

**HEALTH PROTECTION AGENCY
MEETING OF THE HPA BOARD
24 March 2010**



Q fever in The Netherlands: overview of current situation and UK response

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1. PURPOSE OF THE PAPER

- 1.1 The purpose of this paper is to provide an update on the current situation with regard to Q fever in the Netherlands and to outline the UK response to this.

2. RECOMMENDATIONS

- 2.1 This paper has been produced at the request of the Board and the Board is asked to **NOTE** the information it contains.

3. BACKGROUND

- 3.1 Q fever is a zoonosis caused by the rickettsial organism *Coxiella burnetii*. Its primary animal reservoirs include cattle, sheep and goats. In most animals the infection is asymptomatic, however, abortion and stillbirth may occur. Humans are usually infected through inhalation of dust or aerosols containing *C. burnetii*, which may be produced during birth or at slaughter. The infectious dose is as low as a single organism. Most human cases are sporadic but outbreaks do occur. The majority of acute cases of Q fever in humans are asymptomatic, however the infection may also present as influenza-like illness or pneumonia. Chronic infection occurs in approximately 5% of cases and is associated with substantial mortality, most commonly through endocarditis in those with underlying cardiac pathology. Q fever acquired during pregnancy may result in an adverse effect on the foetus and lead to chronic infections in the mother. The diagnosis of Q fever is most frequently based on antibody testing, and may be complex, especially for chronic cases.
- 3.2 There is no agreed national or international standard for interpretation of test results. This means that there is no consistency in the diagnosis of patients with acute or chronic infection or past exposure, and also that it is difficult to compare results between countries.

4. THE OUTBREAK OF Q FEVER IN THE NETHERLANDS

4.1 Epidemiology of outbreak in the Netherlands to date

- 4.1.1 The current epidemic of Q fever in the Netherlands emerged as an important human and veterinary public health challenge in 2007. Prior to that year an annual average of 17 human cases of Q fever were reported. This increased to 168 cases in 2007, 1,000 cases in 2008, and 2,358 cases in 2009 (2,236 of these confirmed). The clinical presentation of cases is as follows: atypical pneumonia 78%, febrile illness 17%, and hepatitis 5%, with 20-26% requiring hospitalisation. No clear information is available as yet on the occurrence of chronic disease. There have been 10 deaths attributed to Q fever since 2007.
- 4.1.2 The most affected area is the highly agricultural southern province, but cases have also been reported from neighbouring provinces, though no increases have been noted in contiguous areas of neighbouring countries. Q fever has now been confirmed on a total of 73 dairy goat farms and 2 sheep farms. The specific epidemiology of Q fever in the Netherlands is most

likely to be related to intensive goat farming in the proximity of densely populated areas.

- 4.1.3 Dutch authorities have introduced a number of measures to try to control the spread of the outbreak, including mandatory vaccination of small ruminants, a general ban on breeding, testing of bulk tank milk for Q fever, and a cull of all pregnant dairy goats on infected farms.

4.2 European response

- 4.2.1 In December 2009 the European Centre for Disease Prevention and Control undertook a threat assessment in response to the Q fever situation in the Netherlands. This concluded that “the spread to the general population in other countries is unlikely to reach the extent it has in the Netherlands, as farms are not so often in the proximity of densely populated areas, and goats are not kept in the same way.” A preliminary risk assessment was published in February 2010, reaching similar conclusions. A more detailed risk assessment will be completed in April following a meeting of European experts.

5 UK RESPONSE

5.1 Role of the HPA

The role of the HPA with respect to Q fever includes: Q fever surveillance, epidemiology, risk assessment and public health advice; reference microbiology and specialist advice; and co-ordination of the investigation of incidents and outbreaks.

5.2 Reference Laboratories

The HPA provides two reference laboratories for the diagnosis of Q fever; the Regional HPA Laboratory in Bristol and the Special Pathogens Reference Unit of the HPA Centre for Preparedness and Response at Porton. These laboratories provide diagnostic and reference services, specialist expertise and advice to NHS laboratories and others.

5.3 Epidemiology of Q fever in the UK

Current surveillance of Q fever in humans and animals in the UK does not indicate a recent increase in numbers of cases. Since 1999 there has been an average of 74 new diagnoses of Q fever in humans each year in England and Wales, and no significant increase has been noted in the last two years (see Appendix 1). Surveillance in humans is based on laboratory reporting and has several limitations; in particular it may be difficult to distinguish between acute and chronic infection, and very little information is collected on risk factors, occupation, severity of disease and outcome. Further information on the background level of Q fever infection in sheep and goats will be available from a Q fever seroprevalence study commissioned by the Department for Environment, Food and Rural Affairs with preliminary results expected soon.

