Hospital Performance: Concepts and Lessons from Experience

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Outline

- Defining a (public) hospital
- Managing hospital organizations
- Challenges in hospital operations
- Hospital performance
- Measuring hospital performance
- A cost / case mix approach
- Recommendations

Defining a public hospital

Definition

It is a social entity conformed by a set of human, material, economic and organizational resources that are oriented towards a final objective expressed in its **mission**.

It is a labor-intensive service provider, made up of interdependent systems that share a **mission**.

Organization

- It needs to be addressed as a **unit** and at the same time as part of a **network** of services
- It requires **information** of all its areas
- It requires a professionalized **management**
- It must be contextualized in its **environment** (geographic, community)

Key areas

- Knowledge of demand
- Adequacy of supply
- Health care production
- Budget execution
- Measurement of clinical and economic results
- Management models based on results
- **Accountability** and social **responsibility**

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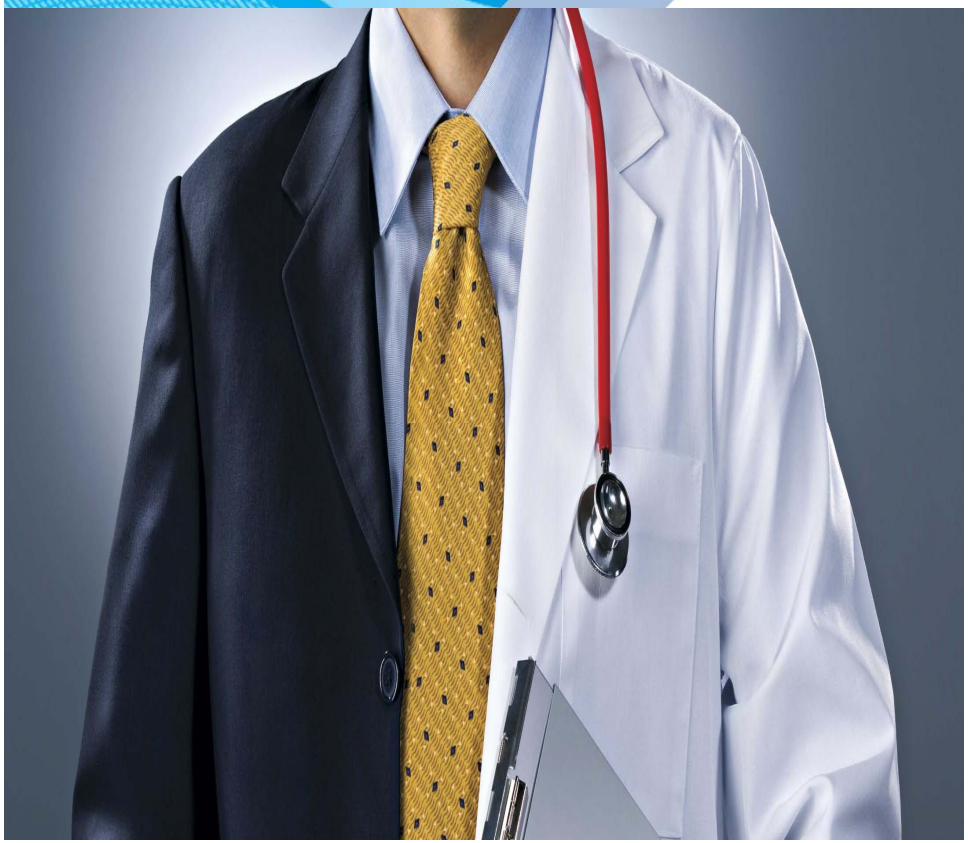
Managing hospital organizations



The modern Hospital Organizations must worry and take **responsibility for the quality of life** of its patients, attending to the basic values, beliefs and fundamental objectives that define the times and society in which they are immersed.

However, in relation to their objectives, hospitals must pursue, like any other company, the **generation, administration and maximization of resources**, in order to ensure their **sustainability**.

Accountability

Performance

It is the evaluation of the result of the general performance process of an institution, of its **productivity** and **quality**, of **compliance** with regulations in accordance with standards and proposed strategies in its social and political environment. It is the measurement of **efficiency**, understood as the degree to which the organization reaches the goals set with the available resources.

