WHO-FIC NETWORK MEETING

Tokyo, Japan
16-22 October 2005

Predictors of Cost of Managing Cardiology Cases in a Teaching Hospital in Malaysia

Syed Aljunid
Professor of Health Economic, Department of Community Health, Faculty of Medicine, Universiti Kebangsaan Malaysia.

Abstract

Hospital UKM is the first hospital to implement case-mix system in Malaysia. The objective of the programme is to utilise case-mix system as a tool in improving efficiency and quality of care. International Refined DRG are selected to enable that process. Initial results are presented here. This will be followed by full implementation in Malaysia in the coming 2-3 years.

From July 2002 to June 2004, a total of 35,568 cases were grouped using IRDRG-Version 1.1 case-mix grouper. Top five MDCs are MDC 14 (Pregnancy, Child Birth and Peurperim) (28.5%), MDC 05 (Diseases and Disorders of the Circulatory System) (10.2%), MDC 08 (Disease and Disorders of Musculoskeletal System and Connective Tissue) (8.3%), MDC 18 (Infectious and Parasitic Diseases) (8.2%) and MDC02 (Diseases and Disorders of the eye)(6.4%).

All 3,622 cases in MDC05 (Diseases and Disorders of the Circulatory System). were selected out for this study. The objectives of the study are to determine the distributions of the cases by severity level, to impute average cost per DRG and to determine predictors of cost in managing the cardiology cases. Medical Cardiology cases consist of 86.5% of the cases and the remaining 13.5% are Surgical Cardiology. Most of the cases are in severity level one (42.8%), 28.6 % in severity level two and 25.1% in severity level three. A total of 127 cases (3.5%) are outliers. The mortality rates for severity level one, two and three are 1.0%, 2.6% and 11.5% respectively. Top three cardiology cases are Acute Myocardial Infarction Without Comorbidity and Complication (IRDRG 05331) (8.4%), Cardiac Catheterization for Ischeamic Heart Disease Without Comorbidity and Complication (IRDRG 05311) (7.6%) and Acute Myocardial Infarction With Major Comorbidity and Complication (IRDRG 05333) (7.4%).

Step-down costing was carried out to obtain the cost for each DRG group. The mean cost per episode of care for Medical Cardiology cases was RM 3,562 (SD = RM 2,119) with average LOS of 6.4 days (SD = 3.8days) . For the Surgical Cardiology cases, the mean cost per episode of care was RM 6,526 (SD = RM 4,585) and average LOS of 5.8 days (SD = 4.1 days). The main components of cost for Medical Cardiology cases are ICU cost (28.8%), pharmacy (17.3%) and Ward Services (15.3%). In Surgical Cardiology, the biggest component of cost is for Operation Theatre (27.9%), followed by Ward Services (25.4%) and pharmacy (8.5%). Multivariate analysis using multiple linear regression found that significant factors influencing cost of cardiology cases are length of stay, age of the patient, discharged outcome, case type and severity level.

Table 1. Ten most frequent DRGs in Major Diagnostic Category 05 - HUKM. 2002-2004

No.	*IRDRG*	Description	*No. Cases*	*%*
1	05331	Acute Myocardial Infarction W/O CC	304	8.4
2	05311	Cardiac Catheterization for Ischemic Heart Disease W/O CC	275	7.6
3	05333	Acute Myocardial Infarction W MCC	268	7.4
4	05431	Angina Pectoris & Chest Pain W/O CC	246	6.8
5	05332	Acute Myocardial Infarction W CC	235	6.5
6	05131	Percutaneous Cardiovascular Procedure W/O AMI W/O CC	184	5.1
7	05393	Atherosclerosis W MCC	167	4.6
8	05392	Atherosclerosis W CC	159	4.4
9	05391	Atherosclerosis W/O CC	152	4.2
10	05432	Angina Pectoris & Chest Pain W CC	148	4.1

Table 2. Component Cost for the Treatment of Cardiology Cases in HUKM

Types of Component Cost	Types of Cardiology Cases: Medical Partition Mean Cost (RM), Standard Deviation and Percentage	Types of Cardiology Cases: Surgical Partition Mean Cost (RM), Standard Deviation and Percentage
Administration*	92±(SD=55), 2.6%	294±(SD=207), 4.5%
Maintenance	131±(SD=77), 3.7%	399±(SD=280), 6.1%
Utility	56±(SD=33), 1.6%	169±(SD=119), 2.6%
Store and Consumables	136±(SD=81), 3.8%	433±(SD=304), 6.6%
IT Centre**	52±(SD=31), 1.5%	167±(SD=117), 2.6%
Hotel Services***	205±(SD=121), 5.8%	226±(SD=159), 3.5%
Others Services****	51±(SD=30), 1.4%	120±(SD=84), 1.8%
Pharmacy	II 614±(SD=365), 17.3%	III 556±(SD=391), 8.5%
Radiology	81±(SD=48), 2.3%	74±(SD=52), 1.1%
Laboratory	334±(SD=199), 9.4%	304±(SD=213), 4.7%
Physiotherapy	44±(SD=26), 1.2%	40±(SD=28), 0.6%
ICU	I 1,023±(SD=609), 28.8%	270±(SD=190), 4.1%
Operating Theatre	190±(SD=113), 5.3%	I 1,818±(SD=1,277), 27,9%
Ward Services	III 543±(SD=323), 15.3%	II 1,657±(SD=1,164), 25.4%

Note: * Include; Director Office, General Administration Department, Finance Department, Human Resource Department and Nursing Administration Department.

** Include; Library Department

*** Include; laundry, dietetic, cleaning services and Security Department.

**** Include; insurance, tax, etc.

I = The highest component cost

II = The second highest component cost

III = The third highest component cost

Table 3. Predictors of Treatment Cost for Cardiology Cases in HUKM

Factors (Predictors)	Beta	S.E *(Beta)	P- value	'Partial correlations coefficients'
Length of Stay	0.048	0.001	<0.001	0.817
Age	0.001	<0.001	<0.001	0.065
Medical Partition	-0.280	0.008	<0.001	-0.498
Discharge died	-0.124	0.014	<0.001	-0.146
Severity level - 2**	0.069	0.007	<0.001	0.157
Severity level - 3***	0.057	0.008	<0.001	0.112

Constant = 3.236 and 'Adjusted' R^2 = 0.778

Note:

*S.E = 'Standard Error'

**Cardiology cases with minor co morbidity and complication

*** Cardiology cases with major co morbidity and complication