

SOME PERFORMANCE INDICATORS OF SURGICAL DEPARTMENTS IN TERTIARY HOSPITALS

Odetta Duma

“Gr.T. Popa” University of Medicine and Pharmacy Iași,
Department of Public Health and Management

Abstract. The purpose of this study was to assess the performance of twenty surgical units from tertiary hospitals of Iași city in 2001 year, through following indicators: average hospital stay and the rates for occupancy, bed turnover and hospital mortality. Interpretation of average hospital stay in surgical care units was based on a comparison of recorded values in different departments with those recommended by Ministry of Health for tertiary hospitals. The highest value compared with that recommended, has been found in a gynecology department (81.8% excess). Seven surgical departments (35 %) exceeded the optimal average hospital stay. High levels of occupancy rates (over 400 days) were found in some departments (general surgery, neurosurgery and orthopedics). Low hospital mortality rates have been found in most surgical departments.

Key words: performance, surgical units, average hospital stay, occupancy rate, bed turnover rate, hospital mortality rate

Rezumat. Lucrarea estimează nivelul de performanță a douăzeci de secții cu profil chirurgical din spitalele terțiare ale municipiului Iași în anul 2001, prin intermediul următorilor indicatori : durata medie de spitalizare, rata de ocupare, rulajul per pat, rata de mortalitate în spital. Interpretarea duratei medii de spitalizare s-a făcut prin comparație cu valorile recomandate de Ministerul Sănătății pentru spitalele terțiare. Cea mai crescută durată medie de spitalizare față de valoarea optimă corespunzătoare a fost înregistrată într-o secție de ginecologie (81.8 %). În șapte din secții a fost depășită durata medie de spitalizare (35 %). Rate mari de ocupare (peste 400) au fost observate în secțiile de chirurgie generală, neurochirurgie și ortopedie. Niveluri scăzute ale mortalității spitalicești au fost constatate în majoritatea secțiilor de chirurgie.

Cuvinte cheie: performanță, secții cu profil chirurgical, durata medie de spitalizare, rata de ocupare, rulajul per pat, rata de mortalitate în spital

INTRODUCTION

In a health system, as any other social sector, resources are always scarce and choices have always to be taken. From this perspective, the tools used by managers are based on certain indicators designed to help the decisions about how to allocate the scarce resources in various ways (1). Hospitals are the main consumers

within the health system and this fact explains the special concern for measuring their performance.

Performance may be defined as the execution of activities and attainment of results through them. Implicated in performance is the attempt to achieve a desired, measurable outcome or target. This can be seen individually as achieving individual professional

excellence or competence, or organizationally as the organization, e.g. the hospital, achieving a desired performance level or a health ministry achieving predetermined goals in health care (2,3).

MATERIAL AND METHODS

During 2001 year the performance of surgical units from tertiary hospitals of Iași city have been assessed. The available data from sanitary statistics allowed the analysis of four following specific indicators for performance assessing:

1. average hospital stay (AHS);
2. occupancy rate;
3. bed turnover rate;
4. hospital mortality rate.

Twenty surgical departments with different profiles from 10 tertiary hospitals of Iași city have been assessed: general surgery and otolaryngology 3 departments each; ophthalmology, gynecology and obstetrics 2 departments each; and other 8 departments with unique profile (maxilofacial, urology, pediatric, thoracic, orthopedics and traumatology, plastic, neurosurgery and cardiovascular). The 1617 beds from all these departments represented 30.4% from total hospital beds registered in 2001.

The data were obtained from national sanitary statistics and from hospital statistics departments, being processed using EXCEL and SPSS 10 software.

RESULTS AND DISCUSSION

1. Average hospital stay (AHS). First indicator varied very much among

different hospitals for the same specialty. As the Ministry of Health recommended specific values of AHS for each surgical specialty at a tertiary hospital level, the interpretation of this indicator was based on a comparison within each surgical specialty, between AHS from different departments of Iași tertiary hospitals with the recommended value (4,5,6).

Two out three general surgery departments have had lower values of AHS (4.5-4.9 days) than recommended value of 6.9 days, as figure 1 shows.

In ENT (ear, nose and throat) departments, the AHS ranged from 1.5 to 10.9 days, whereas the recommended value is 6.7 days (fig. 1).