It is a measure of **responsibility**

Responsibility

- Ensure adequate use of human, economic and physical resources
- Limited resources vs. unlimited demand
- Equity in access to care
- Assign operational and financial performance responsibilities
- Autonomy of decision making within political and normative frameworks.

Transparency

Sustainability

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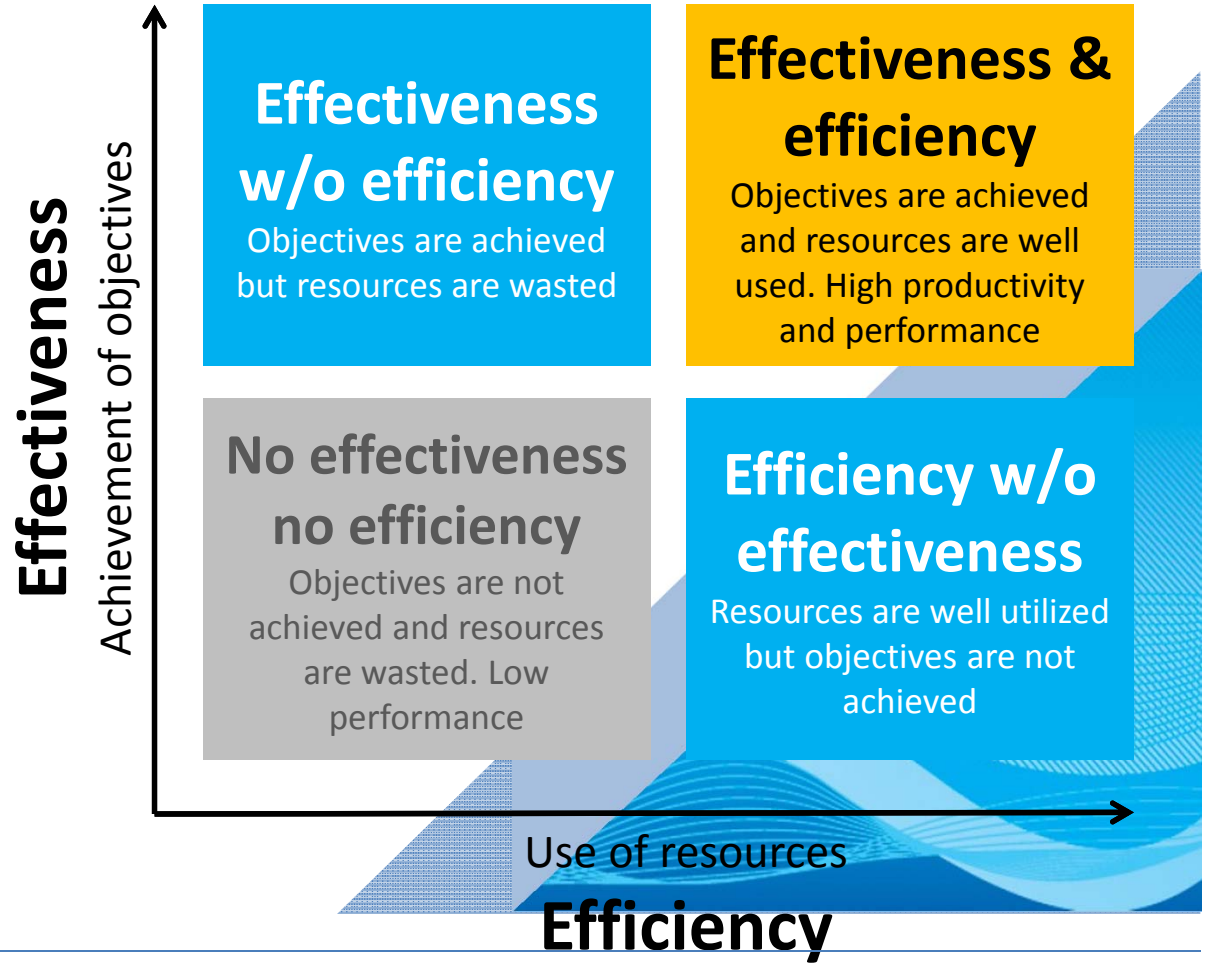
Performance = Effectiveness & Efficiency

