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MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR



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Implications of differences in performance in efficiency and effectiveness in Portuguese hospitals

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26th Patient Classification Systems International Conference
Munich, 17th September 2010

Background

- What objectives must health care pursue?
- How can the perspectives of different stakeholders be reconciled?
- Several studies have tried to document / rule out a potential conflict between efficiency and effectiveness, but the empirical evidence is still unclear.

Purpose

- This study was designed to evaluate the potential conflict between efficiency and effectiveness of care in Portuguese hospitals.

Methods – data selection

- 2005 – 2007
- Inpatient cases in administrative database (except transferences, left against medical advice and support at home)
- Number of deaths, complications of care, readmissions, inpatient days, amount of costs per principal disease (Disease Staging)
- Diabetes mellitus type 2 and hyperglycemic states, Cerebrovascular disease, Coronary artery disease w/o prior coronary revascularization, Pneumonia: bacterial, Other disorders of respiratory system
- Cerebrovascular disease (88.907 cases, 43 hospitals)

Methods – performance measures

Effectiveness

- Mortality
- Complications of care
- Readmissions

Efficiency

- Length of stay
- Cost

Methods – observed values per case

- Mortality : Administrative data (discharge status)
- Complications of care: Administrative data (secondary diagnoses) + Disease Staging
- Readmissions (30 days): Administrative data + Disease Staging
- Length of stay: Administrative data
- Cost : Administrative data + DRG + accounting data from hospitals

Methods – expected values per case

- Administrative data + Disease Staging
- Adjusted for principal disease and stage, comorbidities and stage, age, type of admission
- All scales were recalibrated per year to Portuguese hospitals data

Methods – comparing observed and expected values per hospital

- Comparison at the hospital level
- Performance is evaluated by comparing observed and expected values of all measures, for each hospital

MORTALITY =
$$\frac{\text{Number of observed deaths} - \text{Number of expected deaths}}{\text{SD number of deaths}}$$

COMPLICATIONS OF CARE =
$$\frac{\text{Number of observed COC} - \text{Number of expected COC}}{\text{SD number of COC}}$$

READMISSIONS =
$$\frac{\text{Number of observed readmissions} - \text{Number of expected readmissions}}{\text{SD number of readmissions}}$$

LENGTH OF STAY =
$$\frac{\text{Number of observed inpatient days} - \text{Number of expected inpatient days}}{\text{SD number of inpatient days}}$$

COST =
$$\frac{\text{Amount of observed cost} - \text{Amount of expected cost}}{\text{SD amount of costs}}$$

< 0
Less than
expected

> 0
More than
expected

Methods – comparing measures of performance

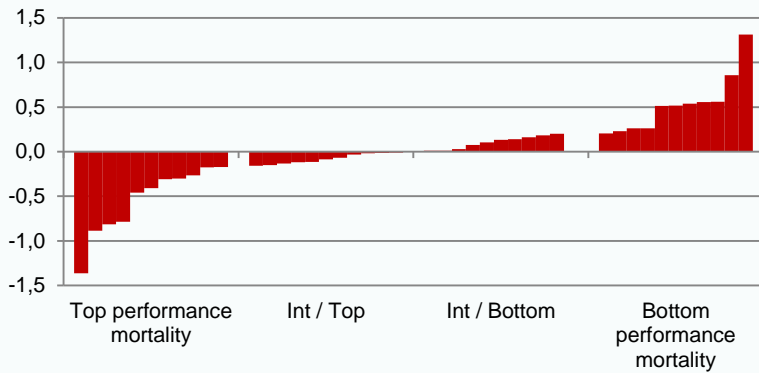
- Definition of quartiles of performance (approx. 11 hospitals in each) and analysis of the performance on a different measure in each quartile
- Pearson correlation
- Coincidence between 5 top / bottom performers

Population considered

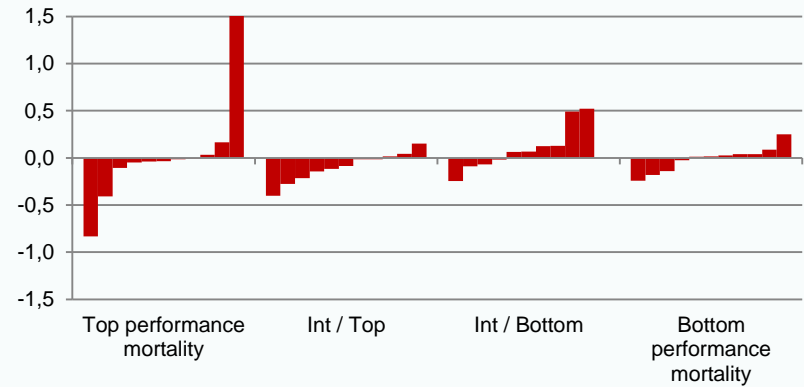
Number of cases	88.907
Number of hospitals	43
Sex (% male)	51%
Age (mean \pm SD)	72 \pm 13
Type of treatment (% medical cases)	94%
Mortality rate	15,0%
COC rate	19,0%
Readmissions rate	4,2%
ALOS (\pm SD)	10,2 \pm 12,5
Average cost (\pm SD)	2.878 \pm 4.061

