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Public and private in italian health care: trends and market quotas

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Abstract

Background: The Italian healthcare system has two components: public and private healthcare providers. Both deliver services on behalf of and payable by the national health care service. This study explores the relationships between public and private healthcare providers.
Methods: The number of hospital admissions and length of stay or number of times the service was accessed stratified by year 2000, 2001, 2002; DRG; type of hospital admission (ordinary or day hospital/surgery); health provider category: public institutions without a specific reference territory, public institutions with a specific reference territory and accredited private institutions and medical or surgery DRGs. A distinction is made between those DRGs defined as belonging to the private sector and those falling within the public sector, assuming there is a majority market portion for services primarily supplied by the private sector. Case-mix index was utelised as the indicator for the complexity of the cases treated and the comparative performance index was used as the indicator for efficiency. Lastly in order to evaluate the services delivered with an inappropriate organizational profile reference is made the rulings defining Essential Level of assistance.
Results: The results showed a shift in the reallocation of service volumes for ordinary admissions towards the private sector; the reallocation relates to the volumes but not to the types of cases treated, since the DRG mix remained substantially unchanged over the 3-year period and those DRG that absorb 51% of services were essentially constant. The private sector never achieved a market majority quota but rather controlled market niches with minority quotas. The private institutions treated less complex cases and worked with lower efficiency levels than the public sector. There was also a shift in the distribution of admissions from ordinary admissions to day hospital/day surgery regimes with a growth in the proportion of the latter.
Conclusions: The study confirmed the predominance of public healthcare providers in the Italian healthcare system as well as their higher complexity and efficiency levels.

Key words: public and private healthcare providers, managed competition, market quotas, DRG, italian health care

Introduction

In the health care debate, the frequently recurring terms "public" and "private" can be analysed from two different perspectives. The former examines how payment is made to cover disease risks, either voluntarily through private funds or mandated by law through public funds. The latter focuses on the provision of health services to satisfy health needs; this aspect underlines the characteristics of the providers, i.e., their juridical status, the finalities pursued and the regulations under which they operate.

In its prospective payment system, the italian health care is public because it is financed by taxes.

The dynamics of the production market differ, since the market is mixed, and the public and private healthcare providers work in managed competition. [1-7]

The latest reform introduced by the Decree Law 502/1992 (Dlgs), along with Decree Law 229/1999 [1,2]- states that the local health care units provide access to health care through direct management hospitals, hospital organizations, public or private institutions and professionals with whom a contractual agreement is established. Two kinds of organizations were established with Decree Law 502/92: 1) local health care units with a catchment area providing services to an area of residents free of charge and encompassing interventions ranging from prevention to hospital assistance; 2) hospital organizations, which on the other hand are medical centres that provide highly qualified services to patients residing in Italy.

Competition between the public and private sectors is regulated:

- services provided free of charge by the National Health Care Service as defined by Essential Levels of Assistance (ELA)
- healthcare providers need not be those authorized to practice healthcare that must

meet minimum legal requirements. Healthcare providers to the National Health Care System must be accredited; accreditation is conditional on their compliance with certain requirements.

The presence of different types of healthcare providers on the italian healthcare market is very similar to the situation found in other industrialized countries where comparative analyses have been conducted. Studies in the United States focusing mainly on the quality profiles of "for profit" and "not for profit" providers have shown that private "not for profit" hospitals have a lower related risk of death [8-12]. In one meta-analysis comprising of 14 studies, private "for profit" hospitals were associated with an increased risk of death (Related risk 1.020, 95% confidence interval: 1.003-1.038, P=0.02) [13]. Costs studies show higher payments for care at private "for profit" hospitals [14-16], which was demonstrated by an meta-analysis which showed that private "for profit" hospitals were associated with higher payments for care [17,18].

An Australian study used average length of stay (LOS) as a proxy for efficiency to compare private and public hospital sectors, concluding that private hospitals were more efficient than public hospitals [19]. An Italian study demonstrated that in Lombardy the case mix distribution was higher in private than in public hospitals. The 10 most frequent DRGs in the private sector represented 29.3% of admissions versus 19.5% in the public sector [20].

It is in this area and within the context of the Italian National Health Service that the present article set out to explore the relationship between public and private healthcare providers in reference to services connected with ordinary admissions and day hospital/day surgery admissions. The aim of the study was to:

- define hospital admission trends in public and private settings during the 3-year period from 2000 to 2002 and evaluate the efficiency and the complexity of the cases treated;
- identify those DRGs that can be defined as belonging to either the private or public sectors;
- determine whether there is a majority portion in the market for services primarily supplied by the private sector;
- define the changes in the health care setting of the DRGs coded in Attachment 2C of the Decree of the President of the Council of Ministers (DPCM) 29/11/01 which defines essential levels of assistance [21].

Methods

Data was provided by the Ministry of Health. The volume of services is expressed as the number of hospital admissions and length of stay (LOS) stratified by:

- year 2000, 2001, 2002
- DRG
- type of hospital admission (ordinary or day hospital/surgery)
- healthcare provider category: hospital organizations, research centres, scientific research and assistance institutes (IRCCS), qualified local healthcare unit-based institutions, direct management hospitals, university polyclinics, accredited private institutions and classified hospitals. The latter of these are inpatient organizations comparable to public institutions in the healthcare service.

