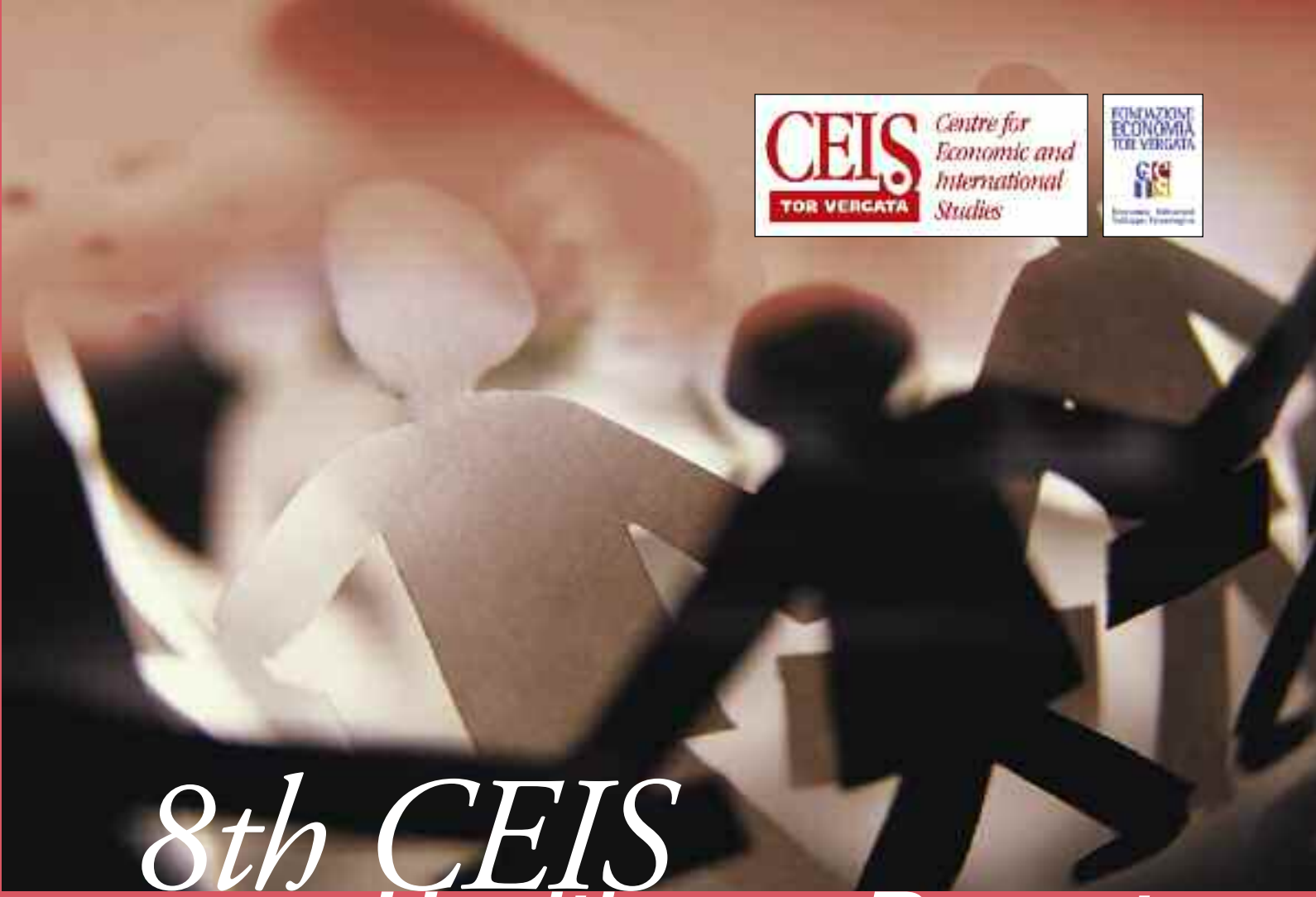

CEIS Centre for Economic and International Studies
TOR VERGATA

FONDAZIONE ECONOMIA TOR VERGATA

8th CEIS Healthcare Report

Welfare Options and Policy Integration

Università degli Studi
di Roma "Tor Vergata"

Edizioni Health Communication

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8th CEIS
Healthcare Report

The 8th edition of the Health Report by the CEIS –Fondazione Economia Tor Vergata, Tor Vergata University of Rome, is the result of a partnership with companies looking to improve their competencies with respect to the healthcare system.
The publishing and circulation of the Report among healthcare operators and experts, and access to the dedicated website, has been made possible thanks to the financial support and commitment of:

- Biogen Idec
- Boehringer Ingelheim Italia
- Fondazione MSD
- GlaxoSmithKline Italia
- Janssen
- Johnson&Johnson Medical
- Eli Lilly
- Pfizer

The project partners share with the CEIS Fondazione Economia Tor Vergata the need to provide healthcare operators and government authorities with scientific information on which to ground their decisions.
The aim of the Report however is also that of disseminating data on the performance of the healthcare system, and therefore targets the general public, community organisations, the world of business and, generally speaking, all the healthcare system stakeholders.

The report puts together the work carried out by the researchers at the CEIS (Faculty of Economics of Tor Vergata University of Rome), who have conceived, designed and written the texts, also providing for an English language version.

8th CEIS Healthcare Report

Editorial note

Editorial note

The CEIS Health Report, which has now reached its 8th edition, is an initiative launched in 2003 with the dual purpose of disclosing information about the activities of the researchers at the "Tor Vergata" Rome University in the field of health economics, policies and management and, at the same time, of supplying elements supporting the health policies, being convinced that the governance of such a complex organization as the health system requires continuous, scientifically rigorous and independent analyses and in-depth studies.

The growing attention paid to the Report by the stakeholders of the health system, but also by the scientific community (the Report is also published in English to promote its circulation abroad) and its success within the context of the research effort designed to interpret the evolution of the Italian health system, confirm that the Report has succeeded in its objective.

The Report is founded on a quantitative approach, out of respect for both the prevailing vocation of the researchers who develop it and the hope that the resulting vision might be based on a rigorous statistical approach. In fact, the Report has always endeavored "to call upon data to speak".

Over the years, the users of the Report have multiplied, but they all concur that it would be quite expedient to have access to more regularly updated statistical information as well as to the outcome of the analyses of current health policies.

This convinced me that the volume was no longer sufficient. With a view to improving both the accessibility and the timeliness of the analyses, with its 8th edition the Health Report has progressed further, being enriched by new tools.

In particular, the wealth of statistics has been extrapolated from the paper volume and stored in a databank that may be accessed on line through a dedicated website, while the information has been organized by macro areas and may be referred to through a thematic index. Every single datum that has been analyzed and suitably processed can be accessed through monothematic tables showing the information in both table and graphic form. Furthermore, each table has been provided with an explanatory text that permits a proper interpretation of the relative data. This novel approach allows the databank to be brought continuously up to date, thereby ensuring timely information. Besides, users may download the tables on their PC in order to use them directly to back up their own analyses.

The areas of analysis of the Report have been enriched with respect to the past edition. The socio-economic reference framework is backed up by an area devoted to the epidemiological context. In their turn, the areas devoted to the (hospital, residential, territorial/outpatient, specialized, pharmaceutical) healthcare systems are backed up by a "chapter" devoted to the welfare services, together with a general overview of the welfare system that also comprises health.

Just as before, there are the areas devoted to the health spending and financing analysis, as well as the area devoted to the measures that are to ensure the fairness and efficiency of the system.

Finally, the Health Report analyses the impact of the health sector on the national economy as well as its contribution to the latter, particularly though a review of the performance of both the pharmaceutical industry and the industry of medical devices.
Most of all, this innovative Health Report is a further attempt to meet both the stakeholders' requirements, supporting their decision-making processes in the governance of the health system, and the general interest in more in-depth studies of Italy's social and health system.

Federico Spandonaro

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8th CEIS Healthcare Report

Foreword

Foreword

Renato Lauro - Rector of the University of Rome Tor Vergata

The current economic crisis is sorely trying the financial sustainability of our National Health Service, even though the NHS remains a fundamental conquest in terms of civilization and social cohesion. Besides, it is an irreplaceable reference point for the population, particularly for the weakest part of it that, for this very reason, is more severely affected by the unfavorable economic situation.

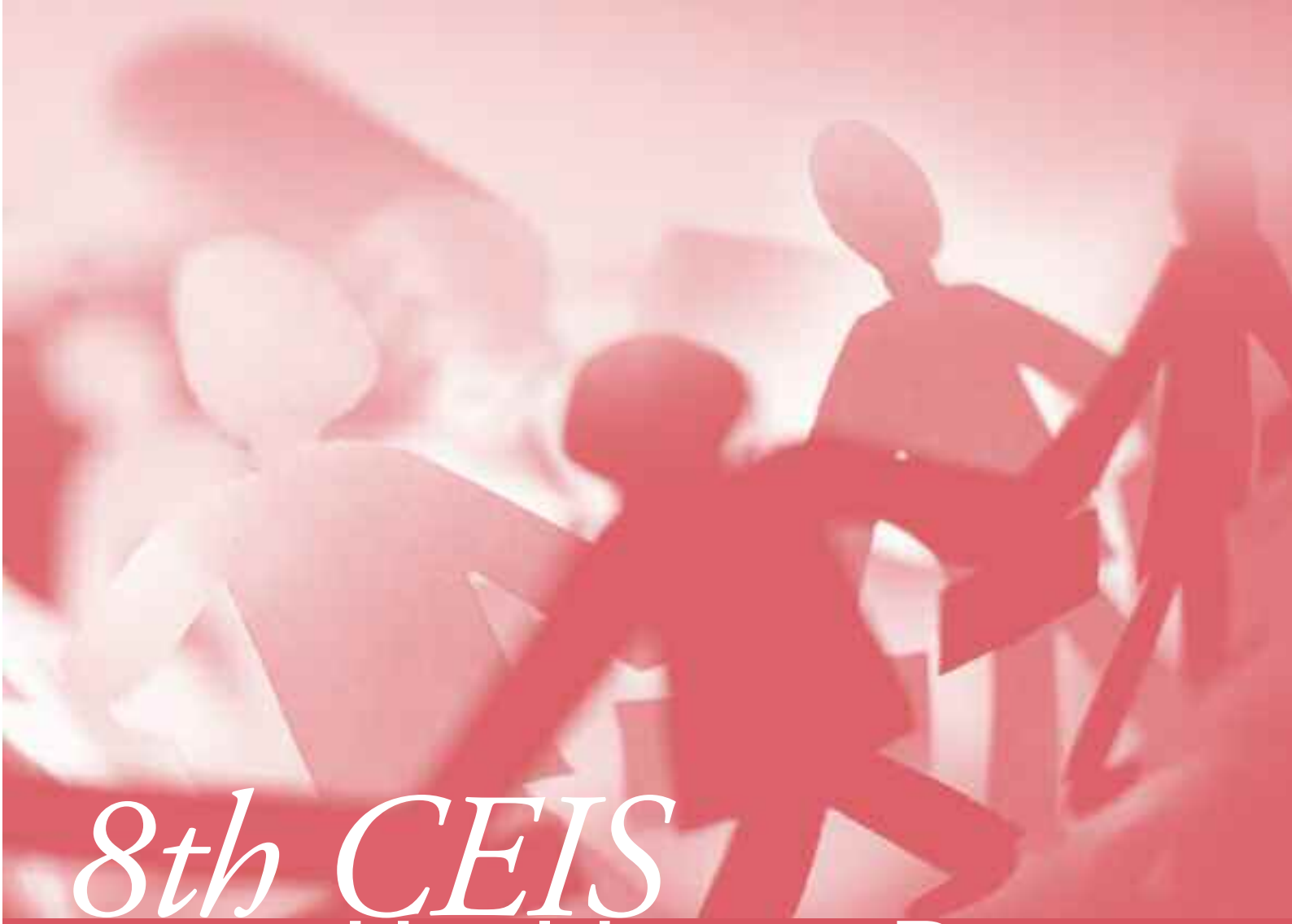
While the universalistic values on which the NHS is founded are shared to a great extent, it is unquestionable that it is becoming increasingly harder for the national budget to meet the growing healthcare expenditure – albeit connected for the most part with increasingly wider and sounder therapeutic opportunities.

During hard times, we are required to succeed in making wise decisions, adopting a perspective that, far from being confined to ensuring the mere survival of the system, is to trigger a new evolution: a modernization that is to leave untouched the basic values that have characterized the NHS up to now. A development in keeping with the times and the new social arrangements that, first of all, needs to be conceived and shared and, subsequently, has to be turned into effective and efficient organizational choices based on scientific evidence in every field: from clinical medicine to the management of healthcare facilities and the empowerment of patients.

The Tor Vergata Rome University is a well-established observatory on the evolution of the health sector and, thanks to its outstanding expertise in all the most important health research areas, it is a think tank that succeeds in integrating the various dimensions and phenomena connected with complex health systems.

Published by CEIS, the Center for Economics and International Studies of the “Tor Vergata” Rome University and by the Tor Vergata Economics Foundation, the Health Report is an example of the University research potential in the field of health. This year, the Report has been enriched by an on-line data bank that represents a further and an extremely useful support for whoever deals with the health sector.

Therefore, we have the pleasure to present the 8th edition of the Report, renewing our hope that the research work it contains might support and be a reference point for health policy decisions, as these decisions need to be informed, modern and always in line with the ethicality and fairness requirements that healthcare imposes.



8th CEIS
Healthcare Report

Presentation

Presentation

Luigi Paganetto - President, CEIS-Economics Foundation, Tor Vergata
P. Lucio Scandizzo - Director, CEIS - Tor Vergata University

We are pleased to present the 8th CEIS - Tor Vergata Economics Foundation Health Report entitled "Welfare Options and Policy Integration".
As usual, the Report originates from the work carried out by CEIS in such fields as health economics, economic assessment of health projects, and management of public and private health authorities, as well as from the CEIS research commitment, which gives rise to an intensive activity of post-graduate education and of technical-scientific assistance to Public and Private Institutions and Bodies.
While the Report has no ambition to summarize the current health situation in Italy, it aims at shedding light on a few critical aspects that concern our Country, particularly by taking into consideration both the structural features and the consequences of the serious economic crisis that is affecting Italy. Hence, it analyses the Italian health system by examining its conceptual bases and the difficulties it is running into in a definitely complex and momentous phase of demographic and economic transition.
Just as in previous years, the Report purposes to provide scientific support to the health policy decisions made by public and private institutions within a context that is to maintain an adequate level of solidarity within the public protection system. As pointed out on a number of occasions, Italy's health system is not more costly, in either absolute or relative terms, than the systems present in other Countries. Besides, it would seem that its results show a significant tendency to improve with respect to both the health of the population and the health spending effectiveness and efficiency. A problem that is still unsolved is represented by the health-spending differences over the territory in terms of performance and results. In any event, the economic crisis and the efficiency-related differences among the institutions are such as to give rise to legitimate concerns with respect to public finance and, what is by no means less important, with respect to solidarity and social inclusion.
The nature of pure common good of the health service is paradoxically complicated by the very success of the Welfare State model adopted until now by the governments of advanced countries, including Italy. The increased life expectancy of the population, which is mostly attributable to the increased effectiveness of medical treatment and prevention, comes with a progressive increase in the demographic weight of the elderly and in chronic illnesses.
An increased investment in prevention turns into a major quality issue. The shift from a system focusing mostly on treatment to a system addressing prevention to a greater extent is a move that needs to be done.
From the point of view of supply, this evolution involves a sweeping change in the tradi-

tional health service that is required to cope with the problem of patients who need continuous attention even though remaining for the most part outside hospital facilities. Therefore, this dual condition – continuous need for healthcare and impossibility to obtain it within hospital facilities – gives rise to the dual problem of financial sustainability and access to the services for elderly citizens.

Within this increasingly more challenging framework, the analyses that have been carried out prove that, through institutional and organizational innovations, Italy's health system is searching for a renewed balance between State and Market. In fact, as a common good, the Health system requires balance in its territorial organization and a balanced relationship between the health services considered as public utilities and all those market elements that are useful to ensure transparency and efficiency in the use of the resources for their production and the control of the quantity and quality of their consumption.

8th CEIS
Healthcare Report

Executive Summary

Welfare Options and policy integration

Federico Spandonaro[1]

The economic and financial background

It seems that the global economic crisis that appeared in 2011, and from which, at the time of writing, Italy has not yet emerged, has affected Healthcare less than other sectors. But only apparently so.

The Berlusconi Government, in fact, had already significantly intervened on health care in the summer, with Decree Law No. 98/2011; the GDP growth was forecasted at about 3%, while funding to the National Health Service (NHS) was adjusted by less than half (0.5%, then 1.4 % in 2013 and 2014). To all intents and purposes, what the Government actually did was cut funding to the health sector by almost half a percentage point of GDP.

It is very likely that the share of ex post public expenditure will not change significantly, remaining close to the 7.3-7.5% mark of the GDP, based on our estimates, compared to 7.1% today, but only because the crisis has revealed itself to be much severer than expected, as a result of which the GDP (the denominator) is not expected to reach the forecasted values.

Forecast of public and private healthcare spending after the budget

	2011	2012	2013	2014
Public health spending trend (bn)	114.2-115.7	115.7-118.3	114.7-118.4	113.2-118.2
Rate of change (%)	1.3%-2.6%	1.3-2.2%	-0.9%-0.1%	-0.2%- -1.2%
Percentage of GDP (%)	7.2%-7.3%	7.3%-7.5%	7.1%-7.4%	6.9%-7.2%
Private health spending trend (bn)	25.0-26.5	22.7-25.3	22.2-25.9	24.7-29.6
Rate of change (%)	-4.2%-1.6%	-9.2%- -4.4%	-2.3%-2.3%	11.2%-14.3%
Percentage of GDP (%)	1.6%-1.7%	1.4%-1.6%	1.4%-1.6%	1.5%-1.8%

This is confirmed by the fact that NHS funding has increased, in nominal terms, over the last five-years, albeit at decreasing rates; and if we do not take account of the price changes, we are left with a drop – in real terms – of -0.9% in 2008, and -0.6% in 2010.

[1] *Tor Vergata University of Rome*

Moreover, we are considering current spending alone: in Italy, capital spending in the health sector is below the average of most OECD countries. In 2010 (OECD Health Data, 2011) it was equal to 3.8% of total expenditure (essentially unchanged year-over-year), dropping between 2005 and 2009, according to a strongly pro-cyclical pattern.
When the above mentioned Decree was issued, we estimated a budget of € 10 bn (taking into account deficit reduction, increased efficiency and increased patient cost-sharing); official sources now consider more or less the same figure, estimating at about € 8 bn the sum needed to ensure compliance with the planning documents.
Obviously, public budgeting is closely linked to the economic cycles and affects the Health sector; likewise, the crisis under way influences, perhaps even more decidedly, the private component of healthcare spending, the weight of which, however, remains significant and accounts for over 19% of total spending, equal to over € 26 bn in 2009.
Although Istat, the Central Statistics Office, has not yet published its data on private healthcare spending in 2011, the data that is available, relating to 2009, is particularly interesting, because it concerns another year of strong financial crisis, a sort of "dress rehearsal", so to speak, for the present crisis. In 2009, the plummeting GDP (-3% year-over-year) caused a significantly higher drop in household consumption (about -6.8%), but what is really striking is how out-of-pocket health spending dropped even more: -7.6%. The severe financial hardships suffered by many households was further confirmed by the drop in the number of households incurring health expenses: about 102,000 less.
Analysing these figures according to a "glass half full" approach, we could say that they are proof of the rationalisation of health spending, at the expense of inappropriate or unnecessary medical care. Unfortunately, however, the situation is probably rather different, as we will show later on in the paper; suffice it to mention here that healthcare spending for dependent family members (which can hardly be defined as inappropriate) stands at an average of € 6,900 per year, while poorer households stop at only € 2,600 year; besides, although the number of lower-income households has dropped, the level of impoverishment has increased: healthcare spending by these households amounts to 15.3% of their total spending; above all, the reduction in consumption, on average, mostly concerned the higher-income – rather than the lower-income – segment of households: the former forgo, or at least postpone, dental expenses, which looks more like putting off expenses that are considered necessary, rather than forgoing inappropriate care; in the case of lower-income families healthcare consumption dropped to a lesser extent, and mainly concerned pharmaceutical drugs and diagnostic tests.
Clearly, we cannot interpret the figures relating to private healthcare spending by households by dismissing them as merely inappropriate and of limited social relevance. The crisis, by making everyone "poorer" has, to a certain extent, "narrowed the gap": but this form of equalization is merely apparent, due to a reduction in spending differences, and does not affect the overall impact of healthcare spending on household budgets.
If the (2009) crisis can teach us something, it is that no sector, and certainly not the health care sector, is immune from the large-scale shrinking of resources: both the levels of spending and its distribution depend on the amount of available resources, and equitable policies can hardly be promoted where there is a lack of resources. It ensues that the

forthcoming healthcare policy decisions, given the general economic scenario, will be of crucial importance for a number of reasons, and must be considered with great awareness, based on the knowledge of the available evidence.

Inefficiency

The first element that needs to be taken into account, of critical importance for its effects on the following arguments of discussion, is the quali-quantitative analysis of the avoidable inefficiencies of the system.

Various econometric models recently proposed by both scholars and research centres estimate huge amounts of inefficiency, in the order of several billion euros; this theory – albeit not explicitly – can also be found in the spending review documents; a similar result can be inferred by extrapolating the data from standard cost simulations: the benchmarking on the regional weighted *per capita* healthcare spending outlined in DL 68/2011, in fact, implies that the entire current deficit at least is the result of inefficient management by the regional authorities; however, it should also be highlighted that the validity of the models depends on the accurate standardization of the outputs; but the standardization criteria used – based on the expected differences of needs of the population – actually appear to be rather slipshod and practically unable to grasp the differences in the quality and outcome of the services. It ensues that the results should be handled with a great deal of care. Based on experience, according to which the models appear redundant, widespread wastefulness becomes very clear, often accompanied by significant quali-quantitative shortcomings in the services provided.

In a nutshell, there appear to be few doubts as to the significant differences in efficiency between the various regional systems, although it is not very clear to what extent the inefficient allocation of resources can be transformed into financial savings. In other words, there is unquestionably a direct link between inefficiency and spending deficit, but it is equally true that poor quality is often associated with low levels of *per capita* spending, and it is often very difficult to prove the cause-effect relationship, among these four dimensions, leaving us with the doubt that in order to improve allocation efficiency and, therefore, the overall performance of the system, it would be necessary to concurrently remove inappropriateness, while at the same time bridging the considerable gaps in the delivery of the Basic Levels of Care; in the latter scenario, the impact on spending is uncertain, to say the least.

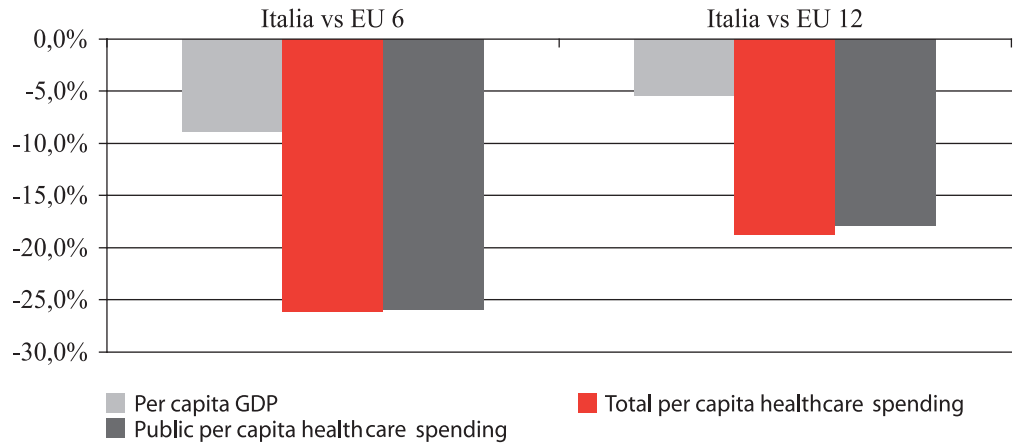
The theory according to which greater quality can be achieved at a lower cost seems purely utopic; in any case, it does not appear to be supported by any hard statistical evidence.

