

# Designing a Dynamic Performance Management System to support Local Health Authorities' Managers in facing patients mobility

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## **Abstract**

Patients mobility is a complex phenomenon *per se* which can be associated with several factors, often intangibles, driving the patients decision to move to another Region to get the expected health care treatment. In the last decades, a growing attention was paid to cross-country patients flows rather than movements across regional borders within the same country. In a regionalized health care provision system, such as the Italian one, this is a relevant issue that must be properly addressed. This paper suggests the adoption of a dynamics performance management approach to support public decision makers in outlining effective policies to cope with patient mobility.

**Keywords:** dynamic performance management system; health care; patients mobility

## **1. An introduction to patients mobility flows**

The free movement of patients or *patients mobility* – implying the access of health care services outside their residential area – can be investigated at two different levels. It can be analysed in terms of movement across regional borders within a given country or cross-border towards other countries.

In the last decades, studies primarily focused on cross-border flows of patients within the European Union (Brekke *et al.*, 2011) rather than on interregional movements. Such investigations flourished to guarantee patients freedom to choose among health care providers across all member states and get refunded from their national health care system. A recent EU directive (2011/24/EU) allowed EU citizens to seek care – recognised by the national health care system – wherever they want and from whatever provider available in any member state.

Data available on patients mobility between countries is extremely hard to collect. According to recent estimations (SEC 2006; Van Ginneken and Busse 2011) it counted for about 1% of overall public expenditure on healthcare. Although this phenomenon is still of relatively modest scale, it

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raises at the country level a series of issues on *how to plan and delivery sustainable care*. It may happen that certain countries and Regions receive high flows of patients, which can be considerable in some period of the year or for particular medical conditions. Consequently, quality, liability, safety and even the ethical dimension of health care treatments received abroad become more prominent (Palm and Glinos, 2010).

A study identified (Palm and Glinos, 2010) a mix of reasons why patients decide to seek care elsewhere linked to the specific situation of the patient, the medical needs and the availability of care at home and abroad. The authors also remarked the importance to distinguish between *a)* persons needing medical assistance while abroad for different reasons, from working to leisure, (*they first move, then need care*) from *b)* persons seeking medical care abroad intentionally (*they first need care, then move*). While for the first category the need for care abroad is incidental, for the others is more explicit and it requires a further investigation. For the second category, in fact, recurrent motivations may vary from searching for *prompt*, better *quality* or more responding patient's care treatments needed or desired (including when care is inexistent or even prohibited at home).

Contrary to the growing attention paid to cross-border patients flows within the EU, movements across regional borders within the same country received less attention. In a regionalized health care provision system, such as the Italian one, patients are free to move from one Region or Province to another. This phenomenon is recognised as *passive patients mobility*.

According to such system, a patient treated in a Region different from the one where he/she resides implies that such Region is financially compensated for the medical treatments provided to non resident citizens. On a annual basis, such financial resources are transferred by the State to each single Region, net of health care services residents received in other Regions.

If on one hand, such a mutual system allows the patients to free decide where to take a given health care treatment and it represents a strength of the National health care system, on the other hand at regional government level such decision is not free of consequences, for both the local economy and citizens, at least for two main reasons.

*First*, the annual amount of money transferred to other Regions can reach a considerable value, which can range in some cases from Eur 200 Million up to Eur 350 Million. Such figures, in particular in recession times, raise a high pressure on public decision makers as these resources represent a loss of economic growth opportunities they could fuel inside the Region.

*Second*, it leads to additional - difficult to quantify - social costs citizens have to sustain to get the desired health care treatments in another Region. Such social costs, often not refundable, mainly refer to travel and accommodation costs for both the patients and the accompanying person/s, and the related loss of working days associated with the period of the medical treatment.

As relatively little is known about patient mobility flows and its consequences for health care policies at regional level, this work aims to contribute towards to fill this gap in the literature.

Main research questions are the following:

- ✓ How can a policy maker face patients mobility?
- ✓ How can a Local Health Authorities' manager design effective patients mobility policies and gauge their sustainability in the medium-long time horizon?
- ✓ What is the role public and private health care providers should take to prevent local patients mobility?

In order to try to answer the above research questions, an inter-institutional perspective is suggested to design a Dynamic Performance Management System to support Local Health Authorities' Managers in outlining patients mobility policies. To this aim an analysis of a Local Health Authority based in a Sicilian Province was carried out.

The paper is organised as follows. After the brief analysis of the patients mobility provided in the introduction, an empirical analysis conducted on a Local Health Authority based in a Province of Sicily will be reported. Based on such findings a preliminary Dynamic Performance Management System to support Local Health Authorities' Managers in outlining patients mobility policies will be presented. Finally, concluding remarks will be also drawn. The above research agenda is expected to foster Local Health Authorities' Managers learning processes in outlining effective patients mobility policies.

## ***2. An empirical analysis of patients mobility flows in a Sicilian Local Health Authority***

Before presenting the specific context in which the study was carried out, a short introduction to the Italian and regional health care system and the role played by its main actors is first provided.

### **2.1. A short introduction to the Italian and regional health care system**

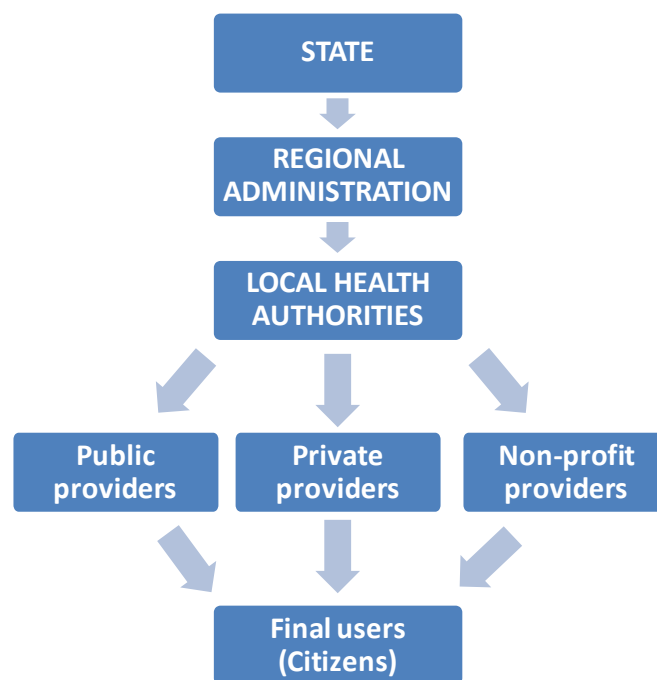
The Italian health care system is based on the principle that all persons have the right to receive the required health care treatments in spite of their social or economic position. This principle is remarked in the article 32 of the Italian Constitution. The cost associated with the care is fully

covered by the State, expect a small contribution “ticket”, which varies for each treatment provided and it is only paid by users with medium-high annual income.