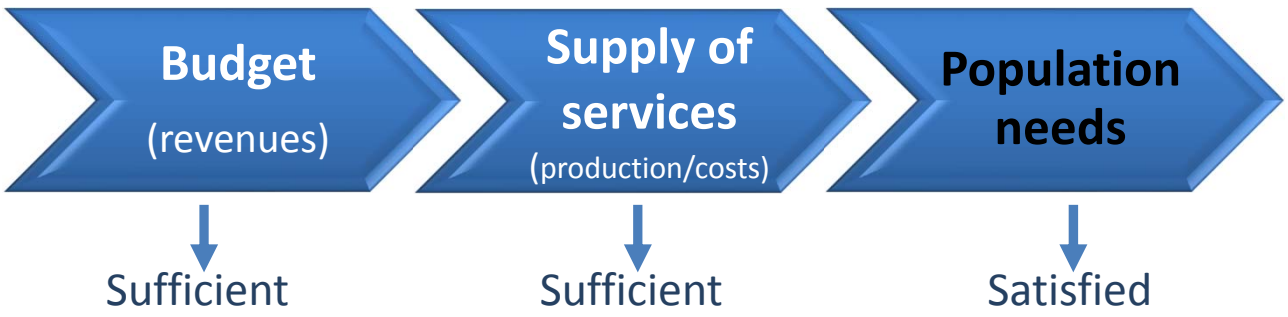
Effectiveness is the ability to execute defined activities in order to achieve the proposed **objectives**. It's about doing the "right things"

Efficiency refers to the productive level obtained in the use of resources to achieve a goal. It refers to the ability to achieve the **maximum results** with the resources invested, guaranteeing the **same quality.** It's about doing the "things right"



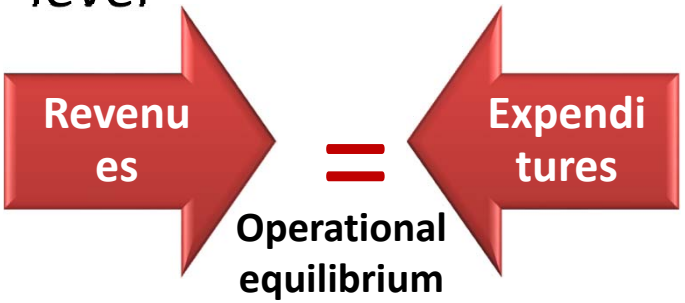
Challenges in hospital operations

- Defining hospital operations

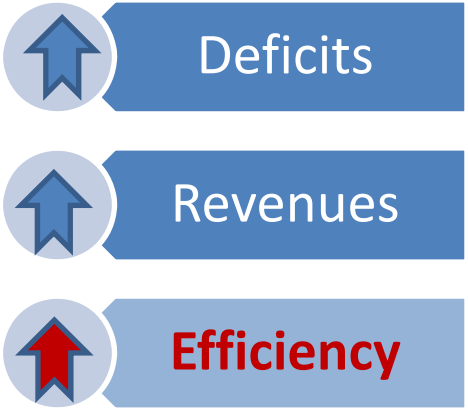


- In practice, “needs” usually exceed the “budget” and the “production capacity (supply)” facing increasing costs
- Budgets are usually prepared on historic bases, do not represent the real operational costs (structure) of the hospital
- Budgetary execution is not a valid measure of hospital performance. It only reflects how much $ was spent

- In theory, hospital organizations should operate at “break even point” level



- Hospital managers will have to develop strategies to cope with demand / supply **imbalances** and rising **costs**, while acknowledging that their **mission** is to take care of patients with specific health problems that can be improved through hospital care (processes).
- In this sense, the **product** of a hospital will be the particular combination of the quantity and types of patients treated (“**case mix**”) ---and not only intermediate processes



Break even point

Broader managerial vision

Maximize resources utilization

Managerial basic objectives	Breakeven point
	Sustainability
	Value generation
Managerial priorities	Results
	Efficiency of resources
	Cost and expense control
Managerial decision making	Operation
	Financing
	Investment