Another important issue is that limiting the discussion to the differences in regional spending is necessarily short-sighted; on the contrary, we should be looking at a much broader picture, taking into account the international data as well. From this perspective, the situation appears much clearer: in Italy, the ratio of healthcare spending to the GDP is now 9.6%, below the average of OECD countries.

This figure alone, however, is rather meaningless, telling us only that each country can obviously afford to allocate an essentially similar amount of resources to healthcare.

If, instead, we focus on the value of spending, the gap between Italy and the rest of Europe stands out and can be viewed as clearly on the rise: -26.1% (-16.9% in 1990) compared to the other EU6 countries (Belgium, Germany, France, Luxembourg and the Netherlands), -18.7% (+4.1% in 1990) compared to the EU12 group. The gap widens even further when we consider public spending: -25.9% (-10.2% in 1990) compared to the EU6, and -17.9% (+10.9% in 1990) compared to the EU12 countries.

Spending and GDP differentials



Source: OECD data workup 2011

The highlighted differences (based on the same purchasing power) are, therefore, very large, and given that the health status of the Italian population (and, to a slightly lesser extent, that of disability) is more or less within the European average, there is no *prima facie* evidence that Italian healthcare is burdened by a considerable degree of inefficiency such as to justify further spending cuts in the region of 10% (as forecasted by the summer budget of 2011, and without considering the outcome of the spending review).
Despite the many allocation inefficiencies, including a degree of wastefulness that prevents improvements to the quality of the services provided, the Italian healthcare system appears to be on the whole rather "judicious", and this should be acknowledged more. The feeling, however, is that the debate on the Italian healthcare system is persistently overshadowed by the ideological convinction that the Public Administration as a whole and, therefore, the public health service (and, generally speaking, the welfare system) as well, is inefficient by definition, regardless of the hard data.
It may be true, of course, that too much money is spent to deliver poor quality services, but this problem can be solved by improving the quality of the services, which does not necessarily entail cutting costs; in other words, setting aside savings would mean accepting and "freezing" the current differences, in terms of quality and outcome, between the regional systems, thus definitively certifying the failure of the NHS.

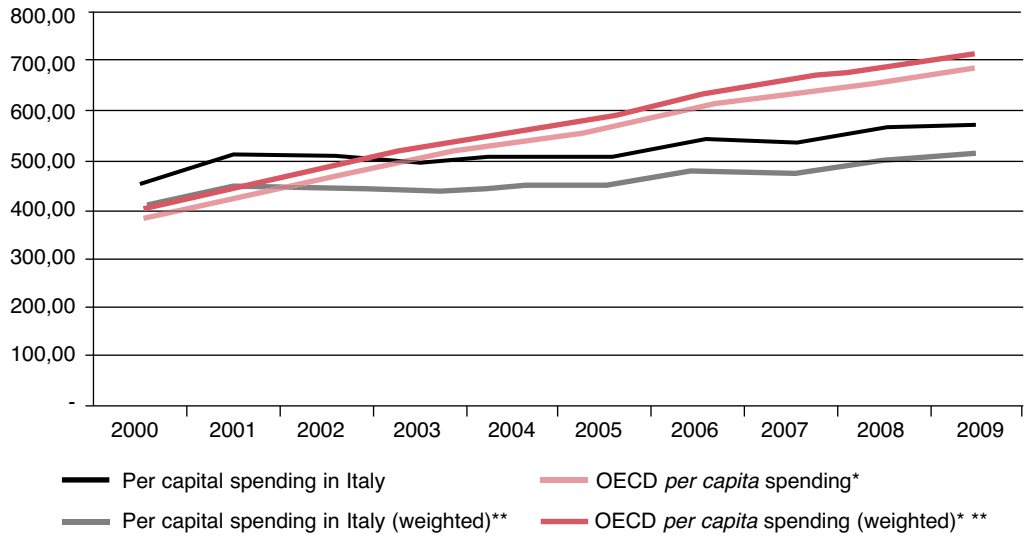
More courage is be needed to introduce, among the matters up for discussion, the issue of the compatibility of the current model of welfare with the available resources: in other words, we need to understand whether a country burdened by a huge national debt, which entails an enormous amount of interest, but above all by a long-stagnating GDP, can afford to pour more public money into the health sector or, indeed, any other sector, on a par with the allocations made by other European countries with a higher average *per capita* GDP (+ 11%, or € 3,728 EU6, +6% or € 2,013 EU12). Compared with the international data, the answer appears to be no.

Integrated policies

Until now, the system has managed to hold together thanks to both rationalization and to price administration policies (which are obviously not immune from the risk of distortion), such as supplier remuneration caps and, indirectly, the now longstanding hiring freeze. The most outstanding case, however, is that of pharmaceutical spending, the only sector where the joint effort of domestic and international regulations effectively enables the implementation of a price administration policy.

The fact that the average price of pharmaceutical drugs in Italy is lower than in most other countries is a given: one issue, however, that has not been sufficiently discussed is whether the current level is really justified, or is possibly a market distortion. Two arguments, in particular, would be in favour of this reduction, implemented through numerous administrative price cuts: if it consists of an adjustment of pharmaceutical prices to the country's level of development (which argument, moreover, is rather questionable); if it has brought *per capita* pharmaceutical spending into line with the other countries, offsetting excessive consumption. If we take a closer look, however, neither of the two arguments can be accepted: with regard to the former, a study by the UK Department of Health shows how the price of the principal molecules in Italy is 7% lower than in France and Spain and no less than 41% lower than in Germany (without considering the USA), which figures are considerably higher than the country's GDP gap. With regard to the latter argument, average *per capita* pharmaceutical spending in Italy has dropped consistently, since 2003, below the OECD average (of € 86 *per capita* in 2009); and if we standardize this spending by population age group (according to the weights published by the OSMED), the gap becomes even higher (€ 155), thus proving that spending in Italy was already in line with the average international figures since 2001, when the progressive price cuts were initiated.

Pharmaceutical spending



** Weighted average (excluding Italy) for OECD countries for which data are available over the period*

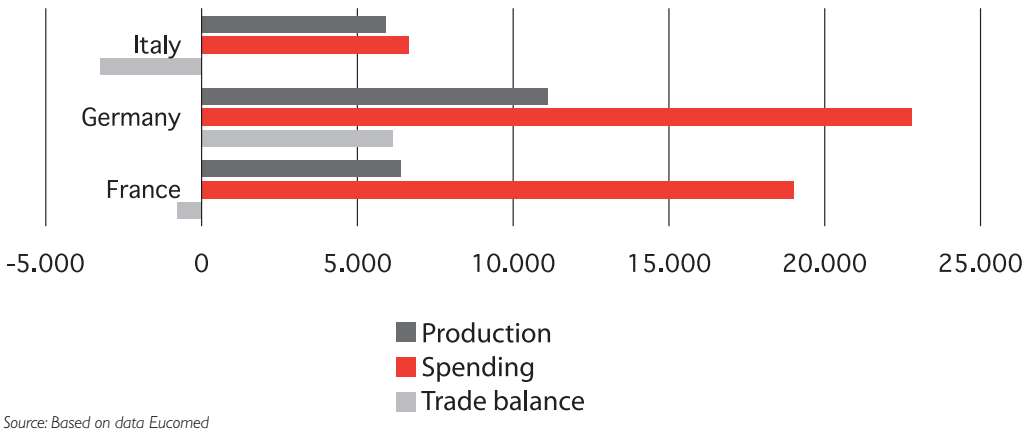
*** System of weights for age and sex used OsMed*

Source: Based on Istat - Time Series (http://seriestoriche.istat.it)

Obviously, price administration policies cannot be pursued indefinitely; on the contrary, in the long run, they can eventually have adverse effects on economic sectors otherwise potentially capable of contributing to relaunching the country's economy.
The true problem faced by the country is economic stagnation, in particular because it is lasting longer and is much deeper than in other European countries: the gap between the Italian GDP and the EU12 countries, which was positive (+2.3%) in 1990, dropped to -5.6% in 2010 (-9.9% compared to the EU6 countries); stagnation is made worse by the burden of the national debt, which "devours" (due to the interest payable) an enormous amount of resources, which could otherwise be used to help relaunch the economy.
If the country wants to maintain the current levels of care (but the same applies to all sectors), it must find a way of relaunching its economy. At present it is at a crossroads: it must decide whether the relaunching process should be grounded on policies that takes away resources from the (public) healthcare sector, because it is deemed to be inefficient, or whether it should rely on it as driver of growth.
Although many speak of an absolute right to healthcare, without realising that rights that need resources in order to be respected are effectively limited by the lack thereof, the issue cannot be circumvented, nor is it ungrounded.
For example, while the ratio of health spending in the last few decades has increased, with respect to both the GDP, and the national budget, spending for education instead has shrinked, as a result of which policymakers should seriously (re)consider the country's priorities, in terms of its development.

The pondered reallocation of public spending might, therefore, be reasonable: certainly with the awareness that any change entails the transfer of equity incentives from one sector to another, with effects that should be attentively valued and assessed; but before moving on to examine the equity aspects, with regard to efficiency, we should carefully analyse the trade-off between the NHS and the industrial policies.
Significantly, countries with an active balance of payments in the healthcare-related industrial sectors also feature a higher *per capita* spending for the goods produced by those sectors. A typical example of this is the medical devices (MD) sector: although the available data cannot be accurately compared, we can nevertheless notice a regular statistical pattern, whereby countries featuring higher *per capita* spending feature active balances of payments (in Europe, Germany, Denmark, Switzerland, etc.), with levels of over € 200 *per capita*, compared to € 112 in Italy. It goes without saying that "locally produced" MDs (or pharmaceutical drugs for that matter) represent a "lower cost", because their production generates jobs and income, compared to imports. An active balance of payments does not come about by accident but is the consequence of industrial policies and planning; this is proven by the fact that, in Italy, the rate of innovation in the medical sector (number of patents *per capita*) is one third of Germany's and one ninth of Switzerland's.

Production, spending and trade balance – Value in € bn – 2009



Source: Based on data Eucomed

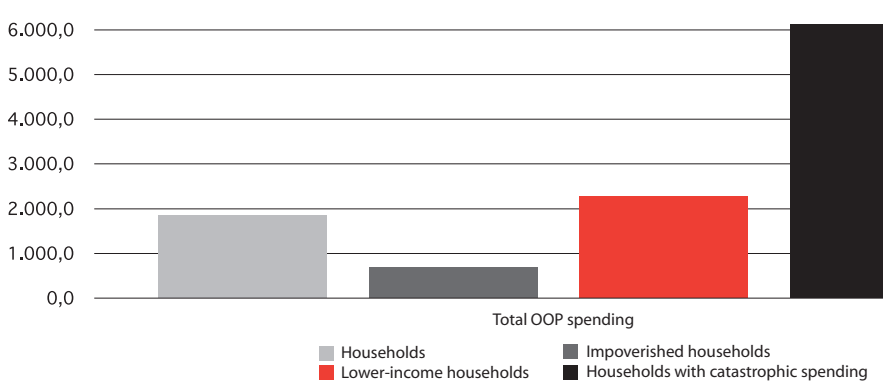
Therefore, at a time when decisions will inevitably have to be taken, one decision in particular can no longer be avoided: which are the strategic priority sectors for relaunching the country's economy and, with regard to the theme of this specific paper, whether or not the Healthcare sector, as a whole, is among these priorities. If the answer is yes, the healthcare policies should be limited only by the general economic interests of the country.

Equity and cost-sharing arrangements

Returning to the matter of the decisions that need to be taken, the most likely scenario is either the reduction or, at least, the substantial freezing of the amount of public resources allocated to healthcare; the logical consequence is that the reduction of healthcare spending would probably result in an increase in private spending, with a significant impact on equity, which needs to be attentively governed.

Based on the previous editions of the Health Report, in Italy a large number of households has been impoverished by healthcare spending, for example the many households required to incur considerable out-of-pocket medical expenses. The latest figures made available by Istat, relating to 2009, show that both the number of impoverished persons and the households having to incur catastrophic spending, have dropped, although, unfortunately, they do not return a clear picture of the actual unease and discomfort of households, for statistical reasons that we will explain later on. The annual average social and health care spending by households totals € 1,840 (€ 1,117 including non-consuming households), equal to 5.8% of total consumption; following the crisis of 2009, actual consumption has dropped considerably (-5.6% compared to 2008), with a huge drop in hospital payments, but also for services classified as ancillary (nursing, physiotherapy, etc.). Instead, pharmaceutical spending and spending for dependent elderly people dropped only slightly. In any case, although the spending cuts were much higher, in the case of households included in the last two quintiles (generally speaking, more higher-income households), spending by low-income households also dropped. Besides the reduction of consumption by the households effectively incurring them, there has also been (as anticipated) a considerable reduction in the amount of households incurring out-of-pocket healthcare costs. Average annual social and health care spending by low-income households totals about € 680 and has dropped by no less than 9.3%, summoning up significant sacrifices: spending, in fact, has dropped across the board, except for dependent elderly people.

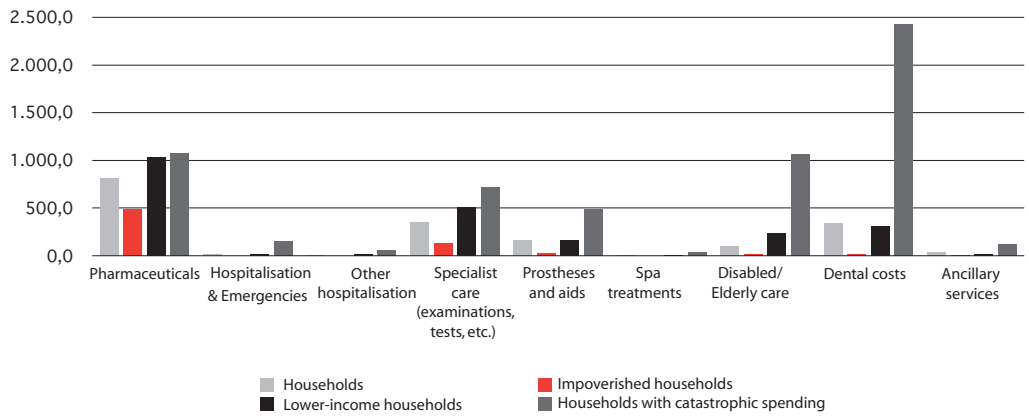
Actual average out-of-pocket healthcare spending



Source: ISTAT data workup

There has also been a significant drop in the trend of impoverishment: 297,670 households (compared to 334,695 the previous year), corresponding to 1.2% of all households (and 2.0% of those incurring healthcare costs); this improvement, however, is due to the even greater reduction, in proportion, of private healthcare consumption by households. In actual fact, although the percentage of impoverished households has dropped, the extent of impoverishment has increased: the average spending of these households has increased by +2.3%. Likewise, there has been a drop in the number of households incurring catastrophic costs, totaling 674,754 households (compared to 747.631 the previous year), equal to 2.7% of all households and 4.3% of households incurring healthcare costs. The average annual spending of households that incur catastrophic costs dropped by -2.2%, for a total average value of € 20,519. Healthcare spending has dropped across the board for impoverished households, or households incurring catastrophic healthcare expenditure, except for the disabled and elderly (which, obviously, cannot be reduced) and specialist consulting (presumably due to the increased cost-sharing). On the contrary, spending for nurses and physiotherapists (-44.7%), prostheses and other aids (-37.2%) and hospitalisation (-34.9%) dropped significantly.

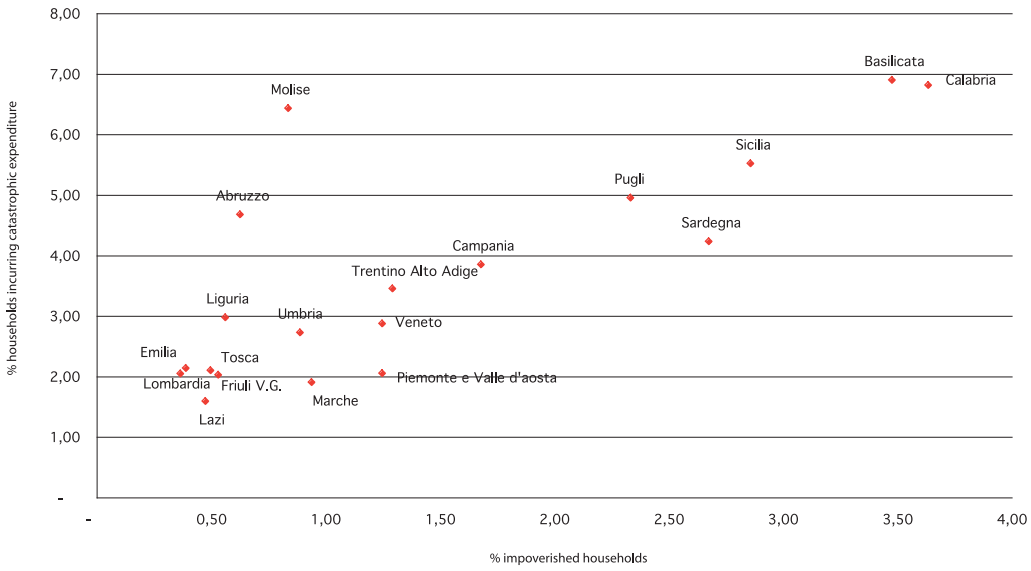
Actual out-of-pocket average healthcare spending



Source: ISTAT data workup

The differences, of course, are accentuated at regional level: while Basilicata and Calabria feature a proportion of impoverished households in excess of 3.5%, with marginal reductions, Emilia Romagna and Lombardy, but also Latium, stand at about 0.5% (one seventh), with a significantly downward trend. Similar observations can be made for households that incur catastrophic spending: once again, Basilicata and Calabria feature a percentage in excess of 6.5%, with marginal reductions, while Lombardy stands at about 1.1% (6 times less); in this case Latium features a countertrend, with a significant increase in the number of households that incur catastrophic healthcare spending, suggesting an increasing “opting out” trend for the Latium population.

Impoverished families and catastrophic impact. Values in% - Year 2009



Source: ISTAT data workup

The picture that emerges is definitely not a reassuring one: a vast majority of households in Italy, including the middle class, are obviously going through very difficult times; moreover, a selective drop in spending confirms that private spending is not an accessory and/or inappropriate expense, and its reduction is tantamount to further weakening the buffer zone against the growing pressures of the system.

Therefore, in an undoubtedly difficult scenario, the forecasted increase of the cost-sharing arrangements (the so-called "ticket"), contained in the Government's new budget measures, acquire a special relevance.

To get an idea of their impact, we have simulated the effect on the household budget of higher cost-sharing, prudentially estimated at € 2 bn (45% on pharmaceuticals, 45% on specialist medical services and the remaining 10% on A&E services): according to this simulation a further 42,000 new households will become impoverished because of healthcare expenditure; to reduce the unfairness of the impact, we have simulated a progressive introduction of the cost-sharing increases, starting with a 5% increase for lower-income households (leaving only the poorest households fully exempt), up to 30% for the higher-income households; according to this simulation, the number of new impoverished households would drop to 7,500.

Action plans: ageing, dependence and prevention policies

Current situation	Impoverished households 297,670 Households incurring catastrophic spending 674,754	
Simulation	**Method**	**Results**
N.1	OOP spending increase of € 2 bn (45% on pharmaceuticals, 45% on specialist medical services and the remaining 10% on A&E services) along with reduction of other (non-healthcare) consumption	About 40,000 impoverished households
N.2	OOP spending increase of € 2 bn (45% on pharmaceuticals, 45% on specialist medical services and the remaining 10% on A&E services) with no changes to non-healthcare consumption	About 3,000 newly impoverished households
N.3	OOP spending increase of € 2 bn (45% on pharmaceuticals, 45% on specialist medical services and the remaining 10% on hospitalisation and A&E services) with no changes to non-healthcare consumption and the progressive introduction of cost-sharing increases based on the household's income	About 7,500 newly impoverished households

Source: ISTAT data workup and DL n. 98/2011

As seen above, expenditure for the dependent elderly remains the major healthcare item Italian households find it hard to reduce further. This is hardly surprising, given the shortcomings of the NHS in this sector and the population trends under way (accompanied by changing social trends, with fewer and fewer young people willing and prepared to look after their elderly relations).

With regard to the issue of care for dependent people, there are also a lot of groundless myths, the principal of which is that the major obstacle to any developments in this sector is the lack of sufficient resources.

Although funding is certainly not high, it does come from a variety of sources. First of all, at the central level there is the National Fund for Social Policy (FNPS), established by Law 328/2000, to which every year the financial law (budget) allocates resources for social care schemes, or for combating poverty, promoting children's and young people's rights, subjective rights and supporting the elderly. Obviously, a part of these funds, especially with regard to the elderly and the disabled, may be used for assisting dependent people. The central Government also channels resources into various funds set up under *ad hoc* laws, as well as benefits and allowances paid out through INPS (Istituto Nazionale per la Previdenza Sociale) to the disabled (invalids, sight/hearing impaired people, etc.).

Since 2007, resources for dependent people have also been allocated into the dedicated fund set up by Law 296/2006, at the Ministry for Social Solidarity, called the National Fund for the Non-self-sufficient (FNA), the aim of which is to guarantee – throughout the country – the implementation of basic levels of care for dependent persons. Funds totalling € 100 m in 2007 and € 200 m each were set aside for this scheme, in 2008 and 2009,

increased by the subsequent financial laws to € 300 and € 400 m. In 2010, the Government guaranteed € 400 m in funds, although the 2011 budget has cancelled this fund. In recent years, most regional Governments have also set up their own schemes, primarily to provide home care to households that take care of a disabled person or dependent elderly person at home.

If we analyse expenditure, in 2008 the local authorities, either individually or in partnership, allocated a total of € 6.7 bn for social care projects and schemes. We have estimated that at least € 3 bn were spent on services for the disabled and the elderly, which are the groups most affected by problems of dependence.

Moreover, the principal source of funding for dependent people remains the INPS for disabled people and the dependent elderly, who receive an attendance allowance (see Law 18/1980). Attendance allowance funding has increased over the years, from € 1.7 m in 2008 to over € 1.9 m in 2011. If to this total we add the disability benefits, which are also paid out by the INPS, the result is € 11.8 bn, which means that expenditure for dependence touches the annual amount of € 15 bn, equal to nearly 1% of the GDP.

This figure is very close to the average expenditure of the other European countries with a special social insurance scheme for dependent persons. These (albeit rough) figures seem to indicate that the problem, in Italy, is not a shortage of funds, but shortcomings in organisation, starting with the lack of a complete definition of the so-called LIVEAS (acronym of Basic Levels of Social Care), and including the consolidation of social and health care, which is of the essence to provide effective all-round services and a holistic response to people's needs, also with a view of preventing social exclusion and marginalisation.

The major obstacle to providing an effective response to the needs arising from dependence is precisely the lack of a thorough definition of dependence, as a result of which the shortcomings in dealing with it ensue.

Dependent people are usually treated as a sub-category of the disabled, which is confirmed by the fact that, according to Italian law, in each region a Multidimensional Valuation Board is responsible for establishing whether or not an applicant is entitled to benefits. The name and membership of each Board changes (albeit limitedly) from region to the region, and likewise the benefit eligibility criteria (in this case, with a greater degree of variability), while all of them share the principle that impairment with respect to one ADL (Activities of Daily Living) is not sufficient to class a person as dependent.

From a regulatory point of view, the Report on Care for the dependent elderly in Italy (2009), defines the condition of being dependent as «*a condition arising from a physical, mental or sensory disability, as a result of which the relevant individual has to depend on others for performing one or more essential and recurrent activities of daily living, which dependence is not affected by the presence of any prostheses or use of other aids*». This definition confirms the view that dependence is consequent to (and, therefore, generally speaking, does not coincide with) a disability. Moreover, it also provides a significant indication as to its cause, which is always of a medical nature (… arising from a physical, mental or sensory disability …).

