Performance measurement in healthcare: regional tools for improving governance

Thesis presented by
Massimiliano Gallo
to
The Class of Social Sciences
for the degree of Doctor of Philosophy
in the subject of
International PhD in Management: Innovation, Sustainability and Healthcare

Supervisor: Prof. Sabina Nuti

Tutor: Dott. Milena Vainieri

Scuola Superiore Sant’Anna

Y.A. 2014-2015
A mio Padre
Acknowledgement

I wish to express my sincere thanks to all the people for providing me with all the necessary facilities for the research.

I would like to express my sincere thanks and express my appreciation for my supervisor, Prof. Sabina Nuti, because she has given me the opportunity to carry out this venture.

I am also grateful to Dr. Milena Vainieri, my tutor, for her guidance, understanding, patience, and most importantly, her friendship during this period.

I take this opportunity to express gratitude to Dr. Giuseppe Montagano who advise me on my personal career and promoted my involvement in many projects so far.

Additionally, I am very grateful for the friendship of all of the members of the “Laboratorio Management e Sanità”.

Finally, I would like to thank my family and friends for all the patience and encouragement.
## Contents

CHAPTER 1 – Introduction

1. Overview ................................................................. 9
2. Research questions .................................................... 12
3. Final outputs of the PhD research ................................. 16

References

CHAPTER 2 - Financial incentive schemes for health care CEOs: some evidence from Italy

1. Introduction ................................................................. 26
2. Framework of analysis .................................................. 28
3. The Italian Health Care System and the role of its Chief Executive Officers 31
4. Methods ................................................................. 32
5. Results ................................................................. 37
6. Conclusion and policy directions ..................................... 42

References

CHAPTER 3 - When the instruments of regional and local governance are integrated. A natural experiment in Basilicata

1. Introduction ................................................................. 50
2. The reforms and tools of the Basilicata region in the last 10 years 54
3. Methods 61
4. Results 67
5. Conclusion 70

References

CHAPTER 4 - Overall patient satisfaction in the Emergency Departments of Basilicata Region: the way to improve

1. Introduction 80
2. Methods 83
3. Results 88
4. Conclusions 99

References
CHAPTER 1 – Introduction

1. Overview

1.1 Theoretical context
Over the last 20-30 years, New Public Management (NPM) in the public sector has become an international trend within the developed countries (Pettersen, 2003; Brorström et al., 2008; Groot et al., 2008). New Public Management is a concept which developed in the United Kingdom and in North America and which is defined as the aim to make the public sector “lean and more competitive while, at the same time, trying to make public administration more responsive to citizens’ needs by offering value for money, choice, flexibility, and transparency” (OECD Publishing, 1994). This concept has been influenced by a variety of theoretical contributions from different disciplines, which can be grouped into three broad categories: neoclassical public administration and public management, management sciences, and new institutional economics (Groot & Budding, 2008). The first stream’s main orientation is the orderly organization of the state, applying empirically derived principles of government organization and collective decision-making. The second (management sciences) advocates the introduction in the public domain of private sector management ideas and techniques. Examples relate to the literature on strategic management and strategy execution (Perlin, 2006; Porter & Teisberg, 2004; Pfeffer & Sutton, 2006), on target-setting (Bevan & Hamblin, 2009; Ham, 2011), on performance and practice benchmarking (Baker et al., 2008; Baranek et al., 2011), and on
innovation applied to the health sector (Christensen et al, 2000). The third orientation (new institutional economics) views governmental decision-makers as self-interested subjects, working in an environment where information asymmetry, bounded rationality and opportunism lead to inefficiencies and agency costs (Groot & Budding, 2008). What these orientations have in common is the fact that they all aim at transforming services by focusing on managing performance and service improvement (Osborne & Gaebler, 1992).

To sum up, NPM is a specific management approach adopted by governments. It is a concept used to describe several organisational control systems originating mainly in the private sector. The main goal is to become more patient oriented by holding public institutions accountable for their work performance and increasingly base resource allocation on performance results. Thus, one of the core issues is performance assessment. Performance measures are proposed in various governmental reforms, in order to encourage public institutions to become more productive and efficient considering qualitative results. With these premises performance in the healthcare sector should be transparent, comparable and measurable (Pettersen, 2003; Linneberg et al., 2007; Lee, 2008).

1.2 NPM in Health care system

Health care is one of the main governmental sector that have faced several changes due to implementation of NPM. During the past 20-30 years there has been a remarkable growth in the health system performance measurement and reporting efforts worldwide (Smith et al, 2009). A number of factors has influenced this growth: cost-containment pressures faced by governments; changing public expectations and demand for accountability and transparency; progress in access to more timely, valid, and reliable information at a lower cost; and an increased interest of governments in the performance management paradigm (Smith et al, 2009). A driving force for the development of health system performance measurement systems has been the emergence of an era of assessment and accountability (Relman, 1988).
If, on the one hand, the concept of health system performance management has become an area of interest for policy-makers, health system managers, and researchers, on the other hand, it has often been described inadequately. “Performance” can be defined as the maintenance of a state of functioning that corresponds to societal, patient, and professional norms (Veillard et al., 2005). “Performance management” is defined as a technology for managing behaviour and results, two critical elements of what is known as performance (Daniels & Daniels, 2004). In the health sector, performance management is a set of managerial tools designed to secure optimal performance of the health care system overtime, in line with policy objectives (Smith, 2002). “Health system performance management” includes both the instruments and processes to improve health system performance (Veillard et al., 2010). Finally, the World Health Organization (WHO) defines “health systems” as all actors, institutions, and resources that undertake health actions—where the primary intent of a health action is to improve health (World Health Report, 2000). Health systems encompass personal health services, non-personal health services, and intersectoral actions designed specifically to improve health. Although health systems throughout the world vary widely in their design and organization, they generally share the same core goals of good health, responsiveness to people’s expectations, social and financial protection, efficiency, and equity (Smith et al, 2009). Health systems have four common functions of stewardship, health services provision, resource generation, and health financing (World Health Report, 2000).

The breaking idea of performance management in health care is largely due to the fact that performance measurement efforts and result-based management have become basic concepts of the several reforms that have affected the public sector. Studies and research have mainly focused on the design of different types of performance measurement systems (see for instance (Neely, Gregory and Platts, 1995; Bititci, Carrie and McDevitt, 1997; Neely et al., 1997). In this research area measurement frameworks are advocated to have specific key characteristics in order to help organisations to identify an appropriate set of measures to assess their performance (Kennerley and Neely, 2002). In
health care, despite the high number of studies on performance assessment frameworks (see for instance (Arah et al., 2003)), some authors have found that there is still a need for assessing the effectiveness of the health care performance measurement system (Klazinga, Fischer, & Asbroek, 2011). Overall, health system performance management is a concept governments have become more and more interested in as they wish to pursue better system outcomes and to achieve higher efficiency. It is also a concept in constant evolution in the public sector in general and in the health sector in particular, which requires a detailed examination of its theory and practice.

This thesis focuses on the development and use of performance management in regional health systems and services and it studies in detail the development and use of performance measurement and management relating to the application of instruments of governance in the public health sector at the macro and micro levels.

2. Aims and outline of the thesis

The thesis aims at offering a contribution to the field of health management by examining the development and use of specific governance tools in relationship with performance system in different contexts. This thesis addresses the following four research questions:

RQ1. Are Italian regional reward schemes for healthcare CEOs following the managerial directions proposed by NPM principles and goal setting theories?

RQ2. Despite the different ways goals can be assigned, does the application of the CEO reward system improve organizational performance?

RQ3. How can health system performance management approaches be developed and used by regional health departments to improve health system performance?
RQ4. What are the implications of implementing performance measures throughout the different organizational levels of a regional system? What is the impact at the Local Health Authority level?

RQ5. How can the healthcare CEOs carry out strategies for performance management at the local level?

The thesis is divided into three different sections.

After this general introduction, the first part of the thesis addresses the first two research questions (in chapter 2) by reviewing the framework of health system management of national health authority in the context of the Region. This work is the result of careful analysis of the literature of NPM theory and of the Regional Italian acts that evaluate the Chief Executive Officers of the health sector. A framework has been proposed to evaluate health system stewardship. All studies shown in the work are focused on the purpose of improving performance management. This paper deals with a detailed description of the differences between the various regional health systems and the different management strategy used by the national health authorities. In particular, the first article "Financial incentive schemes for health care CEOs: some evidence from Italy", is a complete examination of the characteristics of incentive schemes used to evaluate healthcare chief executive officers and their connection with the performance-related pay. The paper describes the analysis of the relationship between incentive schemes and organizational performance and its outcome. It is also a significant analysis of the prospects for application and use of the methodology of "benchmarking" for the definition of health objectives of the Italian regions. In this article is reviewed, from a critical point of view, the situation of different Italian regions comparing the characteristics of the systems of financial incentives for managers of healthcare organizations. The first experiences are listed in details, showing characteristics and types of benchmarking existing, as well as a careful analysis of the implementation process. Furthermore, critical factors of success, related to a correct application of the instrument of "benchmarking" are well described and clarified. Moreover analyses are
described regarding how incentive systems affect financial performance of regional health systems. The results show that the management approach and the simultaneous use of financial incentives positively influence the improvement of organizational performance. The first article, therefore, focuses on the analysis at the macro level of governance tools and their use in the health sector at the national level. The research focuses on the applications within the overall general health system of each Italian region considered in the analysis, providing guidance on how to implement and Governance mechanisms over time.

The second part of the thesis (chapter 3) evaluates the development and application of health system performance measurement and management at a regional level considering the case of Basilicata Region. This study aims at analysing the causes of the progress achieved in health performance rates and at describing the strategy developed by regional decision-makers as far as the implementation of a system measurement-based management is concerned. Furthermore, a detailed analysis of the implication of different management vertical integration between levels of governance from regional to local authorities has been carried out.

In particular, the second article, "When the instruments of regional governance and business are integrated. A natural experiment in Basilicata" consists of two main parts. First, the governance tools used in the Basilicata region between 2007 and 2013 have been analysed and the progress made in that period has been discussed. After, the characteristics of vertical integration governance systems and the difference between local health care authority have been examined. The case of the Basilicata region is interesting because it can be regarded as a natural experiment concerning the integration of governance mechanisms at the regional and local area. It has been demonstrated that, even if both local health care authority have included in their planning and control systems objectives carried out by regional level, different achievements as far as performance is concerned occurred in the same period. Findings suggest that this is probably due to the fact that the involvement and participation of professionals in the budget process was different. In fact, both the two local health authorities have
worked in different ways, as evidenced by the results of the organizational survey carried out in the two institutions. Indeed, the involvement and the participation of professionals in the budget process is one of the factors considered essential in the literature of managerial control for changing behaviour to improve performance (for further information see Ferreira & Otley, 2009). Moreover, this article argues about the purpose and use of budget programs in the contest of healthcare were sometimes the managerial tools at different levels are not integrated. The importance of the connection and the coherence between the different operational mechanisms adopted is one of the key issues addressed in the management control (see for instance Airoldi 1989; Amigoni 1988; Grandori 1995; Armstrong 2009). Although the integration of planning and control systems and incentive system is generally shared, also in the privat sector (see for instance Greve 2003), is much more complex to define the ways in which this can be done, (see for instance Ferreira & Otley 2009).

Finally, the last part of the thesis (chapter 4) addresses the last research question and studies the development and use of a management tool, applied to a specific health care service, focusing on quality performance improvement. In this work, a statistical quantitative method has been used in order to research into the best combination of determinants which might positively affect patients’ satisfaction.

The third article "Overall patient satisfaction in the Emergency Departments of Basilicata Region: the way to improve" discusses what the main actions needed to increase the overall patient satisfaction in the Emergency Departments of Basilicata Region (Italy) are. The main aim of this paper is to deepen understanding of how management tools can be used by decision-makers in specific health services, such as emergency, where patient satisfaction should be considered. The statistic methodology is an application of the optimization model based on maximization function identified by the patient satisfaction level. Applying this management tool, health care staff involved in emergency services can concentrate their efforts on specific aspects that could have considerable impact on overall patient satisfaction. Findings suggest that management tool, such as supplying
useful information so as to support health care workers, is essential for the decision-maker in order to improve performance in health care service.

3. Final outputs of the PhD research

The research questions presented above are analysed and discussed in the attached papers. Hence, the research questions mentioned above are to be regarded as the starting point of all the papers. The papers however differ with respect to what development dimension is investigated and to the methods used. Furthermore, it has to be considered whether the paper is empirically or conceptually based. The following table include the papers, their title, purposes and relationship to development dimensions, research methods and type.

<table>
<thead>
<tr>
<th>Title</th>
<th>Purpose</th>
<th>Paper I</th>
<th>Paper II</th>
<th>Paper III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial incentive schemes for health care CEOs: some evidence from Italy.</td>
<td>To investigate challenges experienced in the development of a performance measurement system in</td>
<td>To increase the understanding of how performance measurement systems are designed and</td>
<td>To increase the understanding of how management tools can be used in specific health services</td>
<td>Overall patient satisfaction in the Emergency Departments of Basilicata Region: suggestions for improvement.</td>
</tr>
<tr>
<td>When the instruments of regional and local governance are integrated. A natural experiment in Basilicata.</td>
<td>To increase the understanding of how performance measurement systems are designed and</td>
<td>To increase the understanding of how management tools can be used in specific health services</td>
<td>Overall patient satisfaction in the Emergency Departments of Basilicata Region: suggestions for improvement.</td>
<td></td>
</tr>
<tr>
<td>Paper I</td>
<td>Paper II</td>
<td>Paper III</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italian health care services.</td>
<td>implemented by local units in Basilicata health care organisations.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Keywords</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reward systems, Chief Executive Officers, New Public Management, healthcare, Italy</td>
<td>Performance, governance, vertical integration, Basilicata region</td>
<td>Optimization model, emergency department, patient satisfaction, Basilicata Region</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Development dimensions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design</td>
<td>Design and implementation</td>
<td>Design, implementation and use</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Research methods</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Literature review. Data collection through documents of regional deliberative acts</td>
<td>Case study in Basilicata health care organisations (7 districts and 6 hospital). Data collection through documents and observations</td>
<td>Case study in Basilicata health Emergency Departments (6 Units / ER). Data collection through interviews and documents</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Type of paper</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conceptual development with empirical findings as examples</td>
<td>Empirical</td>
<td>Empirical</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Authors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vainieri M, Bini B, Gallo M, Nuti S</td>
<td>Vainieri M, Gallo M, Nuti S, Montagano G</td>
<td>Gallo M</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additional deliverables carried out during the period of PhD:

Sistemi Sanitari Regionali” collana Innovazione e Management in Sanità, Società Editrice Il Mulino.