Health providers are grouped into three classes:

- Public institutions without a specific reference territory (PI): hospital organizations, research centres, IRCCS, qualified local health care unit-based institutions, university polyclinics and accredited private institutions
- Public institutions with a specific reference territory (PIT), e.g. direct management hospitals
- Accredited private institutions (APS)

The indicators characterizing the area of services delivered by public and private providers were the number and type of DRG that represent 51% of admissions. This cut-off value was selected by the authors to determine the major quota of the services provided.

The trends for admissions were analysed by stratifying the data for each group of providers as well as by year according to the volume of admissions, percent of surgical DRGs over total admissions, LOS and number of accesses. Based on the available data, ordinary admissions also were analysed for:

- Case-mix index: calculated as the ratio between the mean weight of admissions for each category and the mean weight of admissions by all providers during the 3-year study period. This is an indicator of the complexity of the cases treated by the provider category analysed.
- Comparative performance index obtained with the formula shown below that expresses the relative efficiency of the cases treated by the provider category.

$$\sum_{i=1}^{n_c} [d_i * N_i] \Big/ \sum_{i=1}^{n} [D_i * N_i]$$

d_i = mean LOS of DRG- i numbered in a provider category

D_i = mean LOS of DRG- i numbered in all provider categories

N_i = number of discharges of DRG- i numbered in all provider categories in the 3-year study period
n= number of DRG in all provider categories
n_c= number of common DRG overlapping between provider category and all providers

Lastly, reference is made to DPCM 29/11/2001. With this ruling the Italian government defined Essential Levels of Assistance, specifying those services provided free of charge by the National Health Care Service and those for which costs are shared.

Attachment 2C of DPCM 30/11/01 contains a detailed list of the services included in the ELA; however, these services present a potentially inappropriate organizational profile. We defined inappropriate as those cases treated as ordinary admissions or those Day Hospital/Day Surgery cases that could have been treated by healthcare institutions in a different healthcare setting, with the same advantages for the patients but using fewer resources. The attachment defines the 43 DRGs, of which 26 are medical and 17 are surgical, with a high risk of inappropriateness in an ordinary admission regime. Envisaging an assistance formula for these in Day Hospital or Day Surgery regimes is advisable.

Results and discussion

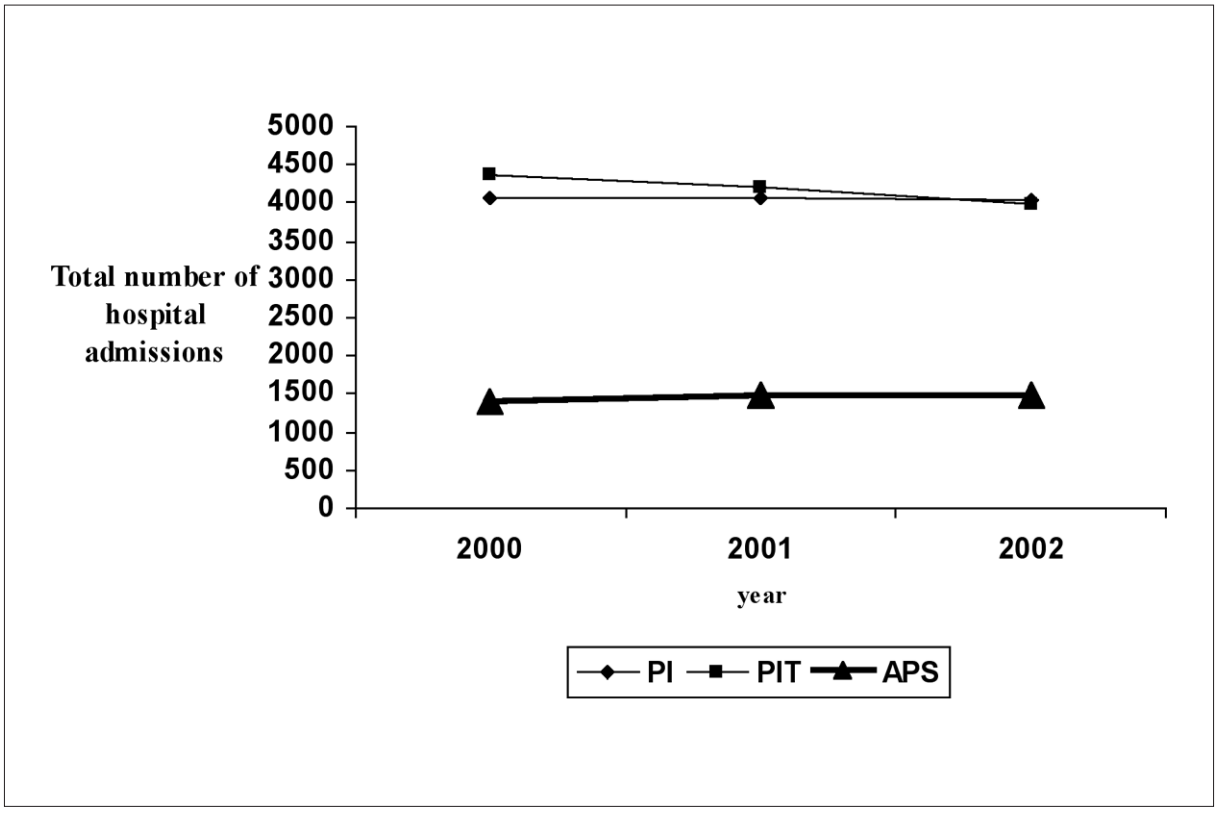
Hospital admission trend in ordinary stay and in Day Hospital or Day Surgery

