

MEETING ABSTRACT

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The impact of introducing case mix on the efficiency of teaching hospitals in Malaysia

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From 26th Patient Classification Systems International (PCSI) Working Conference
Munich, Germany. 15-18 September 2010

Introduction

In Malaysia, work on case mix based on DRG (Diagnostic Related Groups) was initiated in 1996 with the establishment of a case-mix research team consisting of representatives from the Ministry of Health, the University of Malaya, the University of Kebangsaan Malaysia, and the University of Science Malaysia. This team conducted a research project involving 12 public hospitals in Malaysia, including three university hospitals.

The Hospital University of Science Malaysia (HUSM) and University of Malaya Medical Centre (UMMC) were involved in the research project but, until now, they have not completely implemented case-mix systems in the management of their hospitals. The University Kebangsaan Malaysia Medical Center (UKMMC) was the first hospital in the country to fully implement a case-mix system, which has been in existence since July 2002.

The main objective of this paper is to assess, using a Stochastic Frontier Analysis (SFA), whether the introduction of the case-mix system into the three university hospitals in Malaysia has improved efficiency. The hypothesis for the study is that the implementation of a case-mix system would improve the level of efficiency.

Methods

Twenty-one clinical departments from the three teaching hospitals were selected for this study. Data from the years 1998–2006 from these departments was collected for the study. Four inputs and one output were used for the SFA model. The four inputs were 1) number of beds as representative of capital, 2) number of doctors, 3) number of nurses, and 4) number of non-medical staff

as representative of labor. The one output was the number of discharged inpatients in each department.

The SFA model can be expressed as: $y_i = f(x_i, \beta) + v_i - u_i$ (1)

The technical inefficiency effect is specified as: $u_i = z_i\delta + w_i$ (2)

The maximum likelihood estimation procedure is proposed for estimation of the parameters of the stochastic frontier in first model, and the ordinary least square in second model. The explanatory variable in the inefficiency model is a dummy variable, with a value of 0 for before, and 1 for after, the introduction of a case-mix system.

Results

The output of the SFA model, which assessed productivity and efficiency, showed that the sign for number of beds, number of doctors, number of nurses, and number of non-medical staff is positive. The coefficient of the variable for beds is the highest, and the coefficient of the variable for non-medical staff is the lowest. However, the variable for non-medical staff was found to be statistically insignificant. The sign in the inefficiency model is also expected. The coefficient of case-mix effect equals -1.29, which is statistically significant

Conclusions

In the stochastic frontier model, positive signs for number of beds, number of doctors, number of nurses, and number of non-medical staff suggest that a one unit increase in each of these variables results in an increase in inpatients discharged in each department. In both the half-normal and truncated normal, the variable of non-medical staff is statistically insignificant. The sign in the inefficiency model is also expected. The result for case-mix effect suggests that if a clinical department is working in the case-mix environment, it reduces the inefficiency effect by 1.29 percent.

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Published: 6 October 2010

doi:10.1186/1472-6963-10-S2-A9

Cite this article as: Aljunid *et al.*: The impact of introducing case mix on the efficiency of teaching hospitals in Malaysia . *BMC Health Services Research* 2010 10(Suppl 2):A9.

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