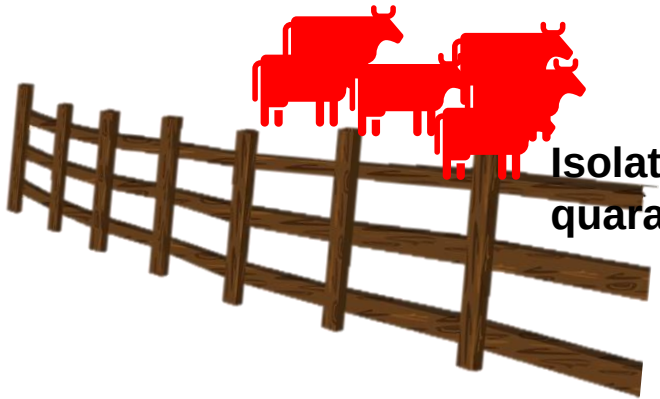
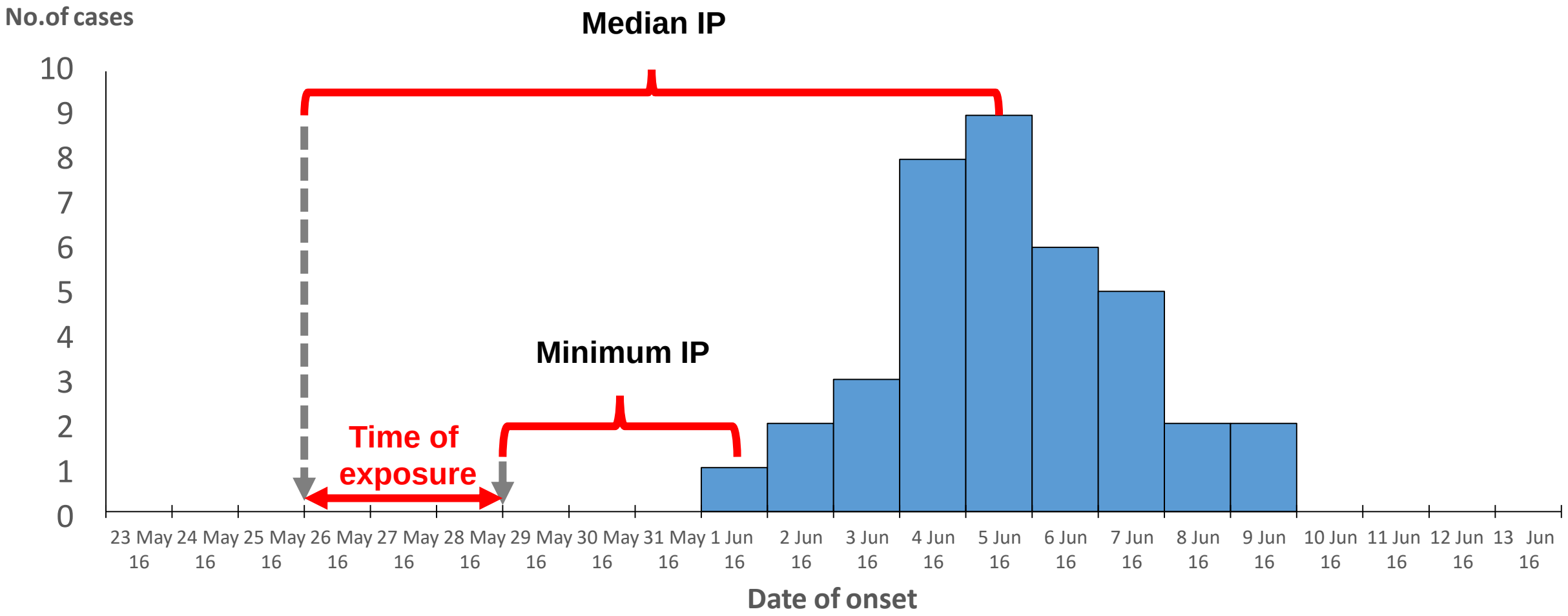


Figure 2. Epidemic curve of suspected blackleg cases among cattle and buffaloes in Nakhon Phanom Province, Dec 2015 – Jan 2016 (n=12)