On the whole, there was a slight drop in ordinary hospital stays over the 3-year-period, with a decrease of 0.7% in 2001 versus 2000 and 2.6% in 2002 versus 2001.

The patterns differ across the three provider categories (Figure 1): the public institutions without a specific reference territory (PI) showed an increase in 2001 (0.3%) and a decrease in 2002 (0.6%); a different pattern was present in the private sector (APS), with an increase of 5% in 2001 and 6,4% in 2002 versus 2000. On the other hand, the public institutions with a specific reference territory (PIT) showed a decreasing trend of 3.6% in 2001 and 8,9% in 2002.

The proportion of surgical admissions over the total number of admissions increased between 2000 and 2001, before plateauing in 2002 in both the PITs and PIs, but increasing from 29.7% to 30.3% and from 35.1% to 35.9%, respectively, while surgical admissions in the APSs rose from 45.3% in 2000 to 46.7% in 2001, before diminishing slightly to 46.1% in 2002. The APS were characterized by a higher proportion of surgical admissions.

Figure 1. Trend of ordinary hospital admissions (in thousands)



Legend: PI denotes public institution without a specific reference territory; PIT public institution with a specific reference territory; APS accredited private institution.

The average weight of hospital admissions showed an increasing trend across all three classes of health providers (Figure 2). This means that there was a gradual increase in the complexity of the treated cases in both types of accredited private institutions, where the volume of services also increased, and in the PITs where, in contrast, the trend turned downwards. An increase in the complexity of the cases treated by the providers was confirmed by the case mix indices (Figure 3), which showed between 2000 and 2002 a growth rate of 7.6% in the PITs, 6.5% in the APSs and 5.2% in the PIs. These indices demonstrate that case complexity was greatest in the PIs, followed by the APSs and the PITs.

The duration of ordinary stays in hospital showed similar, more prominent trends (Table 1). The LOS decreased by 2.2 % between 2000 and 2001 and by 2.4 between 2001 and 2002.

In the PITs, the reduced LOS corresponded with a decline in the number of hospital admissions, albeit at a stronger rate (4.4% and 9.9%, respectively, versus 2000). In the accredited private institutions the LOS increased by 1.8% in 2001 and 5% in 2002. This differs from the trend of hospital admissions to PIs, where the LOS decreased over the study period, unlike the trend in hospital admissions. In all three provider categories the performance index fell during the study period. While in APSs it was consistently above 1 (2000: 1.16; 2001: 1.13; 2002: 1.1), in the PIs it was always below 1 (2000: 0.97; 2001: 0.95; 2002: 0.92) and it varied in PIT (2000: 1.02; 2001: 0.99; 2002: 0.96). This means that efficiency improved over the 3-year period and that PIs were the most efficient provider category.

Table 1. Days of hospital stay in ordinary admissions (in thousands)

	Reference year		
	2000	**2001**	**2002**
PI	31066	30558	30090
PIT	30201	28867	27221
APS	12065	12279	12664
Total	**73332**	**71704**	**69975**

Legend: PI denotes public institution without a specific reference territory; PIT public institution with a specific reference territory; APS accredited private institution.

Table 2. Number of accesses to day hospital/day surgery admissions (in thousands)

	Reference year		
	2000	**2001**	**2002**
PI	4173	4636	5010
PIT	3469	3737	3919
APS	500	537	675
Total	**8142**	**8910**	**9604**

Legend: PI denotes public institution without a specific reference territory; PIT public institution with a specific reference territory; APS accredited private institution.

The number of day hospital/day surgery stays increased by 13.7 % between 2000 and 2001, with a further increase of 8.5% in 2002. The inclination in the growth curve (Figure 4) is higher in APSs, followed by PIs and PITs. The proportion of surgical admissions over total admissions grew during the study period in the PIs (31.7% in 2000; 33.4% in 2001; 37.4% in 2002), in the PITs (40.2% in 2000; 43.9% in 2001; 47.9% in 2002) and in the APSs (59.8% in 2000; 62.2% in 2001; 68.7% in 2002).

The number of accesses showed a similar trend, although at a lower growth rate. In all categories, the number of accesses increased by 9.4% between 2000 and 2001 and by 7.8% between 2001 and 2002 (Table 2).

In the three provider categories the highest growth rate was recorded for the accredited private institutions, which benefited from an increase of 35.2% in the span of two years.