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Dimensions in evaluating hospital performance

Dimension	UK	Canada CIHI	Australia - ACHS	USA - AHRQ	WHO - PATH	OECD
Acceptance		X				
Access	X	X	X	X		X
Adequacy		X	X			
Care and Services	X					
Concurrence		X				
Capacity			X			
Continuity		X	X			
Effectiveness	X	X	X	X		X
Health improvements					X	
Financial management, costs and expenditures					X	X
Efficiency		X	X	X	X	X

Dimension	UK	Canada CIHI	Australia - ACHS	USA - AHRQ	WHO - PATH	OECD
Equity	X	X	X	X	X	X
Governance	X					
People centered care	X	X	X	X	X	X
Security	X	X	X	X		
Sostenibility			X			
Oportunity	X			X		

- Hospital **performance** (efficiency and effectiveness) is challenged by: the need to control **costs**, the fast development of medical **technologies**, the higher **demands** and **expectations** of the population and the changing epidemiological and demographic profile of the population they serve.

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http://www.redalyc.org/articulo.oa?id=43427048002

AHRQ Agency for Health Research and Quality (US)
CIHI Canadian Institute of Health Performance
ACHS Australian Council of health Care
WHO – PAT performance Assessment Tool for QI in Hospital
OECD organization for Economic Co-operation and Development

Performance Indicators in Top 20 Hospitals

DIMENSIONS	
Quality	Index of mortality adjusted by risk
	Index of complications adjusted by risk
	Index of readmissions adjusted by risk
Adequacy of Practice	Index of surgery substitution w/o entrance
	Index of avoidable hospitalizations adjusted
Efficiency	Index of adjusted stays adjusted by risk
	Productivity as units per health worker
	Procurement costs per production unit

Producing performance indicators

Productivity and Performance	Productive capacity	1	Waiting lists	4
	Services production	2	Idle capacity	5
	Performance by resources	3		
Clinical results	Average stays	1	Inputs consumption and activity	4
	Percentages of occupation and use	2	Adverse events	5
	Consumption of diagnostic aids	3	Case mix – Patients complexity	6
Costs	Total cost and expenditure	1	Average bed cost	4
	Costs and expenditures by service	2	Per capita unit cost	5
	Cost per activity/DRG/Set	3	Costs structure	6
Financial indicators	Budget execution	1		
	Ratio income/expenditure	2		
	Balance and results	3		

Management board model

Managing a hospital is not only about its financial status!

Measuring hospital performance

- Two approaches to analyze and measure hospital performance (effectiveness and efficiency):
  - Output: The **cost** and **volume** of treatments are the most important indicators of performance. The measurement of hospital performance is focused on "technical efficiency" (Questions: is the institution cost effective and efficient?; is there an adequate # of treatments performed for the available resources?). Method: relates costs and case-mix. Tool: e.g. PERC
  - Outcome: The **outcome** and **quality** of hospital care are the most important indicators of performance. The measurement of hospital performance is focused on "allocative efficiency." (Questions: is the clinical work appropriate? What benefit does the patient get from the treatment received?). Method: compared performance (DRG, DEA, benchmarking) corrected by case-mix and/or health outcomes

What and how to measure?

