



Original Contribution

A Case–Control Study of Environmental and Occupational Risks of Leptospirosis in Sri Lanka

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Abstract: Sri Lanka has one of the highest incidences of human leptospirosis worldwide. Outbreaks of this zoonotic infection are related to the monsoons and flooding. The study investigates risk factors associated with environmental, animal and occupational exposure while acknowledging the potential bias due to hanta viral infections in the study samples. Data were obtained from structured interviews with 483 patients (276 cases and 207 controls). Risk exposures were studied for the entire population and for two stratified occupational groups: non-paddy workers and paddy workers. A higher odds ratio (OR) of leptospirosis transmission for paddy workers was observed compared to non-paddy workers (OR 1.905, 95% CI 1.274–2.856). Rat exposure was not associated with a significant higher risk for any of the groups. Instead, cattle and household animals seemed to be important for transmission of leptospirosis to humans, especially among non-paddy workers (OR 10.655, 95% CI 1.213–93.582). Leptospirosis in paddy workers was associated with environmental factors linked to contamination and wetness in paddy fields. Interestingly, abandoned paddy fields were found to have a protective effect against transmission to paddy workers (OR 0.421, 95% CI 0.237–0.748). Keeping animals on these dryer fields may act as a boundary for contamination of paddy fields with infectious animal urine. This finding may be considered as a public health intervention targeting leptospirosis among paddy workers.

Keywords: Zoonoses, Leptospirosis risk factors, Planetary health

INTRODUCTION AND PURPOSE

Leptospirosis is a zoonotic infectious disease caused by *Leptospira spp.*; it is estimated to affect approximately one million people annually (Costa et al. 2015) with the largest burden of disease occurring in tropical low-income countries and small pacific island states (Costa et al. 2015; Torgerson et al. 2015). Sri Lanka has the second highest

burden of disease worldwide measured in disability-adjusted life years (805 DALYs per 100,000) (Torgerson et al. 2015) and the highest incidence (Warnasekara and Agampodi 2017; Warnasekara et al. 2019). Transmission occurs by direct contact with infected animals or by contact with water contaminated with urine from infected animals (Terpstra 2003; Zhang et al. 2012; Costa et al. 2015; Mwachui et al. 2015). Working in paddy fields is a well-documented specific occupational exposure for leptospirosis, because of the unprotected wetland exposure (Zhang et al. 2012; Costa et al. 2015; Mwachui et al. 2015).