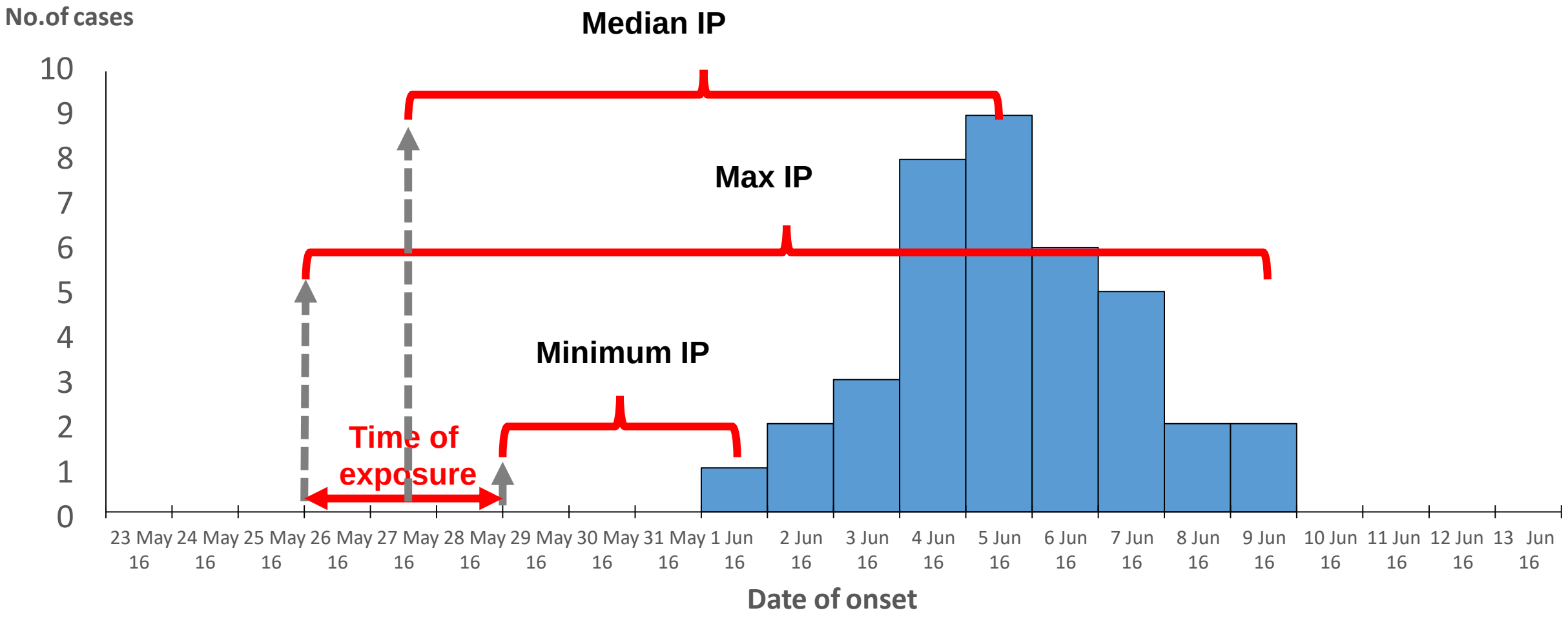
- The first case was found in paddy field A on 15 Dec. 2015 → butchered in paddy field A
- The second case was in 10 days later → control measures → stop grazing in paddy field A, isolation + quarantine, antibiotic injection
- All cases were grazed in paddy field A



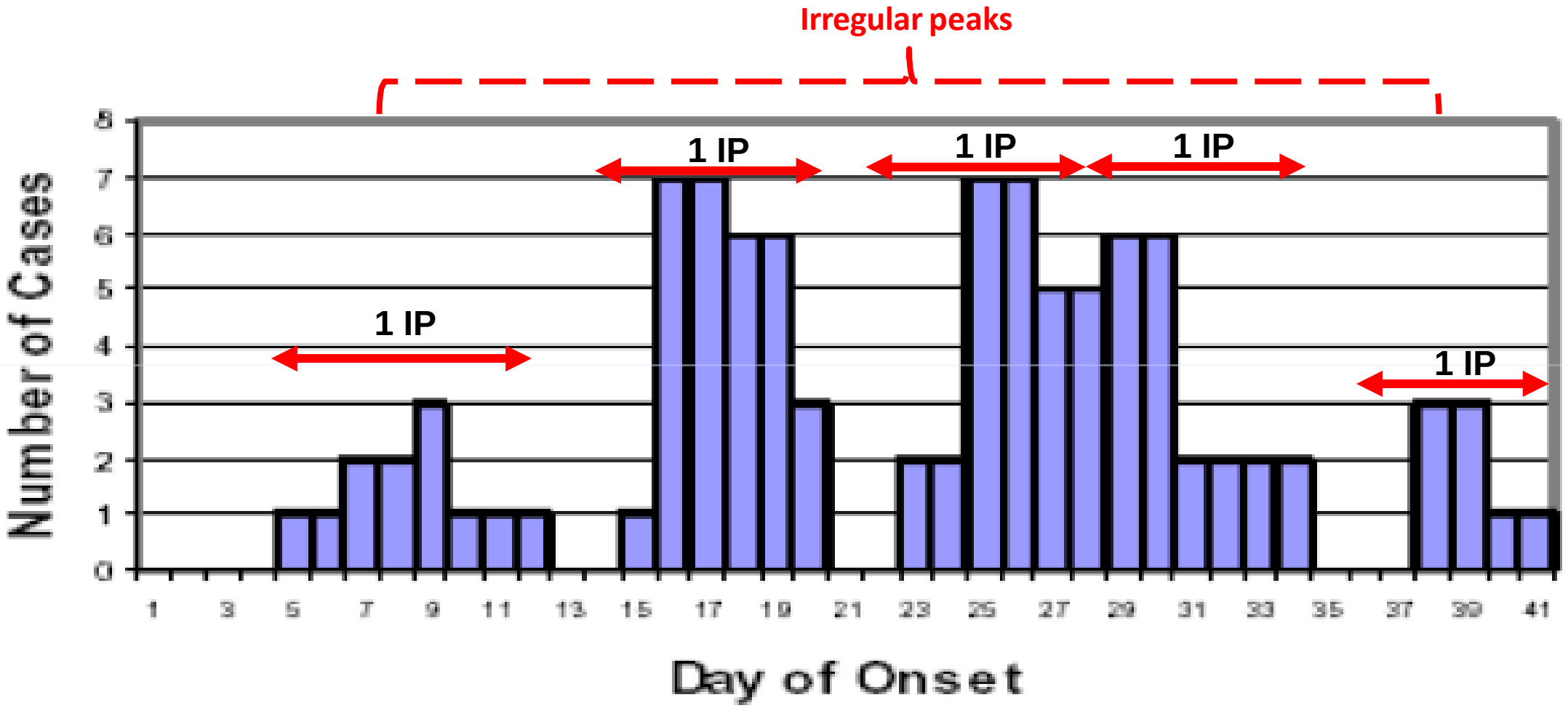
- Known causative agent → possible time of exposure



