Leptospirosis continues to place a significant disease burden on rural New Zealanders, reports Jackie Benschop, Senior Lecturer Molecular Epidemiology and Veterinary Public Health, Institute of Veterinary, Animal and Biomedical Sciences, Massey University.

In 2012, there were 113 notified cases. Of the 107 cases that had hospitalisation status recorded, 66 (61.7 percent) were hospitalised. Leptospira species and serovars (sv) were recorded for 78 notified cases. The most commonly identified serovar was L. borgpetersenii sv Hardjo-bovis (28 cases, 36 percent) and L. interrogans sv Pomona (20 cases, 26 percent). (Health Intelligence Team, 2013)

Of the 104 cases with occupation recorded, 58 were identified as farmers or farm workers, with 22 of the 104 working in the meat processing industry. This follows the trend seen since 2007 of a rise in cases in farmers and a reduction in cases in meat workers (Figure 1).

In a review of 97 notified cases from the Waikato region, dry stock farmers had the highest rates of leptospirosis and dairy farmers formed the second-largest occupational group (Cowie and Bell, 2012). In 2012, there was a case notified in a veterinary technician. Although there have been no notifications of leptospirosis in veterinarians over the past 10 years, veterinarians are a recognised at-risk occupation (Plank and Dean, 2000). This issue of Vetscript includes further articles that discuss leptospirosis in New Zealand veterinarians and farmers.

Notified cases over the past 10 years equate to an annual incidence risk of 2.5 per 100,000. This places New Zealand in the moderate incidence category for the Asia Pacific region (Victoriano et al, 2009) and globally (Tulsiani et al, 2010). Internationally, leptospirosis is an important zoonotic disease with three main epidemiological patterns:

- flooding associated
- poverty associated

The source of infection in humans is direct or indirect contact with the urine of an infected animal; these may be diverse species including domestic animals, wildlife or vermin. For this reason, the disease may be prevalent in both urban and rural settings and depends on animal contact and environmental and socio-economic conditions that facilitate transmission.

Leptospirosis is a protean disease and commences as an acute, generalised illness that may be mistaken for influenza, dengue or malaria in humans. However, the disease can progress to severe sequelae such as acute renal and liver failure, pulmonary haemorrhage and cardiac complications (Levett, 2001). Pulmonary haemorrhage due to infection with Icterohaemorrhagiae, Canlicola and Australis (exotic to New Zealand) can occur in the absence of jaundice with 50 percent case fatality despite early treatment (Marchiori et al, 2011). The most recent global incidence estimate is 1.03 million cases with 58,900 deaths annually. Tropical regions of South and South-east Asia, the Western Pacific, Central and South America, and Africa carry the highest burden (Hagan et al, 2013). Worldwide, however – and this includes New Zealand – the true burden of leptospirosis is likely to be underestimated.

Globally, the major burden of human leptospirosis derives from contact with rodents and, increasingly, outbreaks are seen following flooding (Lau et al, 2010). In New Zealand, however, livestock species play the major role in human disease. Climatic factors are associated with animal disease patterns while those in humans show little association with climate. Worldwide, rodent control and post-exposure prophylaxis are predominant in preventing human disease. In New Zealand, vaccination of domestic livestock and use of personal protective equipment are mainstays for the control of human leptospirosis.
Further, New Zealand has relatively few endemic serovars compared with many other countries, where up to 30 or more serovars may be circulating.

Despite these differences, the New Zealand leptospirosis scientific community has much to offer its international colleagues. For example, Massey University’s Leptospirosis Research Group within the OIE Collaborating Centre for Veterinary Epidemiology and Public Health is one of only a few working both in human and animal health and across a suite of disciplines that include epidemiological field studies, diagnostics, molecular typing, vaccine efficacy, modelling and economics. In addition, New Zealand’s experience with animal leptospirosis vaccination to reduce human infection is unique. On first glance it would appear that animal vaccination as an option for the control of human leptospirosis is only feasible if the predominant serovars found in human cases are maintained in species amenable to vaccination. However, it is proposed that animal vaccination could work to prevent human cases more broadly, especially those associated with rodent–livestock interactions. Massey University’s Leptospirosis Research Group has a growing representation within internationally important groups such as the International Leptospirosis Society, the Global Leptospirosis Environmental Action Network and the World Health Organization. The evolution of leptospirosis work both here in New Zealand and in Nepal, Fiji and Sri Lanka promises the next five years in leptospirosis research to be at least as exciting as the previous five years.

References