This definition however seems "contradictory", or arbitrary to say the least, because it

restricts the field to a permanent condition of dependence and to recurrent activities of daily living. In particular, it does not explain why a 'temporarily dependent' elderly person (but the same applies to any person, regardless of age) – for example, during convalescence – and who is unable to independently perform certain activities of daily living, should be excluded from the legal definition of dependence.
It is a very delicate matter, because the application of the above mentioned definition rules out the eligibility to benefits of temporary and short-term dependent people, leading to the increased "confinement" of people in need, in a home or other facility, which is highly inappropriate, both medically and economically. This ambiguous definition probably originates from an inaccurate reference to the concept of *Long Term Care*, which is something altogether different.
This definition also opens up another issue: the separation between LEA (Basic Levels of Care) and LIVEAS (Basic Levels of Social Care); it is obviously necessary to clearly mark the boundaries between the two concepts, to avoid inefficient duplicates or shortcomings in care. The confusion here is recurrent due to the deeply-rooted stubborness in defining the scope of social and health care integration, on the edges of the NHS' tasks: this integration can be summarised, in accordance with Legislative Decree 229/1999, as «*all those activities that can satisfy, by means of a complex care process, the health needs of a person that require both medical services and social protection, concurrently, in order to ensure continuity of care and rehabilitation in the long term*». This definition requires – in abstract – a medically-dominated form of integration, without however clearly and fully defining the provenance of the Funds required for ensuring its financial coverage.
On the contrary, for a right to be effectively claimed, and consequently delivered, the relevant services must be clearly defined, along with the persons, entities and institutions responsible for ensuring its implementation.
In conclusion, although the resources are rather scarce and limited and, above all, divided, it seems to me that the question is somehow ill posed, since the preliminary issue of the contents of insurance for conditions of dependence have not yet been defined.
We do not intend to provide a solution here, although three cornerstones should be established: first of all, dependence from others (which is the guiding principle for determining eligibility); the second concerns the coverage of the non-medical content of the services, since these are by definition already included in healthcare protection; the third, and perhaps the most difficult, is the quantification of the assistance (in cash or in kind) to be provided. The issue is a complex one, because the social services for dependence are essentially related to the prevention of social exclusion, which should be assessed on a case by case basis: how many hours of support, per day, should a dependent person receive? This depends on the seriousness (or, better, the degree of dependence), but also, and above all, on the level of "dignity" to be guaranteed, and on which functions are deemed essential. Another matter to be tackled, given by way of example only, is should assistance be provided simply to help the patient do his or her shopping, or also to visit a museum or engage in other cultural activities as well? The choice here can only be of a political nature and, given the different needs of different people, can only be applied in a context of subsidiarity.

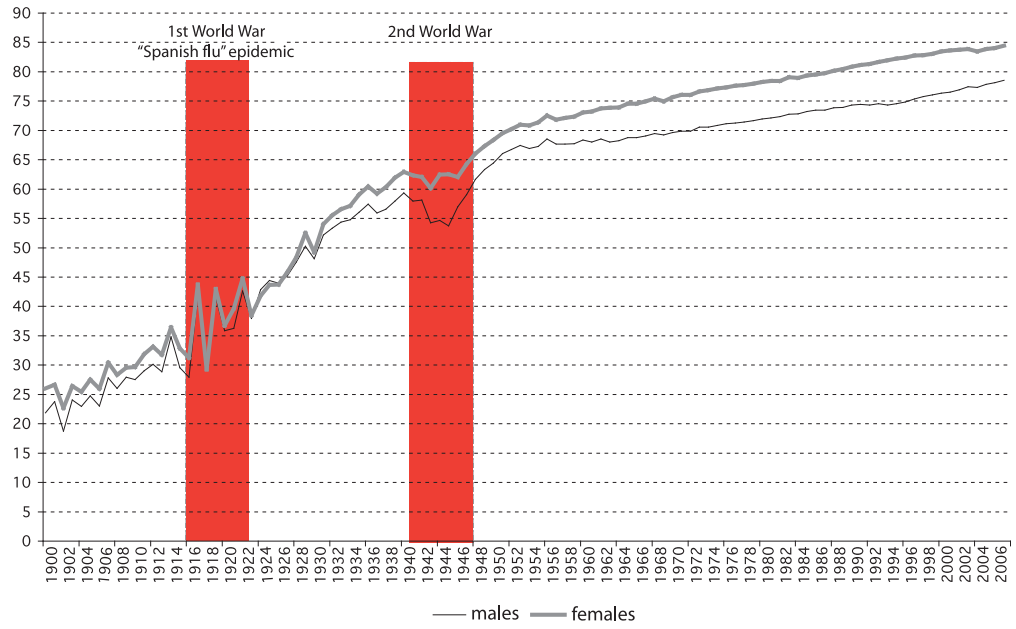
Another issue we need to tackle concerns integration with health care services, whether the system can function without effective coordination: the answer here is probably no, it can't. In this case the coordination duties cannot be taken on by the NHS (or, better, the RHSs), because the cause of the disability is unquestionably related to the patient's health. Of course, the risk is that the NHS is unable to abandon its clinical-centric approach and inevitably focuses on treating the patient as such and, therefore, delivering medical goods and services, whereas it should learn to focus on "care", supporting the person's family (which remains, and rightly so, the first caregiver in the case of dependence). This difficult cultural transformation is already at the core of the discussion on the development of primary care, and if it proves impossible to achieve insurance for dependence, primary care too will never take off.

Obviously, another question that can be posed concerns the future sustainability of the costs for dependence, and of healthcare costs in general arising from population ageing. This issue is always at the heart of the discussion, fuelled by essentially catastrophic forecasts (mostly by the major international organisations), but also descending from the (rather acritical) extrapolations from the present data.

The only certainty is that the population is set to age (not considering immigration flows, however, which are not easily foreseeable), as a result of the dropping birth rate (in Italy at least). Within noteworthy time horizons, for planning purposes, increased life expectancy will also play a significant role. One thing, however, that we cannot take for granted is that this will automatically transform into increased disability and chronicity.

Moreover, the available evidence shows that diseases are gradually setting on at a increa-

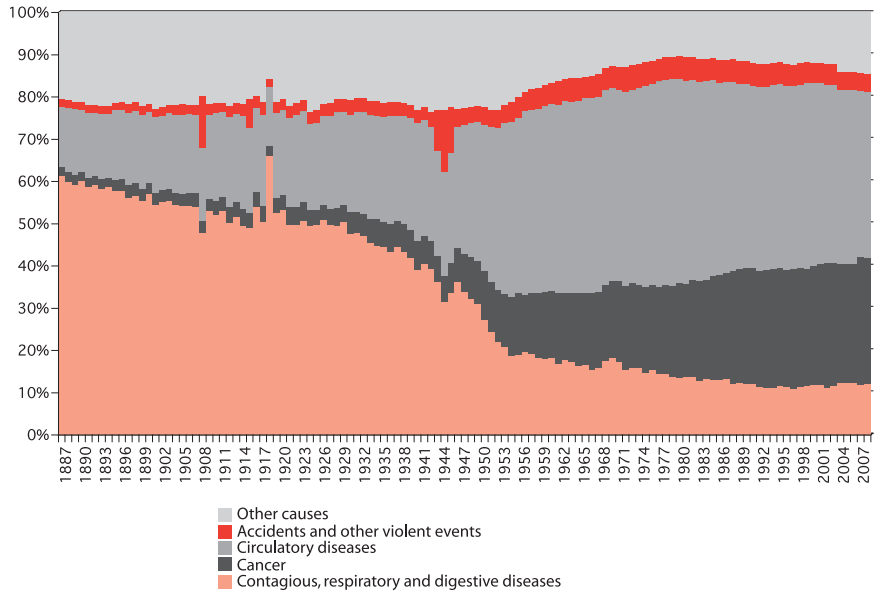
Average age of death by sex – Italy 1900-2007



Source: Istat data processed by the author – Historical series (http://seriestoriche.istat.it)

singly later age, the result of which is that the period of "absorbtion of resources" remains essentially unchanged (or even drops). In addition to this, as emerges clearly also from the recent decisions on retirement requirements, people's working lives are also being extended, which translates into a "net gain" (equal costs and major resources built up over one's life sapn) for both the individual and Society.
There are other possible counter-deductions to this proposition; first of all, longer life

Changes in the contribution to total mortality by groups of causes Italy – 1887-2007



Source: Istat data processed by the author – Historical series (http://seriestoriche.istat.it)

expectancy can increase the number of acute events, which contradicts the alarm centred on chronicity; the only possible response to this is prevention and the appropriateness of treatments. The issue has not been explored in the literature, although we can reasonably infer that the (economic or other) benefits of a longer active life are in any case greater than the burdens entailed by an increase in acute episodes.
A second objection is that some chronic conditions depend on unhealthy lifestyles (obesity and diabetes first and foremost, followed by heart and circulation conditions), which are appearing increasingly earlier in life. Here too we need to underline a problem of terminology, because it is inaccurate to refer to these chronic conditions as a result of ageing. In this case too the line of intervention has been marked and concerns health education and prevention activities, along with "non-medical" actions (increasing tax on junk food, for example, is one of the best examples). In any case, epidemics of this kind of chronic condition is a destiny that can be avoided.

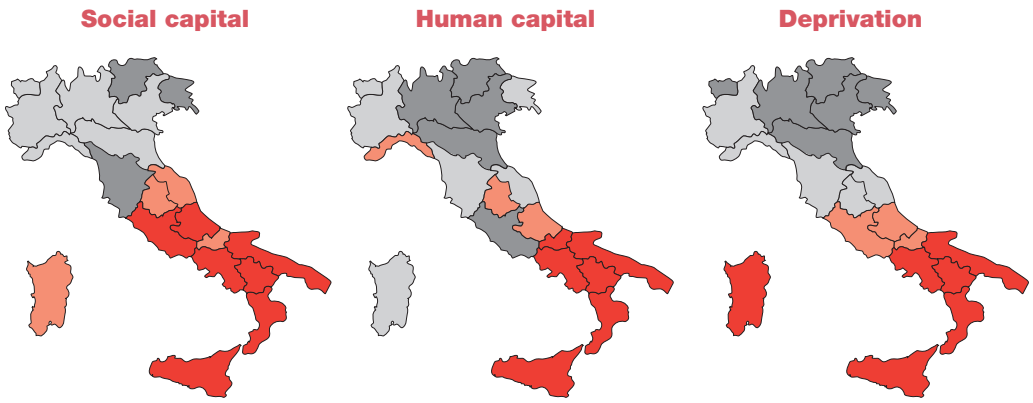
The third objection highlights how it is possible that although need remains constant (years of life with a certain condition or disability) the cost of care increases; this trend is affected by innovation and, therefore, the cost of new technologies, which is a problem only of cost-effectiveness: it should be considered on a case-by-case basis, if the innovatory solutions are found to be good value for money.
If we rule out the second proposition, the other two strictly depend on the expectations we have on the "value" of an active life; obviously, if a person's life expectancy in good health increases, and retirement postponed, but without good job opportunities, then the balance for Society will be negative; if a year gained for Society means a year more outside the labour market there will be no cost-effective innovation (in technical terms the threshold for the cost of QALY will be too low to enable access of new technologies on the market), and it will not be possible to sustain the costs of Health care, or pension benefits for that matter.
Once again, the problem is that of consistency between the levels of Welfare in general (and not just Healthcare) and the country's levels of income. Ageing should be viewed positively, but in a situation of prolonged stagnation it could lead to an enormous growth in social inequality: the real problem of sustainability will be posed in terms of fairness, if Society should become polarised between people stably on the work market (for whom a longer life expectancy will be a benefit) and marginalised people, unable to benefit from longer life expectancy and to pay their own insurance against the "risks of old age". The problem, therefore, is not ageing or the cost of Healthcare and/or of dependence, but the risk of increasing social inequality.

Planning and organisation

Policymakers need to make difficult decisions, which can no longer be postponed, and to choose between the priorities and options for ensuring a Welfare system capable of upholding social cohesion, as well as supporting the country's economy.
Unfortunately, as the recent history of this country shows, the best reforms have often failed following implementation, due to excessively detailed regulations and management shortcomings; therefore, it will not be sufficient, and probably expedient, to think in terms of further reforms, but to adjust the objectives and actions consequent to the new course.
From this perspective one of the critical elements can be represented by the planning and organisation methods, which are both still too tied up with supply dynamics, which have proved incapable of generating a real centrality of the user/patient.
Until now, planning has always focused on determining the supply parameters, on the assumed basis of need ratios; likewise, the organisation models have mostly been centred on the operators and the technological/clinical needs. These approaches are no longer suited to the times.
To effectively place the user at the centre of the system requires the ability to go beyond the purely epidemiological aspects of need; the objective of planning should be to satisfy demand – within the limits of the confines of the meritoriousness of the needs themselves – and the latter cannot be exhausted in a number of incident or prevailing cases.
For example, it is unquestionable that the socio-economic environment has a significant

impact on healthcare systems; based on the estimates it appears that deprivation, which is at the heart of the recent discussion on the apportionment of resources, plays a pre-eminent role in the impact of the economic performance variables of the system. But it also emerges that the social – more than the human – capital is relevant, with regard to results. The contribution of the human capital seems to be rather ambiguous, according to the estimates. This can be explained, in part, by the aggregate approach used, in the sense that it can be assumed that the differences in human capital are effectively immunised by the solidaristic foundations on which the Italian NHS has been built, and that therefore they do not determine significant aggregate impacts (at regional level). It can reasonably be assumed that the differences of human capital may, nevertheless, explain the increasing segmentation of demand: a system that plans its resources solely as a function of the abstract demand expressed by a "typical" member of the public, imagining that he or she desires to "rely on" the technostructure of clinicians, or by a member of the public who, being more independent, builds up his or her own customised package, choosing from among the services on offer, would today be absolutely insufficient.
Likewise, if we examine the interaction between the planning and organisation models,

Synthetic Indicators



The areas in green are below average, while those in red above average; the intensity of the colour indicates the distance from the average

what we see confirmed is the strong risk of remaining entangled in mere supply-side dynamics; a typical example of this is that of hospital organisations where, even in the debate on new intense-care hospitals, as also with regard to the design of the departmental structure, what still prevails is the issue of the clinical model, which is adopted and, perhaps even more, of the effective "ownership" (organisational) of the beds; on the contrary, the priority issue should be oriented in defining which model produces greater satisfaction and quality of life among the patients.

This spasmodic focus on hospital beds obviously descends from the practice of defining policies in terms of the number of beds that can be cut; a policy decision which, for purely financial reasons alone, has been placed at the core of the spending reduction programmes and, generally speaking, of regional policies. In fact, over the last decade, there have been significant cuts in the number of hospital beds, which have dropped from 5.1 every one thousand inhabitants in 2000, to 4.2 in 2009. Which figure is decidedly below the OECD average of 5.2, in 2009.

Undoubtedly, the closing down of inefficient and/or unsafe facilities is exemplary, but planning the offering based on predetermined – and national – need ratios, may become distortive. If we consider demand on a much broader scale, we can observe how, for example, Emilia Romagna has (in theory at least) a significantly excessive supply of hospital beds, but which is set off by the demand due to inbound patient mobility; the opposite is true of regions such as Calabria and Campania, the aim of which should be to reduce outbound patient mobility, which, however, if achieved would create a bed shortage problem.

The weakness of the planning/organisation models emerges even more in primary care, where it is difficult to clearly determine the objectives and, instead, policies are pursued that are not necessarily based on actual evidence.

For example, if we analyse the frequency of generic examinations (assumed here as a proxy for accessibility to the service) and use of A&E, there emerges a lack of correlation that seems to indicate how an increased access to general medicine is not sufficient to reduce improper use of hospital services; the problem of the inappropriate use of A&E is obviously of a more general nature and of an organisational kind; instead, what we see highlighted is a strong positive correlation between exam frequency and number of prescriptions per person, but not with the expense. Therefore, this means that a higher number of prescriptions does not necessarily entail an induction to spend, suggesting instead an unjustified variability of clinical practise.

The preceding paragraphs seem to provide indications on the necessity of creating more efficient incentives to ensure that the role of filter (with regard to A&E, for example) and (appropriate) patient hospitalisation – which is the domain of general medicine – may suitably evolve. The remuneration system is undoubtedly a significant incentive, in terms of the rationalisation of activities. However, the current per-capita-based remuneration, although recently be integrated by the latest National Collective Agreement, seems no longer suited to the new requirements. The remuneration of general medicine practitioners could certainly be preserved on a *per capita* basis (fixed part), provided that it is suitably organised in such a manner as to reward the actual work burden, but also the qua-

lity of the service (variable part), on a pay-per-performance basis, which has already produced excellent results in other countries, aimed at striking a balance between the "quantity of care" and its quality.
In conclusion, if we don't reconsider the planning methods and organisation models, the system can hardly evolve in a balanced manner, abandoning its (natural) hospital-centred vocation and developing a primary care structure grounded on initiative (which is of fundamental importance for tackling health and healthcare risks arising from the new lifestyles).
Planning therefore should evolve, going beyond the mere indication of supply standards and striving to identify suitable incentives for guiding the system towards more efficient overall behaviours, capable of more effectively meeting the demands of the public. At the same time, the organisation models too must abandon their operator-oriented rationale (even if they are faultless, with regard to their technical efficiency or clinical quality) and start anew based on an analysis of demand and its segmentation, trying to adapt the system's and suppliers' response capacity to the expectations of the public.

Performance

Lastly, no planning and no organisation can achieve results without suitable accountability, which is a prerequisite for assessing institutions and encouraging them to improve.
It must be recognised that, during the last Parliament, the NHS made enormous steps forward in this respect: suffice it to mention the performance assessment plan by the Regional Health Systems developed by the Scuola Superiore Sant'Anna di Pisa and the national results programme developed by AgeNaS.
For the future, it is necessary to extend the scope of the assessment, to prevent the risk of opportunistic attitudes, and the efforts for improvement should focus on the monitored sectors; it is no accident, in fact, that the sectors finding it hardest to take off, such as primary care, are precisely those that currently feature the lowest amount of monitoring and assessment tools.
We believe that a further useful development is the integration of different assessments; healthcare is, by definition, of a multidimensional nature and each programme specifically measures a certain dimension of performance; a summary becomes useful, for the purpose of preventing the risk of fragmentation of the relevant evidence, from which may descend either a substantial deadlock in the decision-making process, or an inconsistency between the decisions taken in different healthcare sectors.
But we believe that the off mentioned need to tackle a process strewn with obstacles, because the choice of priorities entails conflicts of interest, also requires the definition of a more transparent and shared process, with regard to the formation of decisions.
The valuations that are being developed are the result of essentially technocratic decisions, where the "voice" of the other stakeholders of the system is either mediated (as in the case of the patients, to the extent that they can be effectively represented by the politicians), or is present in an unstructured manner (as in the case of the professionals), or is kept to the sidelines (as in the case of industry).
In order to make difficult decisions socially acceptable, with regard to the acceptance of

solutions that need to negotiate important trade-offs, such as that between access to innovation and financial constraints or, generally speaking, that between care and industrial policies, requires a greater degree of discussion with and involvement of all the stakeholders, by means of “democratic processes” for forming decisions. The Report shows, in fact, that judgements always depend on the selected analysis approach, and in a complex society it would be short-sighted to think that a single approach is acceptable, or even efficient.

To ensure the survival of the NHS, and of its key principles, we need the commitment of everybody and therefore new rules of participation.

Chapter 1

Demographic and Socio-economic Reference Framework: a Few Points Worthy of Further Analysis on the Impact of Context Variables on Health Policies

1 - Demographic and Socio-economic Reference Framework: a Few Points Worthy of Further Analysis on the Impact of Context Variables on Health Policies

Cristina Alato[1]

1.1. Objective

This paper proposes an "exercise" that purposes to delve into the role of those "context" factors that characterize populations when explaining performance gaps found at the level of regional systems.
In other words, this paper means to ascertain whether a few variables such as deprivation, social capital or human capital – which are often left in the background when analyzing the determinants of the performance of health systems – actually play a significant role.
With this view in mind, a few synthetic indicators have been developed in order to represent social capital, human capital and "acquired" deprivation.
Variables that were deemed significant have been selected in respect of each indicator and, therefore, the overall information they provide has been synthesized using a factor analysis model. Refer to the Appendix for the methodological details.

1.2. Human capital

The first step in the analysis entailed the estimation of an indicator that could succeed in representing human capital. This term, the use of which is relatively recent (derived from studies dealing with human capital) means to represent the "nonfinancial" resources available to individuals. The main components that determine human capital are currently identified with education and information.
Education is a fundamental prerequisite for the population to succeed in expressing an adequate quantity and quality of productive capacity. The term "education" may identify a more extensive series of activities connected with the acquisition of knowledge and technical skills, also called investments in human capital. The availability of advanced technologies (for instance, established at a local level by foreign enterprises or aid organizations) may fail to have any appreciable effect on local development if the population is unable to:

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a) learn how to use the technologies on its own;
b) learn how to create its own technologies.

In this paper, human capital at a regional level has been estimated having recourse to the following indicators:

- persons of 3 years and over that use a personal computer;
- persons of 6 years and over that use the Internet;
- university PhD, degree and diploma;
- upper secondary school diploma;
- persons of 6 years and over that read daily papers at least once a week;
- persons of 6 years and over that have read at least a book in the last 12 months.

The factor analysis carried out on the correlation matrix of the manifest variables has led to the selection of two factors that, as a whole, are able to reproduce 91.5% of the total variance.

Table 1.1 - Explained total variance

Factor	Initial eigenvalues			Weights of the non-rotated factors			Weights of the rotated factors		
	Total	Variance %	Cumulated %	Total	Variance %	Cumulated %	Total	Variance %	Cumulated %
1	4,006	66,759	66,759	3,961	66,018	66,018	3,935	65,584	65,584
2	1,689	28,155	94,914	1,527	25,446	91,464	1,553	25,880	91,464
3	0,182	3,037	97,951						
4	0,068	1,137	99,088						
5	0,046	0,760	99,848						
6	0,009	0,152	100,000						

Extraction method: Principal axis factoring

In particular, two principal factors have been identified: the former accounts for 65.6% of the total variance, and essentially represents "*technical and social expertise*", while the latter accounts for 25.9% of the total variance, and represents "*education*".

Table 1.2 - Rotated factor matrix

	Factor	
	1	2
HC_ use a personal computer	0.973	0.106
HC_ persons 6 year and over use Internet	0.985	0.151
HC_ university PhD, degree and diploma	0.353	0.928
HC_ upper secondary school diploma	-0.221	0.796
HC_ read daily papers	0.952	-0.152
HC_ read books	0.970	-0.010

Extraction method: principal axis factoring

1.3. Social capital

In recent years, the expression "social capital" has become a recurrent term used by scholars engaged in the study of society, politics and economics with a view to designating in a synthetic manner a variety of phenomena that affect the quality of our associated way of life, the well-being of individuals, as well as the efficiency of the market. There is no univocally accepted definition of social capital. In the various contexts where this concept has been applied, it has taken on different meanings that, however, share a common element: social capital is a resource that rather than being based on strictly personal resources is actually founded on the existence of some type of social relations and/or rules.

In this paper, the social capital at a regional level has been estimated having recourse to the following indicators:

- persons 14 years old and over who, in the last 12 months, have participated at least once in a meeting of cultural associations and the like;
- persons 14 years old and over who talk about politics every day;
- persons 14 years old and over who, in the last 12 months, have performed a free activity for voluntary associations;
- persons 3 years old and over who practice a sports activity in a continuative manner;
- persons 14 years old and over who, last year, were very satisfied with their leisure time;
- persons 14 years old and over who, last year, were very satisfied with their family relations;
- persons 14 years old and over who, last year, were very satisfied with their relations with friends.