The State and the Regions are in charge of the health care system. In particular, the State fixes the budget for the annual health care and the so called “minimum levels of medical assistance” (*Livelli essenziali di assistenza*), while the Regions make sure inhabitants receive the care treatments needed, with the required level of assistance, in their own territory.

In each Region, health care services are provided by both public and private providers through the coordination of Local Health Authorities (LHAs) .

At the regional level, according to the budget transferred centrally by the State for health care to the single Region, resources are allocated among the different LHAs operating in the territory. In Italy there are more that 150 LHAs, each of them is responsible for coordinating the delivering of healthcare services to the population living in a given area, which usually matches the Province.



**Figure 1 – A simplified picture of the relationships between main actors in the Italian Health care system**

The above picture is the result of the health care reforms introduced in the last two decades. Before 1992, LHAs operated as direct provider of health care services to residents living in a given geographical area. According to such a perspective both planning and delivering were

concentrated in one single public agency and other health care providers were involved when the LHA was not able to meet the demand.

Nowadays, LHAs role differs from the past. To some extent the New Public Management (NPM) movement influenced the decision to assign to LHAs a “steering” rather than a “rowing” (Osborne and Gaebler, 1992) role in the national health care system. Based on such a principle, LHAs focuses primarily on the strategic dimension of the “purchase” of appropriated health care services rather than on the direct “supply” of care. Consequently, big public hospitals were spin-off from the LHAs, thereby creating independent public hospitals able to compete with private providers to delivery services to patients.

In 2007 (ISTAT, 2007) only 35% of health care services were directly provided by LHAs, while most of healthcare services were produced by public independent hospitals and private providers.

The contribution of the NPM to the specific context of health care introducing decentralization, quasi-market and managerialism (Jommi et al., 2001; Anessi Pessina and Cantù, 2006) claimed to be twofold. On one hand, it improves the performance of the system in terms of “efficiency, effectiveness and responsiveness” and, on the other hand, it is likely to provide a “contribution to the achievement of public health goals and wider social objectives of equity within the health care system” (Robinson et al., 2005).

The reforms introduced after 1992 changed the architecture of the health care system by creating a “meso-level institution (the LHA) that focuses on purchasing rather than delivering healthcare services and governing the amount of public resources spent by public and private producers to satisfy the citizens’ health needs.” (Longo *et al.*, 2011).

However, health care reforms have subjected to a range of critics, generally focused on the lack of LHAs managerial effectiveness and managerial tools (France and Taroni, 2005; Longo *et al.*, 2011) and the absence of a real competitive system to improve the quality of the service envisaged by the NPM principles.

A recent study conducted by Longo *et al.* (2011) showed that LHAs managers are more oriented to focus on internal production and direct delivery of health care services rather than on the desired “steering” role previously described. According to this study the above behaviour is rooted in LHAs organisational culture associated with their traditional role of provider, which very often tends to completely absorb managerial attention. Furthermore, the lack of managerial tools and updated

data of the services provided by the public and private suppliers operating in the network weaken the expected LHAs steering function.

As consequence, the relationship between public and private suppliers of health care very seldom is characterized by a competitive principle envisaged by the NPM movement. In the last two decades, private actors gained a central role (ISTAT, 2007) in the health care system. Such a dominant role is often partially linked to the providers' high attractiveness. Instead, it is often the result of their consolidated position gradually acquired inside the system.

The above remarks question the validity or the appropriateness of the competitive arena the NPM approach aims to create between the private and the public health care providers operating in a given geographic area.

## 2.2. The relevance of patients mobility flows in Sicily

In 2010 public health care expenditures in Sicily was above Eur 8.500 Million, which places the Region among the highest health care spending in Italy. Although, such a significant amount of money is annually invested to support the health care system, still a prominent sum is transferred to other Italian Regions to cover the costs of health care services provided to Sicilian residents.

In the last 9 year period, as shown in table 1, patients mobility in terms of expenditures shows a slight decreasing trend. In 2011, the Sicilian government transferred 235 Million of Eur to other Italian Regions as more than 56.000 patients access health care services outside the Region.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Passive mobility towards other Italian Regions</b> <i>(Value in thousands of Euro)</i>	252.204	251.008	251.927	255.270	252.664	n.a.	209.535	238.000	235.000
<b>Active mobility towards Sicilian health-care providers</b> <i>(Value in thousands of Euro)</i>	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	51.000	50.000

**Table 1 - Passive and active patients mobility costs**  
(Source: Health Care Sicilian Regional Administration)

Such figures placed Sicily third from last in the passive patients mobility in Italy. Other regions suffering such phenomenon are Campania and Calabria, which are first and second in this specific ranking. The above three Regions shares their location in Southern Italy.

On the opposite side of this list, it is possible to identify health care providers located in the North of Italy. Among the most attractive regions are *Lombardia, Emilia Romagna* and *Tuscany*. In other words, patients from Sicily, Campania and Calabria who are searching for health care services in other parts of Italy, very often decide to fly to northern Italian Regions.

As discussed in the introduction, patients mobility flows are complex to detect as they can be associated with several factors, often intangibles (e.g., perceived quality of health care service), which drive the patients decision to move to another Region to get the expected health care treatment.

The main drivers of such phenomenon are also hard to understand as movements across regional borders within the same country traditionally received less attention. In Italy, only recently a National Agency for Regional Health Care Services (AGENAS, 2012) released a special issue investigating the different aspects of patients mobility and in the past highly fragmented studies were conducted (France, 1997).