DRG volumes and classes that absorb the greatest proportion of services

Within ordinary admissions, 51% of services were absorbed by 64 DRGs in the 3-year study period in PIs; by 50 DRGs in year 2000 and by 51 DRGs in the other two years (2001 and 2002) in the PITs and by 34 DRGs in the year 2000 and by 35 DRGs in 2001 and 2002 in the APSs. This means that the APS category had a smaller case mix than either the PIT or the PI categories because the majority quota of services is distributed across a smaller number of DRGs. Moreover, the APSs have a different case mix because 51% of services include the DRGs that the PIT and the PI provide to a lower proportion. In addition, in the PIT and PI categories the first two DRGs are medical DRGs, whereas in the APS category the first two are surgical DRGs.

The typology of DRGs in the 3-year period tended to be confirmed.

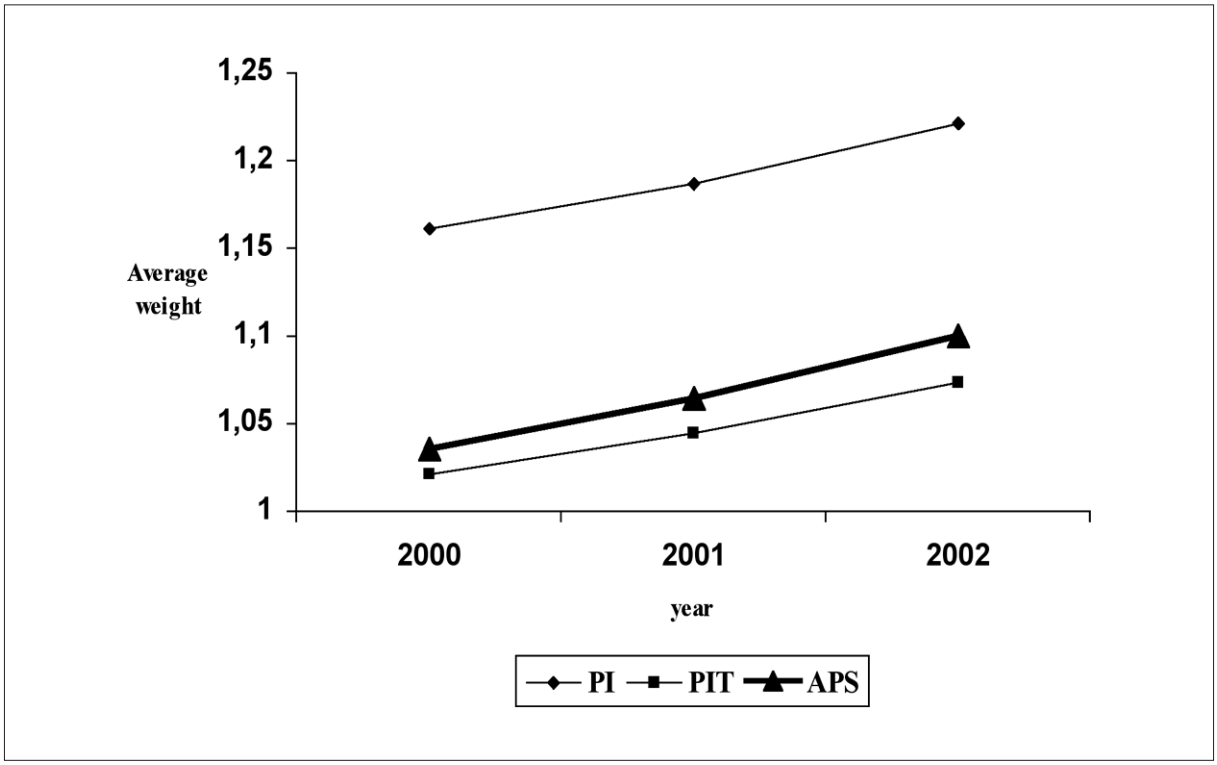
Considering that the average weights per year (Table 3) showed a growth trend in the three provider categories, we can state that, despite almost no change in the DRG mix over the 3-year study period or kinds of providers, there was a

Table 3. Average weight of ordinary admissions

	Reference year		
	2000	**2001**	**2002**
PI	1.161	1,186	1.221
PIT	1.021	1,044	1.073
APS	1.036	1.065	1.100

