

# Hospital Planning Using Patient Classification Systems

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## Overview

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1. Setting the scene
2. Objectives
3. Data/Methods
4. Results
5. Discussion
6. Conclusions

# 1. Setting the scene

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We will talk about ...

- ... an hospital (hospital A)
- ... with a well-defined target population
- ... with a low occupation rate
- ... which needs to make structural changes
- ... and has the possibility to absorb more members into its target population

# 2. Objectives

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**What is the optimum output for the inpatient department of Hospital A?**

1. How can the offer of Hospital A be defined?
2. What are the needs of the target population?
3. Does actual supply responds to those needs?
4. Is it possible to enlarge the target population of Hospital A?

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1. Setting the scene
  2. Objectives

### 3. Data/Methods

4. Results
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## 3.1 Data (1)

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<b>HOSPITAL A</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
Nº of admissions	1.614	1.626	1.756
Nº of beds	60	67	70
Nº of inpatient days	13.090	13.260	13.934
Nº of admissions per bed	27	24	25
ALOS (days)	8,1	8,2	7,9
Occupancy rate (%)	60	54	54

- Number of beneficiaries
  - Present: 20.611
  - If target population increases:  $20.611+73.463=94.074$
- Inpatient department as a whole

## 3.2 Data (2)

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### Information from **DRGs and Disease Staging (DS)**

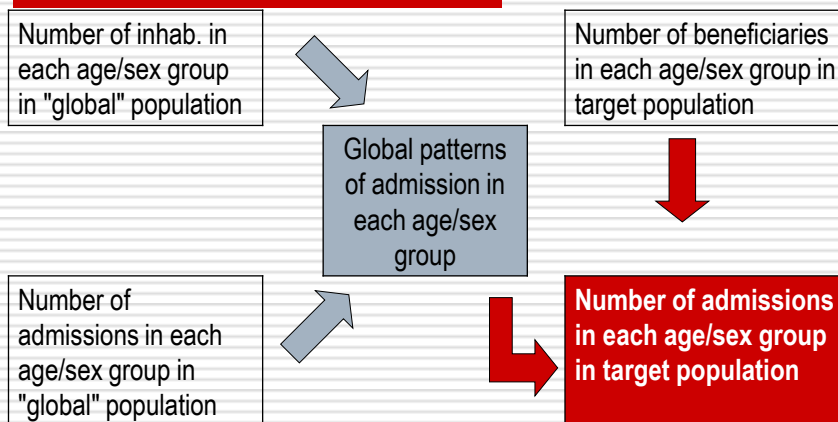
- ❑ DS defines levels of biological severity
- ❑ Severity: risk of organ failure/death
- ❑ Coded version uses ICD codes
- ❑ Three levels/stages of severity for each disease
  - Stage 1: A disease with no complications;
  - Stage 2: The disease has local complications;
  - Stage 3: The disease involves multiple sites, or has systemic complications.

## 3.3 Methods – hospital supply

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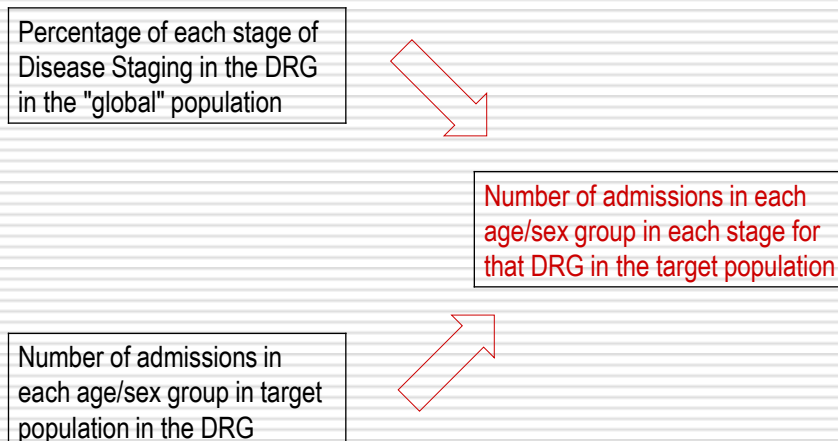
- ❑ DRGs treated in Hospital A
  1. DRGs coded in the database
  2. DRGs coded in the database and adjacent DRGs (except those under 17 years)
  3. **Inquiry to doctors on DRGs treatable**

### 3.4 Methods – expected needs



For each DRG considered treatable.

