

# PERFORMANCE CONTRACTING & CASEMIX PAYMENT

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Jade Khalife, MD, MPH

Espisp2 project – Ministry of Public Health

# Introduction



- Resource consumption is a widely used proxy for illness severity
- Casemix is a reflection of aggregate risk of all individual patients within a hospital
- Developed in the 1970s by Yale researchers
- Originally intended only as a performance measure, they are now widely used for:
  - ▣ Hospital payment mechanism
  - ▣ Increasing transparency
  - ▣ Improving efficiency
  - ▣ Supporting hospital management

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- Useful measure to compare performance using administrative data
  - Casemix using ICD is a valid and feasible alternative for countries not yet using DRGs

# Countries using casemix

1. Albania
2. Australia
3. Austria
4. Belgium
5. Bosnia Herzegovina
6. Bulgaria
7. Canada
8. Croatia
9. Czech Republic
10. Estonia
11. Finland
12. France
13. Germany
14. Greece
- 15.
16. Hong Kong
17. Hungary
18. Iceland
19. Indonesia
20. Ireland
21. Italy
22. Japan
23. Latvia
24. Lithuania
25. Macedonia
26. Malaysia
27. Malta
28. Mongolia
29. Montenegro
- 30.
31. The Netherlands
32. New Zealand
33. Norway
34. Portugal
35. Poland
36. Singapore
37. Slovenia
38. Spain
39. Sweden
40. Switzerland
41. Thailand
42. Ukraine
43. UK
44. US

# Casemix...



- Is a ***tool*** used to allocate funding depending on health policy, not a health policy by itself
- Is ***not*** used to cut healthcare budget or limit spending on individual patients
- Is used to increase the ***fairness*** of budget allocated to different hospitals
- Promotes ***transparency*** and ***accountability***

# MoPH in brief



- 1962 – MoPH coverage of uninsured patients, ‘insurer of last resort’
- 1983 – Alpha-Star rating
- Late 1990s – Rating link to reimbursement rate
- 2001 – Accreditation I
- 2007 – Accreditation II
- 2011 – Accreditation III
  
- Current accreditation-based system likely, but not necessarily, reflects better performance in terms of total quality management

# Re-examining links



- Our main goals were to:
  - ▣ Evaluate if accreditation-reimbursement link is appropriate
  - ▣ Apply casemix to Lebanese hospitals and investigate results



**Hospital accreditation, reimbursement and case mix:  
links and insights for contractual systems**

BMC Health Services Research 2013, 13:505

Walid Ammar, Jade Khalife, Fadi El-Jardali, Jenny Romanos,  
Hilda Harb, Ghassan Hamadeh and Hani Dimassi

# Methodology



- Yang & Reinke (2006) have shown that where use of DRGs is not possible, ICD-derived CMI is a good alternative, especially when using ICD costs
- ICD-10 discharge code costs for all hospitalizations between June 2011 – May 2012

# CaseMix Index (CMI) calculation

$$\text{CMI}_h = \frac{\sum_g [W_g * N_{gh}] / \sum_g N_{gh}}{\sum_g [W_g * N_{gn}] / \sum_g N_{gn}}$$

$h$  is the hospital CMI being calculated

$W_g$  is the weight calculated for each ICD

$N_{gh}$  is the number of cases within each ICD in hospital  $h$

$N_{gn}$  is the number of cases within each ICD in the total population

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- A total of 217,550 cases across 122 hospitals (96.4% of all records) were included in our study population
  - Weight for each ICD code was determined by dividing the code average cost by the average cost of all codes: 2234 ICD weights in our system, ranging from 0.09-29.9
  - We applied the weights on all cases in all hospitals, resulting in a hospital CMI for each

# Hospital characteristics

	Hospitals		Cases	
	n	%	N	%
<b>Accreditation</b>				
A	32	26.2%	71,713	33.0%
B	8	6.6%	21,646	9.9%
C	56	45.9%	93,810	43.1%
D	26	21.3%	30,381	14.0%
<b>Size</b>				
Small (<50 beds)	34	27.9%	41,390	19.0%
Medium (50-100 beds)	53	43.4%	89,795	41.3%
Large (>100 beds)	35	28.7%	86,365	39.7%
<b>Ownership</b>				
Public	24	19.7%	66,844	30.7%
Private	98	80.3%	150,706	69.3%
<b>Total</b>	<b>122</b>	<b>100.0%</b>	<b>217,550</b>	<b>100.0%</b>