In particular, according to AGENAS report three main drivers can be identified:

- a) *local proximity*, related to the choice of a given medical centre perceived by the patient as the most comfortable although it is not in his/her “formal” territory. In this case the comfort is associated with both the distance and the means of communication to reach the identified medical centre;
- b) *lack of high specialized health care services*. This is particularly recurrent for those services of high complexity that are provided by a bounded number of medical centres;
- c) *randomness*, causes associated to the mobility of people, such as work or study purposes or occasional trips.

Although the above three phenomena provide some lights on the reasons patients decide to search for health care services elsewhere, they do not fully explain the reasons why most of the Northern and Central Regions are net exporters of hospital care services and all the Southern Regions are net importers.

*Are there peculiar causes associated with the interregional mobility?*

A previous study (France, 1997) conducted on the interregional movement of paediatric and oncological patients in Italy, among the factors which make complex to deep understand patients mobility decisions, highlighted the distinctive characteristic of the health care service. According to the analysis health care raises a problem of information asymmetry, where “providers possess

more information on the services being transacted than do users". This can classify health care as a "credence" good implying that "the quality can never be fully and confidently assessed, even after consumption". This intangible feature distinguishes health care services from traditional ones which can be classified, indeed, as "experience" goods, where "quality can be assessed only after consumption is occurred".

This implies that users – where applicable – select a given health care provider based on its *perceived reputation* as a proxy of *perceived quality*. Very often the principal reason highlighted by Southern patients to cover considerable distances from their own Region is the *dissatisfaction with the quality of care obtained* locally or in the nearby Regions. Complaints often referred to a lack of *well-equipped or specialised facilities, well qualified doctors, long waiting lists*. As evidence of the health care as "credence" good, France (1997) also recognised mobility patients cases of healthy or banal problems not requiring complex facilities and easy treatable in the home Region were not infrequently. This is also a measure of how poor the reputation of home health care providers is.

However, reputation is not always a proper proxy variable of health care service quality. Proof of this phenomenon is demonstrated by the fact that second diagnoses made by out of the Region providers in most cases confirm the diagnoses made in the home Region. Furthermore, the capacity of facilities in southern Regions seems also adequate for the demand expressed for many services. More justifications appeared to some extent due to the fewer high-tech advanced equipments and related facilities in the South which may boost in some cases waiting lists.

The above remarks suggest as possible hypothesis underlying the interregional patients mobility phenomenon that southern Regions tend to be less endowed than those in the North of Italy:

- *Hypothesis 1*: a lack of available capacity or the absence of a given health care service is the main cause of patients mobility flows towards other Provinces;
- *Hypothesis 2*: a lack of perceived quality of health care services (e.g. long waiting lists) is the main cause of patients mobility flows towards other Provinces.
- *Hypothesis 3*: a performance management system discarding the role played by strategic resources and drivers of patients mobility flows towards other Provinces can lead to ineffective policies and control mechanisms.

In order to test the above hypotheses, an empirical analysis was carried out in a Sicilian Local Health Authority.



### **2.3 An empirical analysis of patients mobility flows in a Sicilian Local Health Authority**

Last health care reform approved by the Sicilian parliament in 2009 identified 9 LHAs (Azienda Sanitaria Provinciale – ASP), one for each Province.

The general manager of each LHA is responsible for the delivery of health care services provided by both public and private providers inside the Province. On the basis of the annual budget assigned by the Regional Health Care Councillorship, the general manager is in charge to directly contract with private hospitals, previously accredited by the health care system, the supply of health care treatments to be delivered.

The general manager is supported by a health care and an administrative director.

The investigated LHA *Alfa* is located in the West-side of Sicily, it embodies more than 270.000 inhabitants divided in 22 municipalities and it covers a geographical area above 2.128 square km.

The LHA is divided in 2 hospital districts in which operate 6 public independent hospitals and 2 private providers.

The analysis is focused on the patients mobility flows of the biggest health care district of the Province, which counts more than 120.000 inhabitants divided in 4 municipalities.

In 2010, 676 beds were available for acute treatments for both ordinary and day hospital admissions, while only 164 beds were dedicated to rehabilitation and long stay hospital.

In the same period, the care treatments received by people living in the investigated area, both inside the Province and in other part of Italy, were 60.978 leading to a cost of Eur 142 Million. More than 22.000 health care treatments (37% of the total) were provided outside the Province, which implied a transfer of Eur 64 Million (45% of the total health care cost) to other Italian public administrations.

The patients mobility flow can be further divided in 'intra' and 'extra' regional mobility. In 2010, intra-regional mobility inside the Sicilian Region recorded 18.676 cases (30.6% of the total patients treatments) implying a transfer of Eur 50 Million (35,3% of the total regional health care cost) to other Sicilian Provinces. Extra-mobility, e.g., patients treated outside Sicily, counted almost 4.000 medical treatments (6,4% of the total cases) generating a disbursement of Eur 14 Million (9,7%) to other Regions.

By analysing the intra-regional mobility flows, patients decided to move primarily towards the two biggest Sicilian Provinces. Catania and Palermo registered respectively 8.404 and 3.777 hospital admissions, equal to the 65% of the total intra-regional mobility. A minor role is played by the

providers operating in the Provinces of Enna, Agrigento and Ragusa, which treated almost the 30% of the total intra-regional mobility flows.

The extra-regional mobility is dominated by 7 Regions mainly located in the North of Italy, such as Lombardia, Emilia Romagna, Lazio, Piemonte, Veneto, Tuscany and Liguria. More than 1/3 of patients selected Lombardia's hospitals as main health care providers, giving rising a money transfer from Sicily to Lombardia health care system of Eur 5,2 Million. The other 6 Regions attracted the 58,4% of the remaining patients, generating a money outflow of Eur 7,6 Million.

By analysing 15 of the top 30 treatments leading to passive mobility flows, classified by Diagnosis-Related Groups (DRG), it emerges that people move to another LHA's providers to face primarily diseases related to cardio-circulatory system, musculoskeletal and connective tissue disorders, nervous system, myeloproliferative and cancer.

