全國性預防接種疫苗之最佳訂購量與分配模式—以台北縣衛生局 DPT 疫苗為例

Construct an Optimal Vaccine Purchasing and Distribution Model of National Immunization Vaccine

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摘要

本研究探討全國性預防接種疫苗最佳訂購量模式，以時間序列法推估來年的接種目標人口數及接種完成率。另以線性規劃方法，求得各衛生所間疫苗的調度及訂購量。以台北縣衛生局之白喉破傷風百日咳混合疫苗（DPT）為例，在考慮疫苗訂購目標以及限制下，決定採購疫苗數量及各衛生所的疫苗調度及分配量。所推估的數據可作為全國性疫苗採購作業預算的參考依據，具有以下三點效益：(1) 有效控制疫苗之存貨，減少不必要的存貨成本支出、提升疫苗品質並增進使用效益。(2) 配合國家政策進行疫苗單劑量、多劑量制定的依據，有效節省國家經費（3）科學化的方法推估各地疫苗的分配量，進行有效調配疫苗進貨量。

關鍵詞：疫苗採購、預測、時間序列分析、線性規劃

Abstract

This study aims to find out the optimum purchase strategy of vaccines, which means lowest cost, lowest inventory and lowest waste. This study applied Time Series Analysis to forecast the population size of new born babies and the total vaccines needed. After that, the amount of vaccines to be dispatched to each public health bureau was calculated by Integer Programming. These approaches will have the following advantages. First, CDC will be able to control the total stock of vaccines to avoid unnecessary expenditure of inventory cost. Second, an optimum combination of single-dose vaccines and multiple-dose vaccines can save the cost. Third, the dispatch model among the public health bureaus will assure the sufficient supply and quality of vaccines.

Keyword：*Vaccine purchase、Forecast、Time Series Analysis、Linear Programming*