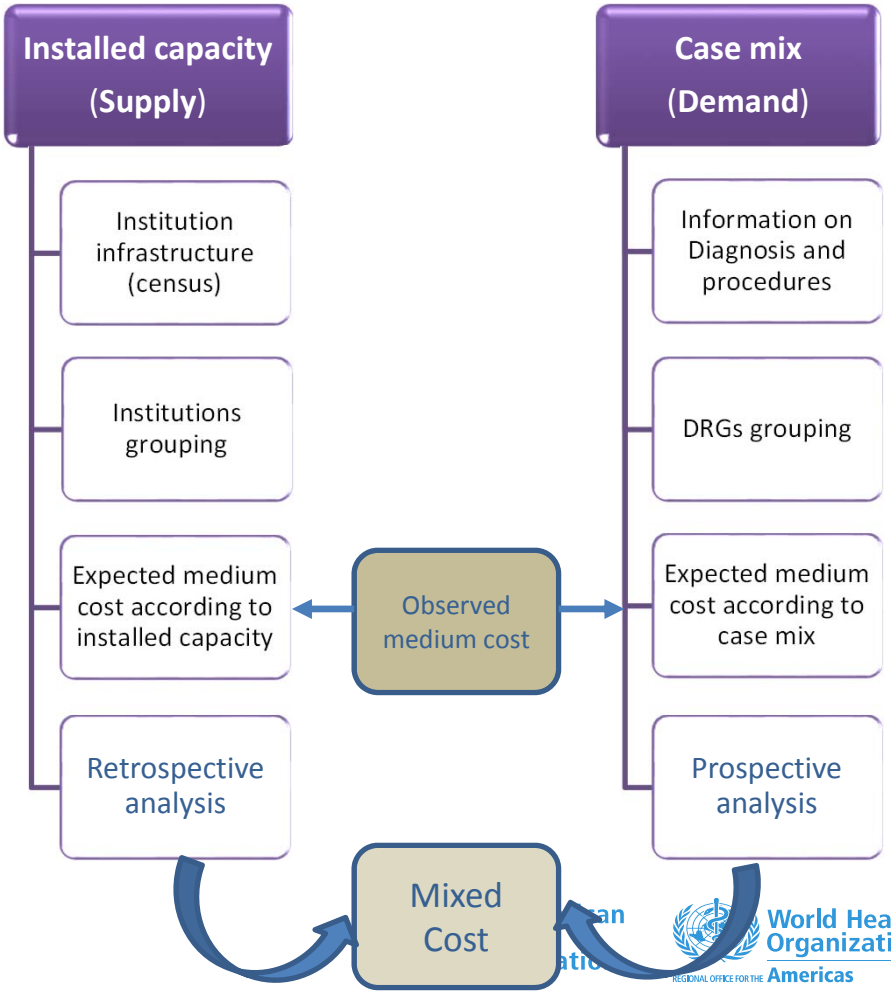
- Four main elements to be measured:
  - Productivity: installed capacity (idle capacity?) **x** use (staff performance: adherence to “agreements”?)
  - Costs: human resources, general expenses, inputs
  - Complexity: case mix
  - Clinical results: process indicators (stays, adverse events, discharges, etc)

- How to measure?
  - Compare: expected vs observed results; within a pool of selected (homogeneous?) hospitals

Compared performance based on structural **capacity** and **case mix**

Measuring installed capacity:

- Variables related to installed capacity
- Hospitals classification according to capacity
- Estimate expected costs according to capacity



Measuring case mix:

- Basic minimum data set (BMDS)
- DRGs grouping and relative prices applied
- Standardization and case mix index estimate
- Expected cost estimates based on case mix

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Costs by capacity in 5 hospitals

Hospital		Discharges	Observed medium cost	Hospital Type	Expected medium cost
Hospital	**1**	**8996**	**262.762**	**2**	**295.895**
	2	**27639**	**382.550**	**1**	**338.036**
	3	**21337**	**329.028**	**2**	**295.895**
	4	**41465**	**310.245**	**1**	**338.036**
	5	**24379**	**321.313**	**1**	**338.036**
Total		**123816**	**321.180**		**321.180**

Hospitales		Expected Medium Cost	Expected Total Costs	Observed Medium Cost	Observed Total Costs	Difference Expected - Observed	
Hospital	1	295.895	2.661.872.724	262.762	2.363.806.952	298.065.772	12,61%
	2	338.036	9.342.972.121	382.550	10.573.301.661	-1.230.329.540	-11,64%
	3	295.895	6.313.514.709	329.028	7.020.476.624	-706.961.915	-10,07%
	4	338.036	14.016.655.415	310.245	12.864.300.217	1.152.355.197	8,96%
	5	338.036	8.240.975.337	321.313	7.833.279.875	407.695.462	5,20%
Total		321.180	39.767.167.410	321.180	39.767.167.163	0	0,00%

Source: Ibern, et al, 2007

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Costs by case mix for 5 hospitals