- Known time of exposure → possible agent



Common source: Intermittent exposure



Example of intermittent common source in animal disease

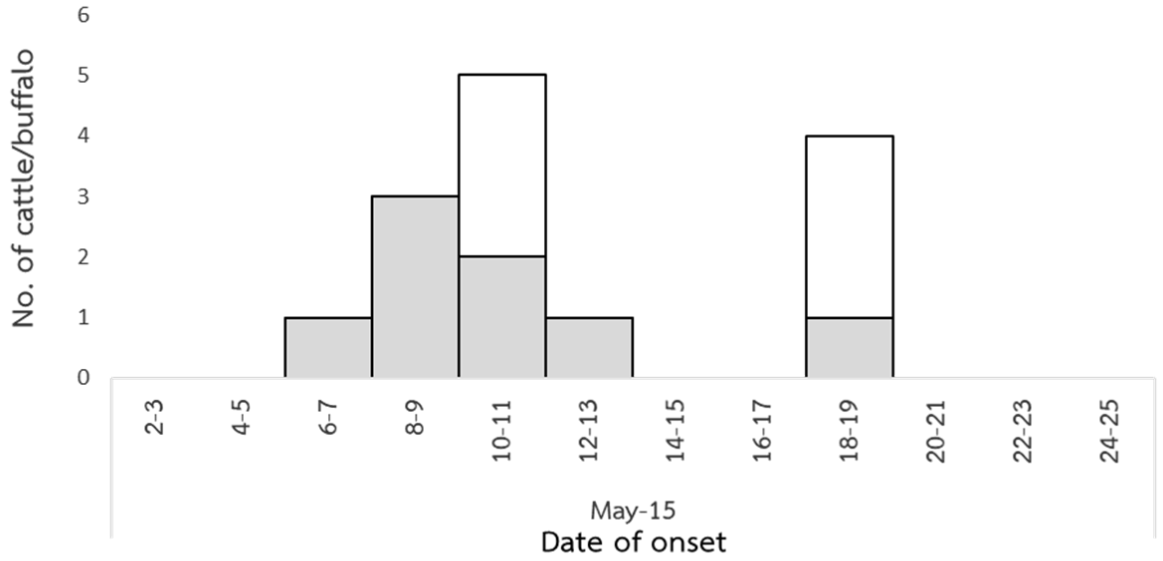
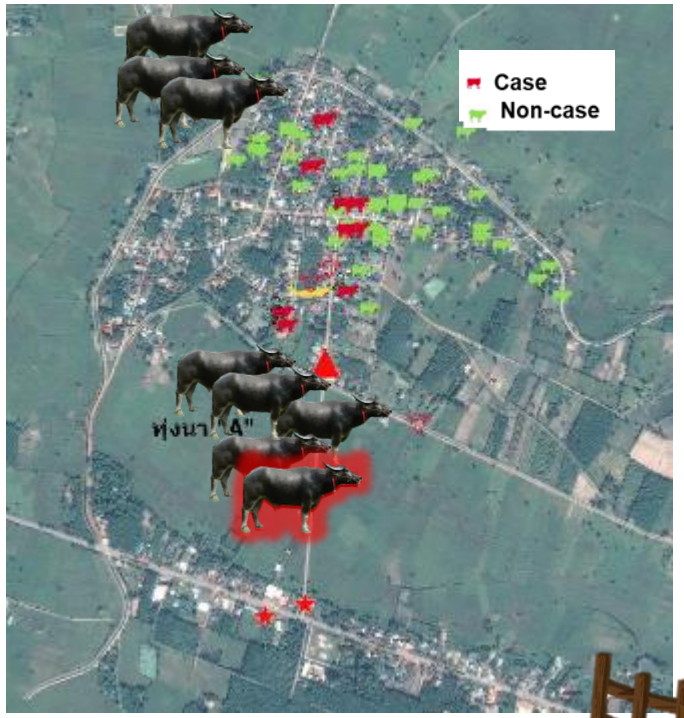
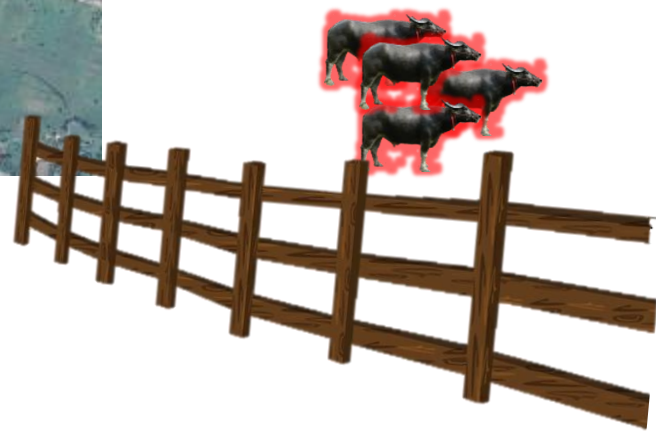