5.4 Threat detection and assessment

- 5.4.1 This is undertaken by HPA’s Gastrointestinal, Emerging and Zoonotic Infections Department at the Centre for Infections. The department provides a public health focus for emerging infections and zoonoses, including horizon scanning, surveillance, networking, and liaison. An integrated horizon scanning approach combining information on both human and animal health is used in order to identify and assess outbreaks and incidents of new and emerging infectious diseases reported nationally and internationally. Information is logged daily and used to produce a monthly summary of those incidents or events which might pose a public health threat to the UK population (see 5.7). Such incidents may be referred to the Human Animal Infections Risk Surveillance group or the National Expert Panel on New and Emerging Infections for further consideration as appropriate.
- 5.4.2 The Human Animal Infections Risk Surveillance group is a multi-agency group with members from the HPA, the Department for Environment, Food and Rural Affairs and its agencies, Department of Health, Food Standards Agency, and the Devolved Administrations, chaired

and organised by the HPA's Gastrointestinal, Emerging and Zoonotic Infections Department. The Dutch outbreak was initially discussed in July 2008, and subsequently monitored by the group.

5.5 Risk assessment

The Human Animal Infections and Risk Surveillance group met in January 2010 to discuss the potential implications of the Dutch situation for the UK and undertook a risk assessment. Evidence from the Dutch outbreak and the European Centre for Disease Prevention and Control threat assessment was considered, together with UK Q fever surveillance data and information on UK farming practices. Current surveillance of Q fever in humans and animals does not indicate any recent increase in numbers of cases in the UK. Furthermore there are significant differences in the pattern of husbandry and density of stocking of goats between the UK and the Netherlands. The group concluded that, due to these factors, it is highly unlikely that the events in the Netherlands could be repeated in the UK. In addition, current scientific evidence did not support the suggestion that a 'hypervirulent' strain may be contributing to the extent of the outbreak in the Netherlands. There is no evidence to date that clinical disease is more severe, with hospitalisation rates similar to those reported in other outbreaks. Furthermore the size of the outbreak is believed to be related to intensive goat farming in the proximity of densely populated areas rather than to an unusually transmissible strain of the organism.

5.6 International liaison

The Centre for Infections liaises closely with colleagues at the European Centre for Disease Control and participated in a European teleconference on Q fever in December 2009. A further meeting of European Q fever experts in April 2010 will be attended by a representative of the HPA Centre for Infections. The Human Animal Infections Risk Surveillance group also receives feedback from the European veterinary meetings on the Q fever situation in the Netherlands.

5.7 Communications

Since September 2008 updates on the Dutch Q fever outbreak have been reported regularly in the monthly summary (*"Infectious Disease Surveillance and Monitoring System for Animal and Human Health: Summary of notable events/incidents of public health significance"*) and in the quarterly HPA Zoonoses Network Newsletter. Both of these are available on the HPA website. In addition the outbreak and risk assessment featured in the *Health Protection Report* on 26 February 2010, and advice to Local and Regional Services and the Regional Microbiology Network was circulated in an HPA Briefing on 5 March 2010. The topic was raised at a meeting of the National Expert Panel on New and Emerging Infections on 22 January 2010.

6. CONCLUSIONS

The current epidemic of Q fever in the Netherlands is an important human and veterinary public health challenge, and despite a range of control measures is still ongoing. European threat assessments undertaken to date agree that the specific epidemiology of Q fever in the Netherlands is most likely to be related to intensive goat farming in the proximity of densely populated areas, factors which appear to be unique to the Netherlands. A risk assessment undertaken by the Human Animal Infections and Risk Surveillance group in January 2010 concluded that, due to these factors, it is highly unlikely that the events in the Netherlands could be repeated in the UK.

7. NEXT STEPS

We are continuing to monitor the situation closely and have been strengthening our ability and capacity to respond. We propose the following:

- a) Establish enhanced surveillance to improve understanding of the epidemiology, clinical course and outcomes of Q fever
- b) Continue with a programme to raise awareness amongst clinicians of the importance of investigation and follow-up of patients with acute and chronic Q fever
- c) Reinvigorate the HPA Q fever working group

These activities will be developed within existing resources.

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March 2010

Appendix 1: Q fever new diagnoses¹ England and Wales, 1999-2009²

Year	Acute	Chronic	Total
1999	71	11	82
2000	73	10	83
2001	47	15	62
2002	119	11	130
2003	75	7	82
2004	49	10	59
2005	53	9	62
2006	47	5	52
2007	43	13	56
2008	56	22	78
2009	45	18	63
TOTAL	678	131	809

¹ patients diagnosed with acute or chronic infection only. Those with evidence of past infection not included.

² data from HPA Reference Laboratories (Bristol and Porton) and national surveillance (LabBase)