HOW TO RE-ALLOCATE RESOURCES WITHIN SERVICES THROUGH DATA BENCHMARKING: SOME EVIDENCE FROM THE TUSCAN HEALTH SYSTEM

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Sabina Nuti, Milena Vainieri, Anna Bonini

Abstract

Background
Tuscany Region has implemented a multidimensional system to assess the performance of all Local Health Authorities (LHAs), based on over 130 indicators classified in 6 dimensions in benchmarking. A study was carried out to use the results of the evaluation performance system to support health system decision makers to cope with resources scarcity.

Objective
To quantify the amount of resources LHAs can re-allocate, taking actions in different sectors, for services with more value for patients.

Methods
The analysis was based on the data benchmarking of all the indicators of the performance evaluation system with an impact on the level of resources used. For each indicator, the first step was to estimate the gap between the performance of each LHA and the best performance or the regional average. The second step was to measure this gap in terms of financial value.

Results
The results of the analysis put on evidence that at the regional level 6 to 10 percent of the budget for healthcare (6,100 ml Euros) can be re-allocated if all the institutions achieve the regional average or the best practice. Some LHAs are already efficient but others have large room for improvement: some of them, working on efficiency and appropriateness, can re-allocate up to the 13% of their total costs in services with more value for patients.

Policy Implications
The implications of this study can be extremely useful for policy makers and the top management of LHAs in a public system that bases its action on cooperation more than competition. Benchmarking makes the system capable to measure the financial impact of different types of actions which can effect efficiency.

JEL Classification: I10, I18
Keywords: Disinvestment, setting priorities, healthcare
Index

Index..................................................................................................................... 4
Introduction......................................................................................................... 5
Objective............................................................................................................. 8
Methods ............................................................................................................. 8
Results ................................................................................................................ 11
Policy Implications............................................................................................. 15
References.......................................................................................................... 17
Introduction

In 2004 Tuscany Region introduced a multidimensional measurement system in order to assess and monitor its Health Authorities (HAs), that are 12 Local Health Authorities (LHAs) and 4 Teaching Hospitals (THs)\(^1,2,3\).

The performance evaluation system was developed by using lessons from the many performance measurement systems that have been developed over the last twenty years\(^4,5,6\), in particular from multidimensional systems already used in health care\(^7,8,9\) and the model of the Balanced Scorecard (BSC)\(^10,11,12\). One of the lessons was the importance of developing the performance evaluation system in close collaboration with health care professionals and managers\(^13,14,15,16\).

The performance evaluation system is based on 50 measures, made up of 130 indicators, classified in six assessment dimensions (the letter is used to indicate each dimension):

- **Population health.**

- **Regional health system,** to guarantee that strategic regional goals are pursued in the time and manner indicated.

- **Quality,** appropriateness, effectiveness, clinical risk management and managing supply to match demand.

- **Patient satisfaction,** the patients' experience and level of satisfaction with health services.

- **Staff satisfaction,** results of surveys on the satisfaction level of staff with their working conditions and management by the LHA.

- **Efficiency and financial performance**
In order to display the performance of each HA, a spider chart with the six dimensions represented was used. The spider chart is also divided into five bands associated with different scores and colours, from dark green, corresponding to excellent performance, to red, corresponding to a poor performance. An indicator with a high score will be displayed as close to the centre (dark green), and one with a low score will be displayed as far from the centre (red).

The performance evaluation system has been a fundamental governance tool in the last years for both the regional and local levels. Moreover, the possibility of each LHA management to have available the results of the other organizations represents an innovation in the context of the Italian public administration.

Banchieri had already collected the best practices of benchmarking in the Italian health sector, most of them regarding the quality of services from both the clinical perspective and the patients’ perception. These experiences appear to be remarkable and exciting as they provide an analytic tool, but they lack the linkage with a management tool that can help managers to make decisions about resource allocation and choice among interventions to maximize efficiency pro efficacy.

Many authors suggest the benchmarking of costs among organizations as a valid accounting tool for the decisional and managerial processes.