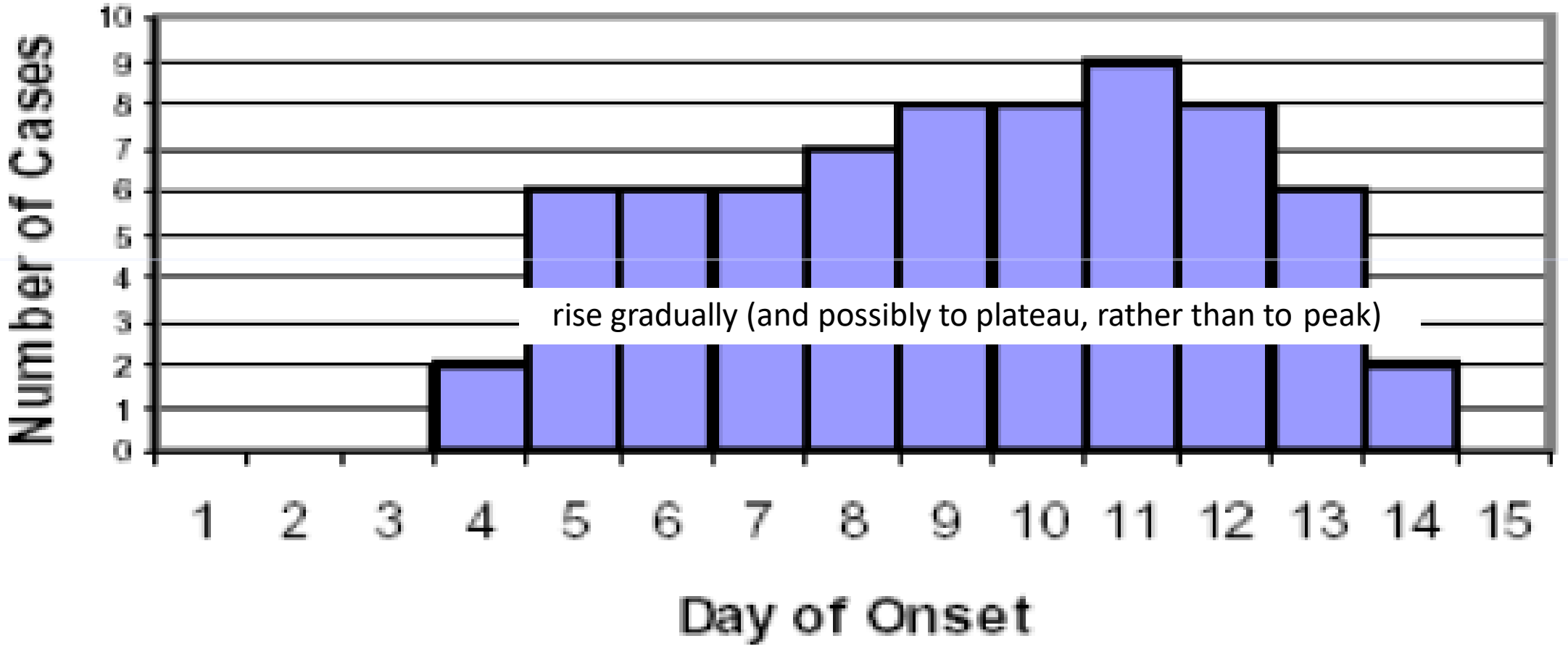
Fig.1 Epidemic curve of suspected HS animal (☐ Sick ■ Death) in Nakae District, Nakhon Phanom Province, Thailand, Apr – May 2015 (n=14)





- HS outbreak in one village in Nakhon Phanom Province, Thailand, 2015
- Source of infection ~ paddy field A
- Farmers quarantine their animal for a while (2 week) , then let their animal grazed in paddy field A

