

Medical Coding Error: How Will It Affect The Budgeting of The Hospital?

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Introduction

- Medical coding error happens when the codes assigned by the coders are different from the actual diagnosis and procedures conducted on the patients.
- These error leads to wrong case-mix codes and finally caused negative implications to the estimations of the hospital's workload budget and income.
- This study aimed to estimate the magnitude of error in medical coding in the largest teaching hospital in Malaysia which is University Malaya Medical Centre using case-mix system.

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Methods

- 40,839 hospital admission data at University Malaya Medical Centre (UMMC) in 2020 were obtained from the electronic medical records (EMR).
- The data consists of various medical disciplines in the centre. Before the implementation of the case-mix at UMMC in 2021, only data on ICD-10 was available in the EMR.
- Those ICD-10 data were coded by the treating clinicians. Quality checks on the ICD-10 codes were done by the experts to ensure that the diagnosis codes were correct.

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Methods

- On the other hand, the clinical procedures were all not coded and in a form of free text.
- Therefore, several trained coders had to do the ICD9-CM coding. After both the ICD-10 and ICD9-CM codes for every admission were documented, the data were imported into a case-mix grouper.
- The grouper then generated the Diagnosis Related Group (DRG) codes for all the treatment episodes at UMMC.
- The magnitude of errors was determined and presented in the form of frequencies and percentages. Subsequently, factors influencing the coding errors were investigated through observations and explorative study.

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Results

- The initial ICD-10 quality check found that 60% of the codes were correct. The remaining 40% error in ICD-10 codes was mainly about the secondary diagnoses, either they were un-coded or wrongly coded.
- Regarding the DRG codes, 5236 (13%) errors were found after DRG data were generated from the grouper.
- They are divided into three main categories of error. 3084 (7.7%) errors of 'no DRG' assigned. This happened when the combination of socio-demographics of the patient, diagnosis and procedures did not correspond.
- 1300 (3.2%) errors were due to the wrong parenteral codes used in the primary diagnosis such as codes with asterisks.
- The remaining 852 (2.1%) errors were due to invalid birth weight for infant cases, invalid date of admission, wrong gender, particularly in the obstetrics and gynecology cases and incomplete principle diagnosis for deliveries in obstetrics cases.

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Results

- Based on the observations, factors associated with the medical coding error were incomplete discharge summaries specifically on the primary and secondary diagnosis, typo error on the socio-demographic characteristics of patients and lack of experience to choose appropriate codes by the healthcare workers.

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Conclusion

- The quality of medical coding is important, especially in a healthcare setting that implemented case-mix as the medium of quality assessment and budget allocations.
- The medical coding errors will lead to inaccurate hospital tariffs and could result in inefficient allocation of healthcare resources and significant potential loss of revenue to the hospital, which will resonate in the poor healthcare service deliveries.
- The implication of medical coding error to the budgeting of the hospital should never be underestimated.
- Close monitoring of the quality of discharge summaries and proper training on coding for healthcare workers is crucial to minimise the error.

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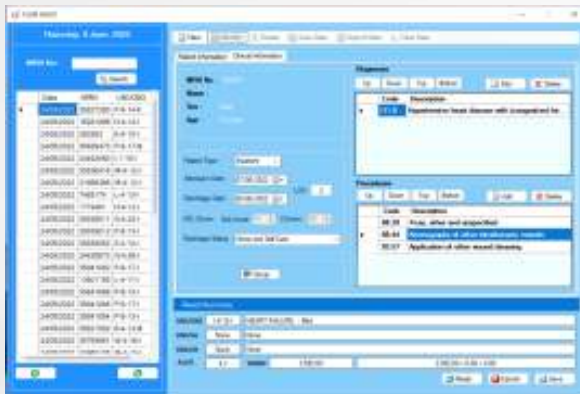
Discussion: Implications of coding error

1. Under costing
2. Less DRG
3. Low Case-mix Index (CMI)
4. High hospital based rate

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Under costing

- Case-mix I11.0- hypertensive heart disease **with** congestive heart failure with same ICD-9CM
- My-DRG cost is RM3592.00
- Case-mix I11.9- hypertensive heart disease **without** congestive heart failure with same ICD-9CM
- My-DRG cost is RM1,915.00



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Implications of coding error

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Low DRG

- In the purchased case-mix system, there are in total 1077 DRGs with 789 Inpatient and 288 Outpatient DRGs.
- Based on the 2020 data, PPUM had only 566 DRGs (compared to 789 DRGs in HUKM and 824 DRGs in MOH)
- Less DRG indicates that the hospital is managing less complex cases and less of variety

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Implications of coding error

1. Under costing
2. Less DRG
3. Low Case-mix Index (CMI)
4. High hospital based rate

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- CMI is an important performance indicator for hospital. CMI is a measure of the severity level of a hospital's cases and complicated procedures performed.
- CMI is calculated by adding up the relative Diagnosis Related Group (DRG) weights for each discharges and dividing that by the total number of discharges in a given month and year.
- In general, the higher the CMI is, the sicker its patients, and the more resources patients required during treatment.

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PPUM CMI is 0.75 for
2020

Negeri	Jenis Hospital	Hospital	CMI		
			2017	2018	2019
		H. Kampar	0.78	0.77	0.77
		H. Sg. Siput	0.81	0.76	0.77
		H. Selama	-	0.74	0.74
Selangor	Berpakar Negeri	H. Tengku Ampuan Rahimah, Klang	0.94	0.92	0.91
	Berpakar Major	H. Kajang	0.90	0.88	0.87
	Berpakar Major	H. Serdang	1.07	1.16	1.18
		H. Shah Alam	-	0.80	0.83
	Berpakar Minor	H. Banting	-	0.83	0.80
	Tanpa Pakar	H. Tg. Karang	0.75	0.75	0.71
WP Kuala Lumpur	Berpakar Negeri	H. Kuala Lumpur	1.04	1.07	1.07
W.P. Putrajaya	Institusi Perubatan Khas	Institut Kanser Negara	2.36	2.11	1.31

Hospital without
specialist

Implications of coding error

1. Under costing
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High hospital based rate

- The hospital base rate (HBR) for a healthcare facility reflects costs incurred to provide services and treatments that inpatients require. It can indicate cost-efficiency in hospital management.
- Hospital base-rate is RM11,626.59 at PPUM
- Low CMI will cause a higher hospital based rate
 - Overall cost of treating a patient in the hospital by taking into account the complexities of cases managed in the hospital

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$$\text{Hospital Base Rate} = \frac{\text{Total Cost}}{\text{Total \# of equivalent cases} \times \text{CMI}}$$