

Modeling Malaria Transmission Risk Using Satellite-Based Remote Sensing Imagery: A
Five-Year Data Analysis in Democratic People's Republic of Korea

Abstract

Geographic modeling, based upon the landscape epidemiological framework, was utilized to determine the pervasiveness of mosquito habitats within the Democratic People's Republic of Korea during the years 2001 through 2005. Research regarding the ecology of vector-borne diseases, the application of remotely sensed satellite imagery, and Geographic Information Systems (GIS) were used to develop nationwide monthly risk indices that represent the potential of malaria transmission among human populations. Spearman Rank Correlation Analysis (SCRA) was utilized to compare the calculated monthly risk indices to observed malaria incidence rates.

The results of this study showed positive rank-order relationships for risk and observed incidence for the years 2001, 2003, 2004, and 2005. Further interpretative analysis indicated 1) a strong association between high and low fluctuations in risk versus incidence during the summer and winter months, respectively and 2) corresponding trends throughout the study's five-year timeframe.