For instance, in the American health sector, it has been years that Market Insight of San Francisco uses cost information that American hospitals send to federal organizations and produces reports based on the cost benchmarking of major hospitals. Reports can be shaped at hospital level or for a specific Department.

This type of information can be very useful in the Italian public health administration that typically presumes it has already reached
the highest efficiency. It is common thinking that costs cannot be reduced, at the most HA may be able to maintain them at the level they are at.

Tuscany Region was not an exception: in the evaluation process of the adequacy of annual resources allocation adequacy to each LHA, it was not considered possible to reduce them, at least at the same volume of output and services delivered. The reasons put forward were, from one side, a small incidence of variable costs on total costs and from the other side the strong self referral culture. When deficits occurred most of the CEOs claimed explanations other than a certain level of inefficiency in the organization: LHAs complained the capitation criteria, not linked to the real need of the population, while THs argued that DRGs’ rates are not updated, in particular for the high complexity DRGs. On the other side, Tuscany Region had not a systematic tool to evaluate the results of the HAs, so the negotiation process was based essentially on trust between the Regional Councillor and the CEO.

The possibility to have a performance evaluation system available with 130 indicators in benchmarking has changed this approach to the problem. In fact, the system has shown a large variability of performance in the majority of the aspects considered, due to different organizational choices and actions as well as different behaviours adopted. The differences prove that the HAs have room for improvement, since one or more, or even the majority of them, have better results in some of the indicators. This evidences has enabled the Region to demolish pretexts, eliminate the word “impossible” and build a new culture of the “possible”.
**Objective**

The study aims at identifying, for each HA and for the regional system as a whole, those areas that have room for improvement on resource utilization. This means quantifying the amount of resources that can be re-allocated, taking actions in different sectors, towards services with more value for patients.

**Methods**

In order to guarantee a long period of system sustainability and to apply budget processes that are feasible and motivating, it is necessary to take action on the aspects that determine costs, without indiscriminate cuts to resources, but with targeted actions. It is crucial to identify areas of deficit. Benchmarking was adopted as a working method to identify room for intervention for each HA.

The analysis was based on the 2006 data benchmarking of all the performance evaluation system indicators with an impact on the level of resources used.

Throughout this analysis, six areas of intervention were identified: hospital appropriateness, hospital efficiency, continuity of care, primary care, pharmaceutical expenses and human resources management (see Figure 1).

Fig 1. Intervention areas and indicators identified
For each indicator, the first step was to estimate the gap between the performance of each HA and the average performance or the best practice within the region. In fact, the analysis was carried out considering two hypotheses, to point out the minimum and the maximum results reachable by each HA and by the system as a whole:

- **Hypothesis 1 (Minimum improvement)**: changes to be obtained if all the HAs with a scarce performance would reach the median, or in some cases, the mean result of all HAs.

- **Hypothesis 2 (Maximum improvement)**: changes to be obtained if all the HAs would reach the regional best practice.

The second step was to associate a financial value with this gap in both hypotheses. The matter of costs relevant to decisions making has been widely discussed and presents various critical
aspects in terms of methodology when applied to organizational contexts \textsuperscript{18,19,20,21}.

Two examples of the method used to apply a financial value to a better performance are presented.

The first deals with the indicator “Hospitalization rate for inappropriate DRGs” (hospital appropriateness): after the calculation in step 1 of the number of hospitalizations that can be avoided for each inappropriate DRG if the HA performs as the regional median or the best practice, the second step consists of multiplying the number of hospitalizations avoidable by the DRGs fares to arrive at the resources that could be saved.

The second example considers the indicator “Average length of stay for each DRG” (hospital efficiency), in which the number of avoidable inpatient bed days were converted into hospital beds. The amount of resources saved depends on the number of beds, on the basis of the type of intervention that can be planned. Three scenarios were assumed.

If the number of beds is lower than 12\textsuperscript{1}, only some variable costs (laundry, food, pharmaceuticals, etc.) are avoidable. In this case, the financial value associated with each inpatient bed day is a fixed amount of 40 € for all HAs.