Common source: Continuous exposure



Example of continuous common source in animal disease

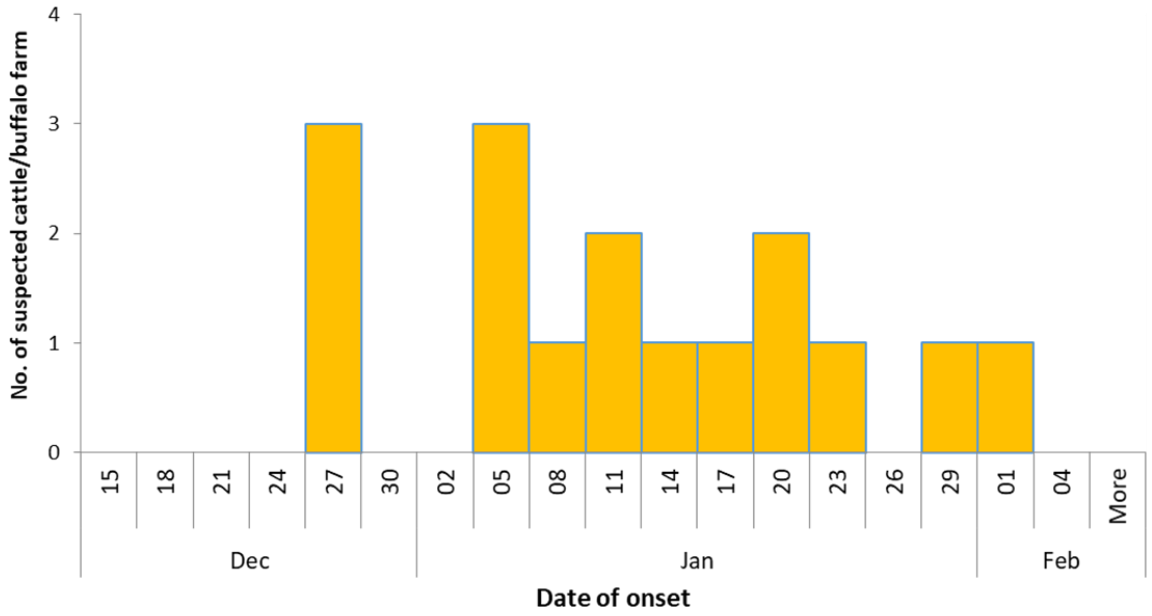
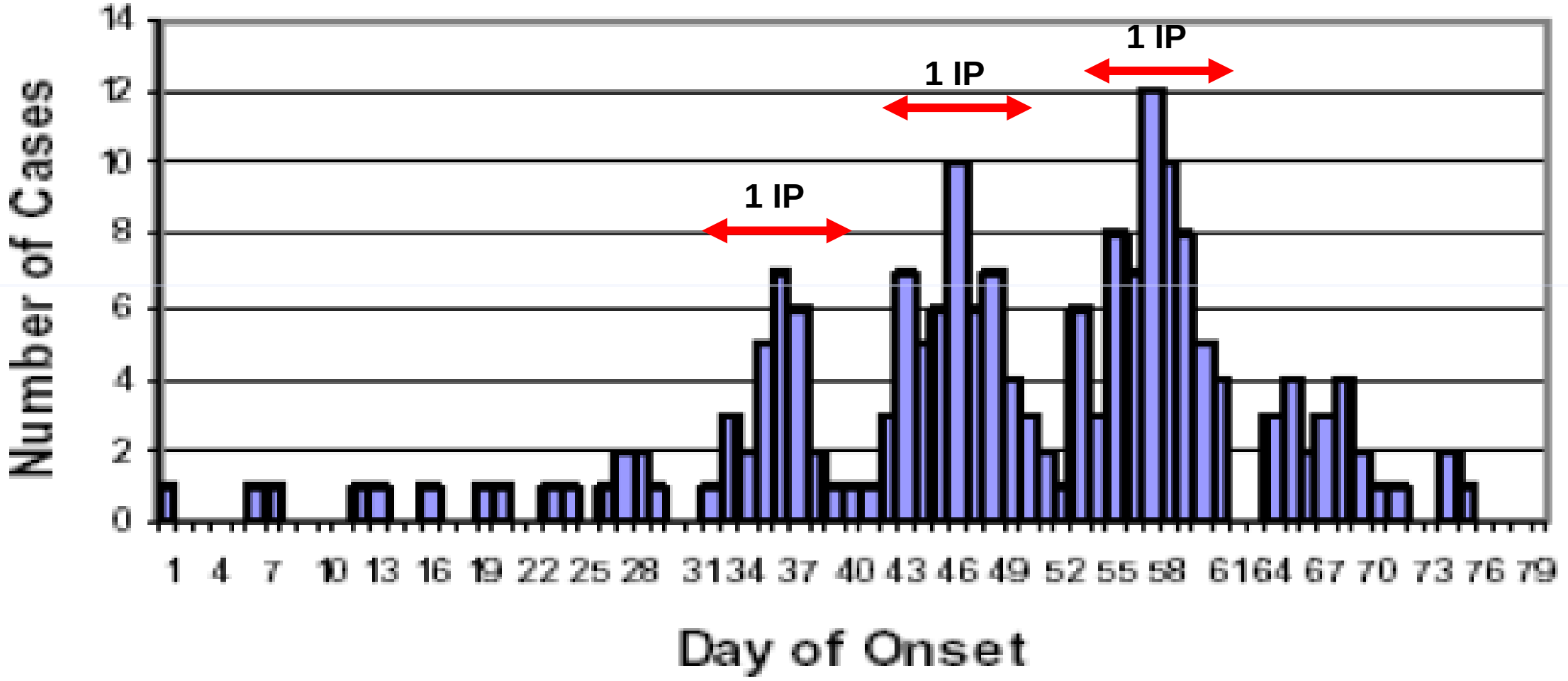


Figure 1: Epidemic curve of suspected FMD in Tha-Uthen District, Nakhon Phanom Province, Dec 2013 – Feb 2014 (n=16)

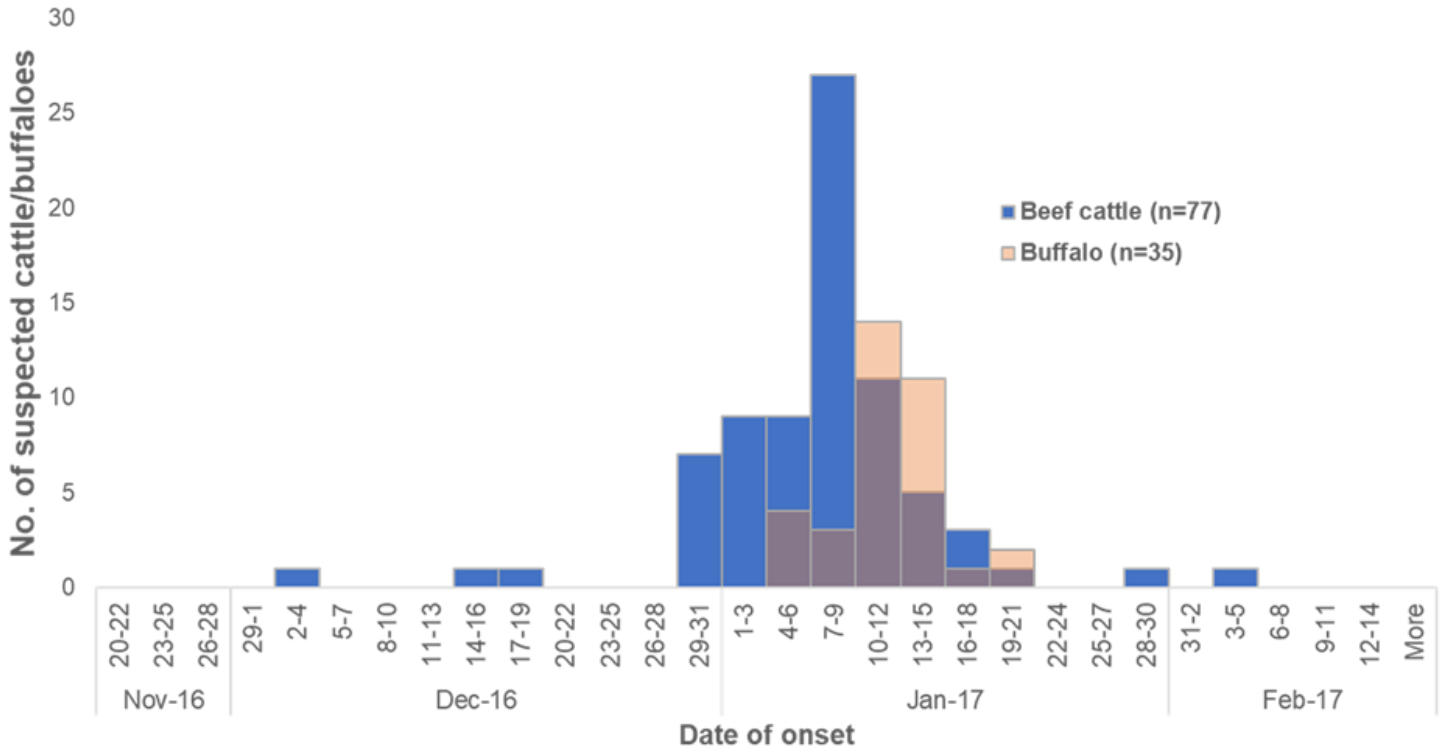
- FMD outbreak in one village
- Index case = new introducing cattle
- Index case used the same pasture (paddy field) with some other cattle herd
- Other farmers continued let their animal grazing in the paddy field

