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Track: Vector borne diseases

Correlates of Rodent Flea, Climate and Human Plague: an Ecologic Study in Vietnam

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BACKGROUND

Human plague (caused by Yersinia pestis) remains a public health threat in developing countries, because the disease is associated with increased risk of mortality and severe economic and social consequences. During the past 10 years, outbreaks of plague have occasionally occurred in Vietnam's Central Highland Region. The present study sought to analyze the ecologic factors that were associated with the occurrence of plague.

METHODS

The study included all 510 communes of the Central Highland Region (with a total population of ~4 million) where 95% of incident of plague in Vietnam had been observed between 1997 and 2002. Plague was ascertained by using a standard protocol. Data on domestic fleas and rodents were obtained in accordance with the World Health Organization's guidelines. Temperature and rainfall were recorded by local meteoric stations. The association between these risk factors and plague was analyzed by using the Poisson regression model.

RESULTS

During the period, 472 cases of plague were reported, of which 24 (5.1%) died. The incidence of plague peaked during the dry season, with ~63% of cases occurring during February to April. Increased rodent density, high flea index, low rainfall, and low humidity were each associated with an increased occurrence of plague. However, after adjusting for season and locality, increased flea index (risk ratio per SD [RR]: 1.08; 95%CI: 1.04-1.12) and low humidity (RR 1.16; 1.00-1.35) were independently associated with the risk of plague occurrence.

CONCLUSIONS

These data suggest that flea index and humidity could be used as ecologic indicators of plague risk in Vietnam. The data also suggest the occurrence of plague was likely resulted from multiple causes which remain to be delineated.