	DRG code (based on National Health care system)	Typology of treatments	Number of cases	Value in Million of Eur
1	517	Cardiovascular operation with stent	353	2,4
2	209	Operations on main joints and implantations of lower limbs	175	1,5
3	410	Chemotherapy not associated with a secondary diagnosis of Leukaemia	670	1,4
4	462	Rehabilitation	335	1,4
5	012	Degenerative diseases of the nervous systems	287	1,1
6	483	Tracheotomy	26	1,1
7	516	Cardiovascular operation without stent	136	1,1
8	359	Uterus Operations	499	1,1
9	544	Replacement of upper limbs or lower limbs	107	1
10	371	Caesareans	424	1
21	127	Heart failure and cardiogenic shock	184	0,5
24	473	Acute Leukaemia without surgical operation (age >17 yrs)	30	0,5
27	430	Psychos	189	0,5
28	001	Carcinoma (age > 17 yrs)	43	0,5
30	403	Lymphoma and not acute Leukaemia	80	0,4

**Table 2. Medical treatments related to passive patients mobility flows <sup>1</sup>**

<sup>1</sup> Source: Alfa Local Health Authority data. It is worth noting that in table 2 after the top 10 treatments acquired by residential people from other Provinces' health care providers, five additional cases are considered. These cases (21st,

According to the analysis reported in the previous pages some of the main reasons underlying the decision to search for out of Province medical care is based on the *lack of high specialized health care services*, rather than *local proximity* or even *randomness* (AGENAS, 2012). A previous study (France 1997) also remarked as the *dissatisfaction with the quality* of care obtained locally is the recurrent reason Southern patients cover considerable distances from their own Region to get the desired health care treatments. One of the causes of the poor quality of health care is based on the perceived long waiting lists and low capacity endowment (e.g., qualified human resources and updated equipments).

However, the study on the active patients mobility flows recorded in the investigated Province, i.e., those patients coming from other Italian Provinces or Regions to receive the desired medical treatments, shows some counterintuitive figures.

In fact, by analysing the top 30 treatments provided to out of Province patients it emerges that most of them overlap and exceed those reported in the passive patients mobility flows.

DRG code	Typology of treatments	Passive mobility			Active mobility		
		rank	Number of cases	Value in Million of Eur	Number of cases	Value in Million of Eur	rank
517	Cardiovascular operation with stent	1	353	2,4	--	--	-
<b>209</b>	<b><i>Operations on main joints and implantations of lower limbs</i></b>	<b>2</b>	<b>175</b>	<b>1,5</b>	<b>188</b>	<b>1,6</b>	<b>1</b>
410	Chemotherapy not associated with a secondary diagnosis of Leukaemia	3	670	1,4	--	--	-
462	Rehabilitation	4	335	1,4	--	--	-
012	<i>Degenerative diseases of the nervous systems</i>	5	287	1,1	133	0,6	5
483	Tracheotomy	6	26	1,1	9	0,4	9
516	Cardiovascular operation without stent	7	136	1,1	--	--	-
359	Uterus Operations	8	499	1,1	--	--	-
544	Replacement of upper limbs or lower limbs	9	107	1	--	--	-
371	<i>Caesareans</i>	10	424	1	104	0,2	20
127	<i>Heart failure and cardiogenic</i>	21	184	0,5	81	0,2	17

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24th and 27th, 28th and 30th) are important to take into account as they are also in the list of the top 30 DRG of active patients mobility flows that will be discussed here above.

	<i>shock</i>						
<b>473</b>	<b><i>Acute Leukaemia without surgical operation (age &gt;17 yrs)</i></b>	<b>24</b>	<b>30</b>	<b>0,5</b>	<b>34</b>	<b>0,5</b>	<b>7</b>
430	<i>Psychos</i>	27	189	0,5	70	0,2	27
<b>001</b>	<b><i>Carcinoma (age &gt; 17 yrs)</i></b>	<b>28</b>	<b>43</b>	<b>0,5</b>	<b>78</b>	<b>0,8</b>	<b>2</b>
403	<i>Lymphoma and not acute Leukaemia</i>	30	80	0,4	35	0,2	28

**Table 3. Treatments related to *passive* vs *active* patients mobility flows**

Table 3 shows in three cases (DRG number 209, 473 and 001) that LHA health care providers attracted a higher number of out of Province patients compared to the those local patients who decided to search for the same treatment in another Province.

Furthermore, it highlights other cases (see, for instance, DRG number 012, 371, 430 and 403) in which local health care services were significantly delivered to out of Province patients, although a large number of persons migrated to other health care centres.

The above analysis seems to reject the hypothesis number 1 (a lack of available capacity or the absence of a given health care service is the main cause of patients mobility flows towards other Provinces), as the LHA public and private health care service providers are able to delivery in some cases more treatments than those requested by residents (see DRGs number 209, 473 and 001 in table 3).

Hypothesis number 2 (a lack of perceived quality of health care services (e.g. long waiting lists) is the main cause of patients mobility flows towards other Provinces) is not possible to test, as it requires a patients survey on the real causes of the mobility not available at this stage of the research.

Concerning the hypothesis number 3 (a performance management system discarding the role played by strategic resources and drivers of patients mobility flows towards other Provinces can lead to ineffective policies and control mechanisms), it is worth to describe the policies the Sicilian Councillorship of Health adopted in the last few years to face the patients mobility flows.

The reduction of the patients mobility flows at interregional level is a strategic objective the Sicilian Councillorship of Health aims to pursue. In the last years, the Sicilian Councillorship of Health identified some policies to contrast such a phenomenon. Initiatives carried out addressed both the public and the private hospitals and joint measures.

In the public hospitals context relevant investments were oriented, for instance, to rationalise and to selectively increase the capacity of the regional health care services according to a so called *hub*

*and spoke model*. Generally, this model of health care service delivery requires that formal links are established between the providers of lower level capability services and the providers of higher level capability services. Links between lower and higher level services aims to ensure that smaller services – often in decentralised municipalities – are supported and that the sustainability of all networked services is potentiated. Another recent initiative aims to create a unitary hospital booking admission centre at the regional level. In such a way patients can easily know the most close health care centre for a given medical treatment and the corresponding waiting time.