Hospitals	Total Weights	Discharges	Case mix Index	Standardized Case mix Index
1	8.899	8.996	0,99	1,13
2	20.928	27.639	0,76	0,86
3	15.622	21.337	0,73	0,84
4	37.864	41.465	0,91	1,04
5	25.201	24.379	1,03	1,18
	108.513	123.816	0,88	1

Hospitals		Discharges	Expected Medium Cost	Expected Total Costs	Observed medium cost	Observed Total Costs	Difference expected - observed	%
Hospital	1	8.996	297.254	2.674.093.197	262.762	2.363.806.952	310.286.245	13,13%
	2	27.639	3.129.362	9.103.222.637	382.550	10.573.301.661	-1.470.079.023	-13,90%
	3	21.337	2.276.693	5.903.804.583	329.028	7.020.476.623	-1.116.672.040	-15,91%
	4	41.465	3.323.016	13.393.855.099	310.245	12.864.300.217	529.554.881	4,12%
	5	24.379	3.479.573	9.253.621.704	321.313	7.833.279.875	1.420.341.828	18,13%
Total		123.816	321.180	39.767.167.410	321.180	39.767.167.410	0	0,00%

Fuente: Ibern, et al, 2007

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Costs by case mix (DRGs) in type III hospitals : Peru

Hospital	N° of Discharges	Standardized DRG Weight	Expected Medium Cost	Observed Budget	Expected Budget	Redistribution
H.R. Honorio Delgado Espinoza	4,896	1.03	72.35	344,144	354,237	3%
H. Goyeneche	1,938	0.91	62.66	132,990	121,434	-9%
Hosp. Regional	2,141	0.84	54.43	139,495	116,529	-16%
H. Antonio Lorena	2,723	1.06	85.69	220,277	233,330	6%
H. Belen De Trujillo	924	0.92	60.61	60,725	56,000	-8%
Hosp. Regional Docente	1,166	1.03	71.48	81,182	83,347	3%
H. Las Mercedes	4,762	0.97	62.42	306,290	297,224	-3%
H. Maria Auxiliadora	8,648	1.03	77.62	648,634	671,230	3%
H.R. de Loreto Felipe Arriola Iglesias	2,082	1.05	109.28	217,360	227,518	5%
Total	**29,289**	**1.00**	**73.55**	**2.154.288**	**2.154.288**	**0%**

Case mix Index

Medium Cost X GRD weight

Expected Medium Cost X No. discharges

Source: Cid y Prieto, 2008

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A cost / case mix approach

Labor
Direct or Indirect

Materials
Medicines & Supplies

General expenses
Indirect production costs

Production Efficiency Costs

Performance indicators

Health service production

Costs & expenses

Portfolio of services

Complexity of care (case mix)

Results of health services

Efficiency in the processes

PERC - Productive management of health services Methodology (PMHSM)
Costs

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Monitoring of results

	Hospital A RN	Hospital B RN	Hospital C RN	Hospital D region	Hospital E region
Human Resources	22,660,382	14,268,232	29,994,095	16,308,327	16,074,876
General expenses	4,654,393	2,424,101	2,231,064	2,226,332	2,249,208
Supplies	9,831,785	5,031,510	15,062,200	9,075,351	7,484,998
Costo total	**37,146,560**	**21,723,843**	**47,287,359**	**27,610,010**	**25,809,082**

	Hospital A RN	Hospital B RN	Hospital C RN	Hospital D region	Hospital E region
Beds	**331**	**348**	**556**	**454**	**518**
Inpatient care	70.9%	79.7%	61.2%	68.4%	72.3%
Adjusted average bed cost/year	79,588	49,765	52,074	41,586	36,039
Bed occupancy	83.05%	99.53%	104.94%	105.9%	98.39%