# Statistical analysis



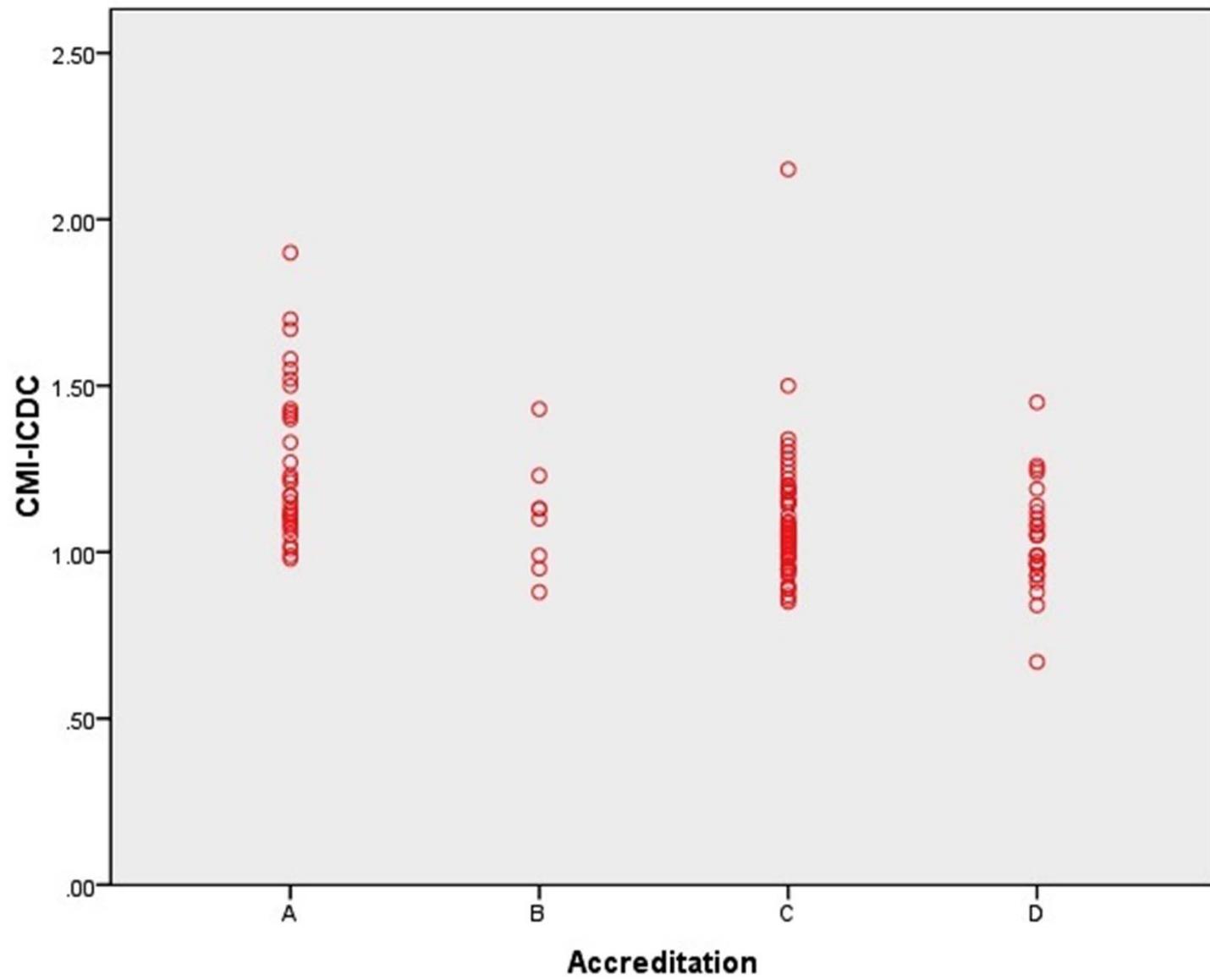
- Analysis of variance (ANOVA) calculated for CMI-ICDC by accreditation and size, and independent t-test used for analysis between public and private hospitals.
- For ANOVA, Levene's statistic was used to determine equality of variances, and where this was unequal, Welch's statistic was interpreted. Where a significant F-ratio was found, Tamhane's  $T^2$  post-hoc comparison was done in all cases with unequal variance.
- Significance level was set at 0.05 for all statistical tests conducted.

# Results

	Mean	Std. Deviation	Minimum	Maximum	P value	Sig*
<b>Accreditation</b>						
A	1.27	0.24	0.98	1.90	<0.001	C, D
B	1.11	0.17	0.88	1.43		
C	1.09	0.20	0.85	2.15		A
D	1.04	0.16	0.67	1.45		A
<b>Size</b>						
Small (<50 beds)	1.04	0.16	0.67	1.45	0.001	Large
Medium (50-100 beds)	1.12	0.20	0.87	2.15		
Large (>100 beds)	1.23	0.25	0.88	1.90		Small
<b>Ownership</b>						
Public	1.01	0.10	0.85	1.20	0.003	
Private	1.16	0.23	0.67	2.15		
<b>All</b>	1.13	0.22	0.67	2.15		

\* Significance determined with Tamhane's T<sup>2</sup> post-hoc comparison

□



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- To address confounding, we repeated analysis after controlling for hospital size and volume (of cases); Results were unchanged
  - Category 'A' hospitals had higher CMI than others
  - No significant difference among category B, C, D

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- Absence of difference in CMI between the remaining three accreditation categories suggests that the payment system used by the MoPH which links reimbursement solely to accreditation ***is not appropriate.***
  - The presence of a few hospitals within categories (A and C) with considerably higher CMI than others in the same category implies that hospitals within the same category are ***not homogenous.***
  - Therefore the current system is unfair and induces inefficiency among and within accreditation categories.

# Points to consider



- Current lack of financial incentives for improving performance
- Larger hospitals' results may be reflection of greater technical capabilities and thus more complex cases
- Overall, private hospital CMI larger than public hospital, but range was wider, suggesting some shifting of more complex cases

# Policy implications



- Recognition that linking reimbursement to accreditation has contributed to better hospital adherence to the accreditation process.
- Current hospital re-imburement based solely on accreditation is not appropriate, and leads to unfairness and inefficiency in the system.
- MoPH should consider associating hospital case mix with reimbursement to enhance performance



*Thank You*