Propagated source (person-to-person)



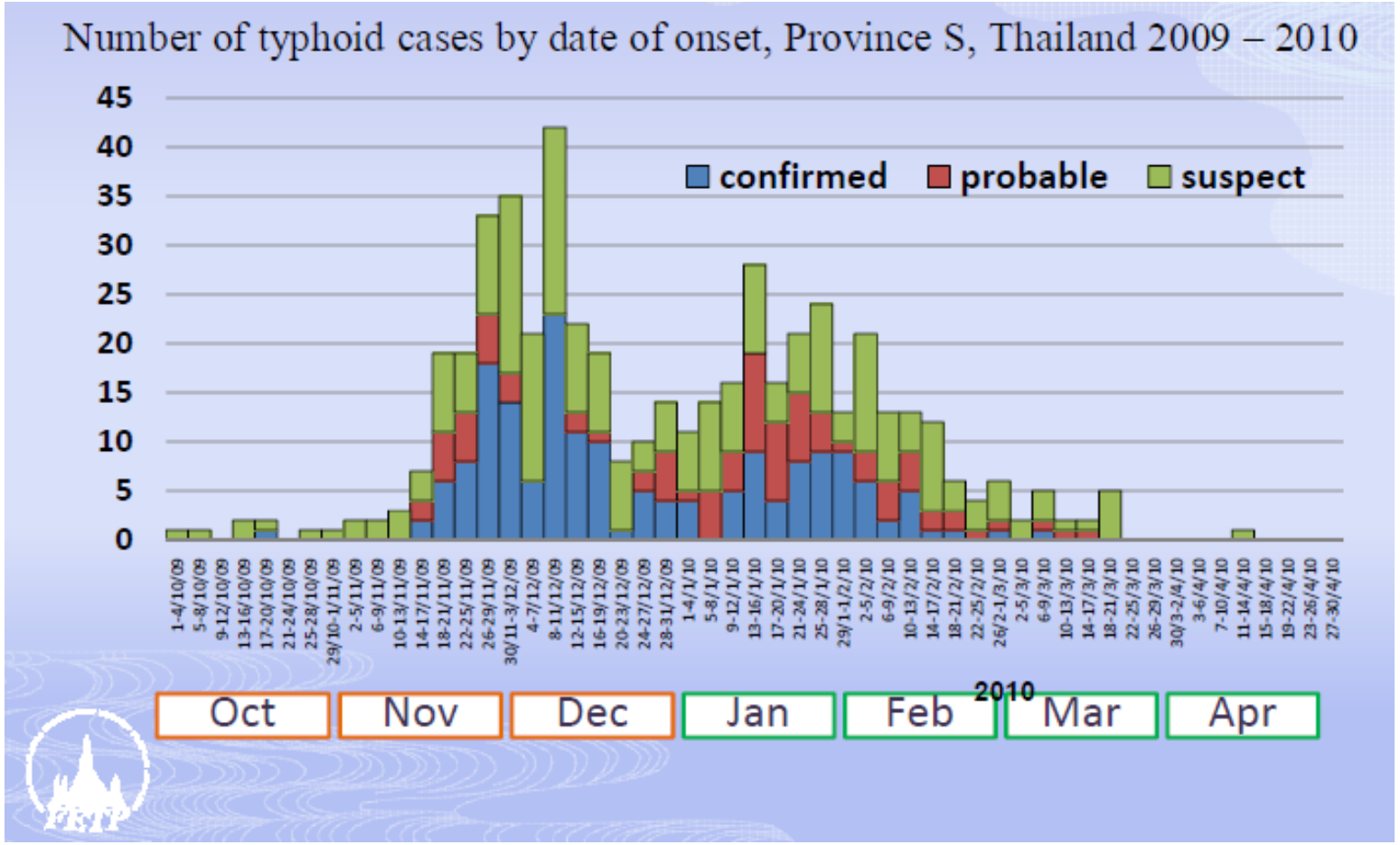
Example of propagated pattern in animal disease

- Another FMD outbreak in my province in 2017
- This affected area raised their animal by free grazing
- After notified, control measures were implemented
  - Isolation, quarantine
  - Disinfection
  - Ring vaccination
- Due to lack of animal feed, the farmers still let their animal free grazed
- Transmission of virus among grazing animal occurred.



