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# Q fever vaccination in small ruminants

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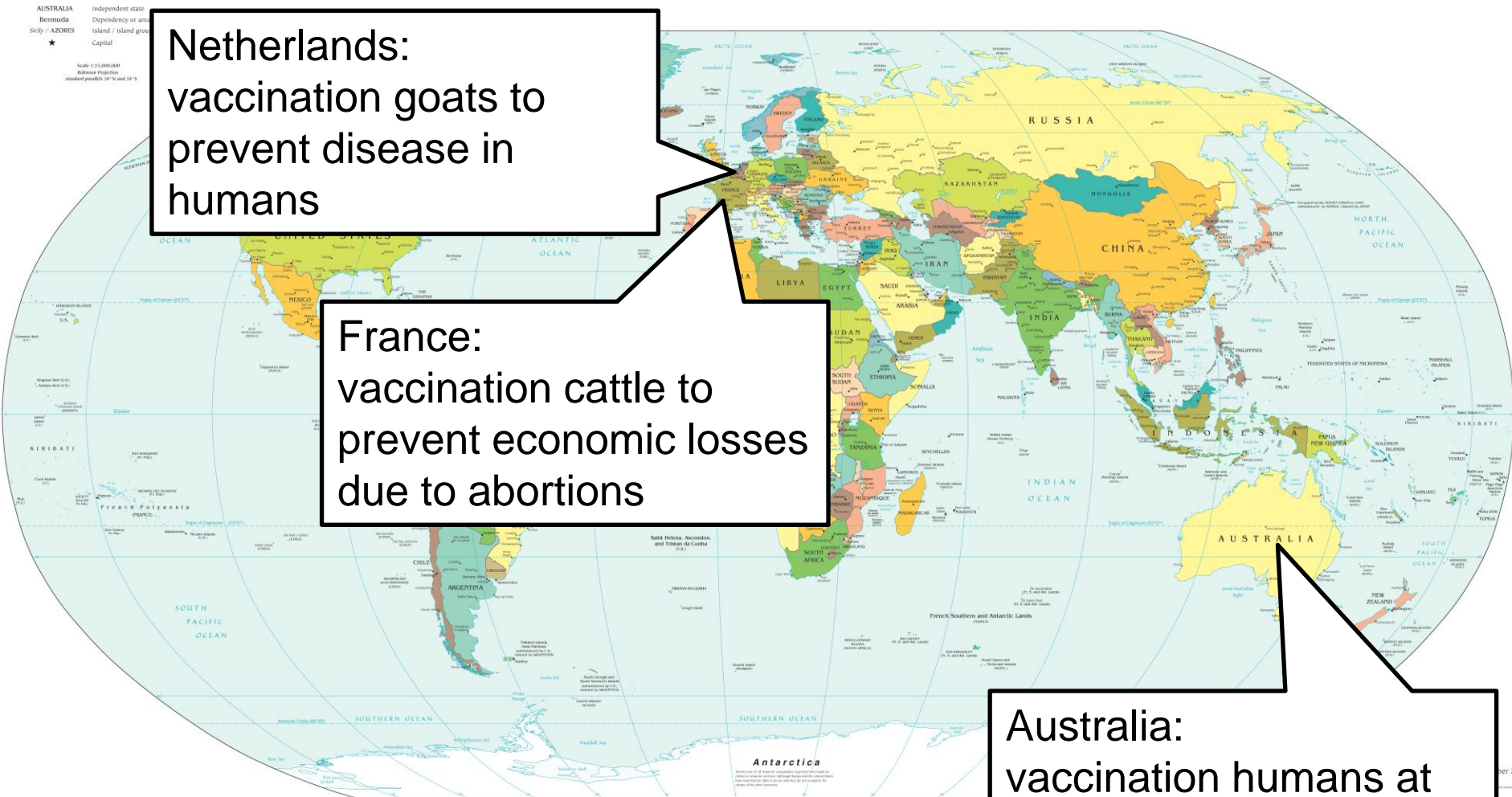
International Q fever symposium  
Amsterdam, 7 June 2012

# Q fever endemic worldwide

Netherlands:  
vaccination goats to  
prevent disease in  
humans

France:  
vaccination cattle to  
prevent economic losses  
due to abortions

Australia:  
vaccination humans at  
risk by occupation





# Q-fever vaccination effect in small ruminants

## Less clinical disease

- Most abortions prevented (Arricau-Bouvery et al, 2005)

## Less transmission from infected to non-infected animals

- Less susceptibility → cattle: 5x lower probability of becoming a shedder (Guatteo et al, 2008)
- Less infectivity (shedding) (Rousset et al, 2009, Hogerwerf et al, 2011, Cremoux et al, 2012)