In the private health care sector, in the last three years specific measures were introduced to face passive patients mobility flows. In particular, in 2010, a list a main DRG treatments taken from Sicilian residents in other Italian Regions was released and an extra budget to private hospitals was assigned (see decree n. 957 dated 2010 April 2<sup>nd</sup>). Such a policy envisaged the possibility for private hospitals to get from the Regional Health care administration additional financial resources, ranging from a minimum of the 50% up to the 70% of the regular DRG cost, in case the treatments provided in 2010 complied with the following two rules. First, the treatments must be included in the pre-assigned DRG list. Second, to get the 70% of the DRG cost, the annual passive patients mobility flow must record at regional level a 20% reduction.

In June 2012, the Sicilian Councillorship of Health reiterated a similar policy (see decree dated 2012 June 4<sup>th</sup>). The measure assigned a maximum budget for each Sicilian Province (which accounted in total for Eur 15 Million) and set the refund up to the 70% of the DRG treatment cost. Such an amount is recognised only for those private hospitals able to provide in 2012 a number of pre-identified DRGs treatments higher than the average number of DRGs delivered in the previous three years (2009-2011).

In July 2013, the same policy with minor changes has been introduced (see decree dated 2013 July 22<sup>nd</sup>). The measure assigned a maximum budget of Eur 9 Million and set the refund up to the 70% of the DRG treatment cost only for those private hospitals able to deliver in 2013 a number of pre-identified DRGs treatments higher than the average number of DRGs supplied in the previous four years (2009-2012).

The passive patients mobility costs reported in table 1 shows a slightly decrease (Eur 3 Million) in the amount of financial resources transferred from the Sicilian government to other Italian Regions. Due to the lack of available interregional mobility flows data it is not possible to detect the effect of the recent implemented measures.

However, the above discussed health care policy to face the passive patients mobility flows through the allocation of financial resources to private health care providers aimed at reducing the pre-defined list of DRG treatments shows, indeed, some limitations.

First of all, the above policy assumes that private health care providers possess unexploited production capacity, which can be oriented to reduce patients mobility flows in the identified DRG treatments.

Second, under saturated capacity, in terms of human resources, beds and equipments, private hospitals could be more inclined to favour the delivery of the identified DRG treatments, instead of the contracted one, as they may generate a higher contribution margin. This undesired private hospitals behaviour may contribute to reduce the quality of the regional health care service.

Third, focusing primarily on the financial resources to be allocated in each single Province to face passive patients mobility flows is undesirable for at least three main reasons:

- it does not take into account the underlying processes leading to a patients mobility flow. In other words, it does not result from an investigation of the real cause-and-effect relationships giving rising the decision to search for medical treatments in another Region;
- it does not set indeed real targets, but instead it merely fixes threshold levels in absolute financial terms untied with the delivery of a given mix of desired DRG treatments;
- it also disregards the role a LHA's general manager may play in facilitating the strategic communication on how to design a sound health care system between the regional Councillorship of Health and the LHAs on one side, and the LHAs and the private health care providers operating in each Province.

Other concerns refer to the delays characterising the process and the time horizon taken into account by the health care policy. As previously discussed, the Sicilian Councillorship of Health used to issue the annual policy to tackle the patients mobility flows in the middle of the year, though a semester is already elapsed. Such measures also require within 45 days from its release that LHAs' general managers contracted the annual DRG treatments private hospitals have to delivery.

As consequence of such a compliance oriented approach, the majority of private hospitals – in particular, those whose capacity is fully exploited – do not have any real stimulus to plan new investments to face patients mobility flows on the basis of an annual basis. This is particularly true, if we consider that additional investments in health care require a medium-long term payback period.

Furthermore, the role played by the LHA's general manager in the design and implementation of health care policies to face patients mobility flows is almost neglected. As remarked by previous research (Longo *et al.* 2011) LHAs managers often adopt a "rowing" rather than a "steering" function.

In order to address the above issues it is suggested adopt a perspective aimed to investigate the dynamic relationships between main drivers of patients mobility flows and related strategic resources. Such an approach is likely to support the design of a Dynamic Performance Management System, which may enable public decision makers to implement effective policy to cope with passive patients mobility.

### ***3. Designing a Dynamic Performance Management System to support public decision makers to outline patients mobility policies***

The passive patients mobility flows affecting the regional health care system described in the previous pages showed some recurrent peculiarities of the public sector. In particular, it is possible to detect several institutions, from the State to the local public and private health care providers, whose roles and interactions at different level are likely to affect the performance of the system. To proper plan the achievement of the desired objects with the often scarce available resources, such complexity must be properly framed and managed. In other words, interrelationships between relevant variables affecting the performance of the system must be made explicit and policy levers on which decision makers can act must be clearly identified.

The investigated phenomenon is also dynamic, as the performance gauged in an observed time period is the result of past decisions made by different actors (with evolving goals) in different moments of the year(s).

In this context, the adoption of formal performance management systems unable to cope with the above peculiarities proved to result in an *illusion of control* (Bouckaert and Peters, 2002; Van de Walle and Roberts, 2008). In particular, such an approach frequently led to unintended consequences, such as (Bianchi, 2010): an increase of *bureaucratization*; a *myopic definition of goals and indicators*; a *lack of coordination* between the political and managerial level, as well as among different institutions involved in the delivery of a public services; a *prevailing view on the single player* rather than on the all system and an *unfocussed communication* to the community of the outcomes associated to undertaken policies.

On the light of the above remarks, in the investigated context, a more systemic and learning-oriented approach to planning should replace formal and static performance systems. In other words, the simplistic compliance framework (e.g., passive observance of the norms) frequently underlying the structure of a performance system in public organisations must be replaced with an explicit picture of the dominant cause-and-effect relationships between relevant phenomena able to influence the performance of both the single actor and the whole system.

