THE IMPACT OF ENVIRONMENTAL FACTORS ON MALARIA IN REPUBLIC OF KOREA

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Background and Aims: After reemerging in 1993, *Plasmodium vivax* malaria has been occurred continuously in the Republic of Korea (ROK). Early after reemergence *P. vivax* malaria mainly occurred in the areas adjacent to the Demilitarized Zone (DMZ) and most patients were soldiers. However, since 2003, the number of civilian patients has been more than soldiers. We aimed to investigate the relationship between malaria and environmental factors, such as climatic factors and land use.
Methods: Malaria data were obtained from Korean Center for Disease Control including incidence date and residence information. Among them we selected civilian and domestic cases excluding soldiers and veterans for the year of 2001-2008. Weather information, such as temperature and rainfall, and land use information were matched with the malaria cases by 47 administrative areas. We fitted to intrinsic autoregressive model to investigate the effect of climatic factors and land use on the increase in malaria adjusting neighboring effect with random effect.
Results: Total civilian cases during the study period were 6,928 showing the most value, 1,295, in 2007. Among environmental factors, temperature for warmer season (May to September), rice paddy area, and river area showed positive correlation with malaria. Gangwha county, located in adjacent to DMZ and seashore, showed the highest log relative risk after adjustment for potential confounding variables. The distances from DMZ presented deterministic to malaria incidence, which implies that malaria situation in ROK has been directly influenced by infected mosquitoes originating from the Democratic People's Republic of Korea (DPRK).
Conclusions: Climate change, such as increase in temperature, can be responsible for elevated malaria transmission risk in ROK in the future. To control malaria in ROK, Climatic factors, land use, and their combined effect should be considered and further study considering human activity is necessary.
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