### 3.5 Methods – expected needs per level of severity



### 3.6 Methods – from number of admissions to number of inpatient days

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- Which ALOS to use?
  - Hospital A's?
  - Central LOS of each DRG?
  - ALOS of global population?
  
- Higher efficiency: ALOS of global population
- Deceased patients not included, since mortality rate of Hospital A is significantly different, for all DRGs' Major Disease Cat.

### 3.7 Methods – capacity of Hospital A

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- Actual capacity (considering a margin of 10% for patients' turnover)
  - $90 \text{ beds} * 365 \text{ days} = 32.850 \text{ days}$
  - $32.850 \text{ days} * 90\% = \mathbf{29.565 \text{ days}}$
  
- Adjustments
  - Admissions that could be treated safely in an outpatient setting
  - Admissions in low volume DRGs

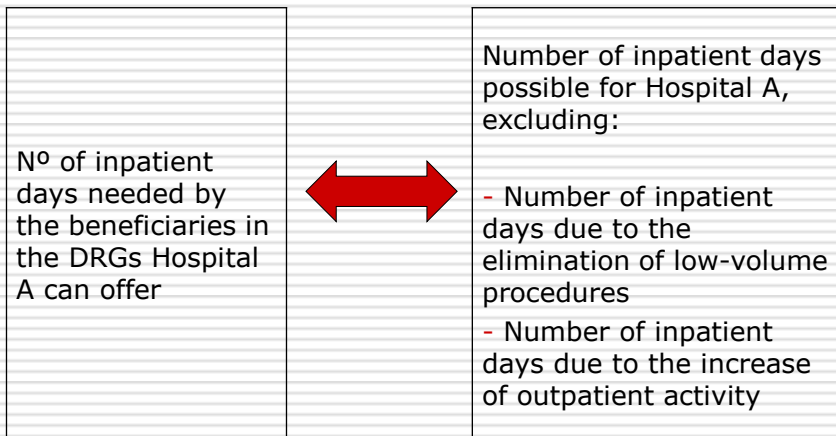
## 3.8 Methods – adjustments to hospital capacity/ambulatory (1)

- ❑ Methodology created by Thomas Jefferson Medical College (Philadelphia, USA) and Regione Emilia-Romagna Health Authority (Italy)
- ❑ Information from DRGs and Disease Staging
- ❑ Presence and severity of comorbidities, patient age
- ❑ Existence of ambulatory structures

## 3.9 Methods – adjustments to hospital capacity/ambulatory (2)

	Surgical admissions	Medical admissions
<b>A</b>	Given the severity of the disease, or low risk of the disease and procedure, the procedure <b>can be performed in an ambulatory setting</b> assuming appropriate facilities area available	Symptoms or signs that are non-specific, or a chronic disease, that <b>can be managed in an ambulatory setting</b>
<b>B</b>	Surgery could be performed in an ambulatory setting, but because of patient age or presence of Stage 2 or Stage 3 co-morbid disease affecting the central nervous system, cardiovascular system, or respiratory system may require a period of inpatient care (1-2 days)	Symptoms or signs, which may be non-specific, but because of patient age or presence of Stage 2 or Stage 3 co-morbid disease affecting the central nervous system, cardiovascular system, or respiratory system may require a period of inpatient observation, usually 1-2 days
<b>C</b>	Not used for surgical DRGs	A disease that requires hospitalization because a diagnostic test or treatment requires at least a short period (2-4 days) of observation
<b>D</b>	Hospitalization is appropriated either because the procedure is typically done in an inpatient setting or the severity of the disease requires hospitalization	A disease that requires hospitalization
<b>E</b>	A disease that requires hospitalization but with complications that may have been avoidable with hospitalization at an earlier stage of the disease or with more aggressive or timely outpatient treatment	