These values suggest excess for ENT A of 63 %, compared to optimal AHS. Both analysed gynecology departments exceeded the recommended AHS as figure 2 shows. Meanwhile, a lower average hospital stay has been recorded in obstetrics (3.7 vs 4.6 recommended).

The highest value compared with that recommended, has been recorded in gynecology A department (81.8% excess and 1.81 ratio 2001 value/optimal).

For ophthalmology there are 2 departments with 6.1 and respectively 7.9 hospital days stay, compared to the recommended AHS of 7.2 days.

Some surgical specialties summarized in table 1, work in Iași city as unique departments of its kind, so their catchment's area is more vast (up to 8 districts).

SOME PERFORMANCE INDICATORS OF SURGICAL DEPARTMENTS

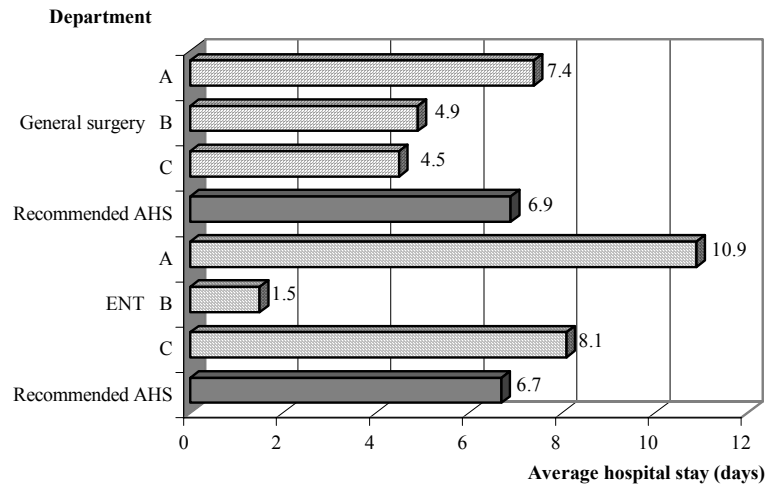


Fig. 1 Average hospital stay (AHS) in general surgery and ENT departments

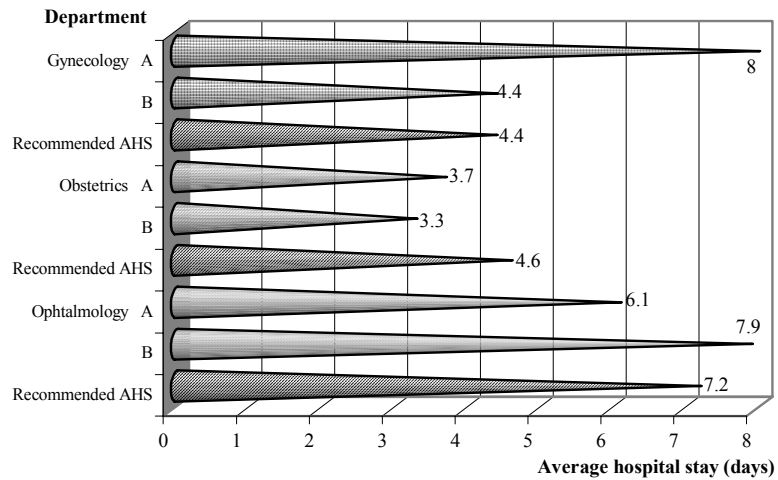


Fig. 2 Average hospital stay (AHS) in obstetrics and gynecology departments

Table 1. Recorded and optimal values of average hospital stay in surgery departments of tertiary hospitals

Surgery department	Average hospital stay (days)		Ratio 2001 values/ Optimal
	2001	Optimal	
Maxilofacial	8.0	6.9	1.16
Urology	5.6	7.6	0.74
Pediatric	3.6	4.5	0.80
Thoracic	13.6	12.1	1.12
Orthopedics, traumatology	10.1	10.7	0.94
Plastic	4.1	8.3	0.49
Neurosurgery	6	7.6	0.79
Cardiovascular	8.4	8.5	0.99

Only in two of these eight departments, the AHS goes beyond the optimal values, for others the ratio 2001 data/optimal ranged from 0.49 up to 0.99.

Seven surgical departments exceeded the optimal AHS (35 %). A detailed analysis of determining causes of long AHS for each department is needed, because the high value means higher hospital expenditure, showing a low efficiency and low hospital performance.