The variable-related information was reduced through the factor analysis.

The analysis, performed on the correlation matrix of the manifest variables (given the scale change invariance property of the factor analysis model) has led to the selection of two factors with eigenvalues and, therefore, variance in excess of 1, capable as a whole of reproducing 86% of the total variance of the phenomenon.

Table 1.3 - Explained total variance

Factor	Initial eigenvalues			Weights of the non-rotated factors			Weights of the rotated factors		
	Total	Variance %	Cumulated %	Total	Variance %	Cumulated %	Total	Variance %	Cumulated %
1	5,316	75,942	75,942	5,218	74,542	74,542	4,423	63,184	63,184
2	1,102	15,740	91,682	0,801	11,447	85,989	1,596	22,805	85,989
3	0,240	3,424	95,106						
4	0,199	2,846	97,952						
5	0,105	1,503	99,455						
6	0,025	0,352	99,807						
7	0,014	0,193	100,000						

Extraction method: Principal axis factoring

From an initial exploration of the rotated factor matrix, we may note the correlation between individual variables and latent factors.
In particular, two principal factors were identified: the former accounts for 63.2% of the total variance, and is essentially connected with the "*civic sense*" present in the population, while the latter accounts for 22.8% of the total variance and is linked to the "*cultural activities*".

Table 1.4 - Rotated factor matrix

	Factor	
	1	2
SC_ meetings_cultural associations, etc.	0.994	0.045
SC_ free activity for voluntary associations	0.912	0.213
SC_ sports	0.824	0.336
SC_ talk about politics	0.052	0.743
SC_ are very satisfied_Family relations	0.682	0.688
SC_ are very satisfied_Relations with friends	0.754	0.595
SC_ are very satisfied_Leisure time	0.941	0.238

Extraction method: principal axis factoring

1.4. "Acquired" deprivation

The last indicator that has been estimated is connected with the concept of "acquired" deprivation. Just a few years ago, the concept of poverty brought together the population group that lived below an economic level calculated based on two distinct conventional thresholds. One is the "relative" threshold, determined on a yearly basis with respect to the mean monthly household spending per capita, and the other is the "absolute" threshold, based on the monetary value of a basket of goods and services brought up-to-date on a yearly basis, keeping consumer price changes into account.
At present, the population that lives on the poverty threshold has increased to a considerable extent and the concept of "new poverties" describes in a more general manner the condition whereby a person experiences the presuppositions of exclusion and marginalization within a defined socio-economic and relational context. From this point of view, poverty can no longer be defined just as want of money, as it is a multidimensional phenomenon, determined by a multiplicity of different factors connected not only to the economic sphere, but also to the social and cultural context.
In Italy, there is by now greater awareness of these issues and, as a result, the analyses that take into account the study of "deprivation indexes" are becoming more frequent.
The deprivation indexes are expedient tools even for supplying a measure of the needs of a given territorial/regional environment, pointing to a situation of disadvantage in relation to the living conditions of the community to which an individual, a household or a group belong.
By synthesizing regional socio-economic characteristics, the deprivation indexes detect this "disadvantage", meant in its variety of dimensions, on an aggregate basis. Besides, however roughly, these measures convey and reveal living conditions in terms of both economic-mate-

rial discomfort and cultural, social and class disadvantage.
Quite clearly, a state of deprivation may include elements connected with a dearth of human and social capital. Therefore, with a view to avoiding overlaps with the indicators of human and social capital referred to above, this paper has circumscribed the concept to the "acquired" material deprivation using the following indicators:

- unemployment rate (15 years and over);
- elementary school-leaving certificate, no educational qualifications;
- elderly dependence index;
- single-parent households;
- average home crowding index;
- disability rate, 6 years and over;
- incidence of poor households.

In this case, the factor analysis has led to the selection of three factors that, as a whole, succeed in reproducing 82.3% of the total variance.

Table 1.5 - Explained total variance

Factor	Initial eigenvalues			Weights of the non-rotated factors			Weights of the rotated factors		
	Total	Variance %	Cumulated %	Total	Variance %	Cumulated %	Total	Variance %	Cumulated %
1	3,474	49,631	49,631	3,323	47,475	47,475	2,408	34,394	34,394
2	1,590	22,708	72,339	1,470	20,995	68,469	2,345	33,500	67,894
3	1,226	17,520	89,859	0,969	13,839	82,308	1,009	14,414	82,308
4	0,362	5,178	95,038						
5	0,214	3,054	98,092						
6	0,086	1,235	99,327						
7	0,047	0,673	100,000						

Extraction method: Principal axis factoring.

The first extracted latent factor accounts for 34.4% of the total variance and gives an indication of the sustainability-related problems linked to the composition of the population by age. The second one accounts for 33.5% of the total variance and represents disability, while the third factor accounts for 14.4% of the total variance and represents a new household structure, that is to say, the "single-parent households".

Table 1.6 - Rotated factor matrix

	Factor		
	1	2	3
D_Elementary school-leaving certificate, no educational qualifications	0.224	0.755	-0.318
D_ Elderly dependence	-0.904	0.182	0.248
D_Households-Single-parent households	0.009	-0.027	0.872
D_ID_home crowding	0.719	0.158	0.142
D_Unemployment rate (15 years and over)	0.709	0.619	0.135
Disability rate 6+ M_F_2005	-0.085	0.958	0.181
Incidence of poor households_09	0.716	0.644	-0.116

Metodo estrazione: Fattorizzazione dell'asse principale.

1.5 Synthetic indicators

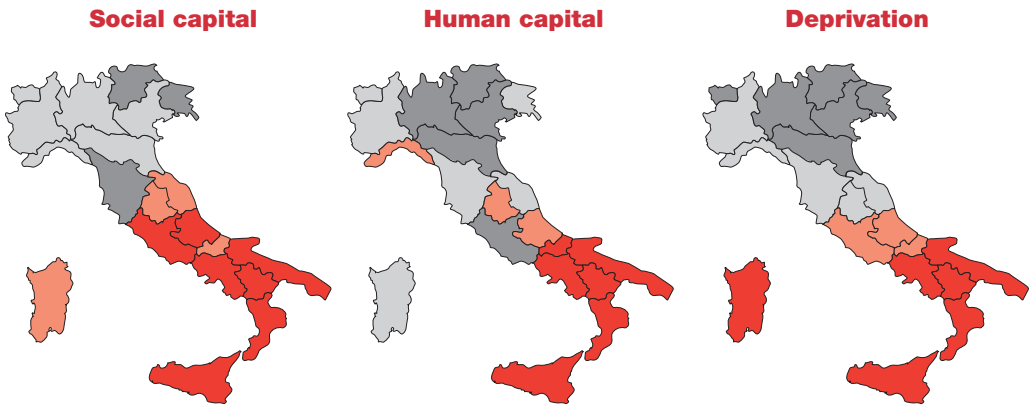
A synthesis of the regional scores relative to the various latent factors has been created with a view to obtaining synthetic indicators, for each dimension of the phenomenon referred to above, that could be used for the subsequent analyses. Such a synthesis has been performed by adding together the regional scores of the latent factors, weighting the scores based on the percentage variance explained by each factor.

Table 1.7 - Weighted indicators

Regions	Social capital	Human Capital	Deprivation
Piedmont	30.2	16.7	-23.2
Aosta Valley	20.5	1.5	-57.4
Lombardy	124.2	15.5	-55.8
Bolzano	108.5	210.6	-64.2
Trent	52.2	157.8	-100.3
Venetian	41.3	28.5	-51.5
Friuli V. G.	38.9	72.0	-42.2
Liguria	-5.8	0.9	-9.8
Emilia Romagna	48.9	22.6	-60.0
Tuscany	39.1	36.5	-25.7
Umbria	-3.2	-2.6	-9.5
Marche	5.8	-10.2	-25.6
Lazio	108.5	-44.4	25.6
Abruzzo	-4.7	-64.7	2.7
Molise	-73.8	-28.2	23.5
Campania	-118.5	-129.7	103.9
Apulia	-115.2	-93.8	68.9
Basilicata	-129.1	-48.9	64.6
Calabria	-82.7	-55.5	71.0
Sicily	-107.0	-76.9	100.4
Sardinia	21.8	-7.7	64.9

In the preceding table, the values with a minus/plus sign point to a regional disadvantage/advantage (quite naturally, the signs for deprivation should be read the opposite way) with respect to the national average (positioned at zero). An analysis of the table points at once to the state of disadvantage of Southern Italy.

Figure 1.1 -Synthetic indicators



1.6 Context factors and impact on the health system

As stated beforehand, the analysis purposes to analyze the relationship among context factors and a few variables that characterize the health systems at a regional level. With this view in mind, we have analyzed the following variables:

- life expectancy at birth by gender;
- total per capita health expenditure by weighted population;
- DRG (Diagnosis Related Group) hospitalization rate at risk of inappropriateness (acute patients hospitalized under a general admission procedure);
- mortality rate standardized by gender;
- standardized rate of at least a serious chronic illness;
- net RHS (Regional Health Service) operating results;
- gross regional deficits.

Before moving on and attempting to interpret the results, it should be said straightaway that, in literature, the question of the causal relationship between health and socio-economic conditions is yet unsolved. In other words, it may not be affirmed whether a better/worse health is attributable to conditions of disadvantage or, vice versa, a better/worse health points to conditions of disadvantage.

Based on the caveats referred to above, a regression model has been estimated with a view to isolating the potential net contributions of the context factors to the explanation of the different regional levels in the analyzed variables.

The model has been defined in respect of each variable using a stepwise backward procedure. All the variables were initially included in the equation and, little by little, they were done away with based on the estimated effect on the dependent variable, net of the influence that each one of them shares with the other ones.
The results show how life expectancy at birth, for both men and women, increases as social capital increases; the per capita health spending increases as the "acquired" deprivation and social capital decrease; the inappropriateness risk increases as the "acquired" deprivation increases.
Male mortality decreases as social capital and deprivation increase; on the other hand, female mortality decreases as the social capital increases, while it increases as the human capital increases; chronicity increases in the presence of conditions of deprivation.
In general, the "acquired" deprivation, depurated from elements that may be referred to human capital and social capital, affects the costs of the system. In fact, it increases the risk of inappropriateness of hospitalizations and, besides, is associated with the deficits of the Regions. Moreover, for the sake of completeness, it proves to be associated with a lower weighted per capita spending, a fact that may be explained in relation to the current mechanisms for the regional allotment of resources that causes the South to report on average a lower health expenditure than the rest of the Country.
Furthermore, deprivation entails a higher chronicity, presumably on account of a more inappropriate supply.
Social capital is chiefly associated with the variables that measure the state of health.
Finally, human capital is linked to a considerable extent to the economic condition.

Table 1.8 - Results

Dependent variable	Human capital	Social capital	Acquired deprivation
Life expectancy at birth_M		++	
Life expectancy at birth_F		+++	
Per capita health spending – weighted population		- - -	- -
Hospitalization rate entailing an inappropriate risk			++
Standard deathrate_M		- - -	-
Standard deathrate_F	+	- - -	
Standard rate - t least a chronic disease			+++
Net RHS operating results	- - -		- - -
Gross regional deficits	++		++

+++/- - - : 100% significant
++/- - : 99% significant
+/- : significant between 92% and 93%

1.7 Conclusions

The purpose of this paper is essentially methodological and its objective is to delve into the role of the "context" factors that characterize the populations in the explanation of the performance gaps resulting at the level of the regional systems.
With this view in mind, a few synthetic indicators have been developed in order to represent social capital, human capital and "acquired" deprivation.
To prevent this methodological exercise from becoming an end in itself, the indicators were then regressed on a few variables that characterize the regional health systems.
The following table summarizes the results that have been attained.
It seems unquestionable that the context has a significant impact on health systems; deprivation, which is at the center of the recent debate on the allocation of resources, seems to play a leading role when dealing with its impact on the economic performance variables, even when considered "net" of the components that may be referred to human and social capital.
On the other hand, even more than human capital, the social capital seems to have a relevant impact on the results, meant in this context as life expectancy at birth and mortality.
The contribution of human capital proves more ambiguous, at least in an approach – like the one being used – that analyzes regional (mean system differences) rather than individual differences. While this aspect requires to be considered more thoroughly, to start with it may be assumed that human capital differences are actually immunized from the solidaristic approach taken as a basis of the Italian NHS and that, therefore, do not determine significant aggregate impacts (at a regional level).

Appendix 1.1

A factor analysis purposes to summarize the information contained in a correlation or covariance matrix by identifying a set of latent dimensions that are not directly observable and that explain the observed link in terms of covariance among the directly observable manifest variables (Stevens, 1986).
Among the various factor extraction methods, we have decided to have recourse to the principal factor method. In this case, the factor extraction is an iterative process that starts from the search for the eigenvalues of the reduced correlation matrix (the diagonal elements of which are the communality estimates obtained from the squares of multiple correlation coefficients between each individual variable and the remaining variables). Then, by bringing up-to-date the communality estimates of the factor loadings, the process ends when appreciable changes in the communality estimates can no longer found. In short, the principal factor method is assimilable to a method of alternative least squares and has several points in common with the extraction method used within the context of the principal component analysis. Assuming that the factors are orthogonal, meaning that they are uncorrelated, the factor loadings represent the correlation coefficients between each latent factor and each manifest variable. Quite often, these relationships are not at all easy to interpret since the factors prove to be correlated with many variables. This is the reason why we found it useful to see to an orthogonal rotation of the axes that allows producing a simpler structure, highlighting the most important factors. Such a procedure is warranted by the fact that, by construction, the factor analysis is invariant

of the orthogonal rotations, that is to say, the factor loading matrix is identifiable to less than an orthogonal rotation. The Varimax method, selected for the orthogonal rotation of the factor axes, maximizes the variance of the squared loadings of each factor in an attempt to "push" a few loadings towards zero (in absolute value) and other loadings towards one (in absolute value). This procedure allows a simplification of the estimated structure, associating with the same factor the smallest possible number of variables. From this point of view, the rotation procedure is used to simplify the estimated factor structure. In the end, the resulting synthetic indicators are represented by the index value; this is the factor score that represents the location of each reference unit in the representation space identified by the extracted factors, that synthesize the information contained in the partial indicators.

APPENDIX 1.2

Further notes on the demographic and socio-economic reference framework[2]
Statistical tables that may be retrieved from the site of the CEIS Sanità Report

- **Population**

Resident population
Resident population. Projections
Resident population. Percentage variations
Foreign resident population
Foreign population. Projections
Foreign resident population. Percentage variations
Regional rates of natural growth. Values for residents
Regional rates of natural growth. Projection
Population structure by age and gender
Population structure by age and gender. Projections
Composition of the population by age groups
Average population age
Average population age. Projection
Average age of the foreign population
Regional share of the population over 65
Regional share of the population over 65. Projections
Regional share of the population over 75
Regional share of the population over 75. Projections
Regional index of elderly dependence
Regional index of elderly dependence. Projections
Regional ageing index
Regional ageing index. Projections
Regional index of structural dependence
Regional index of structural dependence. Projections
Life expectancy at birth by gender

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• **Birth and death rates**
Births
Births. Percentage variations
Births. Projections
Births. Projections. Percentage variations
Generic birthrate.
Generic birthrate. Projections
Deaths
Deaths. Percentage variations
Deaths. Projections
Deaths. Projections. Percentage variations
Generic mortality rate
Generic mortality rate. Projections
Regional perinatal mortality rates
Regional child mortality rates
Regional mortality standardized by gender
Days in life lost due to avoidable mortality
Rates of regional avoidable mortality by type of intervention.
• **Household structure**
Households and mean number of members
Couples and single parents with children
Couples without children
Households with five or more members
Households with unrelated members or groups
Single persons
Single persons over 60.
• **Education**
Resident population by educational qualifications
Rate of transition from secondary school degree
Rate of enrollment university
• **Economic outlook**
GDP
Nominal GDP. Percentage variations
Real GDP.
Real GDP. Percentage variations
GDP per capita.
National Debt as a percentage of GDP.
National Debt as a percentage of GDP. Percentage variations
National Debt as a percentage of GDP. European Union Countries
National Debt as a percentage of GDP. European Union Countries. Percentage variations
Employment rate
Employment rate by gender
Unemployment rate

Unemployment rate by gender
Workforce
Workforce by gender
Persons looking for a job
Persons looking for a job by gender
Inactivity rate
Inactivity rate by gender

• **Household consumption**

Household consumption
Household consumption: percentage composition
Household consumption: composition by consumption quintiles in €
Household consumption devoted to healthcare: composition by consumption quintiles
Household consumption devoted to healthcare
Household consumption devoted to healthcare: percent composition
Household consumption devoted to healthcare: composition by consumption quintiles in €
Household consumption devoted to healthcare: percentage composition by consumption quintiles
Household consumption devoted to healthcare: incidence on the total by consumption quintiles.

• **Household poverty rate**

Poor households
Poor households: composition by household type.

Chapter 2

Epidemiological Context to measure the interrelationships between demographic dynamics and the socio-economic picture in order to plan future assistance

2 - Epidemiological Context to measure the interrelationships between demographic dynamics and the socio-economic picture in order to plan future assistance

Diana Giannarelli[1]*, Letizia Rossella Mancusi*[2]

2.1. Introduction

The objective of epidemiology is to study the dimension of illnesses through the evaluation of the frequency that they have in the population, as well as to estimate the probability that this develop in relation as well to specific risk factors. In particular, the analysis over time and in space of different population groups can make specific conditions emerge: environmental, occupational or social, or specific lifestyles, identifiable as risk factors closely correlated with the symptoms of particular conditions of disease. Epidemiology is an invaluable tool for the definition and planning of health-care systems' strategic policies.

The set of epidemiological indicators, considered as aspects of a single phenomenon, make it possible, for pathology, or homogeneous groups of pathologies, to describe and evaluate their health and social costs. A more ambitious objective is to estimate, as a function of the demographic, environmental and contextual dynamics, also their possible evolution in time.

This contribution hopes to make an attempt in this direction, by using some items of epidemiological evidence available in our country, placing them in relation to the economic and social contexts, both current and those in prospect.

2.2. The current context

Our country's demographic future, confirmed by the latest ISTAT forecasts (ISTAT, 2011), is destined to be characterized by a progressive and inexorable ageing, with a significant increase in the "grand old men" and more generally in the "fragile persons". Furthermore, the scenario that is prospected, in both the medium- and the long-term, is not homogeneous at the national level, but penalizes, as can be foreseen, the areas that already today are economically weaker and backward. On the one side there is confirmed, in fact,

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a generalized negative dynamics of the natural population balance (difference between births and deaths), while reinforced are the trends, differentiated by geographic area, in the migratory balances, whether internal or external, until a total balance is arrived at that is, in prospect, negative for Southern Italy and the Islands. These dynamics will see an acceleration in the medium term. It is in fact within the next twenty or thirty years that the numerous generations of the "baby boom", that is those born in the years between 1960 and 1975, will migrate from the active-age population, to be transferred to the aged population.

Analysis [shows that] the development of the index of incidence of the aged, today equal, nationally, to 31 ultra-sixty-four-year-olds per hundred of those of ages between 14 and 64 years, in a progressive and linear increment, is therefore destined to undergo a net increase starting from 2020-25. The growth of the "old/active" relationship is furthermore, also because of what has been confirmed above, more greatly marked in the Regions of the Italian South. In the South and in the Islands, where levels of this index are relatively lower than for the rest of Italy (respectively 27 and 28%) are seen today, forecasts for the medium- and long-term come into view that indicate values definitely higher than in the rest of the country, with peaks at close to 70%.

The direct consequences for the epidemiological context of these demographic dynamics is the increase, both in absolute value and relatively, in the chronic-degenerative pathologies and consequently in disability, and this is accompanied by a substantial modification of the social context, which is little by little determining, with direct repercussions on the socio-health-care systems, their organization and sustainability. In particular, one of the most evident repercussions is due to the progressive reduction of family support in assistance to fragile subjects, a support that still today plays a subsidiary role of significant importance and that succeeds in part in making up for the lacks. This reduction is directly proportional to the population's number of children per aged person, a value destined to rapidly decrease, which is accompanied by the envisioned progressive increase in the population at risk or below the poverty threshold.

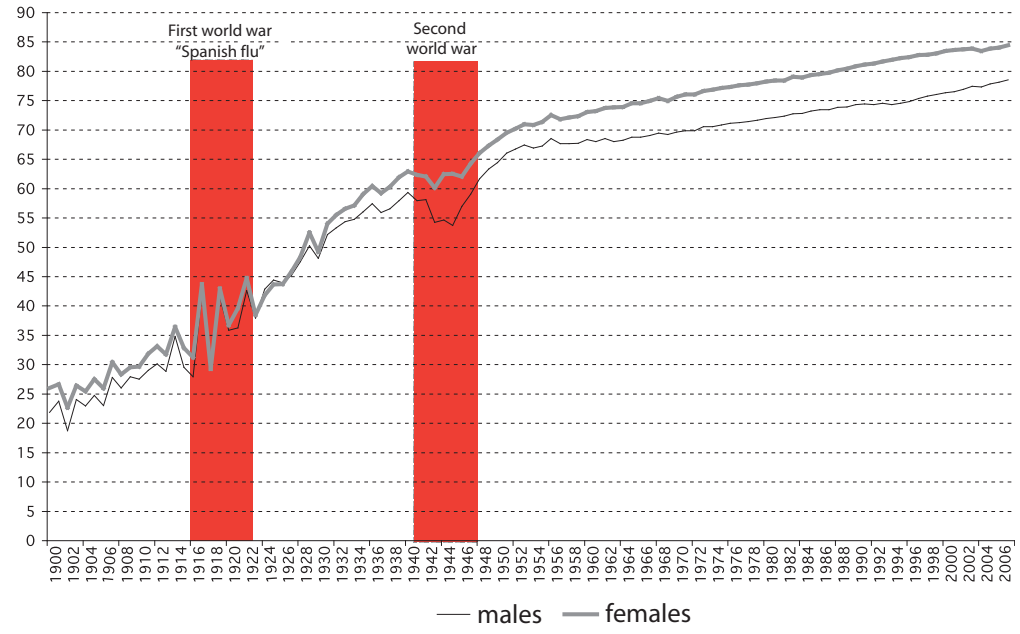
2.3. Historical development

Taking advantage of the information heritage that ISTAT has made useable, on the occasion of the 150th anniversary of the Union of Italy, by placing at general disposal the archive of Italian statistics, in this section it will be attempted to bring out some evolutionary dynamics both from a demographic and epidemiological standpoint, which can help to understand the current national context.

Figure 2.1 sets forth the distribution in time of the median age of death by sex. Beyond the contingencies that can be traced back both to wars and to the Spanish influenza pandemic, evident is the net increase in this index up to the second World War. At the start of the century 50% of deaths were of persons of less than 22 years of age for men, and of less than 26 years of age for women, the result of a dramatic newborn and infant mortality. Think that just twenty years earlier 50% of deaths came about before the age of six years for males and nine years for females. The improvement in socio-health conditions made this value double after only thirty years, after having got past the period of the

second World War. The increase in this indicator maintains the same rapidity up to the '60s, to then continue to grow anyway, even if less sharply. In any case in 2007 50% of deaths came about after 78 years of age for males and after 84 years for females.