If the number of beds is 12 or multiples, a reorganization of health personnel is possible, with a consequent impact on all variable costs, personnel included. In a short period of time the opportunity to move human resources to other services, including the territorial ones, appears to be feasible especially for nurses, while in the medium or long period it is also possible for medical doctors as well.

If the number of beds is 30 or multiples, structural interventions can be made, such as a reduction of hospital beds. Thus, not only

\textsuperscript{1} In the Tuscany HAs the cost accounting system points out that personnel can be reduced when the activity cut corresponds to a number of beds equal to 12, while fixed costs drop reaching 30 beds.
variable costs are saved, but, since there is the possibility to re-organize room, also maintenance and amortization costs can be reduced.

In the last two scenarios the financial value is estimated for each HA on the basis of its own 2006 operating costs.

**Results**

The results of the analysis demonstrate that at regional level 6 to almost 10 percent of the 2006 healthcare budget, equal to 6.100 million Euros, could be re-allocated if all the institutions achieve the regional average or the best practice (See Table 1). These estimates came from the sum of all the inefficiencies in the six intervention areas analysed, considering the two hypotheses.

Thus, taking into account the minimum improvement hypothesis, the total amount of resources that the regional health system could re-allocate is almost 370 million Euros, while in the long period, reaching the best practice, it would be possible to manage 600 million Euros.

It is important to underline that these are not savings, but resources that in the medium and long term can be re-allocated and used for other services.

For instance, in the pre-surgical length of stay for planned interventions the regional standard is one day, goal reached only by the LHA 7. If all HAs perform as well and achieve the standard, the regional system could avoid 120.000 inpatient bed days, equivalent to 330 hospital beds and, in terms of financial value, to 55 million Euros. This estimate is based on the evidence that within the system one HA has already reached the goal, demonstrating the feasibility of accomplishing the standard.
Table 1. Regional amount of resources to be re-allocated in the two hypotheses

<table>
<thead>
<tr>
<th>Intervention areas</th>
<th>Hypothesis 1</th>
<th>Hypothesis 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Practitioners expenses</td>
<td>4.658.570</td>
<td>18.073.913</td>
</tr>
<tr>
<td>Paediatrics expenses</td>
<td>2.549.167</td>
<td>10.458.363</td>
</tr>
<tr>
<td>Other services expenses</td>
<td>10.152.815</td>
<td>41.838.951</td>
</tr>
<tr>
<td>Pharmaceutical expenses</td>
<td>11.397.862</td>
<td>78.060.227</td>
</tr>
<tr>
<td>Hosp. rate inappropriate Surgical DRGs</td>
<td>82.999.030</td>
<td>82.999.030</td>
</tr>
<tr>
<td>Hosp. rate inappropriate Medical DRGs</td>
<td>111.951.597</td>
<td>111.951.597</td>
</tr>
<tr>
<td>in particular: Hosp. rate Heart failure</td>
<td>6.301.686</td>
<td>12.771.020</td>
</tr>
<tr>
<td>Hosp. rate Pneumonia</td>
<td>8.235.635</td>
<td>13.894.202</td>
</tr>
<tr>
<td>Hosp. rate Diabetes</td>
<td>1.023.186</td>
<td>1.849.286</td>
</tr>
<tr>
<td>Average length of stay for Medical DRGs</td>
<td>70.976.020</td>
<td>70.976.020</td>
</tr>
<tr>
<td>in particular: Length of stay Stroke</td>
<td>165.013</td>
<td>729.768</td>
</tr>
<tr>
<td>Length of stay heart attack</td>
<td>49.363</td>
<td>234.700</td>
</tr>
<tr>
<td>Length of stay gastroint. haemorrhage</td>
<td>71.003</td>
<td>291.264</td>
</tr>
<tr>
<td>Pre-surgical length of stay</td>
<td>55.339.680</td>
<td>55.339.680</td>
</tr>
<tr>
<td>Readmission within 30 days</td>
<td>3.974.538</td>
<td>16.740.261</td>
</tr>
<tr>
<td>% Hospitalization &gt; 30days</td>
<td>3.974.538</td>
<td>16.740.261</td>
</tr>
<tr>
<td>Turn-over employees</td>
<td>6.872.817</td>
<td>54.991.259</td>
</tr>
<tr>
<td>Absenteeism rate</td>
<td>8.288.247</td>
<td>58.845.290</td>
</tr>
<tr>
<td>Total</td>
<td>369.332.694</td>
<td>600.784.229</td>
</tr>
</tbody>
</table>

