An outbreak of Q fever associated with domestic animals in southeast Queensland

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Q fever

- Coxiella burnetii
- Transmitted through inhalation of contaminated aerosols
  - Slaughtering
  - Parturient products
- Incubation 2–3 weeks (range 4d–6w)
- Half of cases are asymptomatic
- Animal reservoirs
The Usual Suspects

The Unusual Suspects
C. burnetii in cats & dogs

- Australian seroprevalence
  - 0–8% in cats
  - 1.9–21.8% in dogs
- Outbreaks due to parturient cats and dogs
  - 1 documented outbreak in Australia after C-section of an infected cat in 2011

Q fever vaccine

- Humans: Q-Vax (CSL Limited)
- Pre-vaccination screening
  - Skin and serology
- Recommended for high-risk occupations
  - Abattoir workers
  - Veterinarians and veterinary nurses
  - Professional cat and dog breeders
Outbreak Background

Metro South PHU

Brisbane
**Initial events**

17 Nov  – Notification in animal refuge worker  
         – Reports of other unwell staff  
         – 2 unwell staff at adjacent vet clinic

24 Nov  – Notification in a second worker

25 Nov  – Outbreak investigation initiated

**Investigation Setting & Methods**
### Outbreak setting

- Goats
- Kangaroos
- Geese

### Investigation

- Case finding
- Case interviews
- Livestock animal records
- Cat & dog euthanasia records
- Workplace Health & Safety site visit
- Pre-vaccination screening & vaccination
- Retrospective cohort study
Case definitions

Animal refuge/vet clinic staff 15 Sept-31 Dec

Confirmed
  – Detection of *C. burnetii* through nucleic acid testing, OR
  – Presence of IgM antibodies to *C. burnetii* AND a clinically compatible illness

Probable
  – A clinically compatible illness, AND
  – No history of Q fever or Q fever vaccination

Findings
**Cases**

- 7 cases (6 confirmed, 1 probable)
  - 2 vet clinic, 5 animal refuge workers
- Probable case
  - Non-specific febrile illness
  - Elevated inflammatory markers
  - Slightly elevated liver enzymes
  - No history of Q fever diagnosis or vaccination
  - Unable to perform confirmatory testing

**Onset dates**

- Common exposure period: 09-17 Oct
- Onset dates: 21 Oct-20 Nov
Livestock animal records

- No births or slaughtering
- ‘Mark’ the goat
  - 3-month-old
  - 1 week mid-Sept
  - Dehydrated
  - Treated by vet staff
  - Unavailable for follow-up

Euthanasia records

- Feline birth/euthanasia (5)
- “White/brown wild cat”
  - Trapped on 5 Oct
  - Premature delivery on 7 Oct
  - Queen & litter euthanised same day (by a case)
  - Unavailable for testing
- No euthanasia of puppies
- PPE
Onset dates

- **07 October**
  - All cases at work
  - Incubation 14–44 days
  - Euthanised day of birth

Common exposure period 09-17 Oct

Onset dates 21 Oct-20 Nov

Retrospective cohort study

- 92% response rate
  - 38 animal refuge, 5 vet clinic
- All cases visited each of the livestock, cat impound, and dog impound
- No association with livestock exposure
- Previous Q fever vaccine
  - No veterinary clinic staff
  - 3 animal refuge workers
## Retrospective cohort study

### Disposal of deceased

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<th>Dogs</th>
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<td>RR</td>
<td>4.5</td>
<td>6.9</td>
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<tr>
<td>95% CI</td>
<td>(1.1–19.7)</td>
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### Providing or assisting with euthanasia

<table>
<thead>
<tr>
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<th>Cats</th>
<th>Dogs</th>
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</thead>
<tbody>
<tr>
<td>RR</td>
<td>3.3</td>
<td>4.3</td>
</tr>
<tr>
<td>95% CI</td>
<td>(0.9–11.7)</td>
<td>(1.2–15.4)</td>
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## Discussion & Implications
Outbreak source

White/Brown Wild Cat
07 October

- All cases at work
- Plausible range of incubation periods
- Litter euthanised on day of birth
- Elevated risk ratios
- *C. burnetii* associated with reproductive disorders
- Lack of other plausible sources
Implications

- Cats and dogs are potentially unrecognised sources of Q fever cases and outbreaks
- Increased awareness of the risk of Q fever infection from non-livestock sources
  - Workers
  - Clinicians

Recommendations

- Q fever vaccine currently recommended for professional cat and dog breeders
- Occupations or groups regularly exposed to feline and canine products of conception should receive Q fever vaccine
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Thank you

Questions?