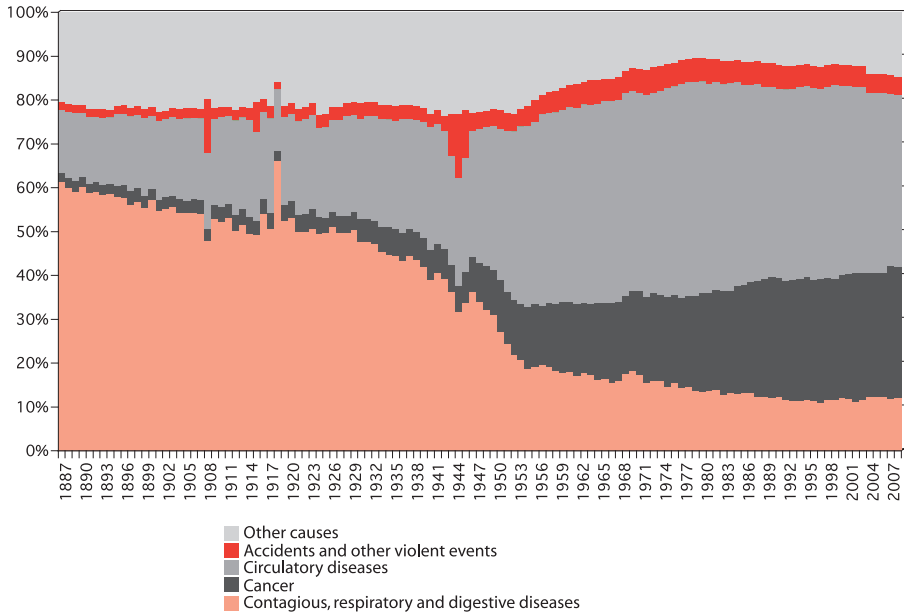
**Figure 2.1 - Median age at death by sex
Italy 1900-2007**



Source: ISTAT – Historic series – data workup (http://seriestoriche.istat.it)

Another standpoint from which to examine the above-described facts is the analysis of the causes of death.
Figure 2.2 shows the percentage distribution of important causes of death in Italy from 1887 through 2007.

Figure 2.2 - : Changes in the contribution to total mortality by groups of causes[3] 1887-2007



Source: ISTAT – Historical Series - data workup (http://seriestoriche.istat.it)

The most significant aspect is on the one side the mortality due to diseases of the circulatory system and to tumors, which goes from 16% to more than 70% of the causes of death, and on the other side the sharp reduction in the proportion of deaths tied to infectious diseases. This is brought out sharply, markedly amplifying the trend, after the second World War with the progressive introduction on large scale of antibiotics and vaccination campaigns.

What comes out further is that, even if the increase is small, the quota of deaths due to

[3] *The workup was made starting from the ISTAT historical series Deaths and raw mortality rates by principal groups of causes – the years 1881-2007 (http://seriestoriche.istat.it). The graph shows the contribution to total mortality of the causes of death. In order to facilitate reading the available data on the causes of death, the illnesses of the respiratory and digestive apparatus were grouped with the infectious diseases, since, as direct cause of death, especially up until the introduction of the antibiotics, they were mostly to be traced back to infectious disease. Furthermore, an estimate was made of the quota of cerebrovascular accidents, they being included once again in the diseases of the circulatory system for the years preceding 1968. In that year in fact the change in the classification of the nosological causes brought about a significant reclassification of these pathologies in the category of "Diseases of the circulatory system".*

Note that the data does not include: for the years from 1915-1918 the deaths taking place in the zone of operations of war and in foreign territory for the years 1917-1918, the civil deaths in the territories of the invaded provinces of the Veneto; for the years 1935-1939, the deaths in the wars or owing to the wars of Africa and Spain; for the years1940-1945, the dead in war zones and in foreign territory.

accident and to violent causes is more stable: the two anomalies seen in 1908 and during the years 1943-45 are due to the Messina and Reggio Calabria earthquake (the former), while the latter springs from civil deaths during the second World War. In particular in 1944 deaths by accidents and violent causes account for a good 14.5% of the total as against a mean, before and after that period, falling between 3 and 4%. Regarding infectious diseases the most obvious anomaly is seen in correspondence with 1918 and is due to the terrible influenza pandemic known as the *Spanish*, which between 1918 and 1919, although it has never been possible to quantify exactly either the number of its victims nor of those infected by it, it is estimated that it infected throughout the world a billion persons, killing twenty million of them. In Italy the "Spanish flu", which reached its apex between Autumn 1918 and Spring 1919, is estimated to have caused between 400,000 and 600,000 deaths.

2. 4. Reflections on a typical case

Cardiovascular diseases, strokes and tumors account today in Italy, as noted above, for more than two-thirds of the total deaths, and in the health-care system consume most of the available resources. The primary objective in terms of planning should be to seek out evidence that interconnects deaths, diseases and disabilities by pathology, within the overall picture of the demographic dynamics. In particular it would be interesting to check whether, correspondingly to changes in the specific deaths levels, there is to be found a consistent decline or increase in disease, whether quantitative or qualitative: this latter being understood as the age of onset of the pathology and most especially in years of life devoid of disabilities. This too in consideration of the clinical context that is continually developing, especially as regards the biomedical technologies, with important repercussions on costs and with growing risks of significant variability in medical practice at the territorial level. This condition would tend to have health costs increase, in consideration too of a social modification of the needs as a function of the development in the western countries of the very concept of "health" and anyway under circumstances of a generalized reduction in available resources. So ambitious an objective clashes however with the fragmentary nature of the information, its failure to be updated and monitored, and the interruption of significant projects, useful only if periodically validated. As further proof of this we set forth here the strongly indicative example of stroke.

The Italian SPREAD (Stroke Prevention and Educational Awareness Diffusion, 5th edition, 2007) guidelines, though displaying the significant variability of rates of incidence and prevalence brought out by both national and international studies, for the purpose of estimating the incident and prevalent cases, go back primarily to the ILSA (*Italian Longitudinal Study on Aging*) study, carried out in 1992-93 by the CNR (National Research Council) on 5632 subjects whose ages lay between 65 and 85 years, and other such Italian studies for other age bands.

On applying these indices to the resident Italian population as of December 31st 2009, the incident cases numbered more than 220 thousand, of which 44 thousand were relapses, and more than one million was the number of subjects who had had a stroke and survived it, with more or less crippling outcomes (Table 2.1).

Table 2.1 - Stroke: estimate of prevalence and incidence - Italy – 2009

Age classes	Population 2010	Rates of prevalence (%)	Subjects with stroke	Rates of incidence (%)	New strokes
<45	32,236,211	0.065	20,954	0.01	3,224
45 - 54	8,452,805	0.41	34,657	0.08	6,762
55 - 64	7,270,894	1.275	92,704	0.25	18,177
65 - 74	6,212,145	4.5	279,547	0.84	52,182
75 - 84	4,355,457	8.796	383,106	2.22	96,691
>=85	1,517,556	16.185	245,616	3.24	49,169
Total	60,047,078		1,056,583		226,205

Source: workup of ISTAT data on the resident population as of January 1st 2009 – Indices of incidence and prevalence - SPREAD Guidelines 5th edition

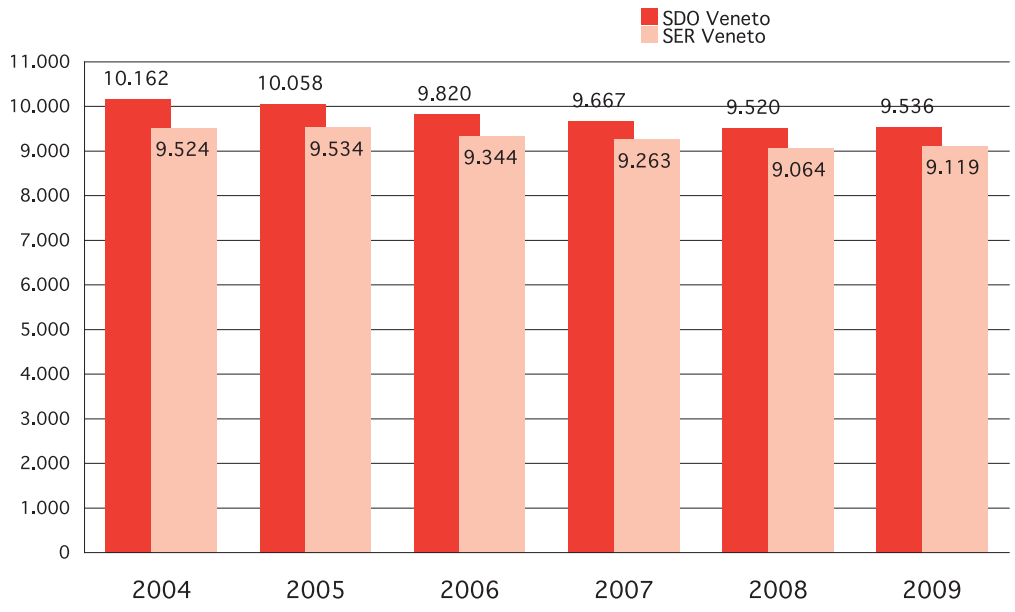
In parallel with this, the demographic dynamics in our country display a progressive ageing of the population, and the two phenomena should lead to a significant increase in the number of cases. In particular, assuming the development of the Italian population as envisioned by ISTAT and projecting on this the rates of incidence and prevalence set forth in the table, in 2030 the increase over the 2010 data turns out to be 40% and 80% in 2050, with a number of cases for prevalent subjects of 1.5 and 2 million respectively and of new yearly cases of stroke of 320 thousand and 420 thousand.

On the other hand, since stroke in almost all cases brings about hospitalization during its acute phase, the rate of hospitalization for this pathology can represent an indirect verification of the verisimilitude of the incident cases estimated by projecting on the population in time the index originated by the ILSA study. Evidently, the extraction from only the hospital-release data cards underestimates the phenomenon, owing to the quota of cerebrovascular events that bring about the death of the patient after having been released from hospital, including the deaths in Emergency Care which do not generate SDO cards (Hospital Release Data Card).

Therefore, a selection was made of the ordinary hospitalizations by principal diagnosis, according to the codes used by the Veneto Regional epidemiological service[4], for the purpose too of having a credible reference with which to compare the results. Figure 2.3 shows the results of the extraction made on the SDO flow and the data published by the Veneto SER (SER, 2011). The extraction made on the SDO flow feels the effects of the impossibility, considering the reduced available layout, of eliminating, as was done by the Veneto SER, both the transfers between hospitals for acute cases (a frequent event especially for haemorrhagic-type strokes), and the re-admissions, under the same diagnosis, taking place within 28 days from the date of the first hospitalization, usually leading back to the same event. This justifies the consistently higher value of the data taken from the SDO cards, relative to the reference; in particular a maximum spread of 7% in 2004, which settled in succeeding years at around 5% (417 in 2009). From a check by typology of stroke, during the six years considered, it appears that between 74 and 80% of the cases in surplus, can be traced back to the haemorrhagic-type stroke.

[4] *Principal diagnosis codes ICD IX CM: 430, 431, 434x1, 436*

Figure 2.3 - Stroke: hospitalization - Veneto Region – 2004-2009



Source: Health Ministry SDO data workup

The Veneto SER (hospitalization in the Veneto region from 2000 to 2009; SER July 2011)

Deeming anyway the spread brought out for the Veneto Region as admissible and expected, the hospitalization data for stroke was compared with the estimates of incidence according to the ILSA study.

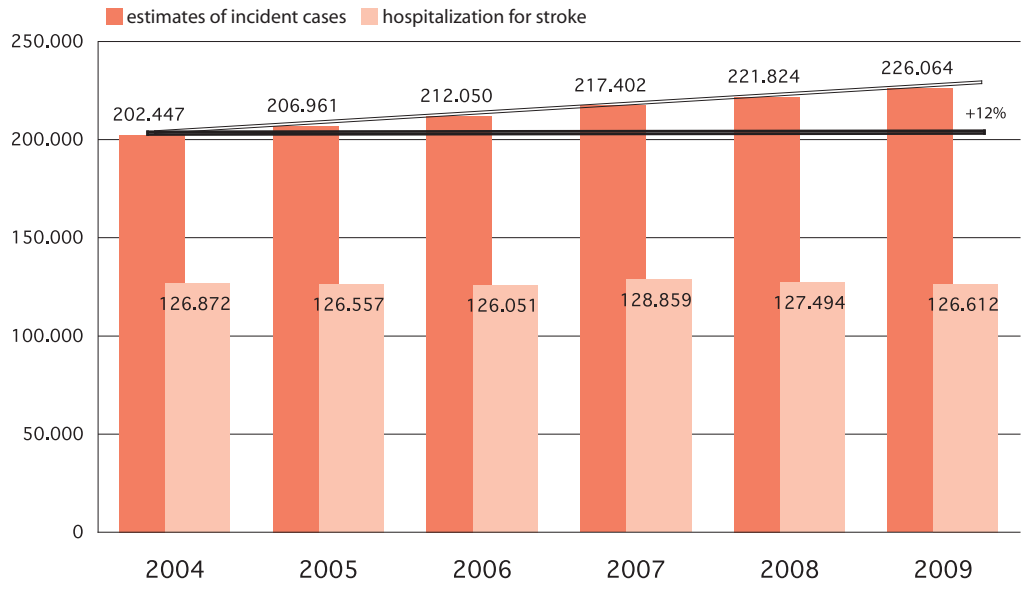
Figure 4 shows the data regarding both the estimates of the incident cases of stroke during the years 2004-2009, using the incidence indices just as set forth in table 2.1, and the hospitalization data deduced from the SDO[5], flow, together with the overestimate and underestimate limits already anticipated.

These critical aspects of the estimates, however, cannot by themselves justify the macroscopic differences that are seen between the two distributions. In particular, to be brought out is a spread of more than 75,000 cases in 2004 – equal to +60 percent of the hospitalized patients – up to more than 99,000 cases in 2009, or 79% of the hospitalized cases. Furthermore, while the hospitalized cases in the six years considered remain substantially constant, the forecasts of the incident cases, whose trend is here exclusively affected by the ageing of the population, display a 12% increase in the number of cases in six years.

[4] *Since the ILSA study in the criteria of etiopathogenetic diagnosis includes as well the ICD IX CM 433x1 codes (cerebral infarct owing to occlusions of the paracerebral arteries) these codes were inserted in the extraction criteria. The hospitalization episodes that can be traced back to this principal diagnosis constitute, over the six years, 5-6% of the total.*

In order to verify whether the net superiority relative to the SDO data of the incidence cases of stroke envisioned, whether or not homogeneously distributed by age, the incidence of hospitalization for stroke was calculated for the age classes considered by the SPREAD guidelines in the six years analyzed (Table 2.2).

Figure 2.4: Hospitalization for stroke vs SPREAD estimates of incidence 2004-2009



Source: hospitalization for stroke: workup of SDO flow (selection by principal diagnosis codes ICD IX CM: 430, 431, 433x1k, 434x1, 436); estimates of incident cases: workup of ISTAT data (resident population as of January 1st 2004-09 – Indices of incidence SPREAD Guide Lines 5th edition)

Table 2.2 - Strokes: rates of incidence

Age classes	T. Inc. (%) SPREAD Guidelines	Attack rate % Hospitalization for stroke					
		2004	2005	2006	2007	2008	2009
<45	0.01	0.01	0.01	0.01	0.01	0.01	0.01
45 – 54	0.08	0.08	0.08	0.08	0.08	0.08	0.08
55 – 64	0.25	0.20	0.20	0.19	0.19	0.19	0.18
65 – 74	0.84	0.53	0.51	0.49	0.49	0.47	0.45
75 – 84	2.22	1.23	1.18	1.16	1.15	1.10	1.08
>=85	3.24	1.92	2.03	1.95	1.93	1.89	1.85
Total	0.28	0.22	0.22	0.21	0.22	0.21	0.21

Source: Incidence indices SPREAD guidelines 5th edition 2007

Attack rate: workup of ISTAT Resident population and of SDO flow – Health Ministry

It is obvious that for subjects younger than 55 years of age, the rate of incidence can substantially be superposed on the hospitalization-for-stroke rate. For this population the haemorrhagic events display, during the six years, a constant trend. In absolute values, between 4200 and 4400 cases per year are found, equivalent to more than 42% of the total number of cases, in particular the subarachnoid haemorrhage accounts for 19-20% of cases.

In the population over 55 years of age, the quota of haemorrhagic episodes drops to around 20%, and no more than 3% of the cases can be traced to subarachnoid haemorrhage.

For younger subjects the greater stability over time of the cases can be in part brought about by the significant quota of haemorrhagic episodes, prevalently determined by congenital malformations that cannot be predicted.

While the hospitalization rates depart in more and more significant fashion from the SPREAD rates of incidence, as age increases.

On examining the over-55-year-old population only, there are found in the six years studied, the population having increased and in particular the older share of the population, insignificant variations in absolute value of the hospitalization episodes, and this brings about a decrease in the observed rate of hospitalization for stroke and a much more marked drop in that standardized whether in males or females (Table 2.3).

Table 2.3 - Observed and standardized direct hospitalization rates per 100,000 inhabitants over the age of 55 years Standard resident population as of 2004

	Hospitalization for stroke		Raw rate		Direct standardized rate	
Year	Males	Females	Males	Females	Males	Females
2004	57,061	59,699	715.0	588.6	715.0	588.6
2005	56,845	59,952	699.7	582.8	694.1	574.8
2006	56,042	60,051	680.0	577.5	670.6	564.6
2007	57,323	61,110	684.2	580.1	668.2	560.3
2008	56,495	60,659	665.3	569.9	643.1	547.0
2009	56,185	60,021	653.1	558.2	626.0	530.1

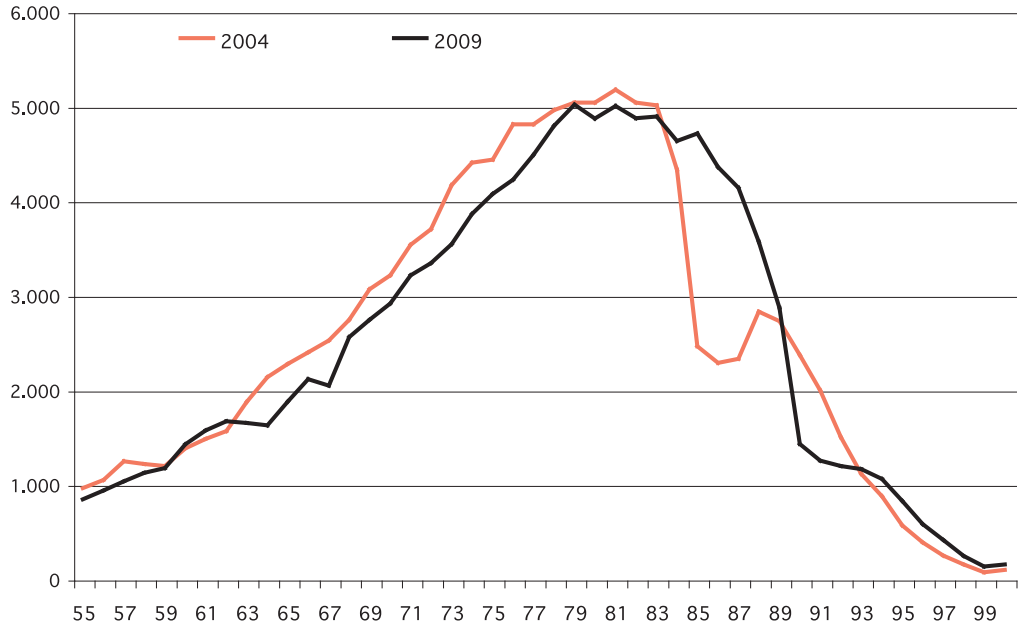
Source: ISTAT resident population data workup – Health Ministry SDO flow

Figure 2.5 shows the distribution by age of the episodes of hospitalization for stroke in 2004 and 2009. The mean age of hospitalization for the total over-55 population goes from 76.5 years in 2004 to 77.3 years in 2009. For males the mean age goes from 74.1 to 74.9 years, while for females, where we see anyway a hospitalization on the whole for more advanced age, the mean figures go from 78.7 to 79.6 years. In absolute values, between 2004 and 2009 the number of hospitalizations for stroke dropped by more than 500 cases.

Figure 2.5 shows the distribution of hospitalizations by age in 2004 and in 2009. The two curves maintain substantially the same behaviour and the same form but translated by one year. In particular, in 2009 the number of events is constantly lower than for those seen in 2004 for the ages between 55 and 84-85 years, where in 2004 there is a sharp decrease in the number of cases, which is repeated, if less marked, for the 90-year-old subjects in 2009.

Another interesting anomaly is found in the 56-57-year-old subjects in 2004 and therefore in the 61-62-year-old subjects in 2009. These anomalies are justified on the one hand by the significant drop in births during the years of the first World War, while the second is the result of an opposite process that took place at the end of the second World War. In fact, in 1946 there was an exceptional number of births: 1,036,098, a figure never again approached in succeeding years until: 1965, where the figure came close: 1,017,944 births.

Figure 2.5 - Hospitalization for stroke: distribution by age 2004 vs 2009



Source: workup of SDO flow – Health Ministry (selection by principal diagnosis codes ICD IX CM: 430, 431, 433x1, 434x1, 436)

2.6. Conclusions

As anticipated in the introduction, epidemiology can be a valuable tool in support of health-care policies, both in directing the operations of promotion of health and of disease prevention and in the planning and optimization of care and rehabilitation. A continual verification of the epidemiology dynamics can furthermore furnish instruments for the evaluation of the efficiency and effectiveness of the regional aid systems. A support that is today yet more important where health policy choices must seek the point of conciliation that determines the lowest social costs, between containment of expenditure in a period of economic recession that is by now in full swing, and the population's health needs. Health needs are tending to increase, the fruit of the combination created by demographic dynamics and of rapid social, cultural, scientific and technological changes.

The value and the utility of epidemiology, within this context, is therefore seen to be directly proportional to the quality of information that it furnishes, in terms of reliability, timeliness and territorial specifics as well as capacity to identify and interconnect the factors, including non-health-care factors, that a given pathology involves.

The data regarding hospitalization for stroke, a typical example of the critical points encountered, can lead to conflicting readings of the phenomenon itself, if not properly filled out with additional information.

What seems to emerge is that considerations of a static type, that do not take account of the interconnections between the various factors, can lead to hasty conclusions as to the development of pathologies and, in particular, to an over-evaluation of the impact of the ageing of the population.
The substantial stability of the absolute number of events observed, accompanied by an increase in the age of onset, can be the fruit of good prevention policies in relation to the risk factors. On the other hand it can determine, with the rise in the age of the subjects struck, a growing frequency of serious events with an increase both of early deaths, within thirty days of onset, and an increase in the quota of subjects having serious or even very serious neurological deficits, and therefore the need to re-determine the quota of resources to be devoted to the acute phase, to the phase of rehabilitation and to services for stabilized chronic patients with neurological handicap, by levels of complexity of assistance.
The exercize conducted indicates the possibility of using in integrated fashion the current health-care flows, which over time have, in standardized fashion, homogeneously over the nation's territory, slowly covered almost all the assistance areas, from hospitalization to pharmaceuticals consumption, from prostheses to integrated home assistance, considering too the information heritage of basic medicine. This approach could, just as some virtuous examples among the Regions demonstrate, offer the possibility of going beyond the limits and the fragmentariness that various traditional information sources, such as pathology registers, have displayed.
On the other hand the exercize conducted appears to confirm the need to consider the interconnections between phenomena, by adopting a dynamic view of the evolution of epidemiology, avoiding simplifications that could distort the projections, throwing off-course a correct planning of the health-care system's responses to the population's future needs.

References

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• (SER, 2011) Servizio Epidemiologico Regione del Veneto L'Ospedalizzazione nel Veneto dal 2000 al 2009 July 2011 (www.ser-veneto.it).

