

Welcome Home Workshop 2014

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Abstract

Introduction: Leptospirosis burdens New Zealand's (NZ) rural communities with most cases occurring in farmers and meat workers. In a recent cohort study in four sheep slaughtering abattoirs in NZ, sera were collected bi-annually from 384 meat workers and tested by the Microscopic Agglutination Test for *Leptospira interrogans* sv Pomona and/or *Leptospira borgpetersenii* sv Hardjobovis. The annual infection risk (incidence) was 12%. Significant risk factors for new infection in the generalized linear model (GLM) were worker position, abattoir and time worked in the meat industry. The aim of the study was to compare the results from the GLM with those from additive Bayesian network (ABN).

Methods: ABNs are a form of graphical modeling which generalize the usual GLM to multiple dependent variables. In a first step we identified the best fitting model using the marginal likelihood metric and in a second step we adjusted this model for any over-fitting applying a parametric bootstrapping approach. The marginal posterior 95% confidence intervals of the log odds ratio for each parameter were estimated and compared with the GLM results.

Results: Results indicate that significantly associated with Pomona were Worker position and Abattoir (GLM) and Worker position (ABN).

The odds of Pomona infection (OR, [95% CI]) was highest at stunning and hide removal (ABN 41.0, [6.9 – 1044.2]; GLM 56.9, [6.5 – 496.6]), followed by removal of intestines, bladder, and kidneys (ABN 30.7, [4.9 – 788.4]; GLM 28.8, [3.3 – 252.4]).

Facemasks/glasses did not have a protective effect.

Conclusions: ABN confirmed the main outcome from GLM.

The advantage of ABN compared to GLM is that all relationships between all variables are modelled, revealing more about key features of complex disease systems.

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TITOLO:

Leptospirosis Incidence and Risk Factors in Meat Workers in New Zealand
Comparison between generalised linear and probabilistic modelling output

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