	Basic Hospital	Departamental Hospital	Regional Hospital	Reference Hospital	Total
Total cost	$42,199,921	$130,789,260	$53,419,092	$106,157,762	$332,566,035
Beds	678	2,473	972	1,235	5,358
Discharges	76,186	201,405	88,244	70,220	436,055
Percentage of occupability	85.56%	86.9%	102.1%	95.8%	92.61%
Annual bed turnover	112.37	81.44	91.6	59.2	
Average bed cost/year	$36,119	$36,001	$38,813	$60,476	
Inpatient care	57.5%	61.2%	70.4%	70.6%	
Production/month	6,349	16,784	7,354	5,852	
Monthly bed turnover	9.17	7.77	7.6	4.9	
Average stay (days)	3.40	4.89	4.0	6.1	

mparison of costs for hospitals by classification : 2016 - 2017

2016	Basic	Departamentales	Regional	Hospital Nacional Bloom	Hospital Nacional de la Mujer	Hospital Nacional Rosales	Total
resources	30,609,756	86,426,372	32,034,927	22,395,153	14,042,054	29,829,783	215,338,045
expenses	3,408,378	13,988,048	4,039,725	4,114,897	2,860,773	2,248,808	30,660,629
	7,585,748	28,114,893	15,974,069	10,282,339	4,514,966	22,707,747	89,179,762
	41,603,882	**128,529,313**	**52,048,721**	**36,792,389**	**21,417,793**	**54,786,338**	**335,178,436**
	12.4%	**38.3%**	**15.5%**	**11.0%**	**6.4%**	**16.3%**	**100%**

2017	Básic	Departamental	Regional	Hospital Nacional Bloom	Hospital Nacional de la Mujer	Hospital Nacional Rosales	Total
resources	30,775,909	90,295,062	32,383,203	22,660,382	14,268,232	29,994,095	220,376,883
expenses	4,360,137	15,964,676	4,475,540	4,654,393	2,424,101	2,231,064	34,109,911
	7,063,875	24,529,522	16,560,349	9,831,785	5,031,510	15,062,200	78,079,241
	42,199,921	**130,789,260**	**53,419,092**	**37,146,560**	**21,723,843**	**47,287,359**	**332,566,035**
	12.7%	**39.3%**	**16.1%**	**11.2%**	**6.5%**	**14.2%**	**100%**

eneral, the larger the # of beds, the least the weight of HR in the costs structure

sts analysis

Year 2016

spital	1	2	3	4	5	6	7	8
ear 2016	$41,224,222,112	$58,943,969,867	$122,216,033,552	$12,749,143,403	$64,695,139,563	$71,823,825,749	$24,991,499,377	$101,819,614,413
	296	466	891	147	418	528	278	706
d/year cost	$139,271,021	$126,489,206	$137,167,265	$86,728,867	$154,773,061	$136,029,973	$89,897,480	$144,220,417
ity	**0.78**	**0.81**	**1.04**	**0.61**	**0.9**	**0.76**	**0.75**	**0.96**

ospital	9	10	11	12	13	14	15	16
ear 2016	$17,410,970,421	$46,213,159,450	$78,904,710,530	$20,747,954,205	$63,632,363,441	$44,323,749,210	$87,048,888,887	$75,280,629,395
	198	378	541	137	506	331	593	401
d/year cost	$87,934,194	$122,257,036	$145,849,742	$151,444,921	$125,755,659	$133,908,608	$146,794,079	$187,732,243
ity	**0.65**	**0.82**	**0.89**	**0.85**	**0.92**	**0.91**	**0.98**	**1.16**

ospital	17	18	19	20	21	22	23	Promedio
ear 2016	$40,907,925,996	$94,158,256,372	$67,088,298,474	$76,617,888,683	$17,801,341,362	$20,740,999,276	$26,356,743,371	
	193	653	527	451	168	100	176	
d/year cost	$211,958,166	$144,193,348	$127,302,274	$169,884,454	$105,960,365	$207,409,993	$149,754,224	$136,931,066
ty	**1.26**	**0.87**	**0.99**	**1.19**	**0.74**	**1.8**	**1.63**	**0.90**

ospitals of medium and high complexity

3 beds

alth regions

Methodology: costing by absorption
Cost analysis tool: PERC

PMHSM plus case mix

per complexity

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ecommendations: optimizing hospital performance