APPENDIX

Further discussion of the Epidemiological context
The principal statistical tables to be found on the site of the CEIS Health Report

• **Cerebrovascular pathologies**
Stroke
Atrial fibrillation
Acute infarct of the myocardium
• **Chronic degenerative pathologies**
Diabetes
• **Tumors**
colon-rectum
lungs
breast

Chapter 3

Health Financing: International Comparisons, Capital transfers and Effects of the Financial Crisis

3 - Health Financing: International Comparisons, Capital transfers and Effects of the Financial Crisis

Cristina Giordani[1]

3.1 International comparisons: current financing

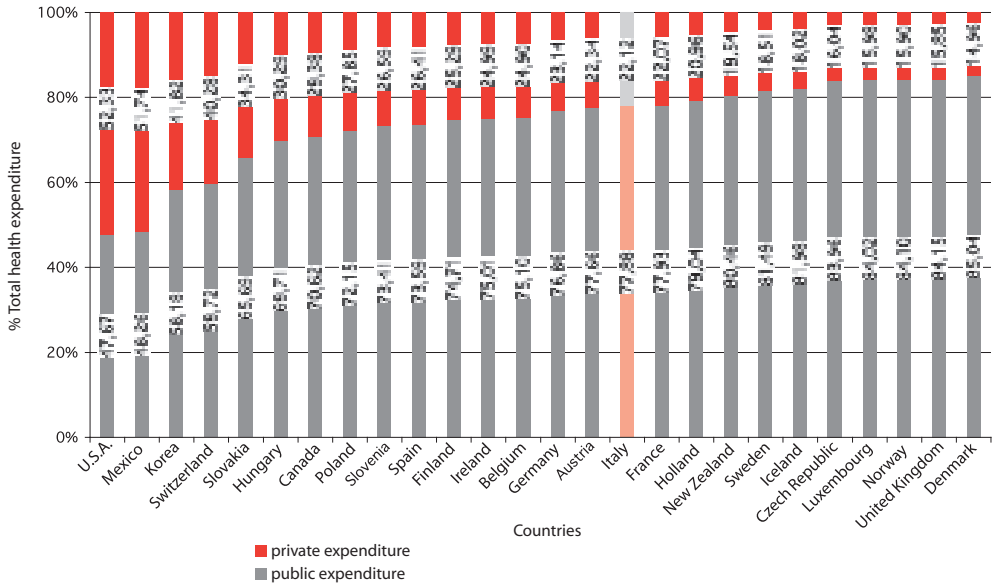
Relevant data confirm that the health expenditure in the OECD Countries is financed for the most part by public resources. In 2009, the share of public expenditure has amounted to 73.0%. The OECD Countries are extremely heterogeneous in relation to the type of healthcare system they have adopted. As a rule, those with a public National Health Service such as, for instance, Denmark (85.0%), United Kingdom (84.2%), Norway (84.1%), the Netherlands (79.0%), France (77.9%), Italy (77.9%), Spain (73.6%) and even Canada (70.6%) stand above the OECD average. Considering the Countries that have implemented a National Health System, Italy reports a share of private expenditure that is just lower than Spain and just the same as France.

In any event, even Countries with compulsory national insurance systems such as, for instance, Germany (76.9%) report a significant share of government spending.

Finally, the public share of health expenditure is by no means negligible even in Countries with a healthcare system that may be classified as being "privatized", such as the United States (47.7%).

[1] *CEIS Sanità, Faculty of Economics, Rome "Tor Vergata" University.*

Figure 3.1 - Health spending by financing source, OECD Countries, percentage values, 2009



Source: CEIS Sanità processing of OECD Health Data 2011

In the long run, all the OECD Countries have reported an increase in their share of public health expenditure, particularly during the ten-year period going from 1970 to 1980, which was followed by a period characterized by a "swinging" trend until 2007. The last few years (2008-2009) have proved extremely significant, as they have coincided with a very severe financial crisis.
In 2009, compared with the preceding year, most countries taken into consideration have increased their share of public expenditure on health, even though none of them in a significant manner. This applies to Italy (where, in 2009, it has increased to 77.9% as against 77.5% in the preceding year), but also to Countries with a "privatized" healthcare system: in the United States, the share has increased from 46.0% in 2008 to 47.7% in 2009.
With reference to 2010, a trend reversal has been reported in five of the seven countries (including Italy) for which the relevant data are available.

Table 3.1 - Public share of healthcare spending, OECD Countries, percentage values, 1990-2010

Countries	1990	2000	2005	2008	2009	2010
Australia	66.18	66.82	66.89	67.99	n.a.	n.a.
Austria	73.37	76.83	76.14	77.16	77.66	n.a.
Belgium	n.a.	74.61	75.93	74.96	75.10	n.a.
Canada	74.54	70.36	70.22	70.49	70.62	70.50
Czech Republic	97.45	90.32	87.31	82.55	83.96	n.a.
Denmark	82.73	83.86	84.48	84.66	85.04	n.a.
Finland	80.91	71.26	75.39	74.45	74.71	75.05
France	76.58	79.38	78.84	77.70	77.93	n.a.
Germany	76.20	79.80	76.61	76.55	76.86	n.a.
Greece	53.70	60.01	60.11	n.a.	n.a.	n.a.
Hungary	n.a.	70.74	72.30	70.98	69.71	n.a.
Iceland	86.62	81.05	81.36	82.60	81.98	80.54
Ireland	71.72	75.07	76.96	76.70	75.01	n.a.
Italy	79.51	72.51	76.20	77.51	77.88	77.62
Japan	77.59	80.81	81.58	80.78	n.a.	n.a.
Luxembourg	93.09	85.07	84.92	84.05	84.02	n.a.
Mexico	40.44	46.56	45.03	46.92	48.26	47.32
Netherlands	67.06	63.08	60.50	75.30	79.04	n.a.
New Zealand	82.41	78.02	77.06	80.25	80.46	n.a.
Norway	82.80	82.49	83.54	84.29	84.10	n.a.
Poland	91.68	70.03	69.30	72.24	72.15	n.a.
Portugal	65.53	66.02	67.07	65.09	n.a.	n.a.
Slovakia	n.a.	89.39	74.40	67.76	65.69	n.a.
Slovenia	n.a.	74.01	72.15	73.44	73.41	n.a.
Spain	78.75	71.62	70.57	72.61	73.59	n.a.
Sweden	89.86	84.89	81.16	81.50	81.49	n.a.
Switzerland	52.38	55.43	59.46	59.50	59.72	59.02
United Kingdom	83.55	79.20	81.88	82.35	84.15	n.a.
Unites States	39.42	42.98	44.08	46.04	47.67	n.a.

Source: CEIS Sanità processing of OECD Health Data 2011

Considering the matter from a different point of view, it should be added that the sizeable exposure of public budgets generated by health financing gives rise to considerable sustainability-related concerns. This applies in particular to a country like Italy, where the difficult situation engendered by an excessive National Debt has been definitively compromised by the propagation of the worldwide financial crisis.

As far as the share of private spending is concerned, it amounts on average to 19.9% of the total health expenditure, ranging from 7.3% in France to 47.8% in Mexico. Italy's position is in line with the mean value, with 19.7% in 2009 and 19.6% in 2010.

Table 3.2 - Out-of-pocket (OOP) and private insurance expenditure as a share of total health expenditure, OECD Countries, percentage values, 2009-2010

	2009		2010	
Countries	OOP	Private insurance	OOP	Private insurance
Belgium	19.95	4.76	n.a.	n.a.
Canada	14.57	12.70	14.65	12.78
Czech Republic	14.43	0.21	n.a.	n.a.
Estonia	20.27	0.23	n.a.	n.a.
Finland	19.03	2.14	18.78	2.14
France	7.31	13.27	n.a.	n.a.
Germany	13.09	9.33	n.a.	n.a.
Hungary	23.73	2.69	n.a.	n.a.
Ireland	12.28	11.04	n.a.	n.a.
Israel	28.79	7.03	n.a.	n.a.
Italy	19.65	1.01	19.60	1.03
Luxembourg	11.63	3.13	n.a.	n.a.
Mexico	47.77	3.97	49.00	3.68
New Zealand	13.39	4.81	n.a.	n.a.
Poland	22.25	0.58	n.a.	n.a.
Slovenia	12.94	12.46	n.a.	n.a.
Spain	20.07	5.36	n.a.	n.a.
Sweden	16.67	0.23	n.a.	n.a.
Switzerland	30.49	8.83	30.87	9.07
United Kingdom	10.45	1.06	n.a.	n.a.
United States	12.26	32.82	n.a.	n.a.

Source: CEIS Sanità processing of OECD Health Data 2011

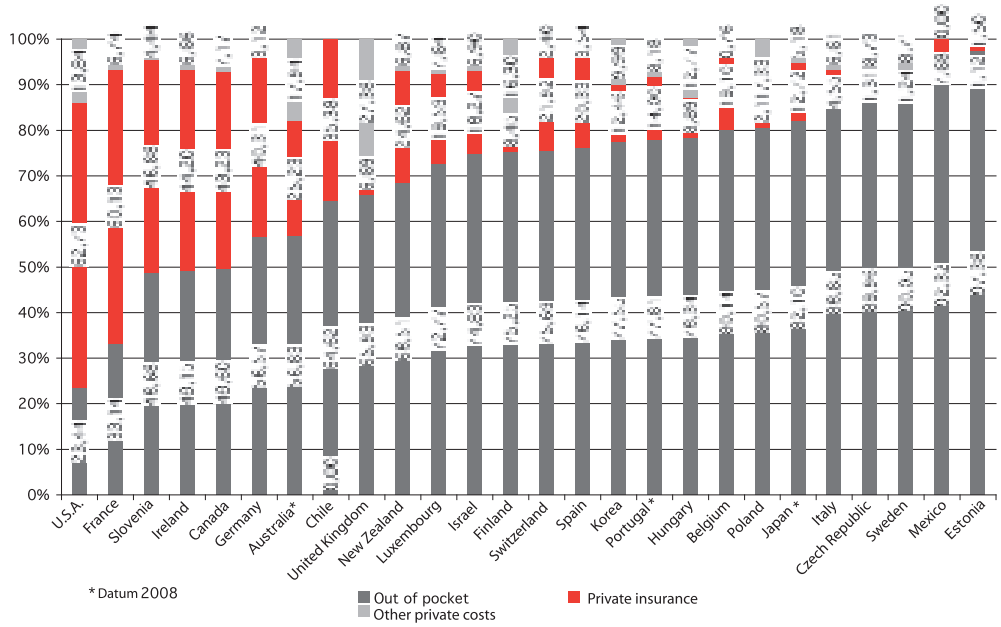
Excepting five countries (United States, France, Slovenia, Ireland and Canada), what prevails is the share of the non-insured private health expenditure that weighs on household budgets (OOP, the so-called out-of-pocket expenditure). The figures range from 56.6% in Germany to 92.3% in Mexico and 97.4% in Estonia (where the current system is based on a compulsory national insurance and a decentralization of the healthcare management). In over half of the OECD member Countries, the share of the OOP expenditure exceeds 75.0% of private expenditure. In 2009, Italy reported an OOP share of 88.9%, on the increase with respect to 2008 (when it stood at 87.4%) while, in 2010, it witnessed a reversal of trend (87.6%).

In 2009, private health insurance accounted on average for nearly 7% of the total expenditure (considering the OECD Countries for which the datum is available), that is to say, 21.7% of private expenditure.

The recourse to private medical insurance is slightly on the increase with respect to 2008 and, in any event, it is an important phenomenon in the United States (62.7% of private expenditure in 2009, as against 62.4% in 2008) as well as in France (60.1% in 2009 as against 59.5%

in the preceding year), Ireland (44.2% in 2009, on the increase with respect to 34.1% in 2008), Canada (43.2% as against 42.9%) and Germany (essentially stable: 40.3% in 2009 and 40.1% in the preceding year).
In Italy, the share of private health insurance accounts for 4.6% of private expenditure in both 2009 and 2010, slightly on the increase with respect to 2008 (4.3%) and 2007 (4.1%). Its percentage on the total expenditure has remained steady at 1.0% since 2007.

Figure 3.2 - Composition of the private financing of health expenditure, OECD Countries, percentage values, 2009



Source: CEIS Sanità processing of OECD Health Data 2011

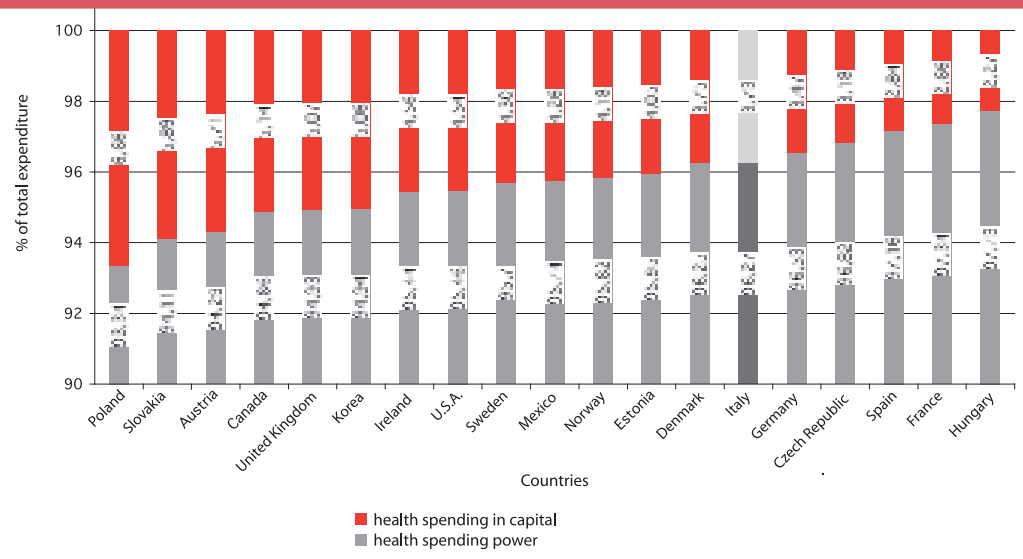
Therefore, this confirms the difficulties in the development of the private insurance market and, as a rule, of the so-called "second pillar" of the NHS. All this, in spite of the considerable share of the OOP expenditure and the attempts to divert it towards less iniquitous health insurance schemes made in 2008 and, subsequently, in 2009 through the decrees of Italy's Health Ministers Turco and Sacconi, respectively. In fact, the aforementioned decrees made it mandatory for Health Funds, Mutual Aid Funds and Associations (SMS) to appropriate 20% of the services provided in order to cover services for non-self-sufficiency and dentistry (that is, those where the NHS has a lower coverage capacity), in order to allow them to benefit from the harmonized tax relief provided for by the 2008 Finance Act. All the same, on December 31, 2010, 279 Health Funds and Associations (224 of which having a contractual nature and 55 SMS) were registered with the Ministry of Health.

3.2 International comparisons: capital financing

While the preceding paragraph related to the current expenditure financing sources, it should be borne in mind that the analysis would be incomplete should we fail to consider the financing of investments (extraordinary maintenance, construction or upgrading of building facilities, technological re-adaptation, etc.). In Italy, there is growing awareness to this subject, as witnessed by the new Health Pact. This is a measure that, among the various issues still being debated (April 2012), including the current financing and the decisions to be taken with respect to the new LEA (essential healthcare standards), attributes great relevance to the arrangements to avoid the deterioration and obsolescence of public health facilities.

According to OECD statistics, in 2009, Italy's capital expenditure on health would seem to be 3.7% of the total expenditure (3.8% in 2010), while other Countries such as Poland (6.7%), Austria (5.7%), Canada (5.1%, dropping to 4.4% in 2010), and even the United Kingdom (5.1%) make higher fixed investments. The bottom-ranking Countries are Hungary (2.3%), France (2.7%) and Spain (2.8%) that fail to reach 3.0%.

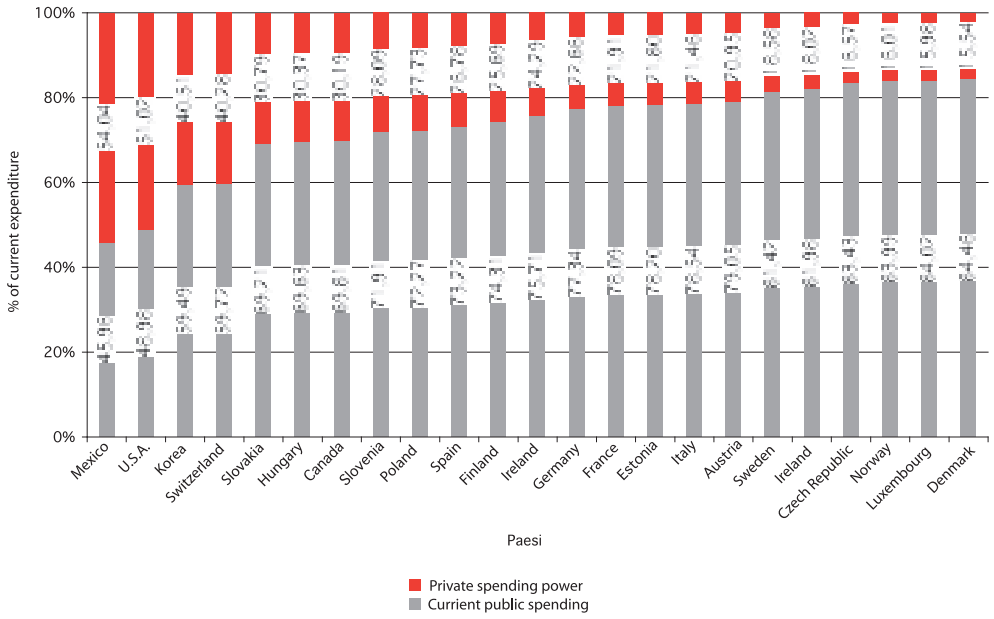
Figure 3.3 - Current and capital financing* as a share of health expenditure, OECD Countries, percentage values, 2009



Source: CEIS Sanità processing of OECD Health Data 2011

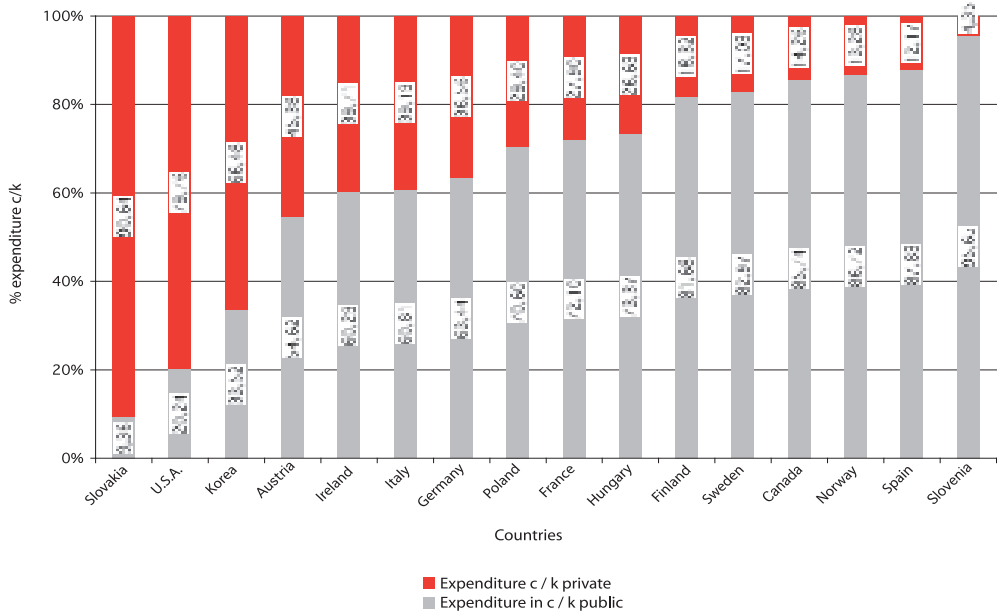
**The name reproduces the name shown in the OECD accounting framework. The item includes all the gross yearly government transfers in the health sector.*

Figure 3.4 - Current health expenditure by financing source, OECD Countries, percentage values, 2009



Source: CEIS Sanità processing of OECD Health Data 2011

Figure 3.5 - Capital health expenditure by financing source, OECD Countries, percentage values, 2009



Source: CEIS Sanità processing of OECD Health Data 2011

These values suggest at least two remarks[2]. On the one hand, the public and private resources devoted to investments seem unrelated to the configuration of the health system in a specific Country and, in particular, to the relative dimension of the public and private component. On the other hand, those very resources seem also unrelated to either the "length of service" of the health facilities or the specific features of the healthcare demand in the individual Country.
Focusing on the total capital expenditure on health, it may be noted that, by using the per capita expenditure cumulated over the last 3 five-year periods as indicator (Table 3.3), Italy has cumulated in each five-year period a lower share than most Countries taken into consideration. The only countries that rank lower than Italy are France, Poland, Hungary and Spain. On the other hand, the United States, Norway and the Netherlands have constantly cumulated higher capital health expenditure.
With reference to Italy, in the five-year period 1995-1999, its investment amounted to US$ 338 per capita, adjusted by purchasing power parity (PPP), as against US$ 995 in the USA and 181 in Spain; in the subsequent five-year period, it reached US$ 479 PPP (as against 1,269 in the United States and 137 in Poland) and, in the period 2005-2009, US$ 586 PPP (as against 1,709 in the United States and 211 in Hungary).

Table 3.3 - Cumulated capital expenditure per capita, OECD Countries, value in US$ PPP, 1995-1999, 2000-2004, 2005-2009 five-year periods

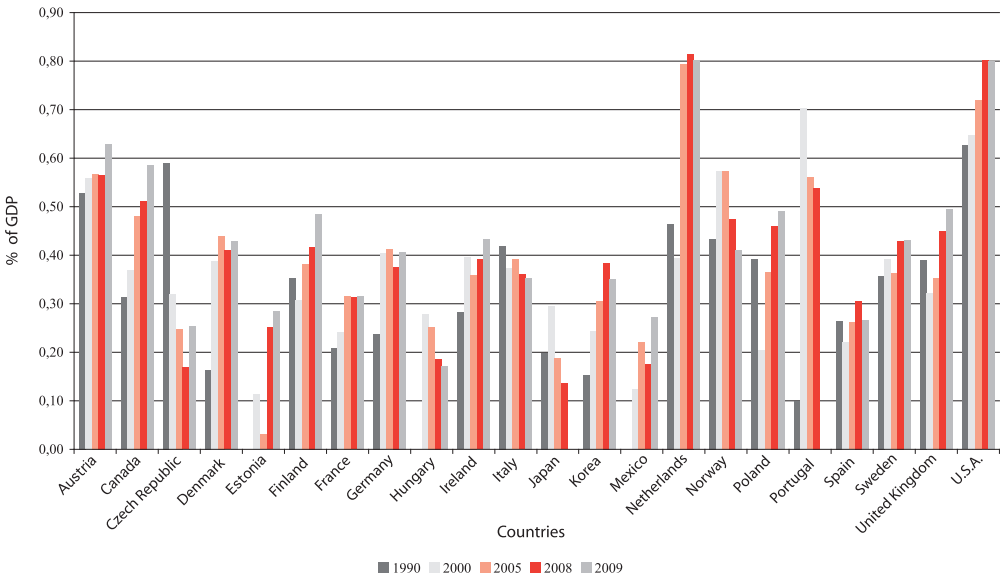
Countries	1995-99	Countries	2000-04	Countries	2005-09
United States	995.19	United States	1,268.77	United States	1,709.42
Norway	769.23	Norway	1,185.92	Netherlands	1,584.99
Austria	718.69	Netherlands	905.24	Norway	1,366.42
Germany	490.89	Ireland	797.15	Austria	1,055.92
Netherlands	483.83	Austria	776.51	Canada	955.42
Sweden	461.96	Canada	636.92	Denmark	801.38
Ireland	408.89	Denmark	608.98	Ireland	783.65
Denmark	407.49	Sweden	581.63	Finland	740.15
United Kingdom	399.94	Germany	574.15	United Kingdom	738.16
Czech Republic	394.18	Finland	487.63	Sweden	718.32
Canada	343.76	Italy	479.14	Germany	667.88
Finland	342.33	United Kingdom	475.72	Italy	585.61
Italy	337.99	France	366.70	France	524.86
France	304.48	Spain	297.89	Korea	451.40
Poland	213.81	Korea	270.56	Spain	450.45
Hungary	192.89	Czech Republic	246.11	Poland	346.40
Korea	186.10	Hungary	211.07	Czech Republic	267.03
Spain	181.12	Poland	136.80	Hungary	210.97

Source: OECD Health Data CEIS 2011

[2] *Already made by F. Pamolli and N. C. Salerno (2004) in "Gli andamenti della spesa sanitaria: l'Italia in una sintetica comparazione internazionale su dati OCSE", January 2004.*

In the following Figure, the capital expenditure on health is analyzed as a percentage of GDP, with reference to the period 1990-2009.