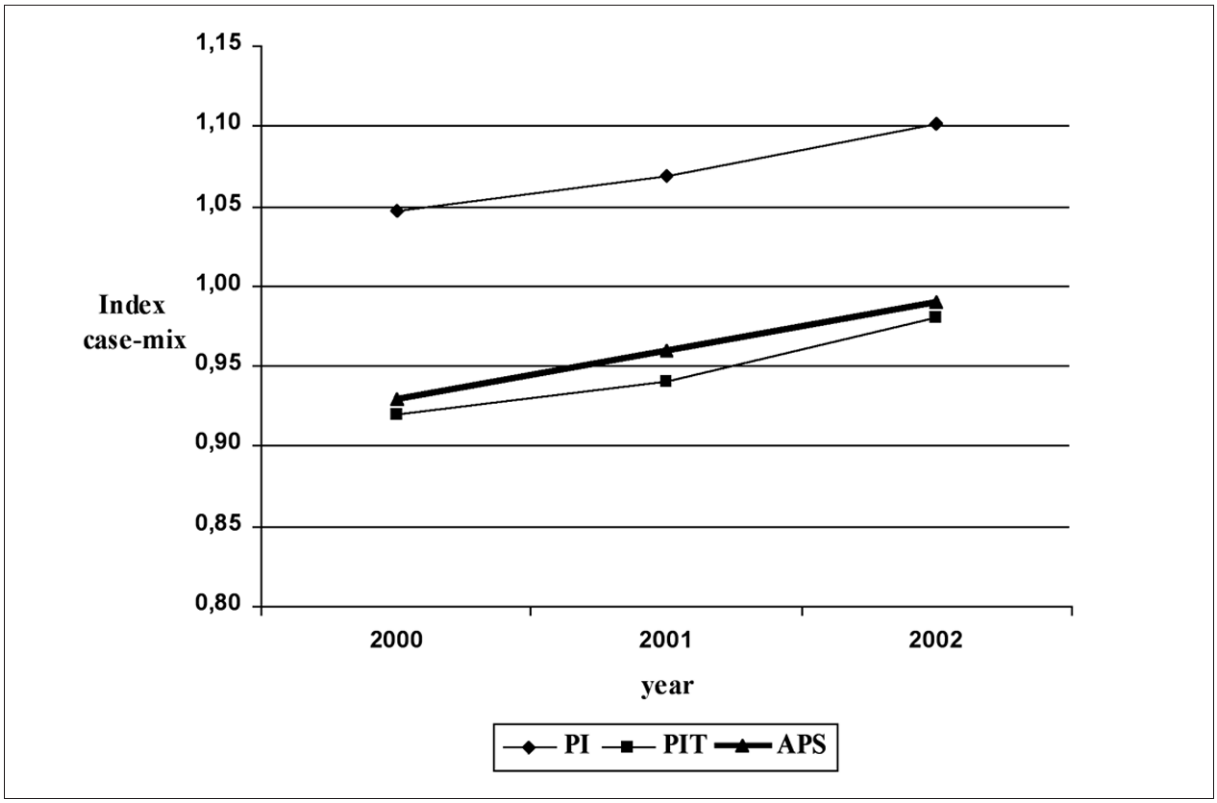
Legend: PI denotes public institution without a specific reference territory; PIT public institution with a specific reference territory; APS accredited private institution.

Figure 2. Trend of the average weight of ordinary admissions



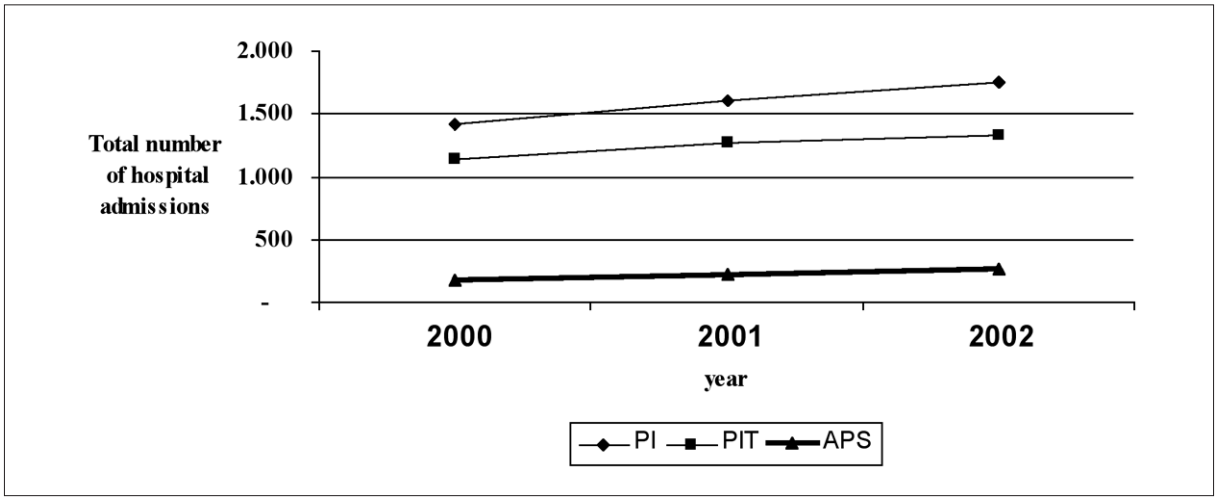
Legend: PI denotes public institution without a specific reference territory; PIT public institution with a specific reference territory; APS accredited private institution.

Figure 3. Trend index case-mix



Legend: PI denotes public institution without a specific reference territory; PIT public institution with a specific reference territory; APS accredited private institution.

Figure 4. Trend of day hospital/surgery admissions (in thousands)



Legend: PI denotes public institution without a specific reference territory; PIT public institution with a specific reference territory; APS accredited private institution.

redistribution of the volumes in favour of those with a higher weight.