− Contributions included in the annual reports of the performance evaluation systems carried out by Laboratorio Management e Sanità.


References

Airoldi, Sistemi di pianificazione e controllo e sistemi di valutazione e ricompensa: integrare ma non confondere, in AA.VV., Workshop Club dei Controller, SDA Bocconi, Milano, 1989.


CHAPTER 2 – Financial incentive schemes for health care CEOs: some evidence from Italy.

Authors: Milena Vainieri m.vainieri@sssup.it (corresponding author), PhD, Assistant professor in Management, Institute of Management, Scuola Superiore Sant’Anna of Pisa; Barbara Bini b.bini@sssup.it PhD candidate in Management, Institute of Management, Scuola Superiore Sant’Anna of Pisa; Massimiliano Gallo m.gallo@sssup.it PhD candidate in Management, Institute of Management, Scuola Superiore Sant’Anna of Pisa; Sabina Nuti snuti@sssup.it Professor in Management, Institute of Management, Scuola Superiore Sant’Anna of Pisa

Abstract

Following goal setting and New public management principles, this paper discusses on one side the characteristics of the incentive schemes applied to the Italian healthcare chief executive officers and their linkages with the performance-related pay. On the other side, it analyzes if incentive schemes affect organizational performance. Findings suggest that managerial approach allows policy makers discriminating Ceo’s evaluation within the Region and that the use of incentive schemes seem to positively influence organizational performance.

Keywords

Reward systems, Chief Executive Officers, New Public Management, healthcare, Italy

Word count including references and tables: 5.063
1. Introduction

Propelled by the New Public Management, more and more public central, regional and local governments have introduced managerial tools drawn from the private sector with the aim to modernize public administration, (Hood, 1991) (Pollitt & Boukaert, 2004) (Lapsley, 2009) (Saltman, Bankauskaite, & Vranbaek, 2007). Among others, performance measurement systems have been developed at different levels and different sectors. In health care, despite the high number of studies on performance assessment frameworks (see for instance (Arah, Klazinga, Delnoij, Ten Asbroek, & Custers, 2003)), some authors have found that there is still a need for assessing the effectiveness of the health care performance measurement system (Klazinga, Fischer, & Asbroek, 2011). On the other side there are many studies dealing with the effectiveness of pay for performance programs but reviews have highlighted that the effects on quality and performance are inconclusive (Van Herck, De Smedt, Remmen, Rosenthal, & Sermeus, 2010) (Christianson, Leatherman, & Sutherland, 2007). In addition, most of the studies on financial incentive programs focus on a single program (such as incentives for specific chronic diseases or immunization coverage) rather than on overall reward scheme and refer to physicians (in particular on general practitioners) rather than to Chief Executive Officers who represent (and manage) the healthcare organization.

The recent review of Shay & White (2013) on CEOs compensation outlines that there is a positive relationship between CEO compensation and the following factors: financial performance, organizational size, ownership, market characteristics, human capital, demographics and board attributes. This evidence confirms what is stated in the general management literature (Daily CM, 2003) (Frydman C, 2010) (Tosi HL, 2000). Conversely, most of the studies analyzed by Shay and
White (2013) have found no statistical relationship between non financial performance and CEO compensation. This finding is particularly alarming for public healthcare organizations whose main goals are quality of care and universal coverage (while respecting financial viability). A possible explanation is the lack of consistency and integration between planning and control and evaluation and reward systems. Indeed, weak integration between control strategies and other operational systems can lead to overall system inconsistency; and this drives organizations towards different objectives besides the ones defined at the strategic level. The importance of integrating these operational mechanisms is underlined by management control experts who stress that employee evaluation and rewards are critical (Ferreira & Otley, 2009) (Chenhall, 2003) (Kaplan & Norton, 1996) (Langfield-Smith, 2007) (Armstrong, 2009). However, some Italian authors have recently cast doubts on the usefulness of CEO assessment (Caldarelli A, 2013) (Lega, 2008).

With these premises, this paper aims to contribute to the literature from one side by providing evidence on the CEO financial reward schemes adopted by Italian regional health systems; and from the other side by providing evidence on the relationship between the presence of incentive for specific goals (both financial and non financial) into the CEO’s reward scheme and the organizational performance.

This paper aims to answer the following questions:

RQ1. Are Italian regional reward schemes for healthcare CEOs following the managerial directions proposed by NPM principles and goal setting theories?

RQ2. Despite the different ways goals assigned, does the application of the CEO reward system improve organizational performance?

The paper outline is the following: section 1 describes the framework of analysis adopted in the study; section 2 reports the background of Ceos in Italian healthcare sector; section 3 shows the methods; section 4 reports the findings of the study and section 5 concludes providing policy implications for
healthcare sector.

2. Framework of analysis

The agency theory is one of the main theories applied by researchers on pay for performance and reward systems in healthcare (Trisolini, 2011) (Christianson, Leatherman, & Sutherland, 2007) (Shay & White, 2013). However, some authors have criticized the economic simplicity of the agency theory because it does not entirely explain the political and social aspects that often coexist in determining executive compensation (Tosi HL, 2000) (Main BG, 2008). Indeed, there are different perspectives and disciplines, such as sociology and psychology, (Trisolini, 2011) which have studied incentive and reward systems by often mixing theories (Antoni, Beaten, Lucas, & Perkins, 2011).

In this paper, the analysis framework is mainly based on management control and motivation theories.

Figure 1- Framework of analysis
Once the central, regional or local government has set its own strategies and organizational choices, it has to design and use the operational mechanisms which will enable the organizations to improve performance. In order to obtain the desired results, it is important to select the right key performance measurements and design targets and evaluation and reward systems in a coherent way on the basis of the information systems (Ferreira & Otley, 2009). However, it is not enough to design them correctly, it is also necessary to pay close attention to the process/use of these systems (Ferreira & Otley, 2009). Increasingly more management control experts have been recognizing the importance of the process: Norreklit et al. (2007) have argued that control systems should follow a constructivist perspective in order to grasp and translate the “reality” of all the actors involved in the measurement tools; around ten years before, Simons (1995) considered the interactive system (which is mainly characterized by the process) as one of the four control levers of his framework. The process is even more powerful in a professional context such as the healthcare sector (Bevan, et al., 2004) (Abernethy & Brownell, 1999) (Nuti & Vainieri, 2015).

The analysis carried out in this paper focuses on four sections: 1. the coherence between mission and targets selected 2. the design of CEO reward systems; 3. the description of the process; and 4. the impact on performance results.

As regards coherence (section 1), there must be congruence between the mission of the health system and CEO goals. Hence, in universal coverage health systems, reward systems and performance measurement systems should mirror the general principles which are to ensure: assistance; financial sustainability and equity of access. This will help align CEO objectives with those of the health unit.

The goal setting theory, which is part of a wider set of motivation theories, was used to analyze both the design and the process of reward systems. Locke and Latham (2006) have identified a list of characteristics and moderators which can influence the expected result.

Locke and Latham (Locke & Latham, 2006) have stated that goals have two primary dimensions: content and intensity. Goal content refers to the features of the goals themselves (design), in
particular, specificity and difficulty, while intensity refers to the process by which a goal is set and accomplished.

As regards the content, the design (section 2) of reward systems can be represented by specific and clear goals which lead to greater output and better performance. Unambiguous, measurable and clear goals together with a clear deadline help avoid misunderstandings. Hence specific and difficult goals are greater motivating factors than easy, general and vague goals. These characteristics are linked to the use of quantitative measures suggested also by Hood (1991).

As regards the process (section 3), the factors taken into consideration are the timeliness and feedback. To be effective, the setting target process must be done promptly: CEOs should be aware of the goals they have to achieve in a timely manner and feedback should be given as quickly as possible.

Another important element of the process in the public sector is transparency. Transparency is at the center of NPM reforms (in Italy for instance it is contained in the law 150/2009). Behind transparency there is the concept of accountability that can be defined as the social relationship where actors feel the obligation to explain and justify their conduct (Pollit, 2003). Although accountability is a broad concept (Bovens, 2007), in the public sector (Bovens, 2005) it is strictly linked with openness (transparency) because account giving is done in public. More in general, transparency leads to peer review and social pressure which are considered important factors in the health care sector (Bevan & Wilson, 2013) (Hibbard, 2003).

Finally, the last section (section 4) measures the impact of PMS on performance results. However, it is important to keep in mind the goal of operational mechanisms which is to orient behavior in order to pursue better results.
3. The Italian Health Care System and the role of its Chief Executive Officers

The Italian public health care system is inspired by the Beveridge model which is characterized by public funding (mostly taxation), free access at the point of use, and political control over providers (Burau & Blank, 2006). During the 1990s, many public sector health systems have underwent reforms with the objective of shifting control from the national to the local level thus raising the scope for flexibility in local management (Saltman, Bankauskaite, & Vranbaek, 2007). As a consequence of decentralization, the Italian regions have become the main institutional actors responsible for financing and steering public health care organizations. Studies have highlighted that there are wide differences in performance, governance tools and their integration between regions (Mapelli, De Stefano, Compagnoni, Gambino, & Ceccarelli, 2007) (Vainieri & Nuti, 2011).

The Italian healthcare organization do not have boards, the main figure is CEO who is appointed and can be dismissed by the Head of the Regional Health Council. Annual CEO evaluations are directly performed by the Regional Councils. The Italian national healthcare reforms of the nineties allowed regions to raise the salary of CEOs by up to 20% on the basis of efficiency and effectiveness targets. Each region, according to the law 229/1999, defines its own governance model, the goals and targets of the reward system, the evaluation process and the total compensation and financial bonuses of CEOs. Italian studies on total CEO compensation have highlighted that CEO compensation varies between Italian Regions and within them from around 100,000 to 177,000 euros (Carignani, 2011) (Longo, Ferrè, Russo Valentini, & Sartriana, 2011). Italian regions can initially direct the activities of their Health Authorities with regional acts (such as plans) but then the Health Authorities are autonomous bodies managed by CEOs who are expected to interpret and clarify strategic goals as
well as guide their organizational unit (Calciolari, Cantù, & Fattore, 2011); the main formal mechanism which is yearly handled by Region to orient its healthcare units is the CEO reward system.

4. Methods

Both qualitative and quantitative methods were adopted in this study. In order to answer RQ1 (Are Italian health care regional CEO reward schemes following the managerial directions proposed by NPM principles and goal setting theories?) an analysis of Italian regional acts was performed. Moreover, statistical analysis were carried out to analyze the impact of reward systems on performance (question RQ2).

Data collection

For both the quantitative and qualitative techniques, the main sources were government acts and reports.

In particular, the regional acts regarding CEO reward systems were collected between 2011 and 2012 for the years 2008-2011. This was done by referring to the official regional healthcare websites and the main internet browsers using the number of the regional acts from the Federsanità Report (Carignani, 2011) and the following keywords: “Name of the Region”+ “year”+ “CEO” + “objectives” or “incentives” or “compensation”. Additional acts were provided by the Ministry of Health which financed the research and formal and informal call to collect acts by Regional Department of Health.
Following these criteria, the acts collected has been 75 covering 14 out of 21 regions (2 from the south and the islands, 6 from the center and 6 from the north of Italy) for the years 2008-2011. This panel was unbalanced.

Concerning the analysis of the relationship between performance and reward, the performance data refers to the indicators that were publicly available on the official Ministry of Health website as well as the principal healthcare indicators provided by annual reports. All the indicators quoted in the regional acts were found on public websites. Those collected and used in this analysis are displayed in table 1.