Results – Effectiveness measures

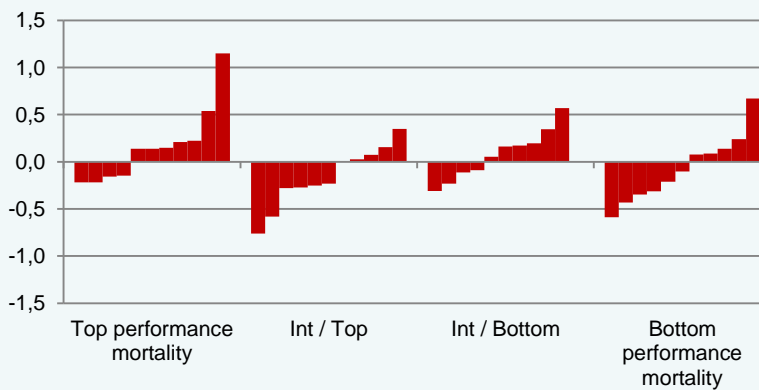
Mortality



Complications of care

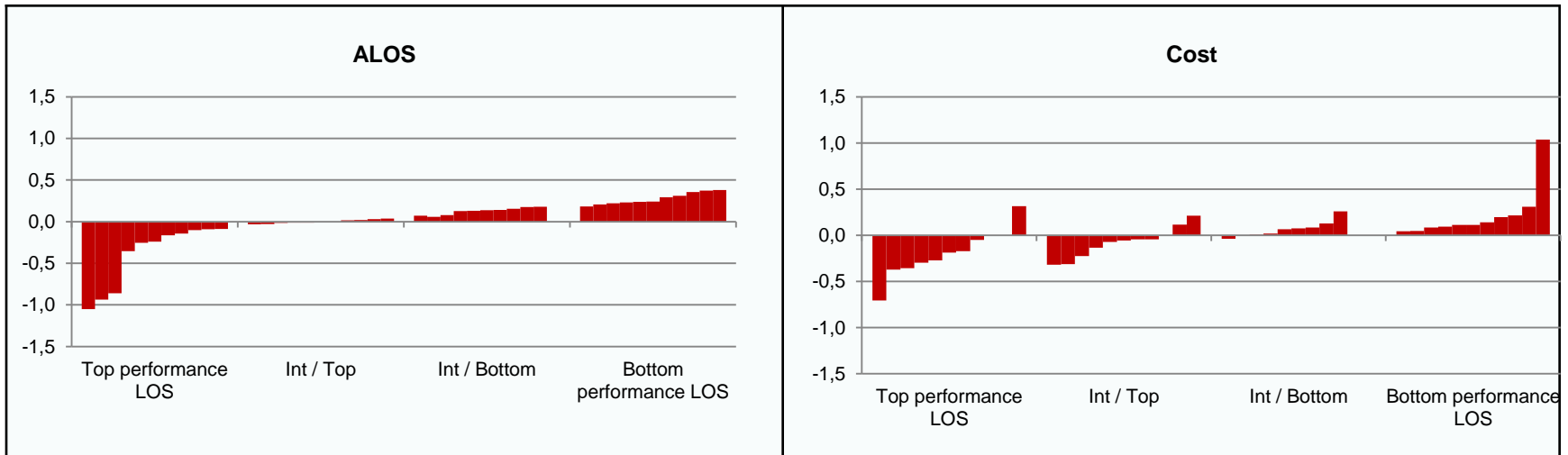


Readmissions



Pearson correlation (sig.)	Mortality
Complications of care	0,07 (0,67)
Readmissions	-0,28 (0,07)