# Q-fever vaccination effect in small ruminants

Q-fever may remain endemic within herds, but

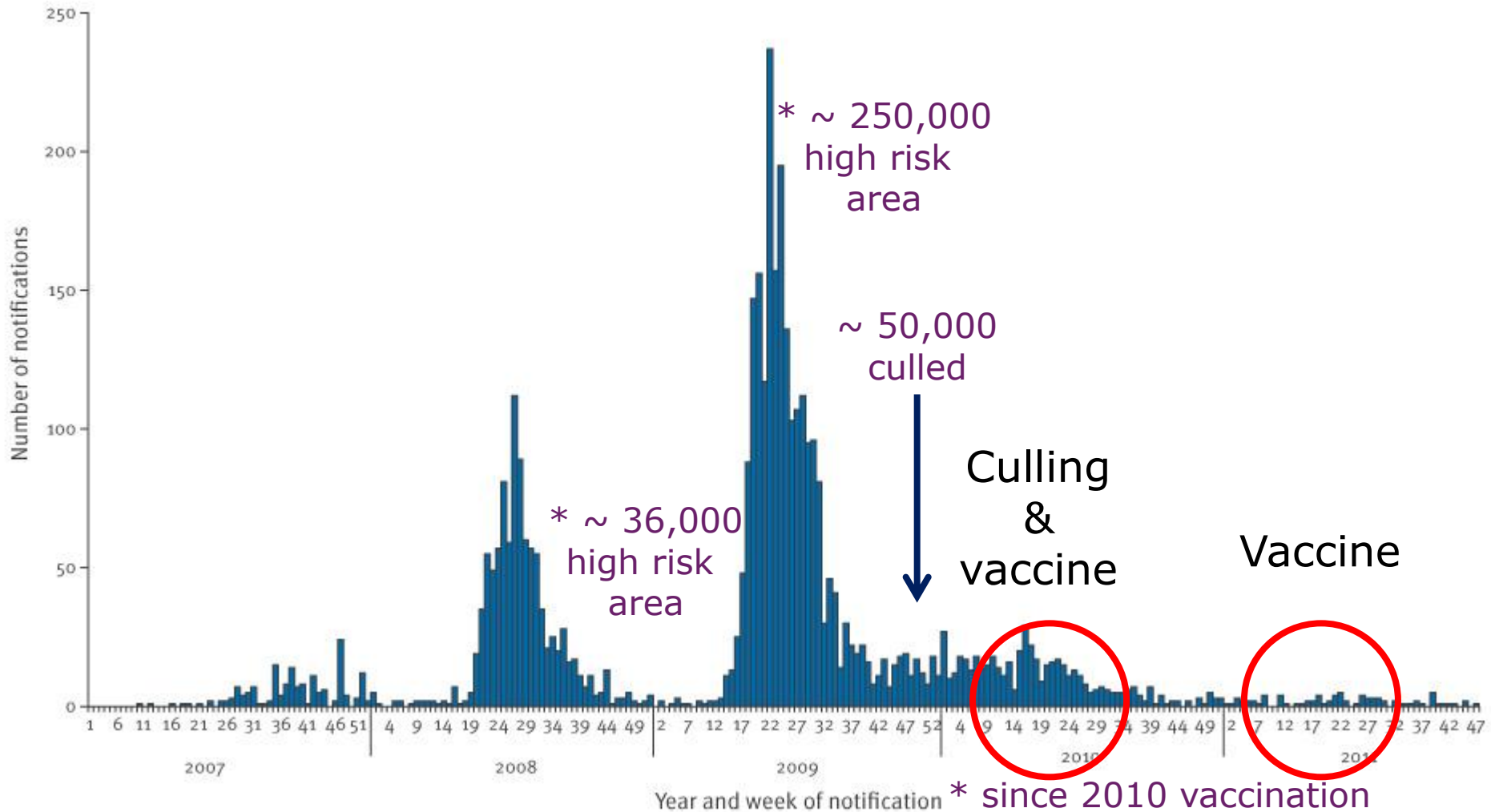
- Less contamination of the environment within farms (Courcoul et al, 2011 (cattle), Hogerwerf et al, in prep. (goats))
- Higher likelihood of extinction of the infection from farms, based on modeling work (Courcoul et al, 2011 (cattle), Hogerwerf et al, in prep. (goats))

→ reduced potential for human exposure

# Q-fever vaccination campaign in small ruminants

FIGURE

Acute Q fever notifications, the Netherlands, 1 January (week 1) 2007–30 November (week 48) 2011



(Figure: van der Hoek et al, 2012)

\* since 2010 vaccination mandatory nationwide (~750.000)



# Drawbacks of vaccine in small ruminants

Side effects (Vellema and v.d. Brom, oral communication)

- local reaction near to the injected area: common
- clinical signs: (very) mild
- feed intake and milk yield: farmers report problems
- possibly depending on previous exposure/vaccination?

May not be effective in animals that are

- pregnant → not proven effective (Guatteo et al, 2008 (cattle))
- already infected → less effective (de Cremoux et al, 2012)



# When to start vaccination? in small ruminants

From herd health management perspective:

- Common infection in ruminants, usually asymptomatic
- Vaccination in response to disease problem
- Individual strategy per farm by farmer and veterinarian

From public health perspective:

- Outbreak in the general population
- Precautionary principle
- Preventive vaccination in goats
- Vaccination obligatory



# When to stop vaccination? in small ruminants

## Consequences of stopping vaccination

- when infection is still present → increase (Courcoul et al 2011 (cattle))
- when herd is free of Q fever → (re-)introduction?
  - if animals are immune → little risk
  - if no immunity → possible risk of epidemic





# Key issues for discussion

## Risk of (re-) introduction into free, non-vaccinated herd without immunity

- Risk of introduction unknown
- Detection mainly around kidding / abortion
  - Detection too late to intervene?
  - Contingency plan?
    - No proven vaccine efficacy in pregnant animals
    - Culling?
    - Antibiotic treatment?



# Key issues for discussion

## How to declare a vaccinated herd free?

- Technical problems with
  - Serology
  - Pathogen detection
  - Clinical symptoms

→ Not easy to declare a vaccinated herd free of Q fever