<table>
<thead>
<tr>
<th>Indicator code</th>
<th>Indicator label</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>Ordinary hospitalization rate—acute admissions (Health Care Agreement 2005)</td>
</tr>
<tr>
<td>H2</td>
<td>Case-mix adjusted length of stay—surgical DRG</td>
</tr>
<tr>
<td>H3</td>
<td>Percentage of medical DRG from surgical departments</td>
</tr>
<tr>
<td>H4</td>
<td>Percentage of laparoscopic cholecystectomies in day surgery or 0-1 day Admissions</td>
</tr>
<tr>
<td>H5</td>
<td>Surgical Essential Levels of Health Services DRG—Standard percentage achieved (Health Care Agreement 2005)</td>
</tr>
<tr>
<td>H6</td>
<td>Medical Essential Levels of Health Services DRG—hospitalization rate (Health Care Agreement 2005)</td>
</tr>
<tr>
<td>H7</td>
<td>Percentage of cesarean births</td>
</tr>
<tr>
<td>H8</td>
<td>Percentage of readmissions within 30 days for the same MDC</td>
</tr>
<tr>
<td>H9</td>
<td>Percentage of femur fractures operated within 2 days</td>
</tr>
<tr>
<td>H10</td>
<td>Pre-op LOS—planned admissions</td>
</tr>
<tr>
<td>H11</td>
<td>Percentage of short medical hospitalizations</td>
</tr>
<tr>
<td>Indicator code</td>
<td>Indicator label</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>T1</td>
<td>Hospitalization rate for heart failure (50–74 years old)</td>
</tr>
<tr>
<td>T2</td>
<td>Hospitalization rate for diabetes (20–74 years old)</td>
</tr>
<tr>
<td>T3</td>
<td>Hospitalization rate for COPD (50–74 years old)</td>
</tr>
<tr>
<td>T4</td>
<td>Percentage of medical day-hospital admissions with diagnostic aim (Health Care Agreement 2010)</td>
</tr>
<tr>
<td>T5</td>
<td>Hospitalisation rate for pediatric gastroenteritis</td>
</tr>
<tr>
<td>T6</td>
<td>Major amputation rate for diabetes</td>
</tr>
<tr>
<td>P1</td>
<td>Flu vaccine coverage rate</td>
</tr>
<tr>
<td>P2</td>
<td>MPR vaccine coverage rate</td>
</tr>
<tr>
<td>P3</td>
<td>Mammography screening extension</td>
</tr>
<tr>
<td>P4</td>
<td>Compliance with mammography screening</td>
</tr>
<tr>
<td>P5</td>
<td>Colorectal screening extension</td>
</tr>
<tr>
<td>P6</td>
<td>Compliance with colorectal screening</td>
</tr>
<tr>
<td>F1</td>
<td>Percentage of off-patent drugs delivered</td>
</tr>
<tr>
<td>F2</td>
<td>Per capita pharmaceutical expenditure</td>
</tr>
<tr>
<td>F3</td>
<td>Health care expenditure per capita</td>
</tr>
<tr>
<td>F4</td>
<td>Personnel expenditure per capita</td>
</tr>
<tr>
<td>F5</td>
<td>Financial viability</td>
</tr>
</tbody>
</table>

Table 1: Indicators and data sources for the incentive-performance analysis

Performance indicators listed in table 1 from H1 to F1 were those selected for a national project on the assessment of regional health care assessment and they were already validated by the regions (Nuti, Seghieri, Vainieri, & Zett, 2012) while indicators for financial sustainability were those selected by a network of Italian regions to assess performance of their health authorities (Nuti &
Bonini, 2011). Indicators related to financial performance are 6 out of 28, around one quarter of the overall list.

**Data analyses**

In order to map regional CEO financial incentive strategies (RQ1), an analysis of the regional acts on CEO reward systems was carried out. The acts were analyzed using the framework reported in figure 1: 1. goal congruence for coherence with the healthcare mission; 2. quantitative measures for design; 3. timeliness and transparency for process.

In order to provide a solid and consistent analysis in terms of identification and classification of the variables for each act and region in each year, the work on the factors was performed by a group of four researchers. The research team conducted an investigator triangulation (Denzin, 1989) for confirmatory purposes (Shih, 1998). The factors adopted to describe the design and process of CEO reward systems and coherence between mission and goals are in table 2.
Table 2: Variables of the factors in the framework

The final CEOs’ evaluation was used to add consideration about performance-related pay and the propensity of Regions to follow the aforementioned factors.

The relationship between reward systems and performance (RQ2) was analyzed for 2008 and 2009 because of the availability of data. For each indicator, the dataset used for our analyses contains the following information: 1) the regional value for 2008 (2009), 2) the regional value for the previous year, 2007 (2008) and 3) the presence of incentives for the related goal (gathered from the regional acts).

In order to evaluate the improvement (or worsening) of the indicators over time, a score ranging from 0 (worse performance) to 5 (best performance) was applied to the indicators values of each year, using the quintile, as in Nuti et al (2012). The improvement (worsening) given by the difference
between the scores of the two consecutive years helps comparisons for two reasons: 1. it standardizes different units of measure by attributing equal values for all (0 to 5 points); 2. it allows avoiding a possible confounding effect associated to the time.

In order to evaluate if incentives actually influence regional performance, statistical distributions were executed between non-incentivized and incentivized indicators. For each indicator, the average scores of the regions that incentivized were calculated versus the average scores of those that didn’t. In order to understand whether there were significant differences between the two statistical distributions (non-incentivized = 0, incentivized = 1), parametrical and non-parametrical tests were conducted with SAS software. In particular, the tests were: the mean and variance tests (ttest procedure and anova), the Wilcoxon test and the median test (npar1way procedure).

5. Results

The first purpose of the paper was to map the different applications of CEO reward systems in Italy’s regional health system (RQ1).

Our content analysis findings show that only a few regions followed (between 2008-2011) the managerial approach expected by the NPM and goal setting principles. Table 2 reports the situation of the 14 regions analyzed for each factor.
Table 2 – Synthesis of results region by region.

While some Italian studies have suggested that the most recurrent domain is the financial one concerning goal congruence (section 1) (see for instance (Caldarelli A, 2013) (Vainieri & Nuti, 2011), this analysis suggests that increasingly more regions have been linking up to 50% of CEO evaluations to goals that directly measure health activities. In particular, 9 out of 14 Regions have focused their reward schemes towards measuring the core business of the health system.

)r=access upon request, difficult to be found on the web
As regards design (section 2), the measurability is critical. Indeed only three regions based their schemes for more than 50% of indicators on quantitative metrics. The large recourse to qualitative measures suggests that the probability misunderstandings occurs is high but it could also suggest that the regions explicitly decide to follow a subjective rather than a managerial approach.

Concerning the process analyzed (section 3), table 2 shows that timeliness seems adequate for most of Regions analyzed: 9 out of 14 Regions are able to set goals by the first trimester. Conversely the openness, despite the recent Italian law on transparency (150/2009), is still low.

In order to provide a general assessment of the scheme, table 3 shows the regional average and variability of the CEOs assessment (performance related pay). As highlighted by table 3 it seems that Regions which mainly adopt a political approach (because they apply only 1 of the 3 factors analyzed) register high average levels of performance related pay (90%) and low variability within their CEOs. Conversely Regions which follow a managerial (3 or 2.5 factors) or mixed (1.5) approach seem to be more able to discriminate across CEOs assessment (high variability).
As regards the impact (RQ2 and section 4) of incentive schemes, the statistical tests carried out seem to confirm the hypothesis that when Italian regions assign a target to their CEOs and link it to a reward system, health care organization performance improves.

The Q-Q plot procedure of SAS confirms that the indicators are normally distributed.

<table>
<thead>
<tr>
<th>Regions</th>
<th>Total factor per Region</th>
<th>Average performance-related pay</th>
<th>Variability within the Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0.5</td>
<td>91%</td>
<td>Low</td>
</tr>
<tr>
<td>13</td>
<td>0.5</td>
<td>n.d</td>
<td>n.d</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>91%</td>
<td>very low</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>60%</td>
<td>no variability</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>n.d</td>
<td>n.d</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>n.d</td>
<td>n.d</td>
</tr>
<tr>
<td>1</td>
<td>1.5</td>
<td>62%</td>
<td>high</td>
</tr>
<tr>
<td>3</td>
<td>1.5</td>
<td>63%</td>
<td>high</td>
</tr>
<tr>
<td>4</td>
<td>1.5</td>
<td>73%</td>
<td>low</td>
</tr>
<tr>
<td>6</td>
<td>1.5</td>
<td>82%</td>
<td>high</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>78%</td>
<td>n.d</td>
</tr>
<tr>
<td>14</td>
<td>1.5</td>
<td>n.d</td>
<td>n.d</td>
</tr>
<tr>
<td>12</td>
<td>2.5</td>
<td>n.d</td>
<td>n.d</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>62%</td>
<td>high</td>
</tr>
</tbody>
</table>
The mean test highlights that, on average, the incentivized indicators improve their position by 0.19 (p value<0.05) point while the non-incentivized indicators remain at the same or lose by -0.03. Figure 2 reports the distribution of the improvement/worsening of the two groups in 2008. The distribution of the performance of the regions which did not incentivize indicators is zero (no improvement) or worse. This could be a signal that some healthcare organizations do not consider this aspect while others did. Conversely, the performance of the regions which incentivized indicators (75% of the cases) improved.

![Distribution of score trend of incentivized and non incentivized indicators](image)

**Figure 2- Distribution of incentivized and non incentivized indicators (2007-2008)**

The analysis of variance and the non parametrical tests between the two groups confirm the aforementioned findings.

Similar results were obtained on 2009 data: the average improvement in position of the non-incentivized group is equal to -0.04, while the incentivized group improve of 0.1842 (p-value<0.05).
6. **Conclusion and policy directions**

It seems that reward systems have not yet implemented all the doctrinal components suggested by the management control and goal setting theory. Coherence, in terms of aligning CEO goals with the health system mission, seems to be followed but there is still a lot of work to be done on the design and process of reward systems from a managerial perspective.

Clarity is the weakest factor: the recourse to quantitative indicators is still low. Regions which follow a managerial or quasi-managerial approach (follow more than one of the three factors analyzed: coherence, design, process) seem to be able to discriminate more than the others the CEOs assessment registering also lower average of performance-related pay. This consideration is based on few observations but, if it is confirmed, it could suggest that Regions which adopt a political approach are not able to justify different degree of assessment across CEOs while others could be able to set more challenging goals.

Quantitative analyses have supported the importance of using a system of CEO objectives and incentives to guide the performance of health agencies. This finding may reduce the skepticism of some authors (Caldarelli A, 2013) (Lega, 2008) on the importance on assessing CEO performance.

Although our analysis was conducted on a few observations for both years, the non-parametrical tests are statistically significant.

These results should be seen as coming from an exploratory study which requires confirmation both over time and over a wider range of indicators and regions.

The possibility of having more data available with the participation of a larger number of regions willing to provide information, would be advantageous for further analysis.
Because of the low number of observations, it was not possible to conduct more in-depth analyses on the characteristics which mostly improve performance. Another interesting point is to detect the influence of factors characterizing the reward system on performance results. Finally, other interesting correlation may concern whether the managerial approach has led to better performance as assumed by a recent analyses at the local level which examined organizational culture and healthcare unit performance (Prenestini & Lega, 2013).
References


CHAPTER 3 – Quando gli strumenti di governance regionali ed aziendali sono integrati. Un esperimento naturale in Basilicata.

Authors: Milena Vainieri m.vainieri@sssup.it (corresponding author), PhD, Assistant professor in Management, Institute of Management, Scuola Superiore Sant’Anna of Pisa; Massimiliano Gallo m.gallo@sssup.it PhD candidate in Management, Institute of Management, Scuola Superiore Sant’Anna of Pisa; Sabina Nuti snuti@sssup.it Professor in Management, Institute of Management, Scuola Superiore Sant’Anna of Pisa; Giuseppe Montagano giuseppe.montagano@regione.basilicata.it executive officer, Basilicata Regional Health Department.

Abstract

This paper discusses the governance tools used in the Basilicata region between 2007 and 2013. The case of the Basilicata region is interesting because it provides a natural experiment concerning the integration of governance mechanisms at the regional and local area. It has been observed that, when regional management tools are integrated improvement is higher. Moreover both local health authorities have integrated regional tools in their planning and control systems but with different level of involvement and participation of professionals into the budgeting process. Findings show that the local health authority with the highest level of involvement, registered also the highest improvements.

Keywords

Performance, governance, vertical integration, Basilicata region

Word count including references and tables: 6.490
1. Introduzione

Nel corso degli ultimi anni in Italia, come in altri paesi europei, sono state varate numerose iniziative di New Public Management (NPM) con lo scopo di migliorare le prestazioni in diversi settori della Pubblica Amministrazione (Pollitt, Van Thiel & Homburg, 2007) introducendo, in termini legislativi, i principi e i criteri di efficacia ed efficienza tipici del contesto aziendale (Borgonovi, 2002). Gli strumenti di NPM basati sui principi e le tecniche di “buona” gestione sviluppati nel settore privato, sono di diversa natura e riguardano la riorganizzazione per processi e per obiettivi delle aziende pubbliche, la misurazione delle performance e il controllo sui risultati, l’utilizzo di strumenti quali il balanced scorecard (Di Paolo, 2007).

In questa prospettiva, il dibattito sulle riforme di NPM ha riguardato lo sviluppo di sistemi di misurazione che monitorano e valutano, le attività ed i risultati ottenuti dai Servizi Sanitari anche attraverso la fondazione di diversi organismi (Pollitt et al., 2004; Yesilkagit, 2004; OECD, 2002; Van Thiel, 2001; Feigenbaum et al., 1999; Kickert, 1995).

In Italia, il sistema sanitario è un sistema pubblico (servizio sanitario nazionale SSN) a copertura universale finanziato tramite la fiscalità generale. Le riforme degli anni 90 hanno modificato i rapporti fra livello centrale, il Ministero della Salute, e livello decentrato, le Regioni istituendo anche le aziende sanitarie, attribuendo sempre maggior potere al livello regionale (France & Taroni, 2005). Attualmente, il livello centrale, tramite il Ministero della Salute e Ministero dell’Economia e Finanza è garante dell’erogazione dei livelli essenziali di assistenza e della sostenibilità economica. Le regioni invece sono responsabili dell’organizzazione dei servizi, erogati dalle aziende, della programmazione sanitaria e decidono come allocare le risorse fra i soggetti del sistema sanitario regionale. Con la
riforma del federalismo fiscale avviata agli inizi degli anni 2000 e ripresa nel 2009 le Regioni diventano responsabili anche del reperimento delle risorse (Ferrario & Zanardi, 2011; Ferrè et al., 2012; Nuti & Vainieri 2011). Con il decentramento il baricentro dei poteri è stato quindi spostato sul livello regionale; a livello intermedio, la Conferenza Stato-Regioni e le Province autonome di Trento e Bolzano costituisce la sede privilegiata della negoziazione politica tra le Amministrazioni centrali e il sistema delle autonomie regionali (a tal proposito si veda Toniolo, 2009). Infine, a supporto delle Regioni, è stata costituita l’agenzia nazionale per i servizi sanitari (agenas) con funzioni di supporto tecnico e operativo alle politiche di governo dei servizi sanitari di Stato e Regioni, attraverso attività di ricerca, monitoraggio, valutazione, formazione e innovazione. Tutte queste riforme di decentramento dei poteri hanno portato ad avere 20 sistemi sanitari regionali con diversi modelli di governance, diversi strumenti come riportato da diversi autori (Formez, 2007; Censis, 2008; Tediosi et al., 2009; Vainieri & Nuti, 2011; Carinci et al., 2012; Mapelli, 2012 per citarne qualcuno).