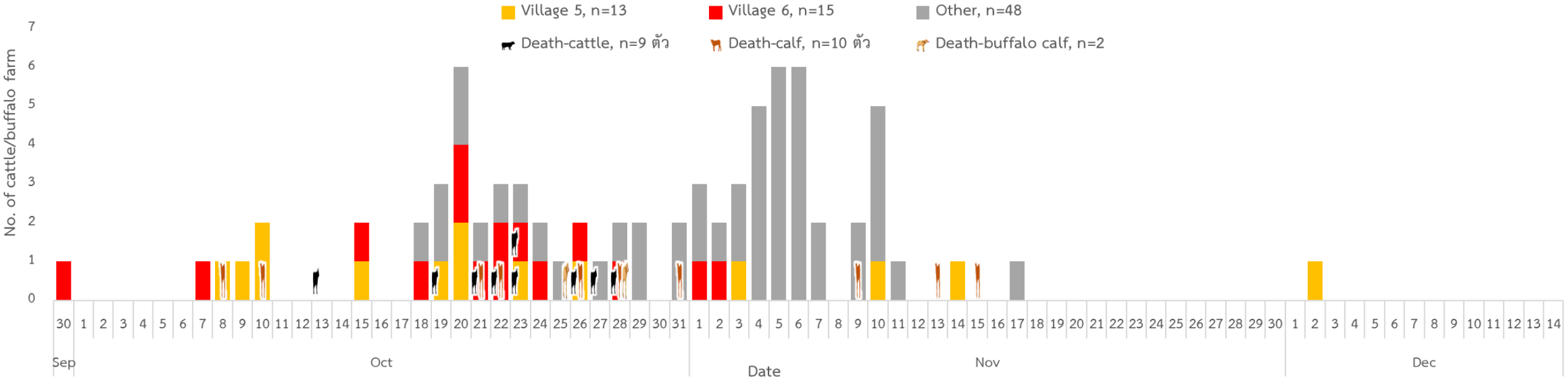
Epidemic curve of FMD in Nakhon Phanom Province, Thailand, Dec 2016 – Jan 2017 (n=112)

Mixed pattern source



- Start with a common source
- Followed by a propagated spread

Example of mixed pattern in animal disease



- The first case was found 2nd Oct (new introducing cattle)
- → nearby farms developed FMD clinical signs → isolated sick animal for treatment, quarantine
- Ring vaccination → 5 Km radius
- Case occurred in other villages within 5 Km radius

Example of mixed pattern in animal disease

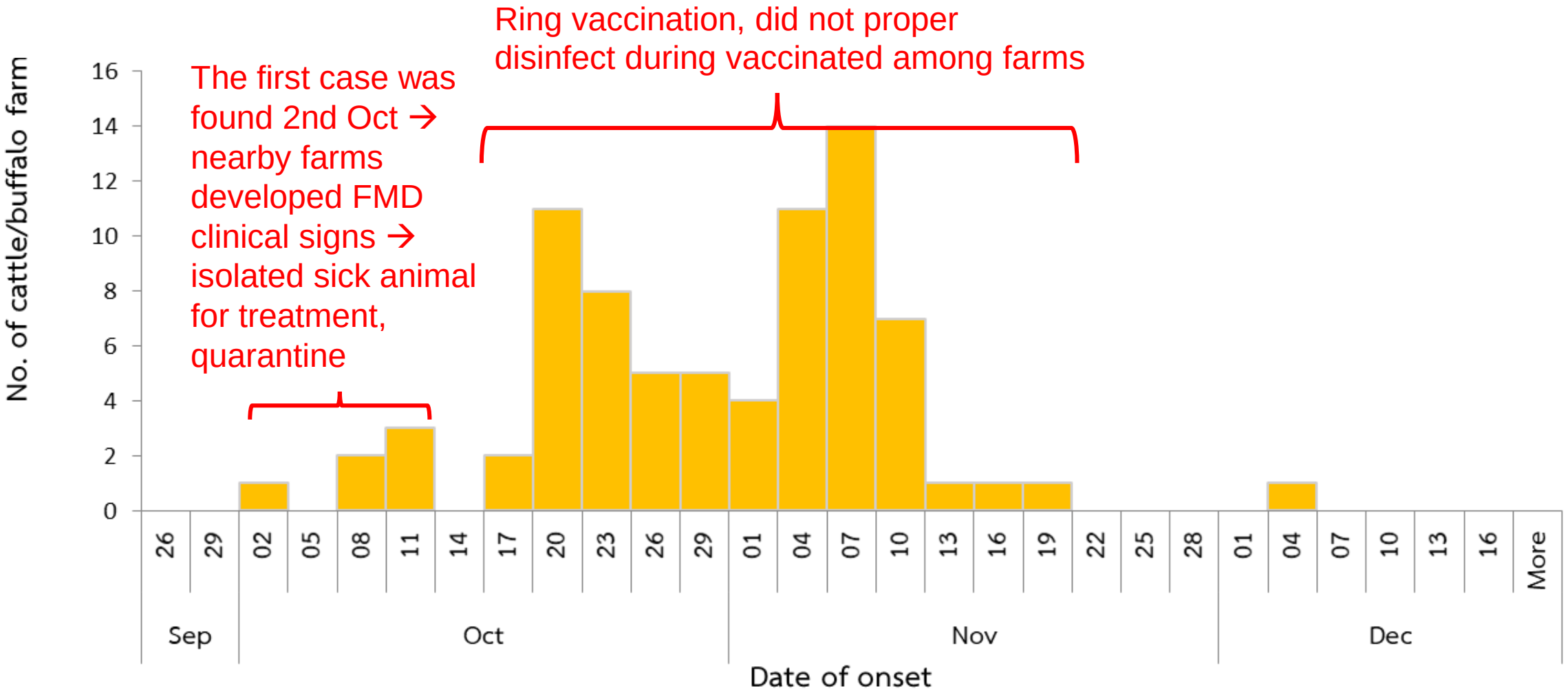
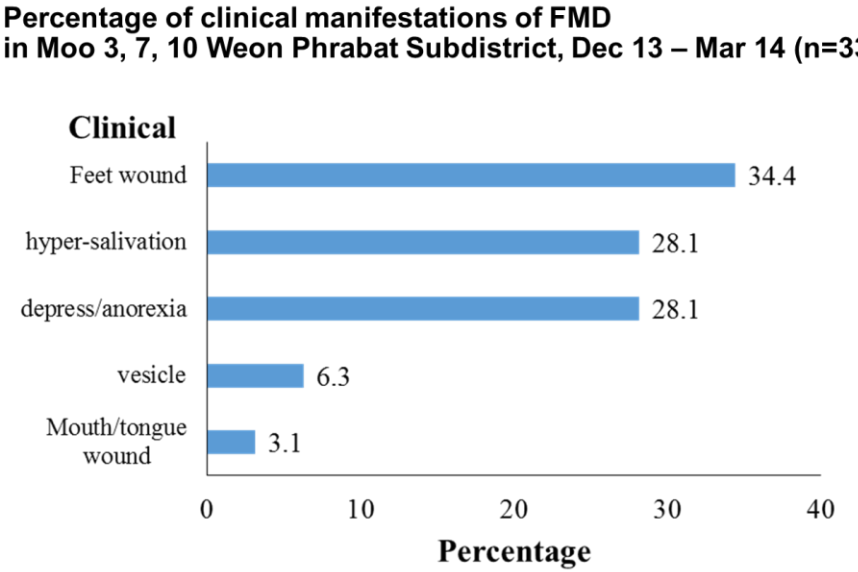


