Research Data Archive, Center for Disease Control, The Executive Yuan,

R.O.C.

Readme file

Project Title: To set up the spatial surveillance system of communicable disease by GIS (Geographic Information System). Project Number:DOH96-DC-2032 Executing Institute: Taiwan Centers for Disease Control Principal Investigator(P.I.): Jiunn-Shyan Wu P.I. Position Title: Technical Specialist P.I. Institute: Fifth division, Taiwan CDC

Abstract:

In this ever increasingly complex world, it is no surprise that the problems public health researchers faced are becoming more and more intricately to solve. Traditionally, epidemiologists use maps in retrospectively analyzing associations between location, environment, and disease. A cross-disciplinary approach may be one of the ways to enhance the temporal-spatial surveillance, using geographic information system (GIS), an emerging important component of many projects in public health and epidemiology.

In our study, we integrated GIS with threshold building, time-series modeling and tracking analysis to evaluate the incidence and prevalence, to locate areas or populations at risk, and to indicate incidence higher than expected of dengue and scrub typhus. We found that the hotzone of dengue showed spatial-temporal clustering in Tainan City and Tainan County this year but the serotype were different for each jurisdiction. The hotzone of dengue explicated the areas with current dengue virus activities and were most essentially to make efforts on mosquitoes control measures for each time point. We also demonstrated the temporal-spatial warning patterns of scrub typhus by using threshold analysis to alert those counties over the threshold value. All clustering, tracking and threshold analysis of dengue and scrub typhus were applied to routine surveillance and disease monitoring.

GIS has been used in the surveillance and monitoring of vector-borne diseases, tracking diseases, analysis of disease policy and planning, identification of high-risk health groups, and planning preventive measure programs. It also enabled researchers to locate high prevalence areas and populations at risk, identify areas in need of resources, and make decisions on resource allocation. Our study established practical model of applying GIS in early warning, hotzone locating and spatial-temporal tracking to allocate resources and efforts on selected hotspots.

Keyword : National Notifiable Disease Surveillance System, Geographical information system (GIS), spatial prediction, hotzone, dengue