In Italia, a livello nazionale, è stato costituito il Tavolo di verifica degli adempimenti, operante presso il Ministero dell’Economia e della Finanza (MEF) che ha il compito di monitorare prevalentemente l’andamento economico delle Regioni (il pareggio di bilancio ed il rispetto di alcuni vincoli di carattere soprattutto contabile o di rendicontazione); il Comitato per la verifica dell’erogazione dei Livelli Essenziali di Assistenza (LEA), operante presso il Ministero della Salute che ha il compito di monitorare la qualità ed appropriatezza dei servizi sanitari e socio-sanitari garantiti dal Sistema Sanitario Nazionale (SSN); il Programma Nazionale Esiti (PNE) gestito dall’Agenzia Nazionale per i Servizi Sanitari Regionali (Agenas) per conto del Ministero della Salute per verificare la qualità delle prestazioni ed infine i Piani di Rientro ed eventualmente il commissariamento delle Regioni stesse volte a “ed a raggiungere il riequilibrio dei conti dei servizi sanitari regionali. Il Ministero, attraverso il programma pluriennale Sistema nazionale di Verifica e controllo sull’Assistenza Sanitaria (SIVEAS), è impegnato nell'affiancare le Regioni nel raggiungere gli obiettivi previsti dai Piani” (http://www.salute.gov.it) Gli strumenti manageriali attivati a livello centrale rispondono in
primo luogo al mandato istituzionale del Ministero della Salute, ossia quello di essere garante di equità a parità di risorse del livello dei servizi offerto ai cittadini italiani, residenti in qualsiasi regione.

A loro volta le regioni si sono dotate di meccanismi per supportare la loro funzione di organizzazione e gestione dei servizi sanitari in alcuni casi anche istituendo altre istituzioni dipendenti (soggetti quindi del sistema sanitario) come ad esempio le agenzie regionali sanitarie o gli osservatori epidemiologici, o collaborando con soggetti indipendenti come il laboratorio Management e Sanità della Scuola Superiore Sant’Anna di Pisa che effettua la valutazione della performance delle aziende sanitarie per diverse regioni italiane.

Lo scopo e gli utilizzi dei programmi e sistemi implementati a livello nazionale e regionale sono diversi. Inoltre non sempre le regioni riescono ad utilizzarli in modo integrato e coerente. L’importanza del collegamento e della coerenza fra i diversi meccanismi operativi adottati è uno dei temi cruciali affrontato nel management control (Airoldi, 1980; Amigoni, 1988; Grandori, 1995; Armstrong, 2009). Sebbene la necessità di integrare il sistema di programmazione e controllo e il sistema di incentivi sia una prospettiva generalmente condivisa anche nella prassi aziendale (Greve, 2003), assai più complesso è definire le modalità con cui questo può avvenire, sia nel pubblico che nel privato (Ferreira & Otley 2009). Di fatto nel 2009 ancora poche regioni integravano i sistemi di incentivazione ed accreditamento con i sistemi di misurazione della performance dei servizi sanitari a livello regionale (Vainieri & Nuti 2011).

Sulla base degli strumenti ed il loro utilizzo nella governance regionale, Nuti et al. (2015), partendo da una variante dei modelli di governance proposti da Bevan e Wilson (2013), hanno classificato le regioni italiane in quattro gruppi: nel primo gruppo sono state considerate le regioni che promuovono la competizione tra i soggetti erogatori quale meccanismo atto a garantire i migliori risultati di performance e utilizzano sistemi di incentivazione per il management aziendale; nel secondo sono incluse le regioni che basano sui meccanismi di comando e controllo il governo del sistema, che è l’approccio fortemente direttivo principalmente adottato dal livello centrale per le regioni in piano
Dall’analisi dei dati 2007 e 2012 la Toscana e la Basilicata, entrambe nel terzo gruppo, si distinguono rispetto alle altre perché la prima, partendo da una buona situazione ha continuato a migliorare e la seconda ha registrato il miglioramento di performance maggiore nel panorama italiano. Mentre per la Toscana vi sono articoli che descrivono in profondità il sistema di valutazione della performance ed i suoi utilizzi (Nuti et al., 2012; Pinnarelli et al., 2012; Nuti et al., 2010); per la Basilicata sono presenti report che descrivono la performance (Laboratorio Management e Sanità, 2011-14; Rapporto CEIS, 2012-13) e brevi informazioni relativi ai meccanismi di gestione della performance adottati prima del 2010 (Carinci et al., 2012; Mapelli, 2007; Censis, 2008; Nuti & Vainieri, 2009).

Questo articolo si propone di analizzare in profondità quali fattori e scelte caratterizzano approfondimenti relativi alla regione Basilicata: da un lato analizza gli strumenti di governance utilizzati in Regione Basilicata fra il 2007 e 2013 discutendo la performance registrata dalla regione in quegli anni; dall’altro lato analizza l’integrazione verticale dei sistemi di governo ossia l’allineamento dei sistemi regionali con i sistemi aziendali. Il caso della Regione Basilicata è interessante perché presenta un esperimento naturale relativamente all’integrazione dei meccanismi di governo fra il livello regionale ed aziendale: entrambe le aziende territoriali hanno inserito nei
propri sistemi di programmazione e controllo gli obiettivi individuati a livello regionale ma con modalità differenti come è evidenziato dalla percezione dei dirigenti di struttura relativamente all’assegnazione degli obiettivi a livello di unità operativa delle due aziende. Il coinvolgimento e la partecipazione dei professionisti nel processo di budget è uno dei fattori ritenuto essenziale nella letteratura di controllo manageriale per la modifica dei comportamenti per migliorare la performance dell’organizzazione (Ferreira & Otley 2009).

2. Le riforme e gli strumenti della Regione Basilicata degli ultimi 10 anni

Nella Regione Basilicata, con poco più di 570.000 abitanti e circa 1 miliardo di euro di fondo sanitario assegnato nel 2014 nel riparto nazionale, negli ultimi dieci anni, sono state avviate una serie di riforme che hanno riguardato sia l’assetto organizzativo del territorio che l’attivazione di strumenti di management allo scopo di sostenere lo stato di salute della popolazione nel rispetto dei vincoli economici.

A livello nazionale, nel 2010 si è avviato il programma nazionale esiti (PNE) dell’Agenas e contestualmente la regione Basilicata ha aderito al sistema di valutazione della performance del network delle regioni della Scuola Superiore Sant’Anna di Pisa. A livello regionale, soprattutto per quanto concerne l’implementazione di strumenti manageriali, negli stessi anni sono stati modificati i criteri di assegnazione e valutazione degli obiettivi dei direttori generali delle aziende sanitarie.

Nella figura seguente si riportano le principali decisioni che hanno modificato negli ultimi anni la governance del settore sanitario della Regione Basilicata. Gli specifici strumenti di management saranno oggetto di approfondimento nei paragrafi successivi.

<table>
<thead>
<tr>
<th>Anni</th>
<th>Eventi</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>Introduzione di nuove modalità di assegnazione degli obiettivi attraverso misure di performance quantitative con contestuale presenza di più dimensioni di analisi</td>
</tr>
<tr>
<td>2008</td>
<td>Riorganizzazione dell’assetto territoriale mediante unificazione delle precedenti aziende territoriali in due aziende a livello provinciale</td>
</tr>
<tr>
<td>2010</td>
<td>Avvio a livello nazionale del programma nazionale di valutazione degli esiti ed adesione al sistema di valutazione della performance del network delle regioni</td>
</tr>
<tr>
<td>2012</td>
<td>Integrazione fra il sistema di valutazione degli obiettivi e sistema di incentivazione finanziaria per i direttori generali delle aziende sanitarie</td>
</tr>
</tbody>
</table>
2.1. L’evoluzione delle delibere regionali di assegnazione degli obiettivi fra il 2002 e 2012

Nel 2002, con la Delibera di Giunta Regionale (DGR) n.366, in Basilicata si assegnano obiettivi e risorse alle aziende sanitarie e ospedaliere della regione rimarcando che “… il raggiungimento degli obiettivi previsti dalla seguente direttiva rappresenta un preciso adempimento per i Direttori Generali e le Aziende da esse dirette… gli obiettivi contenuti nel presente documento sono relativi all’intero anno 2002; pertanto essi si riterranno comunque raggiunti in rapporto ai dodicesimi di anno a disposizione a far data dall’approvazione della deliberazione di Giunta Regionale…”.

E’ interessante notare che, nell’impostazione della delibera di assegnazione degli obiettivi al management aziendale, si ipotizza un raggiungimento pieno “fino a prova contraria”, in altri termini, si parte dall’assunto che al direttore generale dell’azienda sanitaria è riconosciuto un compenso aggiuntivo quale incentivazione per il raggiungimento degli obiettivi assegnati e delle penalità in caso di non conseguimento degli stessi. Nello schema seguente si riporta la sintesi delle penalità per mancato conseguimento del singolo obiettivo assegnato nell’anno 2002:

<table>
<thead>
<tr>
<th>Obiettivi</th>
<th>In caso del mancato raggiungimento dell’obiettivo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bilancio di esercizio</td>
<td>i Direttori Generali e ai Direttori Amministrativi non accedono al fondo integrativo di risultato del 20%; la giunta regionale, inoltre, potrà valutare l’avvio delle procedure di decadenza dall’incarico del Direttore Generale</td>
</tr>
<tr>
<td>Direttive sul personale</td>
<td>i Direttori Generali non accedono al fondo integrativo di risultato del 20%</td>
</tr>
<tr>
<td>Debito informativo</td>
<td>La giunta regionale potrà valutare l’avvio delle procedure di decadenza dall’incarico del Direttore Generale</td>
</tr>
<tr>
<td>Obiettivi</td>
<td>In caso del mancato raggiungimento dell’obiettivo</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Ricoveri ospedalieri</td>
<td>Il fondo integrativo di risultato è ridotto del 5% (riduzione dal 20% al 15% del compenso aggiuntivo)</td>
</tr>
<tr>
<td>Mobilità sanitaria</td>
<td>I Direttori Generali non accedono al fondo integrativo di risultato del 20% ovvero comporterà una riduzione proporzionale al grado di raggiungimento dell’obiettivo</td>
</tr>
<tr>
<td>Farmaceutica ospedaliera</td>
<td>Il compenso aggiuntivo per i Direttori Generali e ai Direttori Amministrativi è ridotto del 3% (riduzione dal 20% al 17%)</td>
</tr>
<tr>
<td>Emergenza Urgenza</td>
<td>i Direttori Generali non accedono al fondo integrativo di risultato del 20%</td>
</tr>
<tr>
<td>Farmaceutica convenzionata esterna</td>
<td>Riduzione del compenso aggiuntivo per i Direttori Generali, Sanitari e Amministrativi del 3% (riduzione dal 20% al 17%)</td>
</tr>
<tr>
<td>Livelli Essenziali di Assistenza (LEA)</td>
<td>Im possibilità di erogazione dei compensi incentivanti al personale dirigente delle strutture aziendali interessate nonché una penalizzazione del compenso aggiuntivo spettante al Direttore Generale ed al Direttore Sanitario delle Aziende del 5% (dal 20 al 15%)</td>
</tr>
<tr>
<td>Accordi contrattuali</td>
<td>Nessun effetto sul compenso aggiuntivo dei direttori generali</td>
</tr>
<tr>
<td>Criteri per la definizione delle tariffe negli accordi interaziendali</td>
<td></td>
</tr>
<tr>
<td>Contabilità analitica</td>
<td></td>
</tr>
<tr>
<td>Acquisti di beni e servizi</td>
<td></td>
</tr>
<tr>
<td>CUP</td>
<td></td>
</tr>
</tbody>
</table>

Nel documento, così come confermato negli anni a seguire fino al 2011, si riportano diverse dimensioni di analisi contenenti obiettivi di performance e target di raggiungimento, oltre a pesi e parametri che rappresentano priorità regionali, il tutto distinto per azienda sanitaria (per approfondimenti si veda Vainieri e Nuti 2015). Dall’analisi delle delibere si rileva che, sebbene lo schema di definizione degli incentivi riprenda molti suggerimenti proposti dalle teorie manageriali sul tema, la valutazione del raggiungimento dei risultati si basa sostanzialmente sulla relazione di fine anno dei direttori generali delle aziende sanitarie.

Un ulteriore cambio di rotta avviene nel 2012 quando l’assegnazione degli obiettivi ed il relativo raggiungimento degli stessi è maggiormente legato agli indicatori di performance esplicitando fin da subito le modalità di calcolo, i target attesi e le soglie da raggiungere per ciascuna azienda. Dall’analisi della documentazione si rileva che gli indicatori ed i relativi obiettivi sono stati fissati considerando i valori di performance delle aziende sanitarie lucane in relazione alle altre aziende sanitarie del sistema di valutazione del network interregionale.