To support public decision makers to understand the complex and dynamic net of variables underlying the performance of the investigated system and to identify alternative strategies to adopt, the use of System Dynamics models (Forrester, 1961; Sterman, 2000; Morecroft 2007; Warren 2008) can aid the design and the implementation of a dynamic performance management system (Bianchi and Montemaggiore 2008; Bianchi 2010; Bianchi 2012). System Dynamics models demonstrated to effectively support the design and implementation of public health policies in different contexts (Vennix and Gubbels, 1994; Wolstenholme, 1999; Lane and Huseman, 2008).

A dynamics performance management system (Bianchi, 2012) is characterised by the interplay between three different, but interconnected, perspectives:

- a) the *objective view* defines “*what*” is the object of the performance management system;
- b) the *instrumental view* identifies “*how*” (e.g., means) to affect the defined object;
- c) the *subjective view* focuses on “*who*” is responsible for the achievement of the goals in the involved organisations and inside the single organisation.

The *object view* aims to first identify the *client(s)/user(s)* with whom an organisation interacts and the desired *products/services* to be delivered. Based on such analysis, it is then possible to make explicit the main objects (or *end-results*) the organisation should plan and the proper indicators to gauge its performance. Such a view also requires that management processes and related activities leading to the above end-results must be made explicit.

The *instrumental view* makes explicit the means able to drive the performance of the investigated system. Although such means refer to the endowment of *strategic resources*, tangible and intangible, an organisation is able to accumulate over time (e.g., through acquisition or internal building processes), only *performance drivers* impact on *end-results*. Strategic resources can be modelled as stock variables, which varies as result of the accumulation and depletion processes over time. Performance drivers outline the capability of an organisation, in relationship with the performance of external counterparts, to influence end-results. For example, the driver



organisation attractiveness takes into account not only the capability of the firm to provide a high quality health care service (stock variable), but also the quality of a “competitor” health care provider. In other words, if the quality of health care service of a given organisation is higher than a direct competitor, the organisation will record a greater attractiveness, which in turn is likely to affect new patients (*end-results*).

The *subject view* makes a link between the previous dimensions, as it aims to identify for each responsibility area the objectives/performance targets to plan and the related activities to carry out.

The introduction of the above framework to support alternative strategies to face passive patients mobility flows also implies the adoption of an “inter-institutional” perspective (Bianchi 2010), as public policies cannot be evaluated at the level of a single organisation, but instead the performance must be assessed in relation to the effects produced on the wider system. In the investigated context, the political player (e.g., the Regional Council of Health) runs the role of ruler and coordinator in a system whose performance is affected by both public and private actors. Modelling the above interrelationships, and the role played by the public decision maker inside the system, can facilitate the coordination and implementation of the identified strategy between the Regional administration and various private institutions.

In order to apply the *dynamics performance management* framework discussed here above to the passive patients mobility flows through the ‘lenses’ of the Regional Council of Health expected *end-results* must be identified. They may refer to a change in:

- Sicilian patients treated locally;
- Sicilian patients treated out of the Region;
- Financial resources, associated to patients mobility towards other Regions;
- Perceived quality of the health care services;
- Regional health care Image.

In order to properly assess the effect generated by the adopted policies, public decision makers should make explicit those *performance drivers* which are able to influence *end-results*. Possible *performance drivers* are:

- the accessibility to health care services;
- the health care service quality;
- waiting list time,

which all together are likely to affect the attractiveness of the regional health care system.

To positively impact on the above *performance drivers*, it is necessary to detect those health care system's strategic tangible and intangible resources to build up and coordinate through regional health care policies. Such resources could be referred to:

- Financial resources;
- Number of beds available in LHAs;
- Perceived quality of the health care services;
- Sicilian patients treated locally;
- Sicilian patients treated out of the Region;
- Public hospitals;
- Private hospitals;
- Regional health care Image.

An overview of the above described three-views is depicted in Figure 2.

