# Serological evidence of exposure to Q fever in humans after an abortion outbreak in dairy cattle due to *Coxiella burnetii*

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## Objective

Q fever is a zoonosis caused by *Coxiella burnetii*, a small bacterium strictly intracellular that is able to infect a wide range of hosts and to survive for long periods in the environment. Many studies confirmed the major role domestic ruminants have as the main reservoir for human infection. Veterinarians and farmers that are in contact with infected animals are considered at risk *(Groten et al., 2020)* through the inhalation of contaminated aerosols. The aim of this study was to investigate an abortion outbreak in cattle related to *Coxiella burnetii* and the possible correlation between the infection in ruminants and the seroprevalence observed in humans in contact with infected cattle.

## Materials and methods

Between April and August 2019, ten 6 to 8 months' pregnant cows aborted in a Sicilian dairy cattle farm milking 220 dairy cows and with no close contacts with small ruminants. Two fetuses were submitted for the detection of the major abortigenic pathogens namely IBR, BVD, *Neospora caninum*, *Leptospira*, *Brucella, Chlamydia* and *Coxiella burnetii*. Moreover, 246 animals (heifers and cows) were serologically tested for the same abortigenic agents. In order to investigate the potential transmission of the infection to humans in the farm, sera samples were collected from 16 people three months after the first abortion outbreak in cattle. This serological investigation involved the farmers, their families and farm workers and was based on testing for *Coxiella burnetii* antibodies (IFA test) to evaluate phase I and phase II IgM and IgG.

## Results

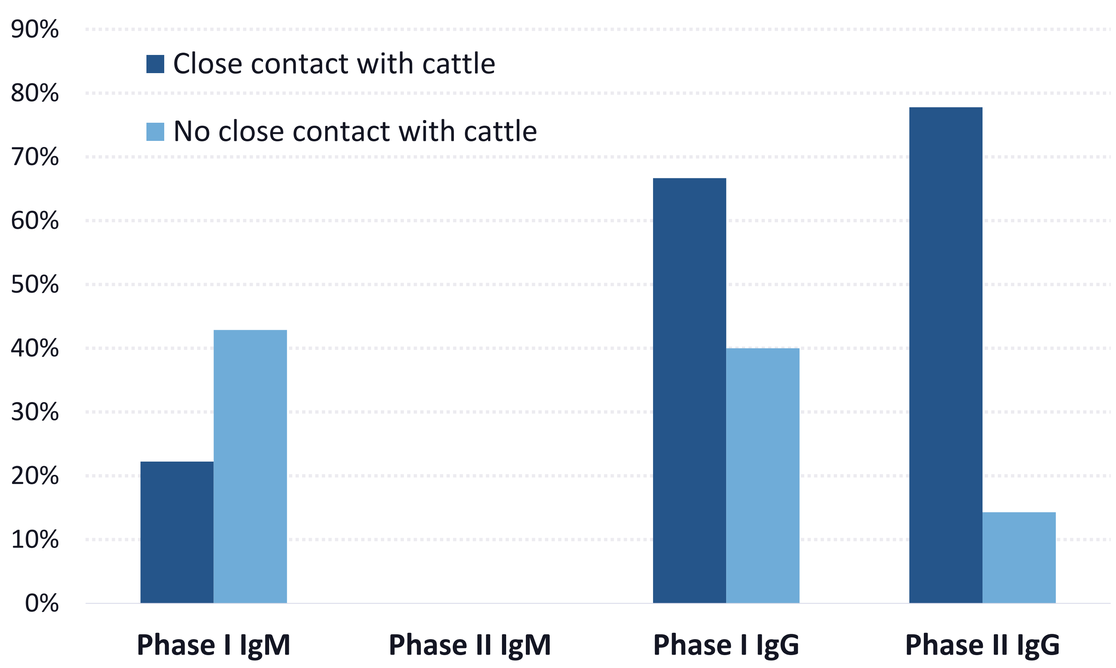


**Figure 1.** Seropositivity for phase I or phase II IgM and IgG in humans working or living in a dairy farm infected with Q fever

- The two aborted fetuses were found PCR-positive for *Coxiella burnetii* and negative for all the other pathogens tested. Seroprevalence in dairy cattle for *Coxiella burnetii* was found to be around 50%.
- A high number of animals were found serologically positive for IBR (≥ 92.1%) and BVD (91.4%), probably induced by prior vaccination with a multivalent vaccine containing IBR (non-marker) and BVD antigens.
- Overall prevalence for *Coxiella burnetii* IgG in human cases was 50% (Figure 1). If we consider the people strictly in contact with cattle, the seroprevalence was found to be about 67% for phase I IgG and 78% for phase II IgG. None of the people showed clear symptoms of Q fever infection with the exception of headache and, in one case, diarrhea.

## Conclusions

- **Data obtained during the study highlight the possibility of transmission of *Coxiella burnetii* from cattle to humans and underline the need to increase epidemiological surveillance and the opportunity to implement infection control plans, including vaccination, in cattle.**

References

The Principles and Practice of Q Fever: The One Health Paradigm. Nova Science Publishers, New York, 2017.

Groten, T., Kuenzer, K., Moog, U., Hermann, B., Maier, K., Boden, K., 2020. Who is at risk of occupational Q fever: new insights from a multi-profession cross-sectional study. BMJ Open 10. https://doi.org/10.1136/bmjopen-2019-030088