Inoltre, per valutare il trend positivo o negativo che il management ha saputo realizzare nella gestione

<table>
<thead>
<tr>
<th>Obiettivi</th>
<th>In caso del mancato raggiungimento dell’obiettivo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pronto soccorso</td>
<td></td>
</tr>
<tr>
<td>Assistenza protesica</td>
<td></td>
</tr>
</tbody>
</table>
della propria azienda, viene introdotto un ulteriore indicatore per valutare la performance globale
dell’azienda. Attraverso il confronto tra il posizionamento che la stessa aveva a inizio anno e il
posizionamento conseguito a fine anno, su un set di indicatori individuati all’interno del totale degli
indicatori impiegati per la valutazione degli obiettivi, viene introdotto un ulteriore elemento di
incentivazione finanziaria (http://www.regione.basilicata.it/giunta/site/giunta/home.jsp).

2.2. Il Programma Nazionale Esiti ed il sistema di valutazione della performance delle aziende
sanitarie del network regioni – Sant’Anna
A partire dal 2010, sono stati utilizzati nel sistema sanitario della Basilicata altri due meccanismi di
governance: il PNE ed il sistema di valutazione della performance del network di regioni della Scuola
Superiore Sant’Anna di Pisa.

Entrambi gli strumenti si basano sul benchmarking e sulla pubblicazione dei risultati con lo scopo di
aumentare l’accountability (Andrisani et al.2002). Entrambi mirano dunque a migliorare la
performance attraverso la leva reputazionale (Bevan & Wilson 2013; Hibbart et al. 2003; Hibbard,
Stockard & Tusler, 2005) e l’apprendimento tramite il confronto. Tuttavia presentano caratteristiche
e finalità specifiche differenti. Mentre il primo strumento è stato introdotto su base nazionale
dall’Agenas per conto del Ministero della Salute con un approccio epidemiologico, il secondo
strumento è stato introdotto su base volontaria da parte della Regione con approccio gestionale.

Il Programma Nazionale Esiti sviluppa nel Servizio Sanitario italiano la valutazione degli esiti degli
interventi sanitari, che può essere definita come la stima, con disegni di studio osservazionali, della
verifica degli esiti di interventi o trattamenti sanitari soprattutto ospedalieri. Le misure di PNE sono
strumenti di valutazione a supporto di programmi di auditing clinico ed organizzativo finalizzati al
miglioramento dell'efficacia e dell'equità nel SSN (http://www.agenas.it/).
Il sistema di valutazione della performance del network delle Regioni, ad oggi, coinvolge 11 Regioni\(^1\) e si basa su un set di indicatori (oltre 100) classificati in sei dimensioni di analisi ed una rappresentazione di sintesi nota come il “bersaglio”. L’adesione al network prevede che ogni anno le regioni siano responsabili di calcolare e caricare i propri dati su una piattaforma informatica comune gestita dal Laboratorio Mes della Scuola Superiore Sant’Anna. Le fasce di valutazione di ciascun indicatore vengono discusse e condivise in incontri trimestrali tra regioni e Sant’Anna. Ogni anno nella prima metà dell’anno, subito dopo il consolidamento del flusso dei dati amministrativi, vengono confrontate le performance delle aziende sanitarie appartenenti alle regioni del network (Nuti et al 2015; Laboratorio Management e Sanità, 2011-14) e pubblicato il report annuale con tutti i risultati per regione e per azienda in chiaro in benchmarking.

2.3. L’integrazione orizzontale e verticale dei meccanismi di governance

IL sistema di valutazione della performance del network in Basilicata è usato in modo continuativo: per avviare processi di apprendimento attraverso i corsi di formazione per i dirigenti di struttura complessa; per discutere i risultati nelle riunioni plenarie anche pubbliche, e a partire dal 2012 per individuare ed assegnare gli obiettivi dei direttori generali.

A livello sub-regionale, le direttive vengono recepite all’interno di documenti di programmazione in cui si definiscono gli obiettivi generali e specifici che l’azienda intende perseguire. In particolare, dall’analisi di tali documentazione in Basilicata, si rilevano che per tutte le aziende sanitarie, gli obiettivi regionali hanno costituito il punto di riferimento per la definizione dei documenti di budget aziendali. Tuttavia le modalità di presentazione degli obiettivi (reportistica) ed il processo di assegnazione degli obiettivi alle strutture sono differenti. In particolare dall’indagine di clima organizzativo effettuata a livello aziendale nel 2012, emerge che, relativamente alle due aziende territoriali (che hanno stessa missione e stessi obiettivi a livello regionale), poco meno del 70% i

---

\(^1\) Le Regioni coinvolte nel network sono: Toscana, Liguria, Umbria, Marche, Basilicata, PA Bolzano, PA Trento, Veneto, Emilia Romagna, Lazio e Lombardia.
dirigenti di struttura dell’azienda sanitaria potentina (ASP) ritiene che l’azienda definisce chiaramente gli obiettivi da seguire mentre nell’azienda sanitaria materana (ASM) la percentuale di dirigenti che ritiene di ricevere chiare informazioni sugli obiettivi si attesta a meno del 25% (rapporto clima interno regione Basilicata 2012).

I risultati regionali del PNE in Basilicata invece sono stati presentati per la prima volta a maggio del 2012. L’utilizzo degli indicatori di esito all’interno dei meccanismi di governo è stato rimandato al livello aziendale come infatti è avvenuto nell’azienda ospedaliera San Carlo che, nel 2013, ha usato gli indicatori per riorganizzare il percorso diagnostico terapeutico e assistenziale (PDTA) intraospedaliero del paziente con frattura del femore.

3. Metodologia di analisi

L’articolo propone due tipologie di analisi:

1) analisi dell’integrazione orizzontale tra gli strumenti di governance adottati della regione Basilicata e la loro relazione con la performance registrata fra il 2009 e 2013;

2) analisi dell’integrazione verticale dei sistemi di governo ossia dell’allineamento dei sistemi regionali con i sistemi adottati a livello aziendale.

L’intento principale quindi è quello di descrivere l’effetto complessivo dell’introduzione degli strumenti di governance presentati nel paragrafo 2, sul valore dell’indicatore di performance misurato nelle strutture lucane nel corso del tempo. In particolare, viene considerato il miglioramento complessivo dell’intero sistema sanitario regionale come l’insieme dei risultati positivi conseguiti dalle aziende sanitarie lucane. Successivamente, viene esaminato il diverso peso di miglioramento
degli indicatori di performance, dall’anno dell’introduzione degli stessi all’interno del sistema di incentivazione finanziaria, fra le due aziende sanitarie territoriali lucane che hanno presentato caratteristiche di clima organizzativo interno distanti fra di loro, in particolare per quanto riguarda l’ambito di assegnazione degli obiettivi aziendali.

3.1 Le variabili e le unità analizzate

Per analizzare la performance conseguita dalla Regione Basilicata nei diversi anni e per confrontare la performance a livello aziendale è stato utilizzato il set di indicatori utilizzato da Nuti et al. (2012, 2015) nel confronto dei risultati di salute delle regioni italiane. Il set di indicatori di performance considerati sono mostrati nella tabella seguente:

<table>
<thead>
<tr>
<th>Codice Indicatore</th>
<th>Indicatore</th>
<th>Obiettivi della Regione Basilicata</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>Tasso ospedalizzazione ricoveri ordinari acuti per 1.000 residenti std età e sesso</td>
<td>Appropriatezza organizzativa</td>
</tr>
<tr>
<td>H3</td>
<td>Percentuale di dimessi da reparti chirurgici con DRG medici per i ricoveri ordinari</td>
<td></td>
</tr>
<tr>
<td>H5</td>
<td>Drg LEA Medici: tasso di ospedalizzazione std per 10.000 residenti</td>
<td></td>
</tr>
<tr>
<td>H9</td>
<td>Proporzione di parti con taglio cesareo primario</td>
<td>Appropriatezza clinica</td>
</tr>
<tr>
<td>H11</td>
<td>Frattura del collo del femore: % intervento chirurgico entro 2 giorni</td>
<td></td>
</tr>
<tr>
<td>H13</td>
<td>Degenza media pre-operatoria interventi chirurgici programmati</td>
<td></td>
</tr>
</tbody>
</table>
Per quanto riguarda gli obiettivi di appropriatezza organizzativa, gli indicatori di ospedalizzazione H1 e H5 sono stati standardizzati per classi di età e genere, utilizzando come popolazione standard quella italiana residente del 2011 di fonte ISTAT (http://www.istat.it/it/). Gli indicatori che misurano l’obiettivo di appropriatezza clinica H9 e H11, rispettivamente la percentuale di fratture del femore operate entro due giorni e la percentuale di parti cesarei, sono stati calcolati secondo i protocolli desunti direttamente dal sito web del PNE.

Per poter esaminare più nel dettaglio il conseguimento degli obiettivi regionali misurati dagli indicatori di performance suddetti, si ipotizza che il risultato complessivo regionale è dato dall’insieme dei risultati conseguiti dai singoli distretti territoriali o dalle singole strutture ospedaliere. Nel presente lavoro, ogni indicatore è calcolato dal 2009 fino al 2013, con cadenza annuale, a livello di singolo distretto, nel caso in cui si osserva un’indicazione di performance basata sulla residenza dell’utente (indicatori H1, H5, T2, T3, T4 e AF5) o per singolo istituto di ricovero, nel caso

<table>
<thead>
<tr>
<th>Codice Indicatore</th>
<th>Indicatore</th>
<th>Obiettivi della Regione Basilicata</th>
</tr>
</thead>
<tbody>
<tr>
<td>H14</td>
<td>% ricoveri ordinari medici brevi</td>
<td>Appropriatezza medica</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>Tasso ospedalizzazione scompenso per 100.000 residenti (50-74 anni)</td>
<td>Efficacia assistenziale territoriale</td>
</tr>
<tr>
<td>T3</td>
<td>Tasso ospedalizzazione diabete per 100.000 residenti (20-74 anni)</td>
<td></td>
</tr>
<tr>
<td>T4</td>
<td>Tasso ospedalizzazione BPCO per 100.000 residenti (50-74 anni)</td>
<td></td>
</tr>
<tr>
<td>AF5</td>
<td>Spesa farmaceutica territoriale pro-capite</td>
<td>Efficienza prescrittiva farmaceutica</td>
</tr>
</tbody>
</table>

Per quanto riguarda gli obiettivi di appropriatezza organizzativa, gli indicatori di ospedalizzazione H1 e H5 sono stati standardizzati per classi di età e genere, utilizzando come popolazione standard quella italiana residente del 2011 di fonte ISTAT (http://www.istat.it/it/). Gli indicatori che misurano l’obiettivo di appropriatezza clinica H9 e H11, rispettivamente la percentuale di fratture del femore operate entro due giorni e la percentuale di parti cesarei, sono stati calcolati secondo i protocolli desunti direttamente dal sito web del PNE.

Per poter esaminare più nel dettaglio il conseguimento degli obiettivi regionali misurati dagli indicatori di performance suddetti, si ipotizza che il risultato complessivo regionale è dato dall’insieme dei risultati conseguiti dai singoli distretti territoriali o dalle singole strutture ospedaliere. Nel presente lavoro, ogni indicatore è calcolato dal 2009 fino al 2013, con cadenza annuale, a livello di singolo distretto, nel caso in cui si osserva un’indicazione di performance basata sulla residenza dell’utente (indicatori H1, H5, T2, T3, T4 e AF5) o per singolo istituto di ricovero, nel caso
l’indicatore di performance misura l’attività ospedaliera (H3, H5, H9 e H11). I distretti che dividono il territorio della Basilicata, denominati “Distretti della Salute”, sono individuati a partire dalla precedente suddivisione per azienda territoriale e dalle zone urbane principali rappresentate dalle due città capoluoghi di provincia. In particolare, i Distretti della Salute sono i seguenti:

- D_101 – l’area dell’ex azienda sanitaria locale di Venosa
- D_102 – l’area dell’ex azienda sanitaria locale di Potenza con esclusione della città di Potenza
- D_103 – l’area dell’ex azienda sanitaria locale di Lagonerco
- D_104 – l’area dell’ex azienda sanitaria locale di Matera con esclusione della città di Matera
- D_105 – l’area dell’ex azienda sanitaria locale di Montalbano Jonico
- D_Matera – l’area della città di Matera
- D_Potenza – l’area della città di Potenza

Per gli indicatori di performance basati sull’attività ospedaliera, si esclude dall’analisi il Centro di riferimento regionale oncologico della Basilicata (CROB) e le strutture private presenti sul territorio a causa della esigua numerosità e specificità dei ricoveri. I presidi ospedalieri considerati nell’analisi del presente studio sono i seguenti:

- PO di Villa D’Agri - Marsicovetere
- PO di Matera
- PO di Lagonerco
- PO di Melfi
- PO di Policoro
- AO San Carlo di Potenza

Per l’analisi a livello aziendale gli indicatori sono stati calcolati per le due aziende provinciali: ASP

\[\text{2 Prima dell’attuazione della L.R. n.12/2008.}\]
3.2 Metodi statistici

Per la prima parte dello studio, il metodo utilizzato è l’analisi della varianza (ANOVA) per misure ripetute. Il modello dell’analisi è composto dalle variabili indipendenti che sono i 5 tempi, dal 2009 al 2013 i quali misurano il prima e il dopo delle applicazioni delle riforme, e dalla variabile dipendente che è il valore dell’indicatore di performance. Il modello utilizzato per misure ripetute su un singolo campione, di volta in volta individuato dalle strutture ospedaliere regionali per gli indicatori “ospedalieri” o dagli ambiti territoriali distretti della salute per gli indicatori “territoriali”, è espresso dalla seguente equazione:

\[ y_{ij} = \mu + \tau_j + \pi_i + e_{ij} \]

dove:
- \( y_{ij} \) rappresenta il risultato dell’indicatore della struttura ospedaliera o distretto della salute \( i \) – esimo nell’anno \( j \)
- \( \mu \) è la media generale
- \( \tau_j \) è l’effetto del mutamento al tempo \( j \)
- \( \pi_i \) rappresenta l’effetto casuale associato alla struttura ospedaliera o distretto della salute \( i \) – esimo
- \( e_{ij} \) è una specifica componente di errore casuale per la struttura ospedaliera o distretto della salute \( i \) – esimo al tempo \( j \) – esimo

mentre le assunzioni formali del modello sono:
- gli effetti casuali \( \pi_i \) sono indipendenti e si distribuiscono come una \( N(0, \sigma^2_{\pi}) \)
- gli errori casuali \( e_{ij} \) sono indipendenti e si distribuiscono come una \( N(0, \sigma^2_e) \)
- gli effetti casuali \( \pi_i \) e gli errori casuali \( e_{ij} \) sono indipendenti tra di loro
La somma \( \sum_{j=1}^{t} r_j = 0 \)

L’ipotesi di base sottoposta a verifica, con le misure ripetute nei 5 anni osservati, è “non ci sono differenze tra gli anni”, ovvero:

\[
H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 \\
H_a: \text{almeno una coppia di } \mu_j \text{è diversa}
\]

La verifica e la valutazione della significatività di tale differenza viene effettuata mediante il calcolo del p-value per ogni indicatore, tenendo presente di volta in volta le assunzioni del modello e apportando le correzioni statistiche opportune. Viene inoltre mostrato graficamente il trend di miglioramento per ogni singolo indicatore.