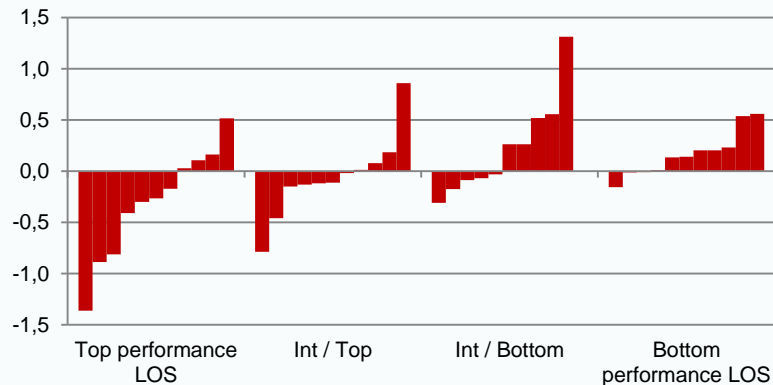
Results – Efficiency measures



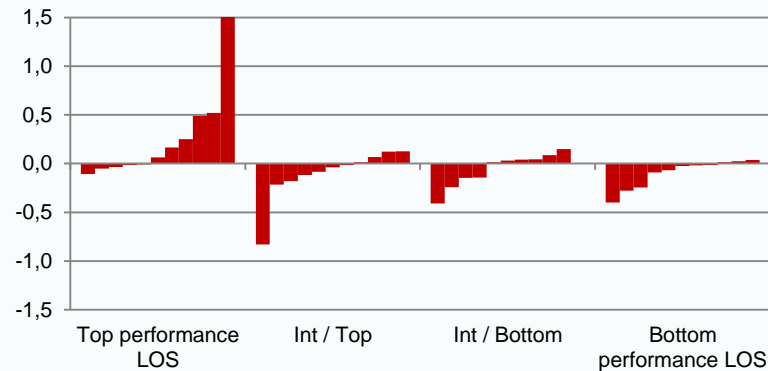
Pearson correlation (sig.)	LOS
Cost	0,45 (0,00)