% on 6.100 millions of euros | 6,05% | 9,85%

This study has significantly modified the use of the performance evaluation system itself. In fact, managers have become conscious of the benchmarking usefulness, not only to comprehend how the organization performs compared to the others, but also as a tool that facilitates the identification of priority intervention areas with respect to an efficient resource utilization.

Priorities change within HAs, in fact each HA can now distinguish the areas where interventions are possible and the room for improvement. The mix of interventions is different from one HA to another, depending on the strengths and weaknesses of the organization. Figure 2 shows the resources to be re-allocated by HAs for each type of intervention, if all HAs reached the median or mean result of all HAs (Hypothesis 1).
How to re-allocate resources within services through data benchmarking: some evidence from the Tuscan Health System

For instance, it appears that the TH AOUP should concentrate its effort on the average pre-surgical length of stay, which represent its major inefficiency. In fact, TH AOUP results with 38,000 in bed days more, equal to 105 hospital beds, with a financial value of 21 million Euros.

Fig. 2 Resources to be re-allocated by each HA in the intervention areas – Hypothesis 1

The total amount depends on the size of the HA, thus i.e. HA 10 presents roughly twice the opportunity of many others since it is the largest organization, with approximately three times more inhabitants. The relationship between resources that can be re-allocated and the annual budget permits management to determine the percentage of resources used inefficiently. In 2006, some HAs were already efficient but others had large room for improvement. In particular, in Hypothesis 1 of minimum improvement, HAs could save and re-allocate an amount that varies from 2% to 11% of their annual
budget, while considering Hypothesis 2 of maximum improvement this percentage is between 4.5% to more than 13% (See Figure 3).

Fig. 3 Percentage of resources to be re-allocated on the 2006 budget by each HA - Hypothesis 2

In this context it becomes difficult for HAs that show large room for improvement to argue they don’t have enough resources to achieve the financial balance and they need an increase in the annual budget. The analysis puts on evidence that, having to cope with scarcity of resources, there are ways for a more appropriate management of resources. It may be a complex and difficult approach because it forces managers to deal with professionals in order to change the organization.

Publication and distribution of data benchmarking, within and outside the organizations, represent means that managers can use to extend the awareness that cutting resources is necessary where they are no longer required to place them where they are more needed. Managers should have the audacity to make this type of
decisions, and organizations should support it to take advantage of the benefits of this opportunity.

**Policy Implications**

The implications of this study can be extremely useful for policy makers and the top management of HAs in a public system that bases its action on cooperation more than competition. Benchmarking helps to measure the amount of resources that can be re-allocated in the medium and long term achieving the best practice. This may be important to support decision making process regarding new investment in actions directed to maximize outcomes and value for citizens. Certainly, the results obtained are a consequence of the areas and indicators identified. This means that the values are conservative and an extension of the same methodology to other areas will permit to find out aspects that can be add to the present ones. Thus, the amount of resources to be re-allocated could be even greater.

This analysis allows the identification of resources to be re-allocated in the medium term at least at the same level of outcome, that is without reducing the quality of services. On the contrary, in most cases improved outcomes due to appropriate resource allocation are tied to a measurable enhancement in quality. Giving an example, reduced rehospitalizations result from one side in savings and in the other side in better clinical quality.

Further developments of this study will focus on where should be re-allocated resources.

Once managers of the public health system are aware of the resources they can re-allocate and which are the actions they should pursue, the next step will be identifying which services should be delivered in order to earn assure more benefits for population’s
health. Investment opportunities within the public health system in terms of cost-benefit and prioritization should be undertaken.
How to re-allocate resources within services through data benchmarking: some evidence from the Tuscan Health System

References