Per la seconda parte dello studio, il metodo utilizzato è un analisi della differenza media, tra le due aziende territoriali lucane rispettivamente ASP e ASM, dei miglioramenti del valore degli indicatori a confronto tra l’anno 2011, ovvero prima dell’introduzione della valutazione di performance all’interno del sistema di incentivazione finanziaria, e l’anno 2013, ultimo dato disponibile e l’anno 2009 primo dato disponibile. Per stimare il miglioramento di ogni indicatore, per ogni azienda, sono state calcolate le differenze, indicate in termini positivi a seconda dell’andamento dell’indicatore, tra il valore del 2011 e quello del 2013 e 2009 diviso la somma degli stessi valori, moltiplicato per 100. In termini analitici, la formula utilizzata per la stima del miglioramento di ogni indicatore è la seguente:

\[
(\pm) \frac{y_{ij} - y_{i(j-t)}}{y_{ij} + y_{i(j-t)}} \times 100
\]

dove \( y_{ij} \) rappresenta il risultato dell’indicatore della azienda \( i \)-esima nell’anno \( j \) e \( t \) sono il numero di anni indietro considerati per il confronto. Il rapporto assume valore positivo (+) se l’indicatore migliora quando incrementa nel corso degli anni, mentre assume valore negativo (-) se l’indicatore migliora quando diminuisce nel corso degli anni.
4. Risultati

Dall’esame dei valori nel corso degli anni e del trend, ogni indicatore considerato registra complessivamente risultati in netto miglioramento. Queste evidenze rafforzano la Regione nella scelta di adottare strumenti di governance, ossia di programmazione e controllo basati su queste misure. L’analisi delle misure ripetute nel corso degli anni considerati (2009-2013), nelle strutture ospedaliere e nei distretti della salute in Basilicata, sono differenti in maniera significativa come riportato nella tabella 1, che sintetizza i dati a livello regionale. Per ogni indicatore è rappresentato il valor medio annuale, la significatività statistica e un grafico sparkline. Dall’osservazione della tabella si evince un miglioramento più marcato nel 2011 quindi successivo alla riforma che ha ridotto il numero di aziende territoriali ed all’introduzione della Basilicata del sistema di valutazione della performance nel network di regioni.
La Tabella 1 mostra l’andamento degli indicatori fra il 2009 e il 2013 della Regione Basilicata.

Il miglioramento continua anche nel 2012, anno in cui la Regione decide di integrare i meccanismi di governance disponibili. Queste performance mostrano quindi che gli strumenti adottati dalla Regione hanno avuto un impatto positivo sui risultati monitorati. Inoltre il miglioramento è più significativo quando intervengono in modo coerente più strumenti e/o meccanismi.


Nella tabella seguente sono presentati i valori medi per ciascun indicatore e azienda negli anni considerati e le distribuzioni accoppiate dei valori stimati di miglioramento percentuale relativo fra i
Due anni a confronto.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ASM</td>
<td>ASP</td>
<td>ASM</td>
<td>ASP</td>
<td>ASM</td>
</tr>
<tr>
<td>H1</td>
<td>Tasso ospedalizzazione ricoveri ordinari acuti per 1.000 residenti std età e sesso</td>
<td>113,13</td>
<td>120,61</td>
<td>107,51</td>
<td>113,48</td>
<td>104,08</td>
</tr>
<tr>
<td>H3</td>
<td>Percentuale di dimessi da reparti chirurgici con DRG medici per i ricoveri ordinarini</td>
<td>40,25</td>
<td>38,93</td>
<td>40,38</td>
<td>39,01</td>
<td>34,49</td>
</tr>
<tr>
<td>H5</td>
<td>Drg LEA Medici: tasso di ospedalizzazione std per 10.000 residenti</td>
<td>404,23</td>
<td>492,90</td>
<td>295,63</td>
<td>411,85</td>
<td>230,87</td>
</tr>
<tr>
<td>H9</td>
<td>Proporzione di parti con taglio cesareo primario</td>
<td>38,63</td>
<td>40,57</td>
<td>23,88</td>
<td>34,57</td>
<td>27,44</td>
</tr>
<tr>
<td>H11</td>
<td>Frattura del collo del femore: % intervento chirurgico entro 2 giorni</td>
<td>25,07</td>
<td>27,37</td>
<td>22,14</td>
<td>25,12</td>
<td>34,96</td>
</tr>
<tr>
<td>H13</td>
<td>Degenza media pre-operatoria interventi chirurgici programmati</td>
<td>1,37</td>
<td>1,25</td>
<td>1,13</td>
<td>1,53</td>
<td>1,05</td>
</tr>
<tr>
<td>H14</td>
<td>% ricoveri ordini medici brevi</td>
<td>17,28</td>
<td>16,53</td>
<td>17,71</td>
<td>14,40</td>
<td>16,24</td>
</tr>
<tr>
<td>T2</td>
<td>Tasso ospedalizzazione scompenso per 100.000 residenti (50-74 anni)</td>
<td>402,56</td>
<td>486,35</td>
<td>297,98</td>
<td>377,76</td>
<td>271,58</td>
</tr>
<tr>
<td>T3</td>
<td>Tasso ospedalizzazione diabete per 100.000 residenti (20-74 anni)</td>
<td>65,74</td>
<td>94,27</td>
<td>46,20</td>
<td>44,18</td>
<td>29,76</td>
</tr>
<tr>
<td>T4</td>
<td>Tasso ospedalizzazione BPCO per 100.000 residenti (50-74 anni)</td>
<td>144,82</td>
<td>101,97</td>
<td>97,03</td>
<td>51,11</td>
<td>58,49</td>
</tr>
<tr>
<td>AF5</td>
<td>Spesa farmaceutica territoriale pro-capite</td>
<td>307,32</td>
<td>287,60</td>
<td>262,61</td>
<td>258,61</td>
<td>219,33</td>
</tr>
</tbody>
</table>

**Tabella 2 - Le performance ed i miglioramenti dell’Azienda sanitaria di Matera e di Potenza nel 2009, 2011 e 2013.**

Dai risultati riportati nella tabella, emerge che non vi sono differenze significative fra le due aziende prima del 2011 mentre, con l’entrata a regime della nuova riorganizzazione, abbinata all’uso integrato di sistemi di valutazione della performance, nel periodo dal 2011 al 2013 l’azienda di Potenza (ASP) registra miglioramenti più rilevanti rispetto all’azienda di Matera (ASM). Infatti il miglioramento medio degli indicatori monitorati del secondo periodo (2011-2013), è risultato pari a 22,2 per l’ASP e 9,6 per l’ASM (la differenza è statisticamente significativa, p-value 0,004). Al contrario il miglioramento registrato nel 2009-2011, era mediamente del 9,4 per l’ASM e 9,1 per l’ASP, risultati pressoché simili (p-value 0,46). La tabella 2 riporta nel dettaglio i miglioramenti (corretti secondo la metodologia sopra riportata) per ciascun indicatore selezionato nei due periodi 2009-2011 e 2011-2013.
5. Conclusioni


Ad un’analisi più approfondita dei dati regionali si evince che le due aziende territoriali provinciali hanno registrato performance simili, in miglioramento, nel triennio 2009-2011 senza presentare differenze significative mentre nel triennio 2011-2013 hanno registrato miglioramenti differenti: il miglioramento medio degli indicatori monitorati per l’ASP è di 22,2 mentre il miglioramento medio registrato dall’ASM 9,6 (differenza significativa dal punto di vista statistico p-value 0.004). Nel 2012
entrambe le aziende hanno introdotto all’interno delle proprie schede di budget gli obiettivi definiti dalla delibera regionale per l’incentivazione dei direttori generali. In questo modo l’integrazione del sistema di valutazione della performance è avvenuta sia a livello regionale, con il sistema di incentivi e sia aziendale con il sistema di budget. La distinzione fra le due aziende ha riguardato le modalità di comunicazione e partecipazione dei professionisti all’intero processo: l’azienda potentina che nel 2012 presentava livelli di partecipazione elevati (circa il 70% dei responsabili di struttura ha dichiarato che gli obiettivi erano chiari) ha registrato performance significativamente migliori dell’azienda materana (dove solo il 25% del personale dichiarava di ricevere obiettivi chiari).

Questa distinzione, derivante da un esperimento naturale, conferma quanto sostengono alcuni autori (Nørreklit et al., 2007) relativamente al coinvolgimento dei dipendenti nella definizione e monitoraggio dei sistemi di budget: la partecipazione dei dipendenti riduce la distanza fra la realtà e le misure, soprattutto in contesti ad elevata professionalità come il settore sanitario (Bevan et al. 2004; Abernethy & Brownell, 1999).
Bibliografia


Borgonovi, E., 2002, Principi e sistemi aziendali per le amministrazioni pubbliche, Egea, Milano.

Censis (2008), I modelli decisionali nella sanità locale, Roma: Censis.


Formez (2007), I sistemi di governance dei servizi sanitari regionali, Formez, 57.


Hospital Performance Reports: Impact On Quality, Market Share, And Reputation. Judith H. Hibbard, Jean Stockard, and Martin Tusler Health Affairs, Volume 24, Number 4


Mapelli, V. et al. (2007), I sistemi di governance dei servizi sanitari regionali, Roma, Formez.

Nuti e Vainieri, a cura di (2009) Fiducia dei cittadini e valutazione della performance nella sanità italiana. ETS


**Sitografia**

http://www.salute.gov.it
http://www.agenas.it/

http://www.regione.basilicata.it/giunta/site/giunta/home.jsp

http://www.istat.it/it/
CHAPTER 4 – Overall patient satisfaction in the Emergency Departments of the Basilicata Region: what needs to be done.

Authors: Massimiliano Gallo m.gallo@sssup.it PhD candidate in Management, Institute of Management, Scuola Superiore Sant’Anna of Pisa

Abstract

In recent years, the number of patients who have been admitted to the Emergency Department (ED) has increased significantly all over the world. This paper discusses what needs to be done in order to increase patients’ satisfaction in the EDs of the Basilicata Region (Italy). Both regression and optimization models have been used to identify an effective combination of those aspects of care (for example, patient’s involvement when decisions are to be taken) which might positively affect patients’ satisfaction. The results of this study might provide useful information to support professionals of the health care sector. Main findings suggest that the most important aspect of care to consider in order to increase global patients’ satisfaction within the Basilicata Region is the “level of collaboration between physicians and nursing staff”. Therefore, decision-making relating to the emergency services management should focus on these specific aspects in order to gain the greatest impact on patients’ satisfaction.

Keywords

Optimization model, emergency department, patient’s satisfaction, Basilicata Region

Word count including references and tables: 5,064
1. Introduction

Since the early 80s, several studies in health care have dealt with the managerial dimension of perceived quality or relational related to user satisfaction (Pascoe, 1983). Recently, the term "responsiveness", that is the ability to meet the personal needs of users, was suggested by the World Health Organization as far as perceived quality is concerned (Murray & Evans, 2003). This choice is based on the fact that patients’ satisfaction with the services received depends on whether they have met or not their expectations, which makes comparison between different social classes difficult to be made and leads to the conclusion that it is best to investigate users’ specific experiences. In the specific context of the assessment of customer satisfaction as for health services, ranging from hospital care to treatment outside the hospital, a number of studies concerned with the field of emergency services / emergency was produced (Boudreaux et al., 2004; Boudreaux et al., 2003; Trout et al., 2000; Brown et al., 2005).

This paper aims at illustrating a methodology which might support the health management organization of the Basilicata region working on strategic emergency / urgency, in particular, the Emergency Department units (ED). The main purpose of the methodology, described below, is to increase users’ satisfaction towards the services received, starting from the measurement and analysis of the perceived quality on the part of citizens from Basilicata who went into ER.