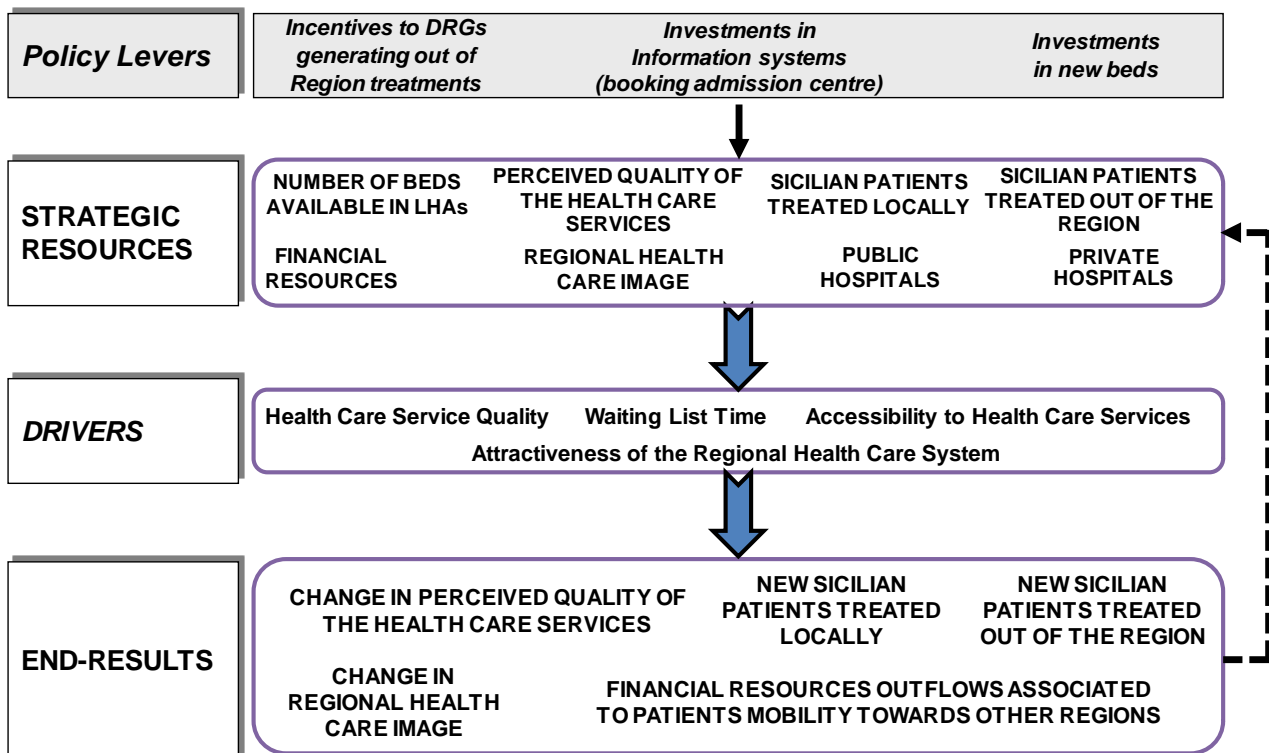
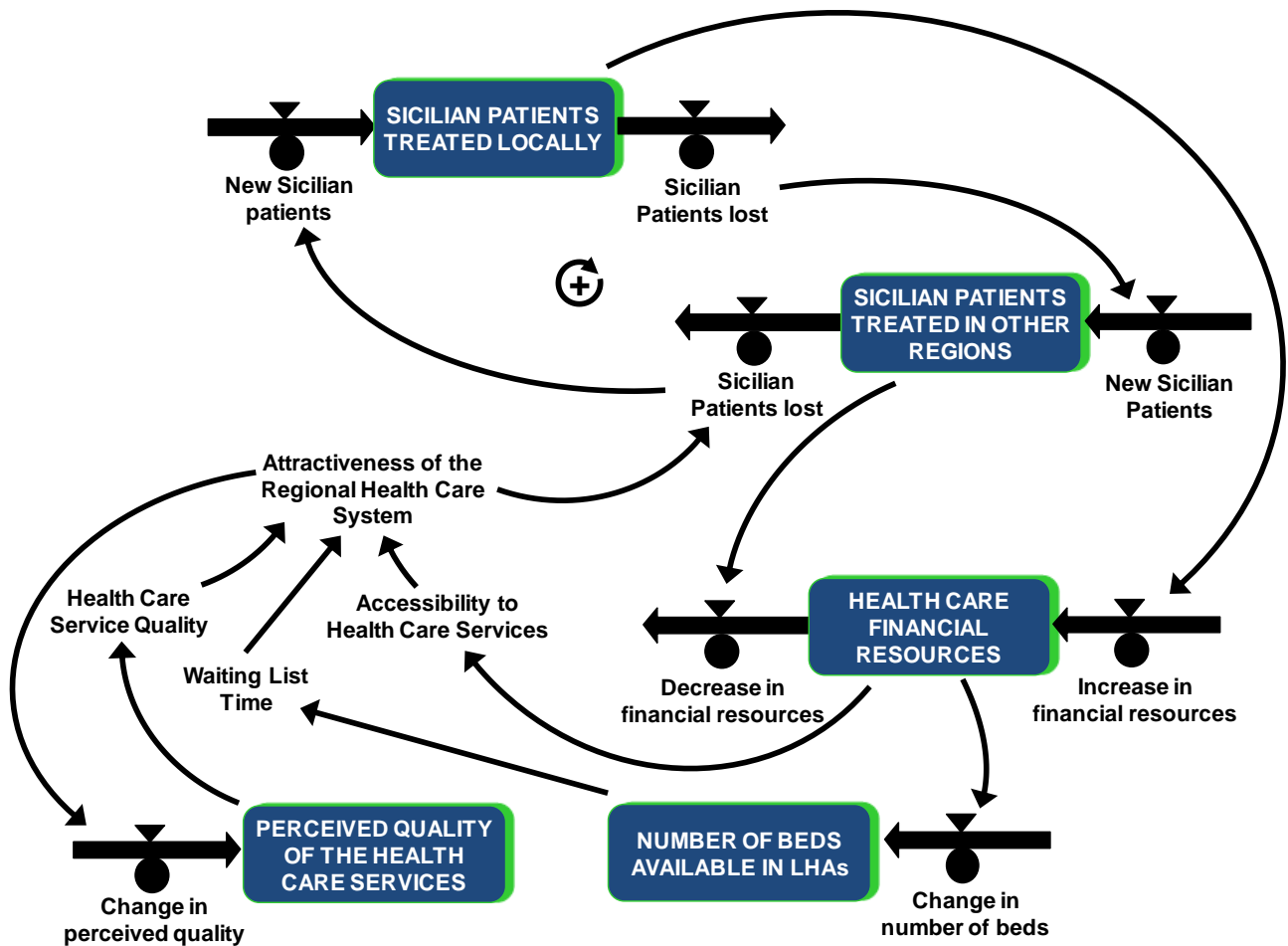


Figure 2 – Framing health care policies based on a dynamic performance management system



**Figure 3 – Simplified accumulation and depletion processes affecting health care *strategic resources, performance drivers and end-results***

Figure 3 shows a simplified picture of the cause-and-effect relationships resulting from the introduction of the dynamics performance management approach in designing health care policies to face passive patients mobility. Investments in *a)* information systems (booking admission centre), *b)* new beds and *c)* incentives to DRGs generating out of Region treatments are likely to boost the “attractiveness of the regional health care system”, which in turn give rise a change in the “perceived quality of the health care services” and in the correlated strategic resource (perceived quality of the health care services). A high “attractiveness of the regional health care system” is likely to drain the stock of “Sicilian patients treated in other regions” thereby increasing “new Sicilian patients treated locally”. As less Sicilian patients are treated in other Regions more “health care financial resources” can be invested in the above three policies. The above described relationships show a reinforcing mechanism (reinforcing feedback loop) which may contribute over time to support the pursue of the desired objective.

#### 4. Concluding remarks

This paper aims to show the benefits of introducing a dynamic performance management system logic to support public decision makers in outlining effective patients mobility policies.

The use of SD modeling can enhance the design of a performance management system, as it is likely to support decision makers in understanding how strategic resources accumulation and depletion processes affect performance drivers, which in turn influence end-results. By making explicit strategic assets accumulation and depletion processes decision makers can also identify those policy levers on which to act to pursue the desired objectives.