2. Occupancy rate. Relation between AHS and the number of beds per department is not so obvious as in case of the occupancy rate. This indicator depends by an appropriate hospital size (beds). This term “appropriate” means to have permanently few unoccupied beds, being difficult to establish exactly this number.

Beds that are unoccupied in a hospital represent the insurance against the risk of not having enough beds when the number of patients goes higher. The “premiums” for this insurance are

made up by the cost of having unoccupied beds and include uncompensated depreciation of the facilities, as well as the cost of staff who is not working while beds are unoccupied. The former is almost negligible, while the latter is substantial (7).

The “benefits” of this insurance result in preventing the increased disability of patients, because a shortage of beds may cause:

- the delay in admission until a bed is available;
- the necessity of referral a patient in a substitute or inadequate hospital facility, instead of proper one;
- the premature discharge of a patient to make room for a new one who needs to be admitted.

Too few beds result in increased health hazards, while too many beds lead to higher financial costs. There is always the chance that some emergencies or other catastrophe overload facilities

SOME PERFORMANCE INDICATORS OF SURGICAL DEPARTMENTS

that may be more than ample for ordinary needs. Occupancy rate analysis is preferred in order to determine the degree of overloading in a given service (8).

A normal occupancy rate is less and close to value of 365, showing the total number of inpatient days per bed during one year (9). Of course, in case of two patients per bed (theoretically an unacceptable situation, but reality

seems to be different sometimes), occupancy may exceed the level of 365. This alarming situation has been recorded in 4 surgical departments, as shown in figure 3.

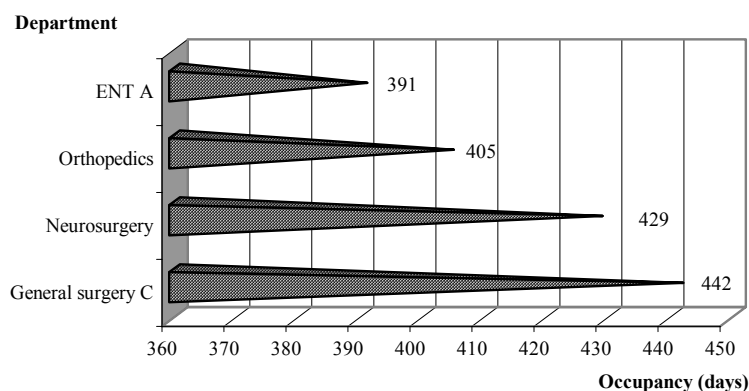


Fig. 3 Levels of occupancy rates over 365 days in some surgical departments

The opposite situation is that of very low occupation rate, described in table 2.

Table 2. Low occupancy rates (<300 days) in surgical departments

Surgery department	Occupancy (days)
ENT B	104
ENT C	256
Gynecology B	264
Gynecology A	266
Ophthalmology B	281
Urology	290

Between these two poles, there are surgical departments with a good occupancy rate, ranging from 300 to 365: ophthalmology A (304), plastic surgery (305), general surgery A (319), obstetrics A (326), maxillofacial surgery (338), pediatric surgery (333), general surgery B (352), obstetrics B (359), and cardiovascular surgery (364).

Possible solutions for high occupancy rates are: reducing the increased AHS to optimal values in conditions of high quality provided care; increasing the

number of hospital beds in care units with a good AHS.

In case of low or very low occupancy rate, reducing the number of hospital beds and improving thus efficiency and hospital performance represent the best solution (10).

3. Hospital bed turnover rate. Taking account that turnover depends on surgical unit's profile it is difficult to establish an appropriate level.

In table 3 there are presented the highest and lowest values for bed turnover rate in surgical departments investigated.

Table 3. Bed turnover rate in surgery departments

Surgery department	Turnover
Thoracic surgery	24
Gynecology A	33
ENT A	36
Ophtalmology B	36
Ophtalmology A	50
Gynecology B	60
Obstetrics A	89
Pediatric surgery	93
General surgery C	99
Obstetrics B	110

Generally, turnover is inverses proportionally with AHS, when the occupancy is acceptable. This means that a higher turnover rate in obstetrics or general surgery and lower in orthopedics, thoracic and cardiovascular surgery may be considered as normal.