Figure 3.6 - Capital health expenditure as a percentage of GDP, OECD Countries, percentage values, 1990-2009



Source: CEIS Sanità processing of OECD Health Data 2011

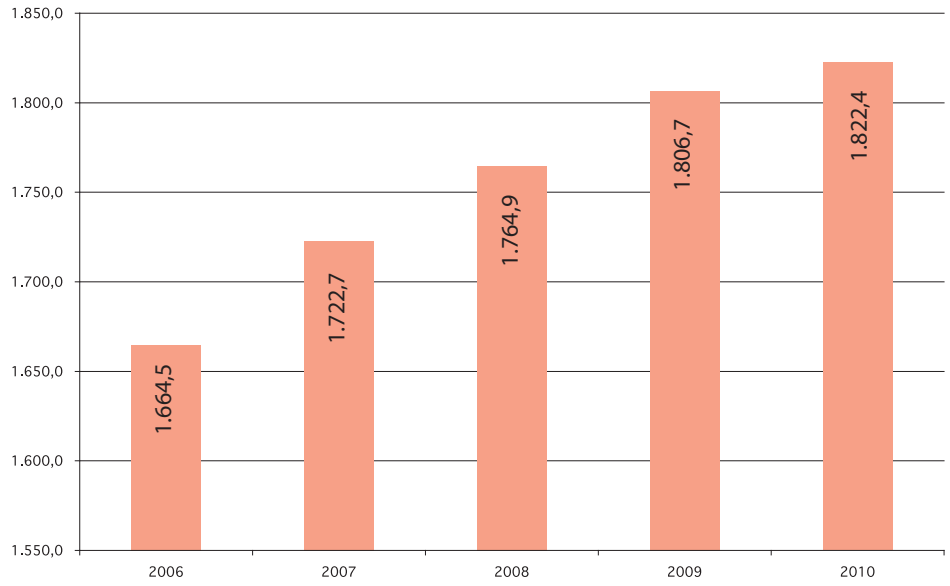
Analyzing the case of Italy, the effect of the 2008-2009 crisis may be easily detected. The capital expenditure as a percentage of GDP amounts to 0.39% in 2005, 0.36% in 2008 and 0.35% in 2009, while it rises to 0.38% only in 2010, getting roughly back to the 2005 values. In any event, it seems unquestionable that the capital expenditure is strongly pro-cyclical.
It should be borne in mind that, according to ISTAT (National Statistical Institute), the State capital expenditure (the total rather than merely the health spending) has witnessed an extremely marked drop (-16.6%) that has affected to a different extent all the various components. The gross fixed investments decreased by over 11%, the investment grants by over 10% and, to an even greater extent the other capital transfers, but just on account of the concentration in 2009 of the extraordinary refunds granted to enterprises in application of the 10% IRAP (Regional Business Tax) deduction in the face of higher IRE (personal income tax) and IRES (corporate income tax) payments made in the tax periods until December 31, 2008. As pointed out by the Court of Auditors in its 2011 Report on the coordination of public finance, the definite decrease in capital expenditure is no accident. Since 2002, numberless provisions have followed one another with a view to cutting the government expenditure and they have by no means spared capital expenditures and transfers, highlighting a strategy going against the structural programmatic commitments designed to boost and accelerate public works and infrastructures. With reference to the health sector, this entails the risk that the public health

facilities in our country might be fated to meet with a progressive deterioration. Besides preventing a recovery in the long run, this may only have negative repercussions on the quality of healthcare and on the preservation of the essential healthcare standards.

3.3 The NHS funding and the operating result

Taking into consideration the NHS funding[3], it may be noted that while the per capita values have grown in the five-year period 2006-2010, their yearly rate of growth has been always lower that the preceding year.

Figure 3.7 - NHS funding per capita, values in €, 2006-2010

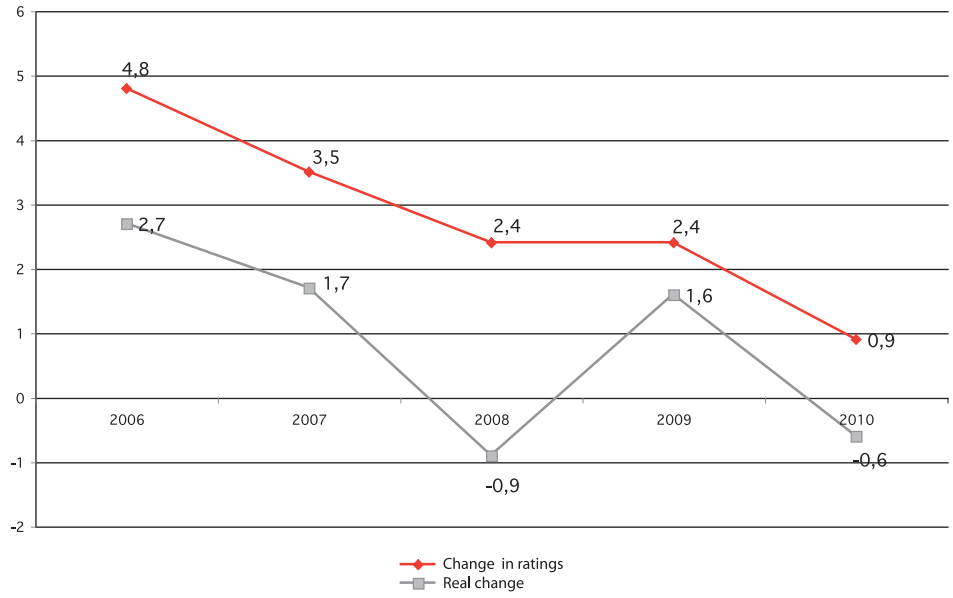


Source: CEIS Sanità processing of Ministry of Health and ISTAT data

As highlighted in the Figure, the financing per capita has grown over the years: in 2010, it amounted to € 1,822.4, as against € 1,806.7 in 2009 and € 1.664.5 in 2006. However, observing both the nominal rates of growth and those adjusted for the inflation rate, it may be noted that the growth is actually limited when it is not even on the decrease.

[3] *Source: Ministry of Health; both the extraordinary operations and the private provision of health services within the public healthcare system are taken into consideration.*

Figure 3.8 - Nominal and real variations in the NHS financing per capita, percentage values, 2006-2010



Source: CEIS Sanità processing of Ministry of Health and ISTAT data

As shown in the graph, the nominal growth rates decrease on a yearly basis, moving from +4.8% reported in 2006 with respect to 2005 to +0.9% reported in 2010 with respect to 2009. However, if the price variation[4] is taken into account, not only are the financing growth rates lower than the nominal rates, but both 2008 and 2010 witnessed a drop in per capita financing in real terms (-0.9% and -0.6%, respectively).

In spite of the crisis and, therefore, of the limited increases in the financial resources for the NHS, a trend towards a reduction of the deficit has been reported. Further to a far-reaching analysis of the management of Italy's public finance, the Court of Auditors, in its 2011 Report on the coordination of public finance, has detected "univocal signs of significant progress and important results" during the past year.

In perspective terms, it should be noted that the Health Pact 2010-2012, approved with the agreement dated December 3, 2009, had provided for an updated of the resources to finance the National Health Service as specified below:

- for 2010: € 106.2 billion;
- for 2011: € 108.7 billion;
- for 2012: € 111.7 billion.

[4] *Source: ISTAT, NoiItalia 2012*

Decree Law no. 98/2011 ("Urgent measures for financial stabilization") has subsequently redefined the NHS requirements on the decrease:

- for 2011: € 106.9 billion (+1.27%);
- for 2012: € 108.8 billion (+1.75%);
- for 2013: € 109.3 billion (+0.5%);
- for 2014: € 110.8 billion (+1.4%).

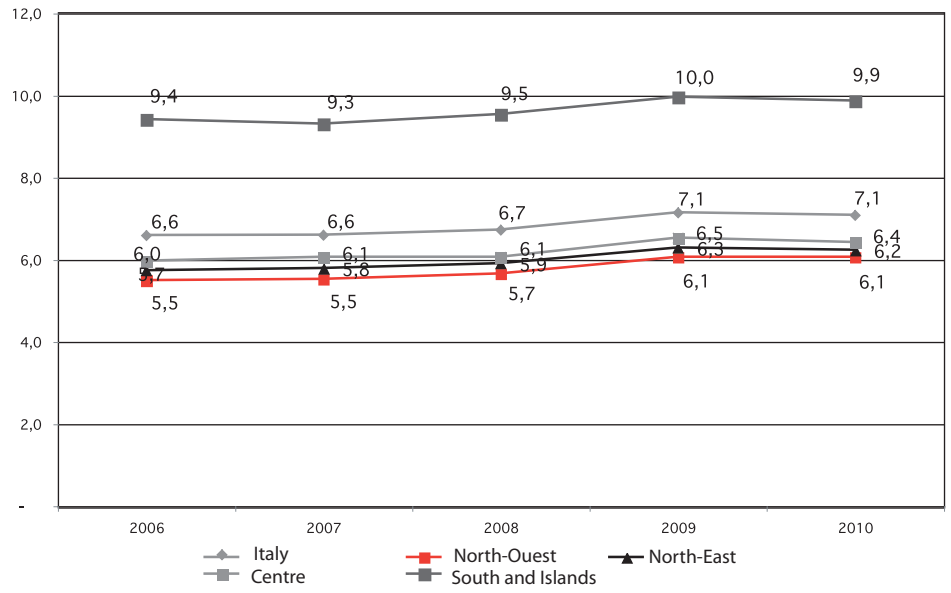
In absolute terms, the increases are definitely minimal and, in any event, lower than the anticipated GDP increase rates during the same period: hence, the expectation of a trend reversal with a reduction of public financing as a percentage of GDP, as we are going to see later on.

The new Health Pact (the draft of which is currently being debated at a Government level within the State, Regions and Autonomous Provinces Conference), which should affect the three-year period 2013-2015, aims at extending the application of the previous Pact, at delving with and settling the question of the new essential healthcare standards and – as previously pointed out – at dealing with the financing of healthcare investments.

Hence, if we look at the NHS funding as a percentage of GDP, the effects of the crisis that in recent years has depressed Italy's Gross Domestic Product are quite evident. In fact, as shown in the Figure, the funding proves on the increase, particularly in 2009 (the year when the variation of the national GDP amounted to -3.5%) with respect to 2008, and the latter with respect to 2007. As for the 2010 data, they point to the expected trend reversal, even though one should take into account the fact that, given that no ISTAT data on the regional GDP are yet available, those shown are the fruit of estimates that tend to overestimate the real datum.

Furthermore, a few remarks should be made with reference to the geographical breakdown of financing.

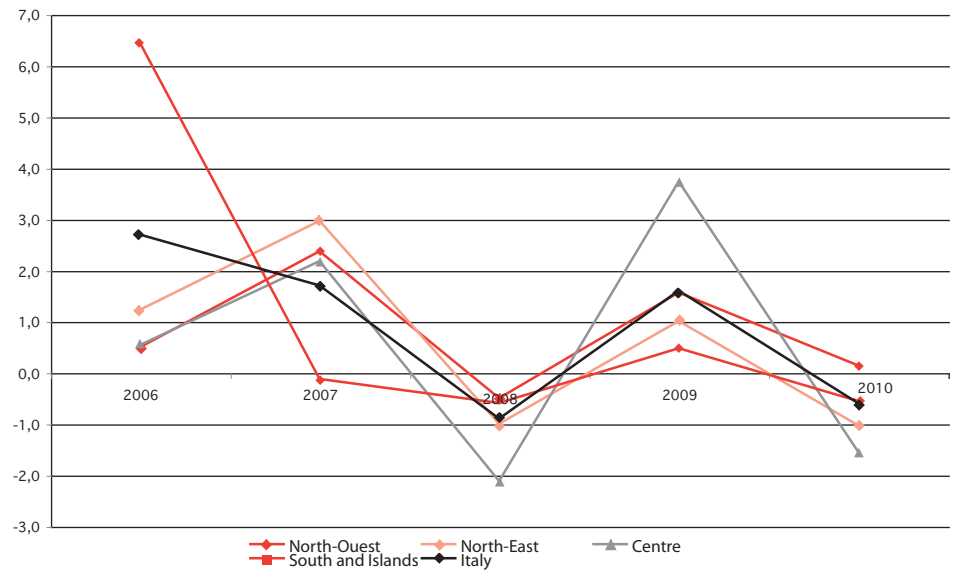
Figure 3.9 - Financing as a percentage of GDP, broken down by geographical areas, percentage values, 2006-2010



Source: CEIS Sanità processing of ISTAT data 2011

Considering the historical datum of the geographical breakdown of financing as a percentage of GDP, it may be noted that every year, from 1992 to 2010, as a result of the redistribution made by the allotment system based on the healthcare requirements pursuant to Law no. 662/1996, the financing of Southern Italy (calculated as a percentage of its regional GDP) has been higher than the financing at a nation-wide level. Southern Italy is followed by the Center and then by the North.
However, particularly in recent years, this result is adversely affected by the crisis[5] that has led to a GDP recession, particularly in the southern Regions. In fact, one only has to look at the per capita financing increases, particularly if calculated in real terms, to obtain an extremely different geographical picture.

Figure 3.10 - Real financing variations per capita by geographical areas, percentage values, 2006-2010

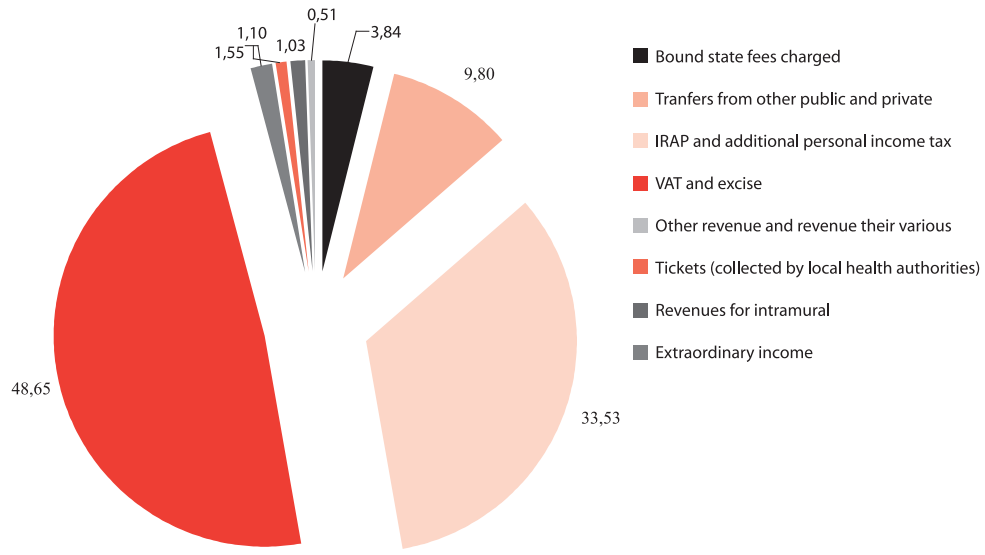


Source: CEIS Sanità processing of ISTAT data 2011

[5] *ISTAT has disclosed consolidated territorial GDP data up to 2009. As for 2010, a 2.2% GDP increase is estimated at a national level, even though the calculations by geographical areas relative to 2010 are the fruit of our estimates that overestimate the real datum.*

This phenomenon is particularly evident in 2009 when, as repeatedly stressed, we have witnessed a strong GDP recession. As shown in the Figure, during that year, the real per capita financing increase in the southern Regions has been lower than both the nation-wide figure and the figures relative to the other geographical areas: the highest increase has been reported in the Center Regions, followed by those in the North. Actually, in 2007, a slight decrease in the real per capita financing has been reported just in the southern Regions, while a percentage increase with respect to the preceding year is reported in all the other geographical areas (North at the top).

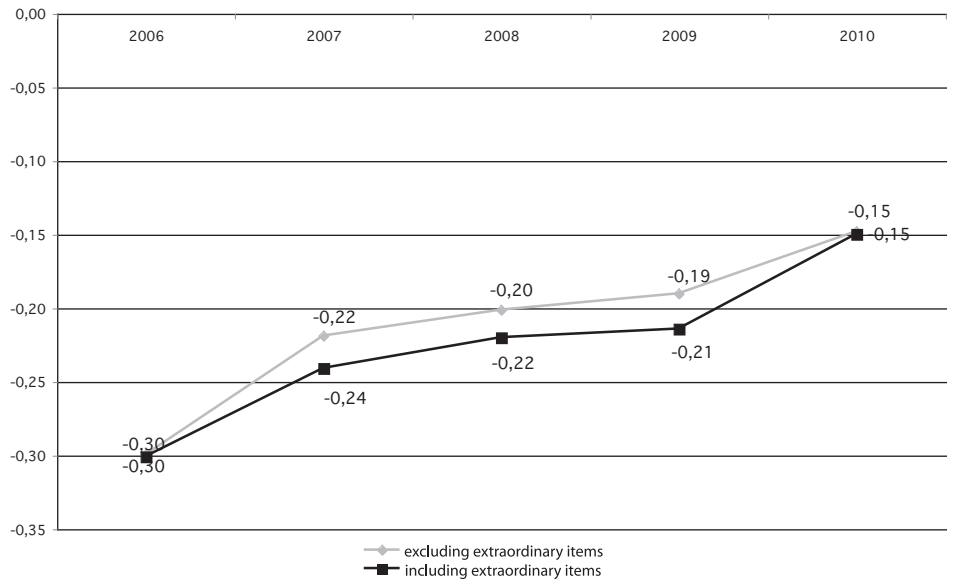
Figure 3.11: NHS financing sources, percentage values, 2010



Source: CEIS Sanità processing of Health Ministry data 2011

With reference to the NHS funding sources (Regions and Autonomous Provinces) for 2010, the higher share comes – as in other years – from the VAT and Excise tax yield (48.65%), on the increase with respect to the preceding years, followed by the IRAP and the IRPEF surcharge yield (33.53%) and then by all the other items.
In 2010, the national deficit[6] reported a slowdown, dropping to € 2.3 billion (as against € 2.9 in 2009 and € 3.2 in 2008), without considering extraordinary returns and costs.
The decrease becomes more evident if the extraordinary operations are also taken into account: € 2.3 billion in 2010 (last year, the extraordinary operations have been a limited contributing factor), as against € 3.3 billion in 2009 and € 3.4 billion in 2008. The following graph shows the operating results as a percentage of GDP reported in the five-year period 2006-2010, both inclusive and net of extraordinary operations.

Figure 3.12 - NHS operating results as a percentage of GDP, with and without extraordinary operations - percentage values, 2006-2010



CEIS Sanità processing of Ministry of Health and ISTAT data

[6] *In this chapter, the term "deficit" is taken to mean an "operating loss" that, at a national level, is calculated – as specified by the Ministry of Health – as the algebraic sum of the profits and losses reported by the individual Regions. Likewise, the term "surplus" refers more properly to an "operating profit".*

The graph highlights that, in the three-year period 2007-2009, the extraordinary operations have negatively affected the operating loss witnessed at a national level, while its effects have been substantially neutral in both 2006 and 2010. In any event, the trend reported in the last five-year period shows a decrease in the national deficit even though, as repeated a number of times, the crisis has led to a decrease in GDP.
As shown in Table 4, even if the per capita operating results cumulated in the last two five-year periods are taken into consideration, a decrease is reported at a national level in the period 2006-2010: a per capita deficit of € 271, as against € 340 in the five-year period 2001-2005.

Table 3.4 - Cumulated per capita regional operating results (ordinary operations), values in €, 2001-2010 by 5-year periods

Regions	2001-2005	2006-2010
Italy	- 340	- 271
North	- 152	- 17
Center	- 555	- 664
South and Islands	- 461	- 383
Piedmont	- 257	- 39
Aosta Valley	- 592	- 369
Lombardy	- 42	28
A. P. of Bozen	- 729	122
A.P. of Trent	- 71	- 177
Veneto	- 153	- 16
Friuli Venezia Giulia	51	101
Liguria	- 456	- 338
Emilia Romagna	- 161	4
Tuscany	- 125	- 29
Umbria	- 134	- 41
Marche	- 299	29
Lazio	- 991	- 1.378
Abruzzo	- 512	- 424
Molise	- 625	- 924
Campania	- 777	- 509
Apulia	- 95	- 306
Basilicata	- 138	- 202
Calabria	- 313	- 123
Sicily	- 458	- 374
Sardinia	- 499	- 394

Source: CEIS Sanità processing of Health Ministry data 2011

Considering the geographical allocation, what stands out is a marked reduction in the Regions of Northern Italy: a per capita deficit of € 17 in the last five-year period taken into consideration as against € 152 per capita cumulated in the period 2001-2005. On the other hand, in the last five-year period, the central Regions reported a slightly higher cumulated deficit than in the preceding period. Meanwhile, in the period 2006-2010, Southern Italy reported a slight reduction of the cumulated deficit (€ 383 per capita) with respect to the preceding five-year period 2001-2005 (€ 461).

Positive "trend reversals" are reported at a regional level: Lombardy (per capita deficit of € 42 in the period 2001-2005, as against a cumulated per capita surplus of € 28 in the five-year period 2006-2010); Emilia Romagna (per capita deficit of € 161 in the period 2001-2005 as against a cumulated per capita surplus of € 4 in the subsequent five-year period); Marche (per capita deficit of € 299 in the period 2001-2005 as against a cumulated per capita surplus of € 29 in the five-year period 2006-2010).

Furthermore, there are Regions that reported a nominal increase in the per capita deficit cumulated in the period 2006-2010 with respect to the preceding five-year period: the Autonomous Province of Trent (€ 177 as against € 71), Lazio (€ 1.378 as against € 991), Molise (€ 924 as against € 625), Apulia (€ 306 as against € 95) and Basilicata (€ 202 as against € 138).

As at 2010, ten Regions have adopted a deficit Recovery Plan. The latter has been entered into by Lazio, Abruzzo, Liguria (that, in 2010, succeeded in finalizing it and, therefore, in having access to additional financing), Campania, Molise, Sicily and Sardinia in 2007. These Regions were followed in 2009 by Calabria and in 2010 by Piedmont and Apulia.

In 2010, taking just the ordinary operations into consideration, these Regions are among those that have cut to a greater extent their deficit with respect to the preceding year, even if the concentration has increased. The Regions with a Recovery Plan in 2010 have cumulated over 93% of the total deficit, calculated without taking into account the Regions with a surplus (including Calabria, even though it should be pointed out that the auditing of accounts is still under way).