#### 5. References

- Agabiti N, Davoli M, Fusco D, Stafoggia M, Perucci CA, 2011. Comparative evaluation of health services outcomes. *Epidemiologia e Prevenzione*, 35 (2 Suppl. 1): 1-80.
- AGENAS (National Agency for Regional Health Care Services). 2012. The Health Mobility (La Mobilità Sanitaria), Monitor, N. 29, quarter report.
- Anessi Pessina E, Cantù E. 2006. Whither managerialism in the Italian National Health Service? *Int J Health Plann Manage* 21(4): 327–335.
- Bianchi C. 2010. Improving performance and fostering accountability in the Public Sector through System Dynamics modelling. From 'external' to an 'internal' perspective. In Public Sector Applications of the System Dynamics Approach, *Systems Research and Behavioral Science*, 27(4): 361–384.
- ISTAT. 2007. Health for All—Italy. ISTAT: Rome
- Bianchi C. 2012. Enhancing Performance Management and Sustainable Organizational Growth through System Dynamics Modeling, In: Groesser, S. N. & Zeier (Eds): *Systemic Management for Intelligent Organizations: Concepts, Model-Based Approaches, and Applications*, Chapter 8, Springer, pp 143-161
- Bouckaert G, Peters BG. 2002. Performance Measurement and Management. The Achilles' Heel in administrative modernization. *Public Performance and Management Review*, 25(4): 359–362.
- Brekke KR., Levaggiy R., Siciliani L., Straume OR. 2011. Patient Mobility, Health Care Quality and Welfare, No 8559, CEPR Discussion Papers
- Cislaghi C., Morandi I., DiVirgilio E., Tavini G. 2009. La mobilità ospedaliera, in L'attività ospedaliera: dati e riflessioni. *I quaderni di Monitor*, 5° suppl., 24: 120-130.
- Directive 2011/24/EU of the European Parliament and of the Council of 9 March 2011 on the application of patients' rights in cross-border healthcare.
- European Commission, *Consultation regarding Community action on health services*, SEC (2006) 1195/4, 26 September 2006.
- Fabbri D., Robone S., 2010. The geography of hospital admission in a national health service with patient choice. *Health Economics*, 19: 1029-1047.
- Forrester JW. 1961. *Industrial dynamics*, MIT Cambridge Press, Cambridge, MA
- Fox CJ. 1996. Reinventing government as postmodern symbolic politics, *Public Administration Review*, 56(3): 256–262.

- France G, Taroni F. 2005. The evolution of health-policy making in Italy. *J Health Polit Policy Law* 30(1-2): 169-187.
- France G. 1997. Cross-border flows of Italian patients within the European Union, *European Journal of Public Health* 7, Supp: 18-25.
- Glinos IA., Baeten R. 2006. A literature review of cross-border patient mobility in the European Union, *Observatoire social européen*.
- Glinosa IA, Baetenb R., Maarsea H., 2010. Purchasing health services abroad: Practices of cross-border contracting and patient mobility in six European countries. *Health Policy*, 95(2-3): 103-12. *Health Data* 2007.
- Lane D, Huseman E. 2008. System dynamics mapping of acute patient flows, *Journal of the Operational Research Society*, 59: 213-224.
- Longo F., Salvatore D., Tasselli S. 2011. Are public health authorities able to “steer” rather than “row”? An empirical analysis in the Italian National Health Service, *International Journal of*
- Longo, F., DelVecchio M., Lega F. 2010. *La sanità futura*, Egea, Milano.
- Mattei P. 2006. The enterprise formula, new public management and the Italian health care system: remedy or contagion? *Public Administration* 84(4): 1007-1027.
- Morecroft J. 2007. *Strategic modeling and business dynamics*. Chichester, Wiley
- OECD. 2007. Developments on health work at the OECD relevant to SHA implementation. OECD
- Osborne D, Gaebler T. 1992. *Reinventing Government: How the Entrepreneurial Spirit Is Transforming the Public Sector*. Addison Wesley: Reading, MA.
- Osborne D, Gaebler T. 1992. *Reinventing Government: How the Entrepreneurial Spirit Is Transforming the Public Sector*. Addison Wesley: Reading, MA
- Palm W. and Glinos IA., 2010, Enabling patient mobility in the EU: between free movement and coordination, in Mossialos, E., Permanand, G., Baeten, R., Hervey, T. (eds.), *Health Systems Governance in Europe : the role of EU law and policy*, Cambridge University Press, Cambridge, chapter 12, pp.509-560.
- Propper C, Damiani M, Leckie G, Dixon J, 2007. Impact of patients’ socioeconomic status on the distance travelled for hospital admission in the English National Health Service. *Journal of Health Services Research & Policy*, Vol 12 No 3: 153-159.
- Robinson R, Jakubowski E, Figueras J. 2005. Organization of purchasing in Europe. In *Purchasing to Improve Health Systems Performance*, Figueras J, Robinson R, Jakubowski E (eds). McGraw-Hill International: New York.
- Salvatore D. 2006. Physician social capital: Its sources, configuration, and usefulness. *Health Care Management Review*, 31(3), 213-222.
- Sterman JD. 2000. *Business dynamics: systems thinking and modeling for a complex world*, Irwin McGraw-Hill, Boston
- Van de Walle S, Roberts A. 2008. Publishing performance information: an illusion of control? In *Performance Information in the Public Sector*, Van Dooren W, Van De Walle S (eds), Mac Millan: New York; 211- 226.
- Van Ginneken E., Busse R. 2011. Cross-border healthcare data, in Wismar M., Palm W., Figueras J., Ernst K., van Ginneken E. (eds.), *Cross-border Health Care in the European Union*, European Observatory on Health Systems and Policy, chapter 9, pp. 289-340.
- Vennix J, Gubbels J. 1994. Knowledge elicitation in conceptual model building: a case-study in modelling a regional Dutch health care system. In *Modeling For Learning*, Morecroft J, Sternam J (eds). Productivity Press: Portland, Oregon; 121-145.
- Warren K. 2008. *Strategic management dynamics*, Wiley, Chichester

Wolstenholme E. 1999. A patient flow perspective of U.K. health services: exploring the case for new 'intermediate care' initiatives, *System Dynamics Review*, 15(3): 253–271.