

Objective-Based System Dynamics Modeling to Forecast the Number of Health Professionals in Pudong New Area of Shanghai

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Abstract : Background: In 2014, there were 28,341 health professionals in Pudong new area of Shanghai and the number per 1000 population was 5.199, 55.55% higher than that in 2006. But it was always less than the average number of health professionals per 1000 population in Shanghai from 2006 to 2014. Therefore, allocation planning for the health professionals in Pudong new area has become a high priority task in order to meet the future demands of health care. In this study, we constructed an objective-based system dynamics model to forecast the number of health professionals in Pudong new area of Shanghai in 2020. Methods: We collected the data from health statistics reports and previous survey of human resources in Pudong new area of Shanghai. Nine experts, who were from health administrative departments, public hospitals and community health service centers, were consulted to estimate the current and future status of nine variables used in the system dynamics model. Based on the objective of the number of health professionals per 1000 population (8.0) in Shanghai for 2020, the system dynamics model for health professionals in Pudong new area of Shanghai was constructed to forecast the number of health professionals needed in Pudong new area in 2020. Results: The system dynamics model for health professionals in Pudong new area of Shanghai was constructed. The model forecasted that there will be 37,330 health professionals (6.433 per 1000 population) in 2020. If the success rate of health professional recruitment changed from 20% to 70%, the number of health professionals per 1000 population would be changed from 5.269 to 6.919. If this rate changed from 20% to 70% and the success rate of building new beds changed from 5% to 30% at the same time, the number of health professionals per 1000 population would be changed from 5.269 to 6.923. Conclusions: The system dynamics model could be used to simulate and forecast the health professionals. But, if there were no significant changes in health policies and management system, the number of health professionals per 1000 population would not reach the objectives in Pudong new area in 2020.

Keywords : allocation planning, forecast, health professional, system dynamics

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