## 3.10 Methods – optimal output



1. Setting the scene
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#### 4. Results

1. How can the offer of Hospital A be defined?
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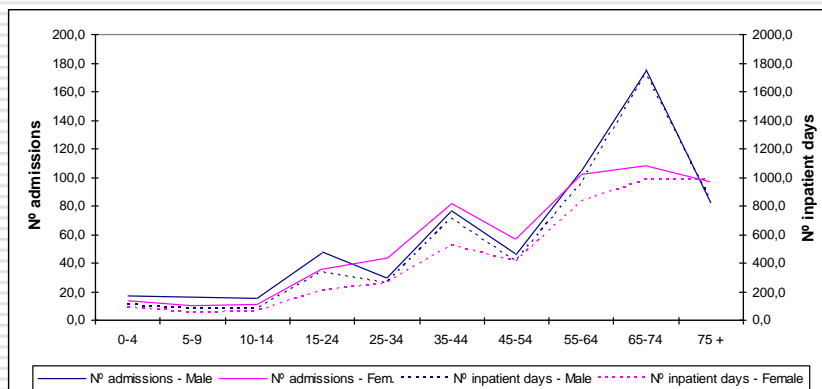
5. Discussion
6. Conclusions



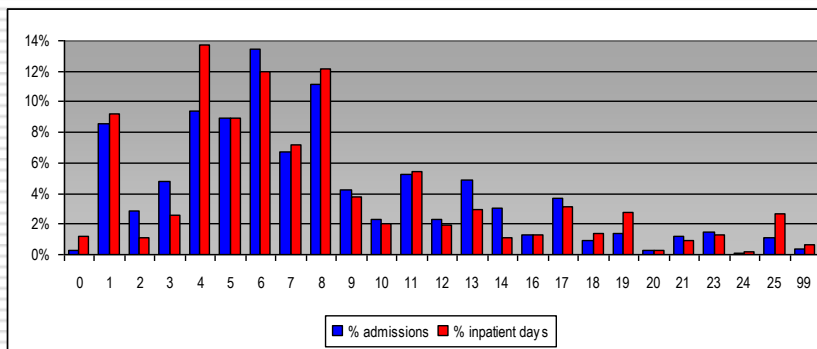
## 4.1 Supply of Hospital A

Number of DRGs	412
Medical DRGs (% number DRGs)	55
Diseases and disorders of the... (% number DRGs)	
...musculoskeletal sys. and connective tissue (8)	13
...digestive system (6)	9
...kidney and urinary tract (11)	7
<i>Includes all MDCs except MDC15 (Newborns...) and MDC22 (Burns)</i>	

## 4.2a Expected admissions and inpatient days per gender/age- target population



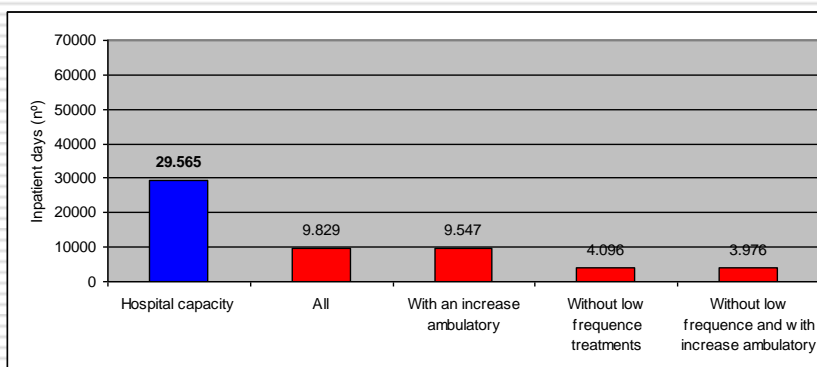
## 4.2b Expected admissions and inpatient days per MDC – target population



