

Comparisons of different methods of geographical accessibility in evaluating township-level physician-to-population ratios in Taiwan

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Objectives: An appropriate evaluation of the supply of and demand for physician resources is important for the allocation of medical resource. The current evaluation practice, the township-level physician-to-population ratio, cannot capture the characteristics of cross-district movements of the population. The purpose of this study was to use a geographic information system to capture spatial variations in order to compare different methods of spatial accessibility in the evaluation of physician resources. **Methods:** This study proposed a geographically modified physician-to-population ratio by using a two-step floating catchment area method which incorporated two different distance-decay functions to evaluate physician resources in Taiwan. These methods were also compared with current evaluation practices. **Results:** Results from the catchment area method that incorporated two distance-decay functions were different from the current evaluation practice of township level ratios (correlation coefficients were 0.37 and 0.58). The areas of physician shortage identified by these two methods were also different from current evaluation practices ($\kappa = 0.141-0.231$); however, the differences among these methods decreased when township-level population and physician data were aggregated at the county or regional levels. **Conclusions:** Our significant findings showed that township-level resource allocations could be misplaced if cross-township accessibility were not incorporated in the evaluation models. (*Taiwan J Public Health*. 2011;**30(6)**:558-572)

Key Words: *physician-to-population ratio, geographic accessibility, geographically modified physician-to-population ratio, geographic information system, Two-step floating catchment area method*

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