In Italy, the measurement and evaluation of the quality perceived by citizens in relation to the assistance received is an essential part of the performance evaluation system (Nuti, 2008) that the Laboratory Management and Health (MeS) of the Sant'Anna School of Pisa has developed and then implemented in all the health organizations in Tuscany since 2004 and since 2008 in the other regions
involved in the project. The system consists of six dimensions (assessing levels of population health; evaluation of the ability to pursue the strategies of the regional system; social health assessment; external evaluation, which includes the indicators relating to citizens’ assessment of the quality of the care they receive; internal evaluation and, finally, the evaluation of operational efficiency and financial performance) which are concerned with those aspects characterizing a health system performance. Therefore, not only does the evaluation system monitor the health units, but it also provides them with useful feedback as for the actions taken, in this way making checking and reviewing possible. The indicators relating to external evaluation are based on the results of satisfaction surveys led by the Laboratory MeS among citizens using the health services. The high articulation of the questionnaires, which take into account several aspects of the service delivery mode, allows to understand their strengths and weaknesses, leaving room for improvement.

Customer satisfaction surveys and the experience of the Emergency Department service users are among the investigations carried out systematically (Marcacci, Nuti & Seghieri, 2010; Seghieri, Sandoval, Brown & Nuti, 2009) and the indicator "User rating of ER on the quality of care they receive" is based on their results. This survey has been carried out every year in Tuscany since 2005, it was carried out in Umbria and Liguria in 2010 and in 2012 the Basilicata Region has also asked their local health authorities to carry it out. In particular, the main objective is to assess users’ satisfaction with the health services as far as all the different aspects of the assistance received are concerned, not only health care in the strict sense.

Performance measurement regarding the emergencies / urgencies services has been the most important source of data used in relation to the external evaluation dimension in the Basilicata region. In order to acquire information about the levels of satisfaction of citizens from Basilicata, the emergency department users’ satisfaction survey was conducted on six locations in the region under the direction of the two Regional Health Authorities, Potenza Local Health Services (ASP) and Matera Health Agency (ASM), and the only Hospital of the territory (San Carlo).
Despite dramatic increases in the use of hospital ERs since the 1950s, an estimated 85% of ER visits are made for non-life-threatening reasons (Padgett & Brodsky, 1992). In Basilicata, like in other Italian regions and, more generally, in Western countries, there is a continuous increase in access to the ED, especially for minor needs, for which users may find answers in other assistance "setting " (Marcacci, Nuti & Seghieri, 2010).

With a population of less than 600,000 inhabitants, in Basilicata in 2011 there were about 40,000 accesses to the ERs and this belief on the part of the citizens that the emergency department is the best answer when health and safety are concerned is common not only on Basilicata. Therefore, it is widely acknowledged that the use of the emergency department by the population is inappropriate. The general practitioner is considered a professional that visits and directs the patient to other healthcare institutions even when dealing with non-urgent needs. "The reality is that even where territorial medicine is a suitable alternative, integrated with the medical service and able to offer continuity of care within 24 hours, many people prefer to go to the emergency department, even accepting long waits, but satisfied to receive a service "turnkey", that is a service including additional diagnostic tests, if necessary, and with a final diagnosis. Then there are other circumstances that help to make 'special' this service in the perceptiveness of the citizen: it is not always able to choose the structure for health service, a particular physical condition Emergency subjective or objective, the impact "of the first time "with the healthcare environment, unknowns for lack of practice, random assignment of the medical and nursing staff and, therefore, the absence of the established relationship of confidence between patient and doctor (Goldwag at al., 2002)."
2. Methods

The survey in Basilicata was conducted on a sample of over eighteen users chosen at random from the list of patients who visited emergency department in October-November 2012. In the definition of the sample was used as the target of total over eighteen population users who went to one of ED from Basilicata in 2011 for colour code of access to triage. In particular, the sample was defined to be representative in two stages.

In the first stage, the sample was stratified by individual ED providing a statistical significance of the estimator of 95%, and 7% of sampling error for ER of I level, while the only ER of II level (San Carlo Hospital), the expected sampling error was 5%. The sample was then subsequently stratified by code. For the survey overall regional programme in Basilicata, 1,349 statistical units constituted the sample size.

The questionnaire was drawn up and developed by researchers at the Laboratory Management and Health (MES) of the Scuola Superiore Sant'Anna of Pisa on the basis of the existing literature (Boudreaux et al., 2004; Boudreaux et al., 2003; Trout et al., 2000; Brown et al., 2005; Marcacci, Nuti & Seghieri, 2010; Seghieri, Sandoval, Brown & Nuti, 2009) and shared with the Organization Departments and professionals from Basilicata. The main reason why it was written was to collect information about emergency service users. The questions were related reporting, type reporting, type rating and they were aimed at pointing out not only citizens’ experience but also evaluation of the service used.

This "modus operandi" has allowed a deep understanding of users’ levels of dissatisfaction connecting the latter to the true events. The questionnaire was formulated using 56 questions grouped into 10 sections, namely:

- Admission - 12 questions
− Reception (triage) - 4 questions
− Perceived waiting time - 3 questions
− Comfort and cleanliness - 3 questions
− Support and communication - 7 questions
− Physician-patient relationship - 5 questions
− Nurse-patient relationship - 5 questions
− Discharge - 7 questions
− Overall rating - 5 questions
− Socio - demographic patient characteristic - 5 questions

The scale used to measure the degree of satisfaction with the different aspects of the service goes from value "1", indicating the minimum satisfaction, to value "5", which indicates the maximum satisfaction. In particular, the five answers to questions that measured the degree of satisfaction were the following:

− Very poor
− Poor
− Good/fair
− Very good
− Excellent

Moreover, the answer "do not know" was added, which was regarded as a “missing”. Patients who went to Basilicata ED in October-November 2012 were given at admission a leaflet explaining objectives and methods of the investigation as well as privacy related information.

In particular, the users were said that they could be chosen to be part of a sample for a survey and that they would receive at home a questionnaire to fill in and return by using an enclosed pre-paid envelope. Alternatively, the sampled patient could choose to complete the questionnaire using the
method CAWI (Computer Assisted Web Interviewing), filling in the questionnaire on the web by accessing to the online platform (www.indagineps.sssup.it/basilicata) made from the laboratory Management and Health, or to be interviewed on the telephone (CATI - Computer Assisted telephone Interviewing) by specifically trained researchers from the same laboratory. In Basilicata 1.327 interviews were carried out successfully on a sample of 8,000 patients.

The sample estimate method was made first from the hypothesis that the units in the sample represent the units of the population that are not included in it. In order to describe correctly the experience of the target population on the base of the collected results, that is patients of the Emergency Departments from Basilicata in the period under investigation, a weight sample was calculated for each level of the sample. In particular, the reporting units have been attributed a sampling weight from direct weight (the opposite of the probability of inclusion of the units in the sample) and it has been multiplied by a correction factor for non-response (inverse of the response rate). Therefore, the results processed in this way represent data for the entire population, or the total number of emergency departments in the period under investigation.

The aim of this work is to present and discuss the most important features that can support health professionals in the ED so as to increase the overall satisfaction of the services provided.

This approach based on sample data is a sequential combination of the statistical regression method and of the optimization process. The main objective the method is based on is to get as much information as possible in order to focus only on a set of variables for the improvement outcome of the variable that measures the overall satisfaction. Thus, with this procedure there are identified issues of care those need to be modified to produce improvement directly based on the information provided by the questionnaire.

The method used is the same introduced for the first time in the analysis of the performance of health facilities by a group of researchers from the Ministry of Health of Ontario, Canada (Sandoval et al.,
This optimization model uses as its starting point the variables that are both highly correlated with overall satisfaction and have a low level of performance (measured as the average level of satisfaction perceived by the user). Following the technique described, first of all an analysis was conducted to see if the questions in the questionnaire were significantly associated with the questions on overall satisfaction with the service received, secondly 16 items were selected as predictors in the regression model.

The following table shows the 16 items obtained from the questionnaire:

<table>
<thead>
<tr>
<th>Questions</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>From 1 to 5, how kind was the staff at triage (Reception)?</td>
<td>Kindness of the registration staff</td>
</tr>
<tr>
<td>From 1 to 5, was the staff at triage (Reception) able to understand the severity of your health problem?</td>
<td>Ability of the registration staff to understand the severity of the health problem</td>
</tr>
<tr>
<td>After triage (Reception) how long you waited before being visited by a doctor?</td>
<td>Perceived waiting time</td>
</tr>
<tr>
<td>From 1 to 5, what is your opinion of the expected time before being visited by a doctor?</td>
<td>Satisfaction with waiting time</td>
</tr>
<tr>
<td>From 1 to 5, how comfortable was the ED waiting room?</td>
<td>Comfort of the waiting room</td>
</tr>
<tr>
<td>From 1 to 5, how clean was the ED waiting room?</td>
<td>Cleanliness of the waiting room</td>
</tr>
<tr>
<td>Did you feel involved in decisions relating to care and treatment?</td>
<td>Involvement of the patient in care and decisions</td>
</tr>
<tr>
<td>Did you feel you were not being treated like a person by the ED staff?</td>
<td>ED staff treated the patient like a person</td>
</tr>
<tr>
<td>From 1 to 5, how clear was the information provided by ED doctors?</td>
<td>Clarity of the information provided by ED doctors</td>
</tr>
<tr>
<td>From 1 to 5, how kind were the ED doctors?</td>
<td>Kindness of ED doctors</td>
</tr>
<tr>
<td>Questions</td>
<td>Items</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Did you trust the ED doctors who assisted you?</td>
<td>Trust in ED doctors</td>
</tr>
<tr>
<td>Did you feel you were not being treated like a person by the ED</td>
<td>ED nursing staff treated the patient like a person</td>
</tr>
<tr>
<td>nursing staff?</td>
<td></td>
</tr>
<tr>
<td>From 1 to 5, how clear was the information provided by ED nursing</td>
<td>Clarity of the information provided by nursing staff</td>
</tr>
<tr>
<td>staff?</td>
<td></td>
</tr>
<tr>
<td>From 1 to 5, how kind was the ED the nursing staff?</td>
<td>Kindness of the nursing staff</td>
</tr>
<tr>
<td>Did you trust the ED nursing staff who assisted you?</td>
<td>Trust in nursing staff</td>
</tr>
<tr>
<td>From 1 to 5, what is your opinion of the ability to work in teams shown</td>
<td>Level of collaboration between doctors and nursing staff</td>
</tr>
<tr>
<td>by doctors and nursing staff?</td>
<td></td>
</tr>
</tbody>
</table>

Finally, the optimization model was used to calculate the best combination of each predictor in order to increase the item of overall satisfaction with the service received up to a maximum of 15%, and it was represented by the survey question: "From 1 to 5, what is your opinion on the quality of care received in the ER? 

According to the initial restrictions, the model changes the current score of the independent variables until a desirable increase in the dependent variable is reached. In this way, a number of combinations increases of the independent variables can give the increase that is expected of the dependent variable. However, the optimization selects a combination in which the percentage increase of the predictors is minimal. The optimization model, as it has been largely described elsewhere (Marcacci, Nuti & Seghieri, 2010; Seghieri, Sandoval, Brown & Nuti, 2009), implies that it is more difficult to increase the score of a variable that is very close to compared to its benchmark score of a variable that is not close to its benchmark.

Since the estimation of the coefficients in the regression model and the average value of the dependent variable (item of the overall satisfaction), in order to calculate the solution that "optimizes" in a non-
linear and forced way, the Excel Solver tool which uses the 'algorithm Generalized Reduced Gradient (GRG2) was used.

In analytical terms, showed with $X_i$, $i = 1, 2, ..., 16$ the measures of satisfaction about the 16 items predictors and with $Y_i$, $i = 1, 2, ..., 16$ their average performance, the objective function of the optimization model is the following:

$$\min \sum_{i=1}^{16} \left| \frac{X_i - Y_i}{Y_i} \right|$$

subject to the constraints:

1. $X_i \geq 1$
2. $X_i \leq Y_i$
3. $X_i \geq 0.85 \cdot Y_i$
4. $(X_1, X_2, ..., X_{16}) \leq 0.95 \cdot (Y_1, Y_2, ..., Y_{16})$

where $X_i$ e $Y_i$ are the values of the predictors obtained from the regression model.

The first constraint imposes the condition that none of the predictors improves its performance over the maximum value (excellent rating). The second forces the model to find the best values of the average performance. The third imposes the condition that no predictor improves its performance over 15% of the average. Finally, the fourth constraint sets the increase of the dependent variable at 5% or more. For further explanation on the optimization model, see Brown (Brown et al., 2005).