From the day care admissions, 51% of admissions in the PIs corresponded to 29 DRGs in 2000 and 2002 and 30 in 2001; in the PITs the same proportion related to 25 DRGs in 2000, 23 DRGs in 2001 and 21 DRGs in 2002; in the APSs 51% of admissions were divided over 11 DRGs in 2000 and 2001 and 10 DRGs in 2002.This means that the case mix widened, going from the APS to the PIT to the PI provider category because the quota of services is distributed across more DRGs. The APSs deliver the same services as the PITs and the PIs, thus playing an alternative role to public institutions.

The prevailing pattern sees a higher use of daily admissions for surgical operations.

Market quotas between public and private sectors

In an analysis of those DRGs that cover 51% of the services furnished by private providers in ordinary admissions, we can see an increase in the market quota from 19.51% in 2000 to 21.47 % in 2001 to 22.09% in 2002 (Figure 5).

When the volume of each of these DRGs is compared to its overall production for the reference year, we can see that in none of these cases does the APSs have a majority quota of the market.

The DRGs with the highest occurrence rates were:

- in 2000, DRG 270 "Other operations on the skin, hypodermis and breast without complications; weight 0,6174 - surgical DRG" (40.75% of market quota) and DRG 222 "Operations on the knee without complications; weight 1,0926 - surgical DRG" (41.39%);
- in 2001, DRG 222 (44.38%) and 256 "Signs and symptoms related to the musculoskeletal system and the connective tissue; weight 0,5863 -medical DRG" (41.17%);
- in 2002, DRG 222 (49.18%) and DRG 247 "Other diagnoses of the musculoskeletal system and the connective tissue; weight 0,5860 - medical DRG"(46.13%).

If we classify the market quotas on the basis of ranges of ten and if we analyse the changes in each DRG over the 3-year period, we can see that 385 DRG codes remained in the same class that they were in 2000 (Table 4); 38 (7.77%) only moved up to a higher class in 2002, whereas 39 moved to a higher class by 2001; 27 DRGs, on the other hand, did not show a linear trend.

As for daily admissions, the market quota grew from 12.74% in 2000 to 13.51% in 2001 to 14.11% in 2002 (Figure 6); this was always limited to those DRGs that absorbed 51% of private delivery of services.

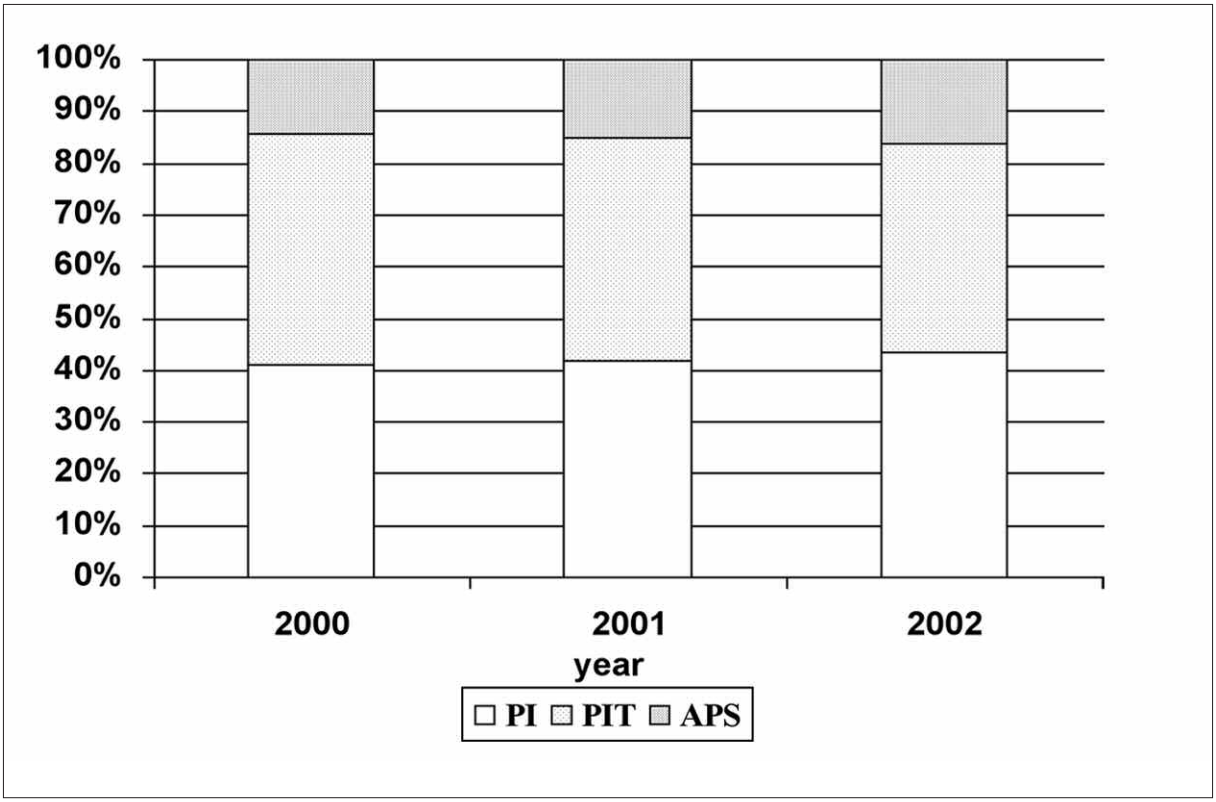
Even in this case, in no DRG did the APS have a larger market quota, however, compared with ordinary admissions, they had a quota that never went beyond 25%. The highest quota belonged to DRG 222, which recorded 22.22% in 2000, 23.69% in 2001 and 24.70% in 2002.