- Need to acknowledge the complex nature, unique organizational structure and mission of a modern hospital organization – no one size fits all formula
- mprovement strategies should focus on quality, outcome, effectiveness and **efficiency**: institutions' "financial health" should not be the ultimate goal. A balance should be found between cost reduction and quality mprovement while promoting equity, patients satisfaction and ultimately, better health outcomes
- Strong health information systems and highly skilled managers are key and essential for optimal decision making and success.
- Considerations in evaluating hospital performance, for more representative results :
  - complement the analysis with outcome measures, not only processes and services (e.g. mortality adjusted by complexity)
  - in comparing performance: choose homogeneous categories and adjust for complexity (case mix)
  - be aware of the limitations of the measuring instruments (e.g. DRGs do not adjust for installed capacity nor geographic location; PERC is a costing tool)

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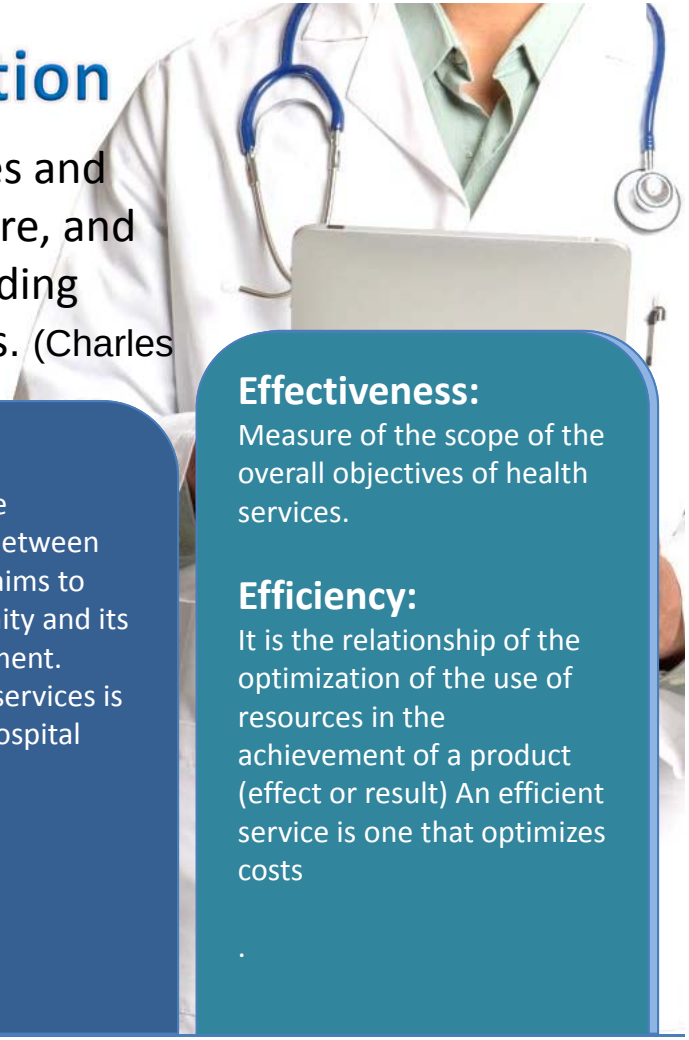
ductive management
of health services

lth management and administration

organize, direct, control, coordinate, evaluate resources and dures for which the demand for medical and health care, and eds of a healthy environment are addressed, by providing es to individual clients, organizations and communities. (Charles n)



ciples

ability:
positive evaluation
lth service. It is
he community and

Equity:
Offer of health care resources for the population, according to social justice criteria, observing their adaptation to the needs of the community, and considering the ease of access, quality and safety

Quality:
Understood as the correspondence between what the service aims to offer the community and its effective achievement. Providing quality services is an obligation of hospital management

Effectiveness:
Measure of the scope of the overall objectives of health services.

Efficiency:
It is the relationship of the optimization of the use of resources in the achievement of a product (effect or result) An efficient service is one that optimizes costs

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ital Management

Business anagement	Clinical management	Operational efficiency	Quality and Security
fine strategies	Integration with health profesionals	Resources optiization	Reference patterns
Care object	New medicine practices	Costs & expenditures control	Risk management
Financing	Biomedical technology	Human resources development	Continuous improvement
ngement practice	Care models		Quality culture
Planning	Model of care	Operational model	Quality management
Governance	Health information	Managemement by competences	Safety patient management
agement Model		Management by process	Management of hospital environment

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