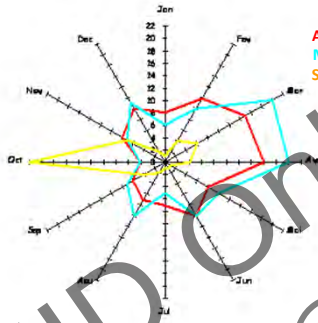
Background

- **Q fever (*Coxiella burnetii*)**
  - Acute infection:
    - symptomatic in 40% of cases
    - flu-like illness, acute hepatitis, interstitial pneumonia
    - 5% hospitalization
  - Widespread zoonosis
  - Domestic animals (cattle, sheep and goats)
  - Inhalation of aerosolized particles shed from infected animals

Importance of the wind in the epidemiology



Tissot-Dupont H, Torres S, Nezri M, Raoult D. Hyperendemic focus of Q fever related to sheep and wind. Am J Epidemiol. 1999 Jul 1;150(1):67-74

Background

- **Q-fever: Low endemicity in Switzerland**
  - Incidence of 0.15 cases per 100'000 inhabitants (about 10-12 infections per year)
  - No mandatory reports to public authority since 1999
  - In animals: 60-80 yearly cases

Cluster

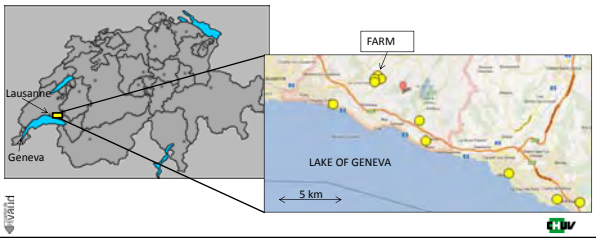
- **Between February and May 2012**:
  - Cluster of 10 human cases of acute Q fever
    - prolonged fever (>2 weeks)
    - hepatitis (2 biopsy proven granulomatous hepatitis)
    - 1 case of vertebral ostomyelitis
  - Diagnosis
    - 10 positive serology including 3 seroconversions
    - 3 positive *C. burnetii* PCR: 1 liver, 1 bone, 1 blood

Method

- **Epidemiological investigations**
  - Patients interviews to identify exposure risk factors and possible outbreak source
  - Public alert to physicians
  - Report of new cases to public health authorities
  - Screening of all blood donors (*Coxiella burnetii* PCR)
- **Veterinary investigations**
  - Environmental examination for *C. burnetii* PCR of possible outbreak source
  - Vaginal swab for *C. burnetii* PCR and paired serology in random samples of 5% of all suspected animals

Results

- **Epidemiological investigations**
  - all patients living (n=5) or walking (n=5) in the Lavaux
  - 5 cases had contact with a sheep farm
  - 2 sheep abortions occurred in this farm (1000 sheep)



Results -2

- **Veterinary investigations (June and July 2012)**
  - *C. burnetii* real-time PCR positive in all 13 environmental samples tested (7 dust and 6 manure)
  - 52 sheep randomly selected (5% of 1000 animals)
    - 43% positive for *C. burnetii* real-time PCR on vaginal swabs
    - 30% positive by ELISA for *C. burnetii*
    - 71% positive by ELISA or positive real-time PCR

Mitigations measures

- **Public alert**
  - 4 additional human cases; all from July to August 2012
- **Screening of all blood donors**
  - 1345 blood donors tested, all negative by *C. burnetii* PCR
- **Veterinarian measures to avoid new human cases**
  - movement restriction of all sheep
  - hygiene measure in farm
  - extensive vaccination of sheep flock

Conclusion -1

- **Active early measures taken may have been sufficient to avoid a much larger outbreak**
  - Public alert including reports to public authorities
  - Mitigations measures to avoid animal-human contact
- **Close follow-up of human cases to identify chronic Q fever is necessary**
  - 1-5% progress into chronic Q fever

Conclusion -2

- **Close collaboration between**
  - Public health authorities
  - Human medicine
  - Veterinary medicine
  - Diagnostic microbiology

  } "one" health paradigm

Questions

1. When to alert public health authorities ?
2. Differential diagnosis of *Coxiella* liver infection ?
3. Proportion of undiagnosed cases ?
4. How to communicate during an outbreak ?
5. How to search for subsequent endovascular infections ?
6. Should we test blood donors ?
7. How to test 150 blood donors per day during summer holidays ?
8. …

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