The DRGs were also classified into homogeneous market quotas for daily admissions. We can observe that of the 469 DRGs representing the overall mix, 393 (83.80%) remained in the same class they were in 2000, 22 (4.69%) only moved up to a higher class in 2002, and 14 had shifted up in 2001; 40 DRGs had an unequal trend.

Changes in the health care setting of DRGs with potentially inappropriate organizational profiles

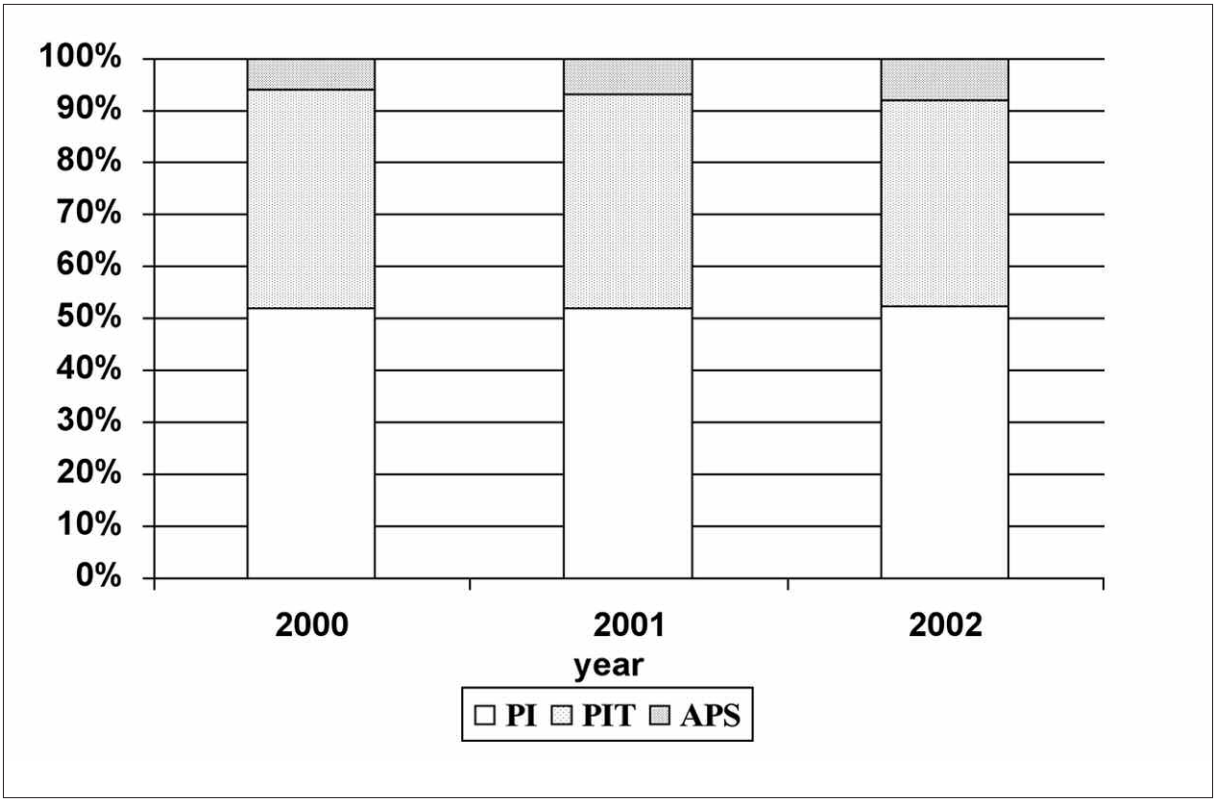
The trend of the volume of admissions with a potentially inappropriate organizational profile

Figure 5. Distribution of market quotas across al ordinary admissions



Legend: PI denotes public institution without a specific reference territory; PIT public institution with a specific reference territory; APS accredited private institution.

Figure 6. Share of market quota of day hospital/day surgery admissions



Legend: PI denotes public institution without a specific reference territory; PIT public institution with a specific reference territory; APS accredited private institution.