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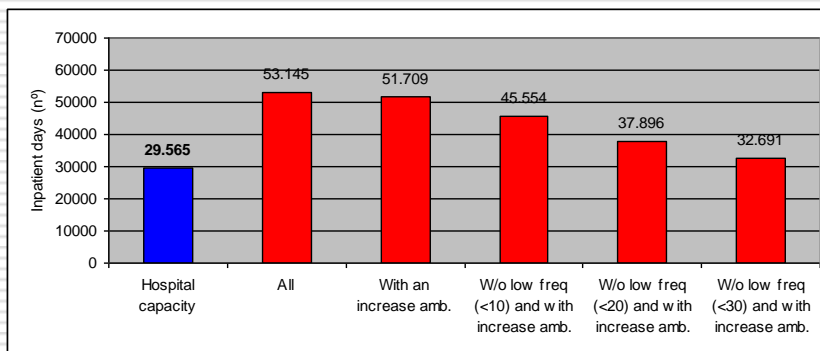
## 4.3 Expected inpatient days and hospital capacity – target population



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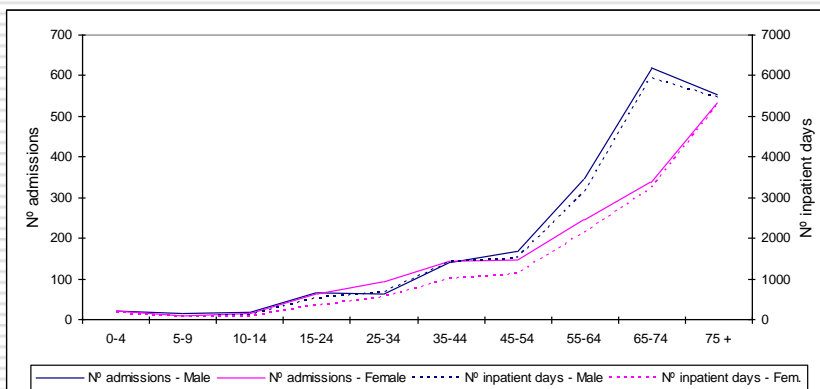
## 4.4a Expected inpatient days and hospital capacity – enlarged target pop.



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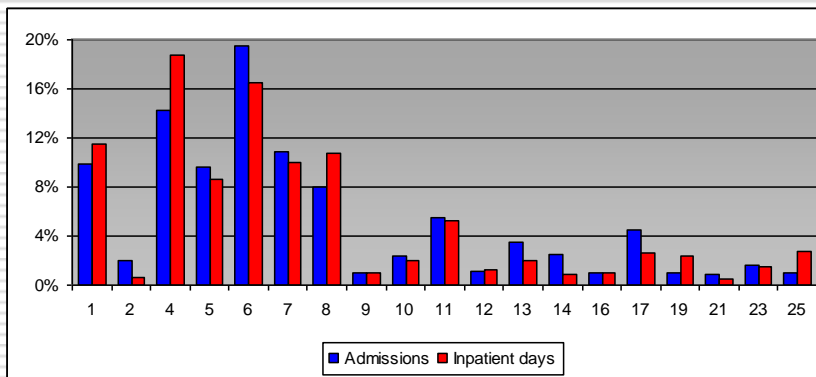
## 4.4b Expected adm. and inpatient days per gender/age – enlarged target pop.



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#### 4.4c Expected adm. and inpatient days per MDC – enlarged target pop.



## 5. Discussion

- Possibility of differences between inpatient rates in global and target population
- Capacity measured in terms of beds. Human and material resources not considered
- Exclusion of DRGs with low volume may imply the exclusion of other related DRGs

## 6.a Conclusions

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- ❑ The supply of Hospital A contain 412 DRGs in all Major Disease Categories except Newborns (15) and Burns (22)
- ❑ The needs of the target population (admissions) vary with age and gender and concentrate on MDCs 6(digestive), 8 (musculoskeletal) and 4 (respiratory)
- ❑ The capacity of Hospital A, in terms of beds, is oversized for the needs of the target population

## 6.b Conclusions

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- ❑ In the actual context, it is not possible to enlarge the target population
- ❑ It is possible to enlarge the target population if treatments of low volume are not performed and if ambulatory activity increases



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Questions?