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**ONE HEALTH APPROACH AND EPIDEMIOLOGICAL  
INVESTIGATIONS OF LEPTOSPIRAL INFECTIONS  
IN NEW ZEALAND**

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**Background and Rationale:** The World Health Organisation defines 'One Health' as “an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals, and ecosystems. It recognizes the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and interdependent”. A One Health approach is particularly relevant in the control of zoonoses, food safety, and antibiotic resistance. Leptospirosis is an example of a zoonotic disease of global importance. In New Zealand, there are six endemic serovars belonging to the species *Leptospira interrogans* and *borgpetersenii*, and livestock and free-living rodents are considered the main sources of human leptospirosis. Human cases are notifiable through the public health system and preventative measures include the use of personal protective gear and livestock vaccination. Therefore, leptospirosis in New Zealand can be used as a model for the application of the One Health approach.

The main objective of this work is to demonstrate work utilising the principles of the One Health framework in *Leptospira* research and control in New Zealand.

An overview of peer-reviewed literature published by New Zealand *Leptospira* research groups in which the integration of animal, environmental, and public health research sectors align with the One Health framework principles.

Examples of the One Health integrative approach in *Leptospira* research in New Zealand could be drawn from a string of publications. Several studies [1-3] analysed human notification data on leptospirosis using epidemiological tools, such as spatial and temporal analysis, calculation of odds ratios, and establishing risk factors for hospitalisation amongst notified cases. Another study<sup>4</sup> investigated work-related seroconversion and the annual infection risk amongst meatworkers. Other works analysed data collected from serological surveys of livestock [5, 6] as the measurement

for *Leptospira* prevalence within sources of infection, as livestock, even highly vaccinated, are still considered the main source of human leptospirosis in New Zealand. Moreover, *Leptospira* seroprevalence was investigated<sup>7</sup> in the slaughter cattle within an abattoir environment. Lastly, another study<sup>8</sup> combined the outlook of the disease ecology and wildlife - livestock interaction in the farm environment. In this study, the authors with the aid of a systematic literature review formulated a hypothesis of the direction of *Leptospira* transmission direction between wildlife and livestock.

The example of the application of the One Health framework allows for describing the distribution of health-related events in both human and animal populations, identifying risk factors for diseases, and identifying causes or determinants of leptospirosis. The outcomes of these studies can inform control and/or preventive measures, establish priorities for allocating resources and recommend interventions for prevention and control

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