Table 4. Variation in diagnosis related group definitions in the 3-year period

Class of market quota in 2000	Total DRG	DRG in the same class of market quota in the 3-year period	DRG with upward change of class from 2001 and confirmed in 2002	DRG with upward change of class in 2002	DRG with linear downward trend	DRG with non-linear trends (increases and decreases in 2001 and 2002)
0 – 10%	259	218 *(84.17%)*	22 *(8.49%)*	15 *(5.79%)*		4 *(1.54%)*
11 – 20%	147	113 *(76.87%)*	12 *(8.16%)*	13 *(8.84%)*	4 *(2.72%)*	5 *(3.40%)*
21 – 30%	62	42 *(67.74%)*	4 *(6.45%)*	7 *(11.29%)*	7 *(11.29%)*	2 *(3.23%)*
31 – 40%	17	10 *(58.82%)*	1 *(5.88%)*	3 *(17.65%)*	2 *(11.76%)*	1 *(5.88%)*
41 – 50%	4	2 *(50.00%)*			2 *(50.00%)*	
Total	489	385 *(78.73%)*	39 *(7.98%)*	38 *(7.77%)*	15 *(3.07%)*	12 *(2.45%)*

Table 5. Proportion of day hospital/surgery admissions over total admissions

	Reference year		
	2000	2001	2002
PI	33.42 %	38.18 %	44.81 %
PIT	29.49 %	34.87 %	41.08 %
APS	17.92 %	21.50 %	26.58 %

Legend: PI denotes public institution without a specific reference territory; PIT public institution with a specific reference territory; APS accredited private institution

(attachment 2C-DPCM 29/11/2001) in ordinary stay admissions showed a downward profile, with a reduction of 4.4% in 2001 versus 2000 and 12.7% in 2002 versus 2001; a percentage decrease much higher than the total number of admissions. However, such a trend was not continuous for all DRGs. In fact, an analysis of individual DRGs in the 3-year period showed that 10 out of 43 DRGs increased in 2001 versus 2000 and 1 out of 43 increased in 2002 versus 2001. In contrast, the downward rate of the other DRGs was always higher than the percentage of decline in the total number of admissions in 2001 versus 2000 and in 2002 versus 2001, except for the DRG 160 "Operations for hernia, except inguinal and femoral, age >17 years, without complications; weight 0,9818."

In this downward trend there was a redistribution of the production quotas in favour of the APSs, which raised their market quota at the expense of the PIs and PITs in 33 out of 43 DRGs.

With regards to daily admissions, the volume of the 43 DRGs envisaged by Attachment 2C resulted in a rising curve during the 3-year period, in line with the trend of total admissions, but showing an intensity in growth higher than the latter. Admissions grew by 19.4% between 2000 and 2001 and by 13.7% between 2001 and 2002. The dynamics of the single DRG vary since 18 out of 43 DRGs grew more slowly in 2001 compared with the increase in the total number of admissions, whereas 13 out of 43 DRGs showed a further increase lower than the total number of admissions in 2002.

The highest volumes were not equally distributed among the providers: the APSs increased their market quotas in 20 DRGs, the PIs increased their quota in 27 DRGs, while the PITs increased theirs in only 4 DRGs.

The proportion of day regime-based admissions over total admissions increased during the 3-year period (Table 5) for all three provider categories, and particularly for the APSs (20% in 2001 versus 2000 and 24% in 2002 versus 2001).

A comparison by year between the volume of admissions in daily routine and the number of the cases treated in ordinary admissions showed a shift in favour of Day Hospital / Day Surgery, with a growth rate of 24.8% in 2001 versus 2000 and a further increase of 30.2% in 2002. This higher growth rate was also seen in connection with the provider categories. The highest growth was seen in the second year (PI: 31.5%; PIT: 29.5%; APS: 32.1% in 2002 versus 2001) and in the PITs where the increase was 66.7% in 2002 versus 2000.

Conclusions

With this survey we analysed the role of public and private health care providers by comparing the volumes of services of hospital admissions in both ordinary settings and those providing day admissions in the 3-year period between 2000 and 2002. Specifically, we defined the trend of admissions in the public and private sectors, identified those DRGs definable as belonging to the public and private domains and the relative market majority quotas, as well as defining the changes that occurred after the implementation of DPCM 29/11/01.

In brief, we can state that :

- there is a trend in the healthcare system towards the reallocation of the volumes of services of ordinary admissions in favour of the private sector;
- the reallocation pertains to the volumes but not the type of cases treated, since the DRG mix had an essentially constant trend in the 3-year period and those DRGs that absorb 51% of services remained essentially the same as before;

- in this reallocation trend the private sector has not gained a market majority quota but rather is in control of market niches with minority quotas;
- the private sector concentrates its delivery of services across a narrower case mix than the public sector, as the Italian study demonstrated, and plays an alternative role in offering the same type of services;
- compared with mean complexity of the all providers, the private institutions treat less complex cases;
- the private institutions work with lower efficiency levels than the public sector, which is in contrast with the results of the Australian study. In addition, they are more orientated towards delivering surgical rather than medical services;
- in the first year since the implementation of DPCM 29/11/01 a reduction in ordinary admissions was observed, although less marked in the public than in the private sector which, in contrast, gained more market quotas. There was also a shift in the distribution of admissions from ordinary to day hospital/day surgery units and a growth in the proportion of the latter.

We think it will be interesting to monitor these changes to confirm or refute the trends described here.

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