Drivers of underreporting and strategies for improvement of surveillance of Q fever in Italy: the case study of Emilia Romagna region.

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Q fever is a globally endemic zoonosis. Domestic ruminants are the main reservoirs, often showing subclinical signs. In humans, it can cause fever, pregnancy loss, and occasionally pneumonia or neurological complications. In Europe, it is a Category E disease under the Animal Health Law, requiring mandatory surveillance. In Italy, surveillance mainly targets abortions, though case definition differs from EU standards. Between 2010 and 2025, epidemiological investigations in Italy reported a pooled herd prevalence of 43.2% (range: 35–59%) and a within-herd prevalence of 15% (range: 3–37.8%), using both PCR and ELISA. However, no Q fever outbreaks have been notified to WOAH's WAHIS, whereas the Italian Animal Disease Information System (SIMAN) reported an average of 5.4 cases per year between 2015 and 2025. Serological surveys in humans showed an average prevalence of 33.7% (range: 8.6–62.9%), yet only 22 cases were reported on the Italian infectious disease surveillance platform PREMAL (2001-2025). The available data point to a potential underreporting of Q fever in Italy.

This study aims to investigate the factors contributing to the potential underreporting of Q fever in Italy across veterinary and public health domains (V&PH). In Emilia Romagna (Italy), interviews and questionnaires were administered to 20 veterinarians working in Local Health Authorities (LHAs), ruminant' farms, and Zooprophylactic Institutes (IZS), and to 62 human health professionals, including general practitioners, LHAs infectious disease specialists, and officials from the Ministry of Health. Among veterinarians, 90% self-reported low-to-medium knowledge of Q fever. Farm veterinarians correctly identified the main clinical signs in animals, and 60% reported having suspected Q fever on farms within the past two years. Their assessment of the zoonotic risk was split: 60% rated it as medium- high, and 40% as low. All were aware of mandatory surveillance. Sixty percent routinely sampled abortions; others did so only during abortion storms or after consulting LHAs for guidance. LHAs and IZSs veterinarians reported that suspected cases are sent to official laboratories, with confirmed cases notified in SIMAN and reported internationally. In public health, 41.5% of doctors reported no knowledge of Q fever, only 50% considered zoonotic risk during anamnesis, and 36% were unaware of mandatory notifications requirements. Limited understanding of diagnostic and notification protocols emerged. Across V&PH, key barriers included poor disease awareness, non-specific symptoms, unclear notification protocols, fear of LHA-imposed restrictions (for farmers), and under-diagnosis of animal abortions.

This study in Emilia Romagna region shows that, in public health, notification is hindered by poor disease awareness, insufficient attention on zoonoses, and an inadequate knowledge of reporting procedures. In animal health, although more than half of interviewed veterinarians are aware of Q fever, of its zoonotic risk, and acknowledge mandatory surveillance, abortion is the principal target of Q fever monitoring and the coverage is not ideal. The paucity of data on Q fever circulation are insufficient to promote effective risk management strategies. These findings call for continuous professional training of V&PH professionals and the integration of standardized diagnostic and notification protocols, with a clear case definition, in national legislation.

Keywords: Q fever, Surveillance, Italy, Under-reporting.