Bed turnover rate ranged from 24 in thoracic surgery unit care to 110 in obstetrics B care unit. Too low values have been recorded in ENT A (36) and gynecology A department (33), suggesting that during the whole year,

a hospital bed has been occupied by only 33 and respectively, 36 patients; these values are related to long AHS as previously shown and suggest a low admission rate.

4. Mortality rate. This indicator varies depending on of surgical specialty, being relevant for hospital performance. Death risk is higher in patients admitted in general surgery for example, compared to ophthalmology and ENT.

A low rate of hospital mortality in comparison with the records of other institutions from the same category of size and specialization might suggest a fine performance as judged by results, but this may be due to a high proportion of unnecessary admissions (11,12).

The highest values of hospital mortality characterized general surgery units C and A (2.36% and 1.67% respectively), followed by thoracic surgery (1.53%).

Taking account the specific death risk for each specialty, favourable hospital mortality rates ranged between 0% and 0.87 as follows: pediatric surgery (0%), gynecology B (0%), ENT B (0%), obstetrics A and B (0.02%), ophthalmology A (0.03%), maxilofacial surgery (0.04%), gynecology A (0.05%), ENT A (0.17%), orthopedics and traumatology (0.19 %), general surgery B (0.21), neurosurgery (0.32%), plastic surgery (0.70 %), urology (0.78 %), and cardiovascular surgery (0.87%).

SOME PERFORMANCE INDICATORS OF SURGICAL DEPARTMENTS

CONCLUSIONS

1. The average hospital stay compared to that recommended by Ministry of Health, varies by the speciality profile. Seven (35%) of twenty surgical departments exceeded the optimal AHS.
2. High levels of occupancy rates (over 400 days) were found in only three departments: general surgery, neuro-surgery and orthopedics.
3. The obstetrics B has the highest level of bed turnover rate (110), followed by general surgery C (99), whereas ENT A (36), gynecology A (33) and thoracic surgery (24) have the lowest ones. According to the speciality profile, these values are normally for obstetrics, general surgery and thoracic surgery, but too low for ENT and gynecology.
4. Low and zero mortality rates have been recorded in most surgical departments, excepting two general surgery units and thoracic surgery, whose deaths levels exceeded 1%.

REFERENCES

1. Ionescu T, Mureşan P, Popescu A: *Management şi marketing sanitar, asistenţă şi protecţie socială*, Ed. Medicală, Bucureşti, 1992.
2. Jolly D, Gerband I: *The hospital of tomorrow*, 1992, Geneva, WHO, document WHO/SHS/CC/92.1.
3. Montoya-Aguilar C: *Measuring the performance of hospitals and health centres*, 1994, Geneva, WHO, WHO/SHS/DHS/94.2.
4. *** *Norme metodologice de aplicare*

a Contractului-cadru privind condiţiile acordării asistenţei medicale în cadrul sistemului asigurărilor sociale de sănătate pentru anul 2001.

5. *** *Anuar de statistică sanitară 2001*, Centrul de Calcul, Statist. San. şi Docum. Med., M.S.F., Bucureşti.
6. *** *Utilizarea paturilor, durata medie de spitalizare, rulajul bolnavilor, mortalitatea şi cheltuielile bugetare în spitale în anul 2001*, Centrul de Calcul, Statist. San. şi Docum. Med., M.S.F., Bucureşti.
7. *** *A Review of Determinants of Hospital Performance*, Report of the WHO Hospital Advisory Group Meeting, 11-15 April 1994, Geneva.
8. Pabon Lasso H: *Evaluating hospital performance through simultaneous application of several indicators*, Bull. of the Pan American Health Organization 1986, 20(4), 341-57.
9. Barnum H, Kutzin J: *Public hospitals in developing countries: resource use, cost, financing*, 1993, The John Hopkins University Press, Baltimore, London.
10. Mahapatra P, Berman P: *Using hospital activity indicators to evaluate performance in Andro Pradesh, India*, Int. J. of H. Plan and Manag., 1994, 9(2), 199-211.
11. McPake B, Kutzin J: *Methods for Evaluating Effects of Health Reforms*, ARA Paper no.13, 1996, WHO, Geneva.
12. Van Lerbeghe A, Lafort W: *The role of the hospital in the district: delivering or supporting primary health care? Current Concerns*, SHS Paper no.2, WHO/SHS/CC/90.2, 1990, WHO, Geneva.