Fig. 1 Epidemic curve of FMD in Mueang-nakhonphanom District, Nakhon Phanom Province, Thailand, Oct-Dec 2020 (n=77)

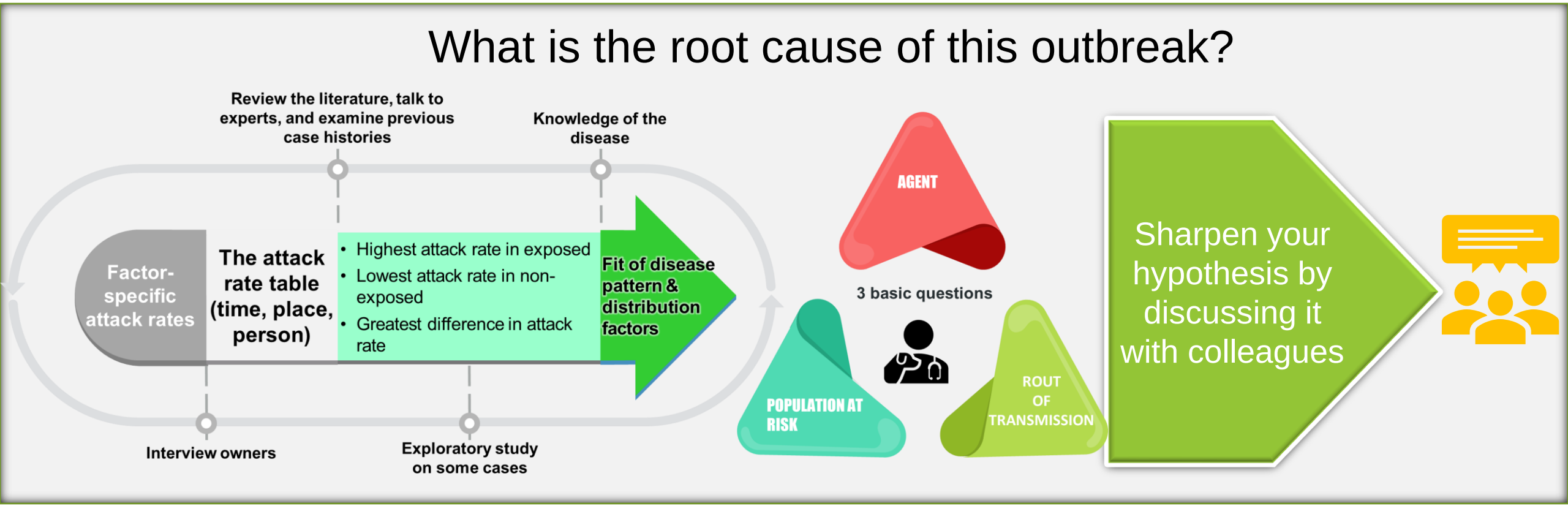
Distribution by animal

- **Signs/symptoms profile**
- **Attack rate**
  1. Crude attack rate
  2. Specific attack rate
     - Species
     - Age
     - Sex
     - Breed
     - Reproductive status
     - Function
     - Wild vs domesticated



Species	No. of total animal	No. of suspected animal	Attack rate (%)
Beef	115	7	6.1
Buffalo	222	26	11.7
Total	337	33	9.8

6. Develop hypotheses



To be continue.....
Part 4; goals and foundation of a disease outbreak investigation for animal disease

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