3. Result

The table below shows the main characteristics of the sample of users who answered the questionnaire. The average age of the sample was 55.9 years (standard error 0.54 with a minimum of 55.9 years).
18 to a maximum of 100 years) and 49.5% were female. In the majority of cases (65.8%) the patient has been assigned a green access colour code, which indicates a moderately severe condition of emergency, and 89.4% of users considered their health conditions at the time of survey as or more satisfying than when admitted to ED.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>not available (n/a)</td>
<td>13</td>
<td>(excluding n/a)</td>
</tr>
<tr>
<td>Female</td>
<td>651</td>
<td>49.5</td>
</tr>
<tr>
<td>Male</td>
<td>663</td>
<td>50.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-45</td>
<td>437</td>
<td>32.9</td>
</tr>
<tr>
<td>46-65</td>
<td>418</td>
<td>31.5</td>
</tr>
<tr>
<td>Over 65</td>
<td>472</td>
<td>35.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>not available (n/a)</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>None/Primary school</td>
<td>457</td>
<td>34.7</td>
</tr>
<tr>
<td>Lower Secondary School?</td>
<td>299</td>
<td>22.7</td>
</tr>
<tr>
<td>Upper Secondary School?</td>
<td>439</td>
<td>33.3</td>
</tr>
<tr>
<td>Graduate</td>
<td>122</td>
<td>9.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Job</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>not available (n/a)</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Pensioner</td>
<td>552</td>
<td>41.9</td>
</tr>
<tr>
<td>Unemployed</td>
<td>120</td>
<td>9.1</td>
</tr>
<tr>
<td>Housewife</td>
<td>142</td>
<td>10.8</td>
</tr>
<tr>
<td>Student</td>
<td>51</td>
<td>3.9</td>
</tr>
<tr>
<td>Worker</td>
<td>153</td>
<td>11.6</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----</td>
<td>------</td>
</tr>
<tr>
<td>Employee</td>
<td>118</td>
<td>9.0</td>
</tr>
<tr>
<td>Businessman</td>
<td>31</td>
<td>2.4</td>
</tr>
<tr>
<td>Self Employed</td>
<td>31</td>
<td>2.4</td>
</tr>
<tr>
<td>Manager</td>
<td>7</td>
<td>0.5</td>
</tr>
<tr>
<td>Artisan</td>
<td>13</td>
<td>1.0</td>
</tr>
<tr>
<td>Teacher</td>
<td>16</td>
<td>1.2</td>
</tr>
<tr>
<td>Dealer</td>
<td>15</td>
<td>1.1</td>
</tr>
<tr>
<td>Others</td>
<td>68</td>
<td>5.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Colour assigned at triage</th>
<th>Number</th>
<th>Percentage (excluding n/a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light blu/white (not very/not serious)</td>
<td>103</td>
<td>7.8</td>
</tr>
<tr>
<td>Yellow/red (very/extremely serious)</td>
<td>351</td>
<td>26.5</td>
</tr>
<tr>
<td>Green (moderately serious)</td>
<td>873</td>
<td>65.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Health condition at arrival</th>
<th>Health status when surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>not available (n/a)</td>
<td>not available (n/a)</td>
</tr>
<tr>
<td>Extremely serious</td>
<td>Very poor</td>
</tr>
<tr>
<td>Very serious</td>
<td>Poor</td>
</tr>
<tr>
<td>Moderately serious</td>
<td>Good/fair</td>
</tr>
<tr>
<td>Not very serious</td>
<td>Very good</td>
</tr>
<tr>
<td>Not serious</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Health condition at arrival</th>
<th>Health status when surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>not available (n/a)</td>
<td>not available (n/a)</td>
</tr>
<tr>
<td>Extremely serious</td>
<td>Very poor</td>
</tr>
<tr>
<td>Very serious</td>
<td>Poor</td>
</tr>
<tr>
<td>Moderately serious</td>
<td>Good/fair</td>
</tr>
<tr>
<td>Not very serious</td>
<td>Very good</td>
</tr>
<tr>
<td>Not serious</td>
<td></td>
</tr>
</tbody>
</table>
The model used for the present work was developed both at a regional and at a single ED level. In particular, a logistic regression has been conducted for each area, using the 16 items as independent variables and searching, the best linear combination discriminant by means of the maximum likelihood method. The following table shows the estimated parameters $\beta$ logistic regression used at regional level ($\chi^2 = 255.3428$ ; df=16 ; p-value <.0001):

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Items</th>
<th>$\beta$</th>
<th>$\beta$ - std</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X_{01}$</td>
<td>Kindness of the registration staff</td>
<td>0.742</td>
<td>0.177</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td></td>
<td>Ability of the registration staff to understand the severity of</td>
<td>0.392</td>
<td>0.170</td>
<td>0.0206</td>
</tr>
<tr>
<td></td>
<td>the health problem</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$X_{02}$</td>
<td>Perceived waiting time</td>
<td>0.090</td>
<td>0.106</td>
<td>0.395</td>
</tr>
<tr>
<td>$X_{03}$</td>
<td>Satisfaction with waiting time</td>
<td>0.565</td>
<td>0.142</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>$X_{04}$</td>
<td>Comfort of the waiting room</td>
<td>0.099</td>
<td>0.142</td>
<td>0.4843</td>
</tr>
<tr>
<td>$X_{05}$</td>
<td>Cleanliness of the waiting room</td>
<td>0.243</td>
<td>0.165</td>
<td>0.1412</td>
</tr>
<tr>
<td>$X_{06}$</td>
<td>Involvement of the patient in care and decisions</td>
<td>0.036</td>
<td>0.075</td>
<td>0.6305</td>
</tr>
<tr>
<td>$X_{07}$</td>
<td>Doctors treated the patient like a person</td>
<td>-0.023</td>
<td>0.082</td>
<td>0.7799</td>
</tr>
<tr>
<td>$X_{08}$</td>
<td>Clarity of the information provided by doctors</td>
<td>0.635</td>
<td>0.168</td>
<td>0.0002</td>
</tr>
<tr>
<td>$X_{09}$</td>
<td>Kindness of the doctors</td>
<td>0.417</td>
<td>0.181</td>
<td>0.0213</td>
</tr>
<tr>
<td>$X_{10}$</td>
<td>Trust in doctors</td>
<td>0.262</td>
<td>0.133</td>
<td>0.0491</td>
</tr>
<tr>
<td>$X_{11}$</td>
<td>Nursing staff treated the patient like a person</td>
<td>-0.033</td>
<td>0.091</td>
<td>0.7135</td>
</tr>
<tr>
<td>$X_{12}$</td>
<td>Clarity of the information provided by the nursing staff</td>
<td>0.222</td>
<td>0.180</td>
<td>0.2178</td>
</tr>
<tr>
<td>$X_{13}$</td>
<td>Kindness of the nursing staff</td>
<td>0.567</td>
<td>0.183</td>
<td>0.0019</td>
</tr>
<tr>
<td>$X_{14}$</td>
<td>Trust in the nursing staff</td>
<td>-0.003</td>
<td>0.127</td>
<td>0.9796</td>
</tr>
</tbody>
</table>
Independent variables | Items | $\beta$ | $\beta$ - std | p-value
--- | --- | --- | --- | ---
$X_{16}$ | Level of collaboration between doctors and nursing staff | 1.782 | 0.177 | <.0001

The most significant predictor of evaluation with regard to the overall satisfaction on the part of the Basilicata ED user was the "level of collaboration between doctors and nursing staff". In other words, based on the sample results, the higher is the level of collaboration between doctors and nurses the higher is the global level of satisfaction experienced by the user. The kindness of the staff at the triage, the opinion about the waiting time before a visit by the doctor, the opinion about the clarity of information provided by doctors and the opinion about the competence of the nursing staff are all associated in a significant way (p-value <0.05) to the user's overall satisfaction with positive relationship ($\beta > 0$).

As far as the application of the optimization model to regional overall data is concerned, the algorithm used the average value of the global satisfaction item equal to 2,165 and the result of the procedure is shown in the chart below.
First of all, these results show that according to this optimization process improvement in overall satisfaction is complete up to a maximum of 11% as any other improvement of items predictors, subject to the constraints of the method, not produces most effect. An increase of 5% of the item "Level of collaboration between doctors and nursing staff" produces an increase of 1% of the item "improvement of overall satisfaction."

Looking at the diagram, it is to be pointed out that an improvement of 5% in the overall satisfaction can be achieved at least with an improvement of the combined items "kindness of the staff to triage", "opinion about the waiting time before a visit by the doctor", "level of collaboration between doctors and nursing staff" to 15%, along with the improvement of the item "opinion about the clarity of information provided by doctors" to 2%.

Regarding the application of the optimization model to the data of the individual points of ER, similarly to what happened at the level of the whole region, the "level of collaboration between doctors staff and nursing staff" always seems to be a significant predictor as for the increase of "improvement of overall satisfaction". The summary results of the individual points of ER are shown in the chart below.
At the San Carlo Hospital in Potenza, according to the optimization process used, overall satisfaction levels may increase of a maximum of 13%. The items that contributed significantly to an increase in the global satisfaction levels, besides the already mentioned "level of collaboration between doctors and nursing staff", are the "opinion about the kindness of the nursing staff" followed by "Rating of the waiting time before being visited by the physician" and the "Opinions about the kindness of the doctors", whereas the items "Ability of the triage staff to understand the severity of the health problem," "Opinion about the cleanliness the waiting room" "Involvement in decisions regarding care and treatment", "Feeling not be considered as a person by doctors" do not seem to have influenced in any way the overall satisfaction levels.
In the Matera Hospital ER, according to the used model, overall satisfaction levels may increase of a maximum of 8%, if an increase of 15% is registered for all the items except the "Opinions about cleanliness of the waiting room, "Feeling of not being considered as a person by doctors "and the" Opinions about kindness of the doctors". In the same ER the items that contributed significantly to an increase in the global satisfaction levels are the "level of collaboration between doctors and nursing staff", the "Opinion about the clarity of the information provided by the nurses" and the "ability of the staff at the triage to understand the severity of the health problem".
In the Policoro Hospital ER, according to the used model, overall satisfaction levels may increase of a maximum of 13% , if an increase of 15% is registered for all the items except the "Waiting time before being visited by the doctor," the "feeling of not being considered as a person by the doctor" and the" Opinion about the clarity of the information provided by the nurses". In this ER the "Rating of the waiting time before being visited by the doctor" contributes to the overall satisfaction earlier the “level of collaboration between doctors and nursing staff".
At the Lagonegro Hospital ER, according to the used model, overall satisfaction levels may increase of a maximum of 8%. The items "Time waited before being visited by the doctor", "Opinion about the cleanliness of the waiting room," "Feeling not be considered as a person by doctors ", "Opinion about the kindness of nurses " and finally " Trust in nursing staff" do not seem to have influenced in any way the overall satisfaction levels, whereas, the items "Opinion about the competence of nurses" and “level of collaboration between doctors and nursing staff” seem to have the same importance as far as the overall satisfaction levels are concerned.
The Melfi Hospital ER, according to the model used, is the one where most items have not influenced the overall satisfaction levels. A 5% increase in the overall satisfaction levels may be reached if an increase of 15% is registered for the items “level of collaboration between doctors and nursing staff” and "Feeling not be considered as a person by doctors".

<table>
<thead>
<tr>
<th>Increase in Overall ratings of care, % (Melfi Hospital)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$x_1$</td>
</tr>
<tr>
<td>1%</td>
</tr>
<tr>
<td>5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Increase in Overall ratings of care, % (Villa d'Agri Hospital)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$x_1$</td>
</tr>
<tr>
<td>1%</td>
</tr>
</tbody>
</table>

These items include:
- Courtesy of the registration staff
- Ability of the registration staff to understand the severity
- Perceived waiting time
- Satisfaction with waiting time
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
- Courteous of the waiting room
- Comfort of the waiting room
- Cleanliness of the waiting room
- Involvement of the patient in care and decisions
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
- Courteous of the registration staff
- Comfort of the waiting room
- Cleanliness of the waiting room
- Involvement of the patient in care and decisions
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
- Perceived waiting time
- Involvement of the patient in care and decisions
- Trust in nursing staff
- Level of collaboration between physician staff and nursing staff
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
- Physician staff treated the patient like a person
In the Villa d'Agri Hospital ER, according to the used model, overall satisfaction levels may increase of a maximum of 15%, if an increase of 5% is registered for the items "Opinion about the kindness of doctors", "kindness of the staff at the triage", "opinions about the clarity of the information provided by doctors" and "opinions about the competence of the nursing staff".

4. Conclusion

This paper deals with the description and analysis of a statistical and quantitative tool which has proved to be extremely useful in evaluating ED user’s satisfaction. Health care staff involved in emergency services can focus on specific aspects that could affect significantly overall satisfaction.

The survey conducted in the health care Basilicata organizations shows that the most important item as far as global satisfaction levels are concerned is the “level of collaboration between doctors and nursing staff”. The same result was reached in Tuscany, where a similar survey was carried out between September and October 2007. For both models, "overall ratings of care" and "willingness to return", the strongest predictor was again the “level of collaboration between doctors and nursing staff” (Marcacci, Nuti & Seghieri, 2010; Seghieri, Sandoval, Brown & Nuti, 2009).

This result is not surprising as other studies have demonstrated that a good nurse-doctor relationship has a positive influence on the organization in terms of reduced costs, improved patient care, economy of the decision-making process (National Joint Practice Commission, 1981; Schmalenberg et al., 2005) and decrease in patient morbidity and mortality (Aiken et al., 2002).

The results for the San Carlo Hospital of Potenza and the Matera Hospital are almost similar. This confirms the validity of this tool. Actually, both ERs related to the above Hospitals are placed in the
Basilicata network of emergency / urgency at the same critical level and, therefore, in general, they have the same needs and same characteristics.

In small areas, it is possible to find different needs that lead to different results. For example, in the Policoro Hospital, waiting times are very important in determining an increase in the overall satisfaction, which might depend on the fact that most of the accesses to this ER are registered in summer, situated as it is in a tourist town.

Then, starting from the results of the survey, which is not the simple listing of the positive and negative aspects of the regional health service, it is possible to identify what needs to be done in order to increase ER users’ level of satisfaction. Using sample surveys, describing and evaluating the results, therefore, encourage improvement processes for the governance of the local authorities themselves, making health professionals able to follow in the care more satisfactorily their patients.

Further studies are needed to understand which types of patients are more disappointed with the service they received. Case management (CM) is a commonly quoted intervention aimed at reducing Emergency Department (ED) utilization by “frequent users”, a group of patients that use ED at disproportionately high rates (Kumar & Klein, 2013).
References


Padgett DK, Brodsky B. Psychosocial factors influencing non-urgent use of the emergency room: a review of the literature and recommendations for research and improved service delivery - Social science & medicine, 1992