Results – Effectiveness measures and efficiency / LOS

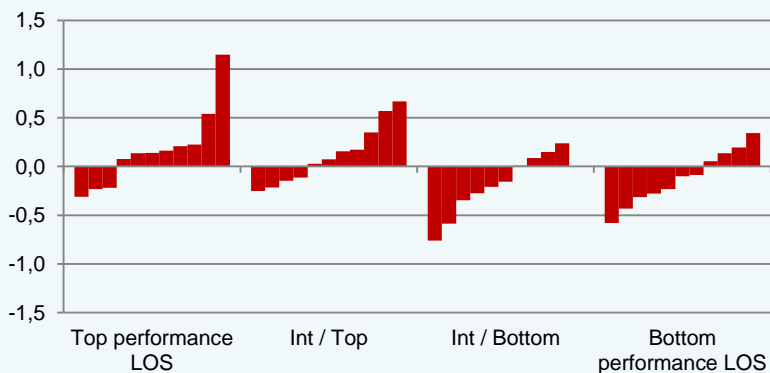
Mortality



Complications of care

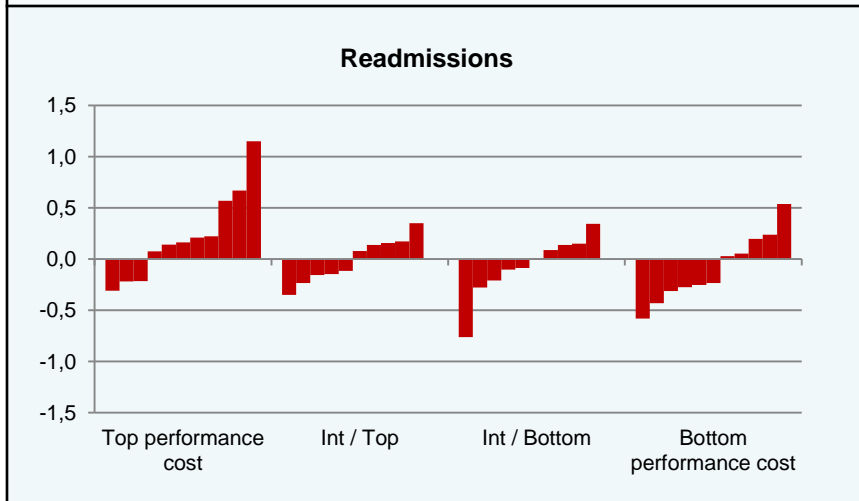
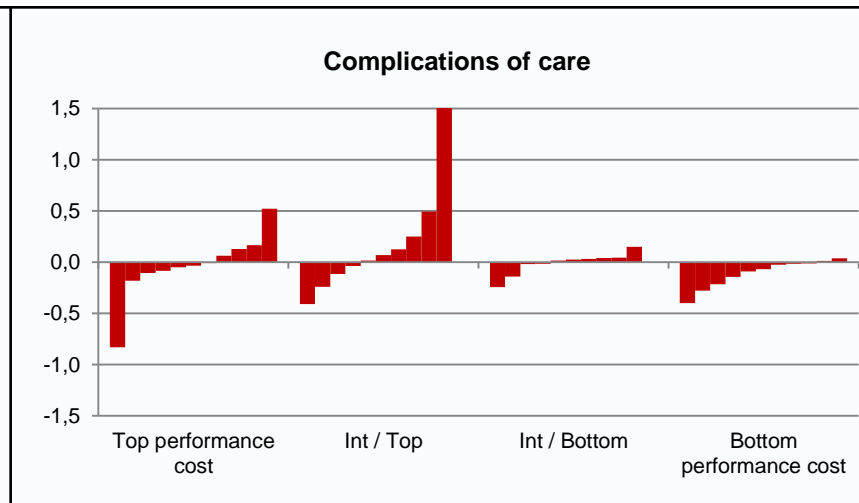
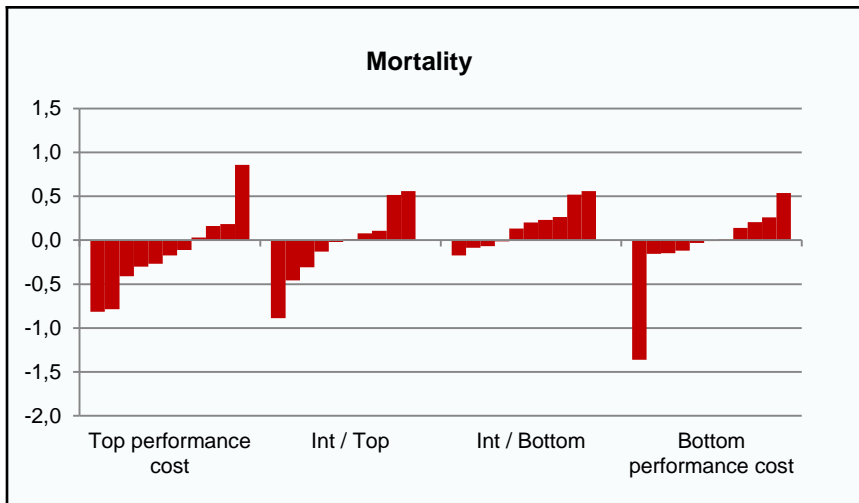


Readmissions



Pearson correlation (sig.)	LOS
Mortality	0,65 (0,00)
Complications of care	-0,40 (0,01)
Readmissions	-0,53 (0,00)

Results – Effectiveness measures and efficiency / cost



Pearson correlation (sig.)	Cost
Mortality	0,15 (0,35)
Complications of care	-0,16 (0,31)
Readmissions	-0,48 (0,00)

Results – Top / Bottom 5 performers (I)

Hospital	Mortality	Complications of care	Readmissions	LOS	Cost
H4	5	17	17	20	13
H9	40	6	5	25	19
H10	43	35	2	23	
H17	42	8	42	22	11
H19	37	40	25	10	20
H21	17	38	1	32	26
H22	27	41	11	11	14
H25	6	39	13	6	7
H28	4	1	14	14	8
H30	7	2	16	24	17
H39	14	11	39	21	15
H43	28	5	20	34	24
H24	16	14	24	19	5
H32	9	18	36	4	2
H37	19	9	9	31	39
H47	33	30	6	36	38
H44	8	16	35	5	10
H7	29	15	23	40	35

Results – Top / Bottom 5 performers (II)

Hospital	Mortality	Complications of care	Readmissions	LOS	Cost
H6	41	27	28	39	28
H20	31	37	41	18	4
H33	25	42	7	9	3
H3	12	4	12	41	40
H35	22	3	3	42	42
H15	1	21	40	1	41
H34	3	12	43	2	1
H40	2	43	27	3	18
H5	39	19	4	43	36

Discussion

- Limitations
 - Administrative data (observed and expected values / risk adjustment)
 - Disadvantages of measures of performance selected

- Possible topics for discussion
 - Overuse / Underuse
 - Structure / Process measures
 - Hierarchy of measures
 - Less / More
 - Concentration / Access
 - P4P

Conclusions

- For the episodes of cerebrovascular disease considered, it was unclear if there was a conflict between efficiency and effectiveness.
- This poses several important questions in terms of managing, evaluating and financing hospitals.