Table 3.5 - Summary operating results for 2010 (ordinary operations)

Regions	Operating results (million €)	Percentage variation of results with respect to 2009	Per capita results (€)	Deficit as a percentage of the total deficit**
Italy	-2,297.5	-20.5	-38.1	100
North	-276.0	142.4	-10.0	13.3
Center	-995.4	-18.1	-83.8	42.7
South and Islands	-1,026.1	-34.3	-49.1	44.0
Piedmont*	-75.5	53.9	-17.0	3.1
Aosta Valley	-6.9	215.8	-54.1	0.3
Lombardy	11.7	-70.6	1.2	
A. P. Bozen	-3.1	-122.2	-6.2	0.1
A. P. Trent	-11.3	-1.3	-21.5	0.5
Veneto	-111.9	91.7	-22.8	4.6
Friuli Venezia Giulia	8.6	-31.0	7.0	
Liguria*	-112.7	2.3	-69.8	4.7
Emilia Romagna	25.0	-51.1	5.7	
Tuscany	3.1	-95.7	0.8	
Umbria	4.6	-136.2	5.1	
Marche	30.4	113.7	19.5	
Lazio*	-1,033.5	-19.7	-181.9	42.7
Abruzzo*	-20.8	-82.1	-15.5	0.9
Molise*	-47.4	-21.1	-148.1	2.0
Campania*	-374.4	-35.7	-64.3	15.5
Apulia*	-313.5	9.1	-76.8	13.0
Basilicata	-31.3	6.2	-53.2	1.3
Calabria*	39.1	-145.9	19.5	
Sicily*	-57.2	-69.2	-11.3	2.4
Sardinia*	-220.6	2.4	-131.9	9.1

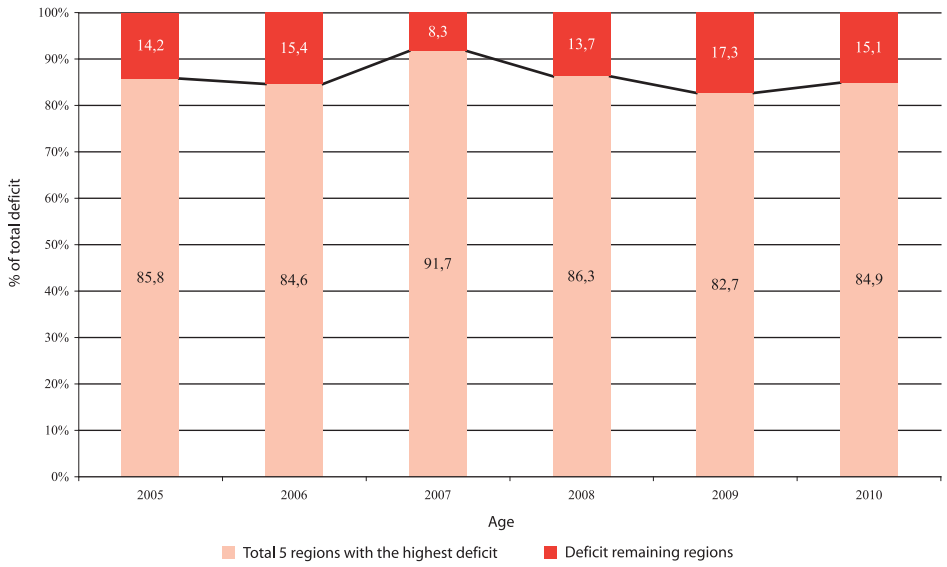
** Regions with a Recovery Plan in 2010*
*** Considering just the Regions with an operating deficit*

Source: CEIS Sanità processing of Health Ministry and ISTAT data

Considering just the five Regions with the highest deficit in 2010 (Lazio, Campania, Apulia, Sardinia and Liguria), they account for 85% of the national operating loss. Should we consider also the extraordinary operations, the percentage rises to 89%.

Figure 3.13 shows that the share attributable to the five Regions with the highest deficit in 2010 has slightly increased, after the downward trend of the two preceding years. In fact, the afore-mentioned share amounted to 82.7 in 2009 (lower than the 86.3 figure reported in 2008 that, in its turn, was lower than the 91.7 figure reported in 2007).

Figure 3.13 - Deficit concentration: share attributable to the five Regions with the highest deficit* - percentage values, 2005-2010

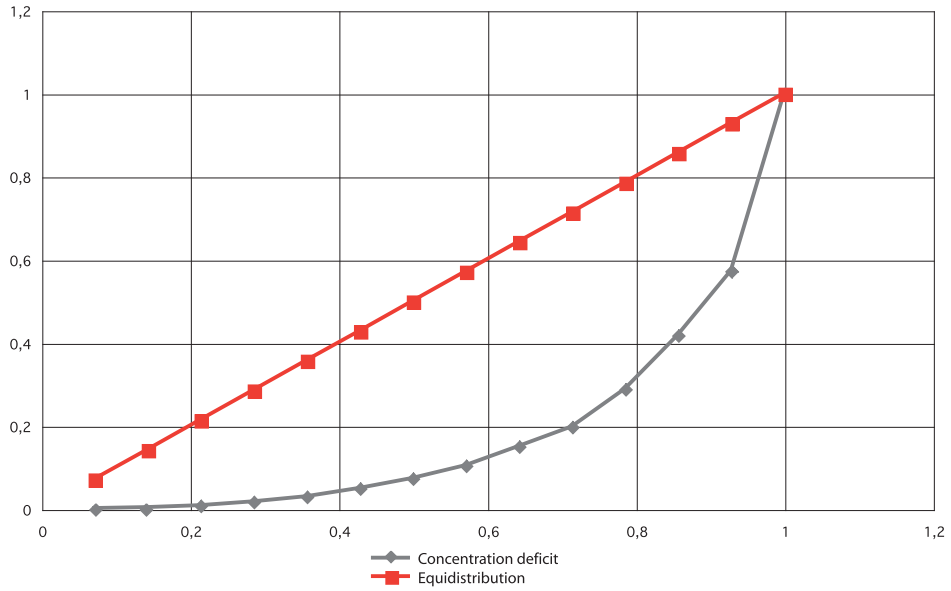


** Only the ordinary operations and just the total of the negative operating results are taken into consideration (therefore, the results of the Regions with a surplus are not included)*

Source: CEIS Sanità processing of Health Ministry data, 2011

A further confirmation of the high concentration of the deficit is obtained using the Gini index, which amounts to 0.70 (0.50 if one considers the per capita values rather than the absolute values).

Figure 3.14 - Lorenz curve - Concentration of the deficit in the 14 Regions with negative operating result in 2010



Source: CEIS data from the Ministry of Health 2011

Analyzing the regional trend of the deficit in the period 2001-2010, what stands out is the considerable contribution of Lazio to the deficit: in the years 2001, 2009 and 2010. Lazio is the Region with the worst operating result. In fact, over the last two years taken into consideration, it accounts on its own for over 40% of the total deficit (24% in 2001, 30% in 2005).
What stands out, on the other hand, is the surplus reported throughout the period 2003-2010 by Lombardy and Friuli Venezia Giulia and, since 2007, by Marche. Taking heed of the fact that we are dealing with provisional data, according to ministerial data the number of Regions reporting a surplus in 2010 would seem to be on the increase with respect to the previous year. These Regions are Lombardy, Friuli, Emilia Romagna, Tuscany, Umbria, Marche and Calabria. The number of Regions where profits exceeded losses was only higher in 2007 since, in addition to those reporting a surplus in 2010, there were Piedmont, the Autonomous Province of Bozen and Veneto, while Calabria reported a deficit.
Finally, with reference to the geographical breakdown of the Regions, in 2010, 44% of the total deficit has come from the southern Regions (South and islands), 42.7% from the central Regions and the remaining 13.3% from the Regions of Northern Italy.

3.4 Conclusions

In short, these conclusions highlight the points worthy of further investigation that have resulted from the 2010 health financing analysis both in the international context and with reference to the Italian Health Service.

Firstly, it may be noted that, within the OECD area, the health expenditure keeps on being financed for the most part by public resources, with an average figure amounting to 73.0% in 2009. Our country exceeds this average value, with a share of public financing amounting to 77.9%, slightly on the decrease (77.6%) in 2010. The considerable exposure of public budgets in order to finance healthcare gives rise to considerable sustainability-related concerns. This applies in particular to a country like Italy, where the worldwide financial crisis being experienced in the last few years has definitely compromised the already critical situation due to the excessive National Debt.

The OECD Countries keep on reporting a high share of out-of-pocket payments. In 2009, Italy's share was equal to 88.9%, on the increase with respect to 2008 (when it amounted to 87.4%). 2010 witnessed the beginning of a slight trend reversal, and the percentage decreased to 87.6%. In any event, in spite of the growth in number of second pillar Funds, these figures show that their quantitative development keeps on being limited.

In Italy, the financing of structural investments, that is to say capital expenditure, is a question that is becoming more and more important. Italy's capital expenditure on healthcare proves on the average lower than in many other OECD Countries (i.e., Poland, Austria, Canada, the United Kingdom, etc.). It turns out that, in 2010, Italy's expenditure for structural investments amounted to 3.8% of the total expenditure (substantially stable with respect to the preceding year). Even the weight of the structural crisis comes to light: in our country, the capital expenditure on health as a percentage of GDP has shown a decreasing trend from 2005 to 2009, even though it seems once again on the increase in 2010 (but the effect is substantially due to the GDP contraction). In any event, it seems unquestionable that this item of expenditure is strongly procyclical.

During the last five-year period, the funding of the National Health Service has grown in nominal terms, but with increasingly lower growth rates. If values were to be considered net of the effects of the variation in prices, we would end up with a decrease in the per capita financing in real terms in both 2008 (-0.9%) and in 2010 (-0.6%). If we look at the level of financing as a percentage of GDP, the positive variation reported particularly in 2009 and 2008 with respect to the preceding years is the effect of the crisis that in recent years has decreased Italy's GDP. This effect becomes all the more evident by resorting to an analysis by geographical areas.

In any event, the deficit of the RHS is on the decrease in both absolute and per capita terms, particularly in those Regions that have implemented a Recovery Plan, but its concentration is on the increase. In 2010, Lazio on its own has accounted for 42.7% of the total deficit, while the five Regions with the highest deficit accounted for 85% of the national deficit. This percentage gets to 89% if extraordinary returns and costs are taken into consideration.

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APPENDIX

Further Notes on "Health Financing". Main statistical tables that may be retrieved from the CEIS Health Report site

- **International comparisons**

Total expenditure on health – % of GDP
Total current expenditure on health – % of GDP
Total capital expenditure on health – % of GDP
Public health expenditure – % total health expenditure
Public health expenditure – % of GDP
Public current expenditure on health – % of GDP
Public capital expenditure on health – % of GDP
Private health expenditure – % total health expenditure
Private health expenditure – % of GDP
Private insurance health expenditure – % of GDP
Private out-of-pocket health expenditure – % of GDP
Private cost-shared health expenditure – % of GDP
Current private health expenditure – % of GDP
Private capital expenditure on health – % of GDP

- **Financing of the National Health Service**

Current financing of the NHS by function
Current financing of the NHS by function - Shares
Current financing of the NHS by function – Variations

- **Financing of the Regional Health Service**

Agreements among State, Regions and Autonomous Provinces on the allotment of the NHS resources
Gross RHS current financing

Gross RHS current financing – Per capita
Gross RHS current financing – Weighted population, per capita
Gross RHS current financing – Variations
Gross RHS current financing – Index numbers
Gross RHS current financing – % of GDP
Net current RHS financing
Net current RHS financing – Per capita
Net current RHS financing – Weighted population, per capita
Net current RHS financing – Variations
Net current RHS financing – Index numbers
Net current RHS financing – % of GDP

- **Financing sources**

IRAP and IRPEF surcharge
IRAP and IRPEF surcharge – Variations
IRAP and IRPEF surcharge – Index numbers
IRAP and IRPEF surcharge – Per capita
VAT and Excise tax
VAT and Excise tax – Variations
VAT and Excise tax – Index numbers
VAT and Excise tax – Per capita
Profits and revenues
Profits and revenues – Variations
Profits and revenues – Index numbers
Profits and revenues – Per capita
Profits and revenues – Percentage composition
Extraordinary profits
Extraordinary profits – Variations
Extraordinary profits – Index numbers
Extraordinary profits – Per capita
National Health Fund (FSN) and further integrations borne by the State
FSN and further integrations borne by the State – Variations
FSN and further integrations borne by the State – Index numbers
FSN and further integrations borne by the State – Per capita
Further public and private transfers
Further public and private transfers – Variations
Further public and private transfers – Index numbers
Further public and private transfers – Per capita

- **Financing tied to the Health Plan objectives**

Resources tied to the Health Plan objectives

- **Health mobility**

Balances of the interregional health mobility

- **Operating results**

RHS gross operating profit
RHS gross operating profit – Per capita
RHS gross operating profit – % of GDP
RHS gross operating profit – % of financing
Gross regional deficits – Composition
RHS net operating profit
RHS net operating profit – Per capita
RHS net operating profit – % of GDP
RHS net operating profit – % of financing
Net regional deficits – Composition

Chapter 4

The cost of health care: international comparisons, forecasts, efficiency

4 - The cost of health care: international comparisons, forecasts, efficiency

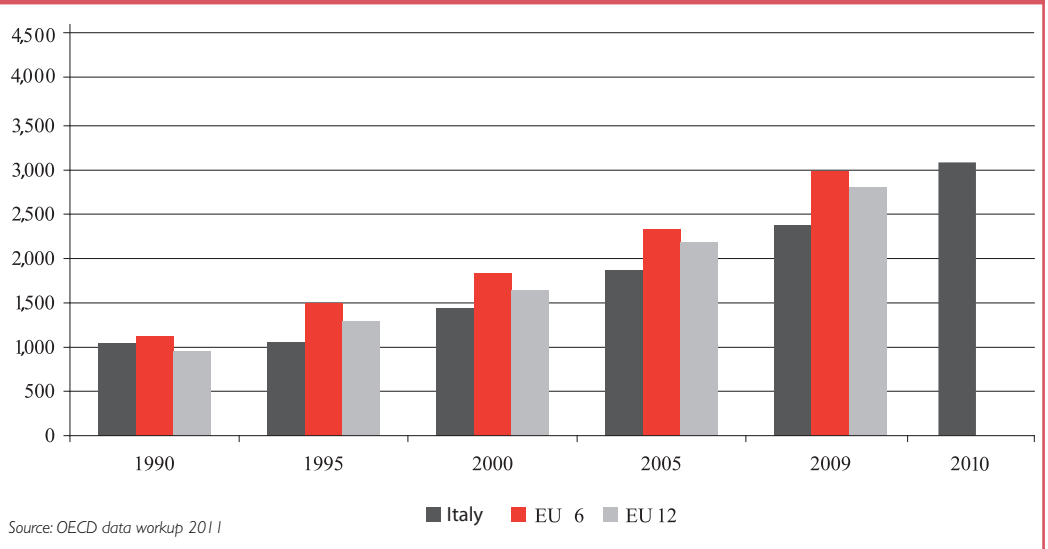
Barbara Polistena[1]

4.1. Health-care cost

Per capita Italian public health-care expenditure, owing to the containment operations carried out over the last few years, is today 15.5% lower than that of Europe of the twelve and 20.6% less than that of Europe of the six. The gap has increased starting from 2005 when public health-care expenditure was 14.5% lower than that of Europe of the twelve and 20.0% relative to Europe of the six.

Starting from 2000 the gap relative to Europe is obvious and growing, also when total health-care expense is analyzed: -7.2% relative to Europe of the twelve and -17.1% relative to Europe of the six in 2000, and in 2009 -16.2% and -20.8% respectively.

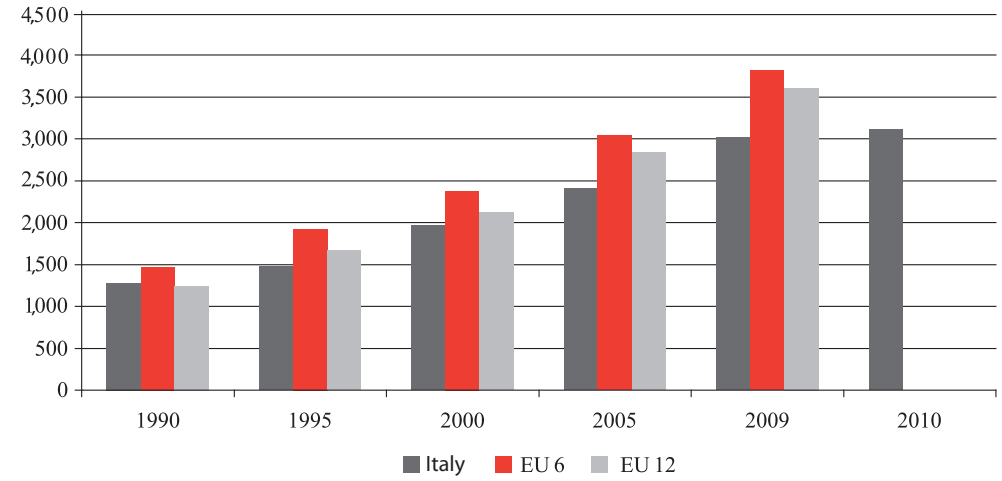
Figure 4.1 - Per capita public health-care expenditure ($PPP) 1990-2010



Source: OECD data workup 2011

[1] *CEIS-Sanità, Economics faculty, University of Rome, Tor Vergata campus*

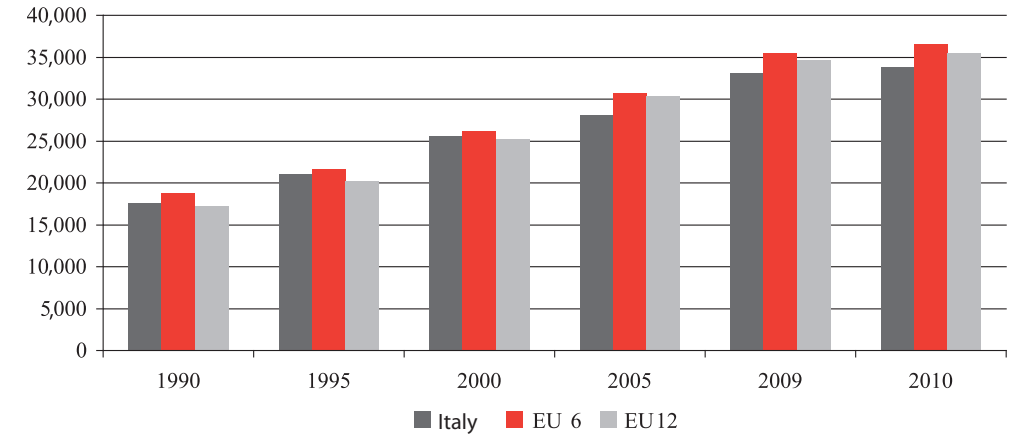
Figure 4.2 - Per capita total health-care expenditure ($ PPP) 1990-2010



Source: OECD data workup 2011

The difference between Italy and Europe in terms of per capita health-care expenditure is greater than the difference in GDP, which in 2009 was -6.8% relative to Europe of the six and -4.7% relative to Europe of the twelve.

Figure 4.3 - Per capita GDP ($ PPP) 1990-2010



Source: OECD data workup 2011

Taking its ratio to the GDP, in 2009 the incidence of total health-care expenditure was 9.1%, considerably lower than the 9.6% for the average of the OECD countries. In 2010 (the last

balance sheet data available from the OECD source) the total expenditure in Italy was 9.6% of the GDP. Thus, the contribution of the public share, 7.2% of the GDP in 2010, remains important. If between 2001 and 2007 total health-care expenditure had anyway increased by 4.2% per year on the average, after the appearance of the economic crisis during the succeeding years the growth was only 0.7% per year on the average (the years 2007-2009). In particular public expenditure, despite a slowdown, continued its growth (4.7% per year on the average between 2001 and 2007 as against the 2.1% between 2007 and 2009, while private health-care expenditure dropped (2.7% per year on the average between 2001 and 2007 and 4.8% between 2007 and 2009).

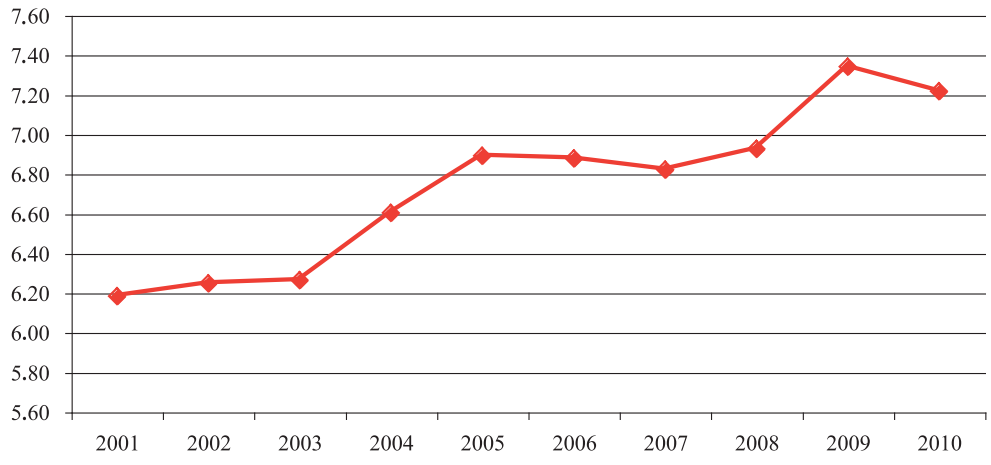
Italy thus marks a trend that cannot be completely superposed on that of the average of the OECD countries, in which the percentage of public expenditure had dropped by 0.6% of the GDP, between 2001 and 2007, while in 2009 it had increased again by 4.9%, an increase due both to the diminution of the GDP and to the rise in public expenditure.

Although the susceptibility to comparison of the health-care data from the OECD data base is not absolute, the numbers cited seem to indicate that, as will be gone into more deeply in what follows, the problems of the NHS efficiency were more of the allocation type than of mere technical efficiency.

The danger that the stagnation-recession of the Italian economy implies a further increase in the gap with Europe in terms of health-care expenditure must be gone into in depth, in particular as regards the measure in which it can create significant obstacles in the way of access to innovations.

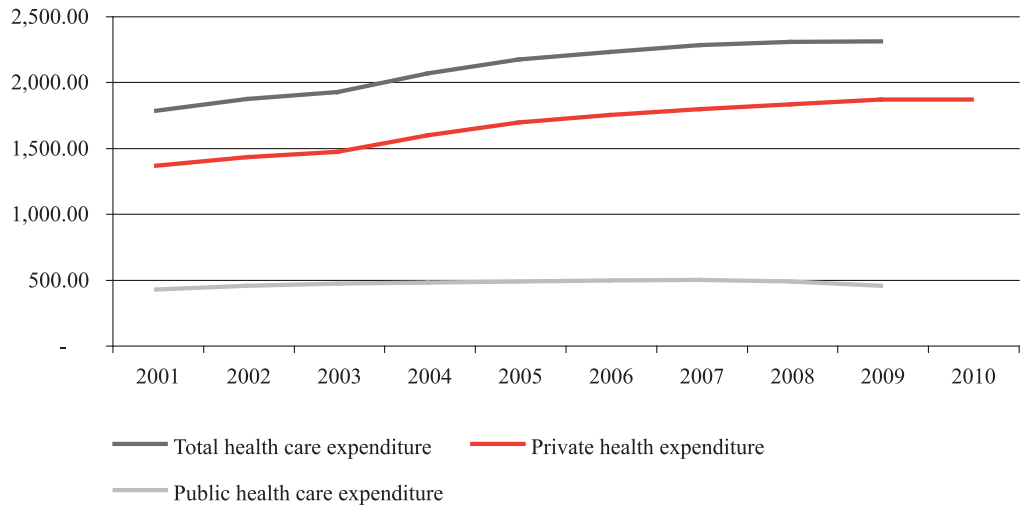
The financial crisis that started between 2008 and 2009 has obviously exerted, and for good reason, an impact on the public health-care system, on which the excess of debt weighs too, as do too the restricted availabilities of the public finance.

Figure 4.4 - Development of the incidence of public health-care expenditure on the GDP. - Italy 2001-2010



Source: Health Ministry and ISTAT data workup

Figure 4.5 - Trend in per capita public, private and total health-care expenditure - Values in €. 2001-2010



Source: Health Ministry and ISTAT data workup

The slowdown in the growth of public expenditure is tied mainly to the containment of direct expenditures, which is reduced in both the Center and the South.

The expenditures made under agreements between the state and private firms, instead, despite the cuts in the pharmaceuticals sold under such agreements (-2% between 2008 and 2009 and -0.6% between 2009 and 2010), went ahead with their growth, pulled most especially by the expenditure for specialist services under agreement (+4.3% between 2008 and 2009 and +6.1% between 2009 and 2010) and for other care given under agreement (+4.3% between 2008 and 2009, and +3.1% between 2009 and 2010).

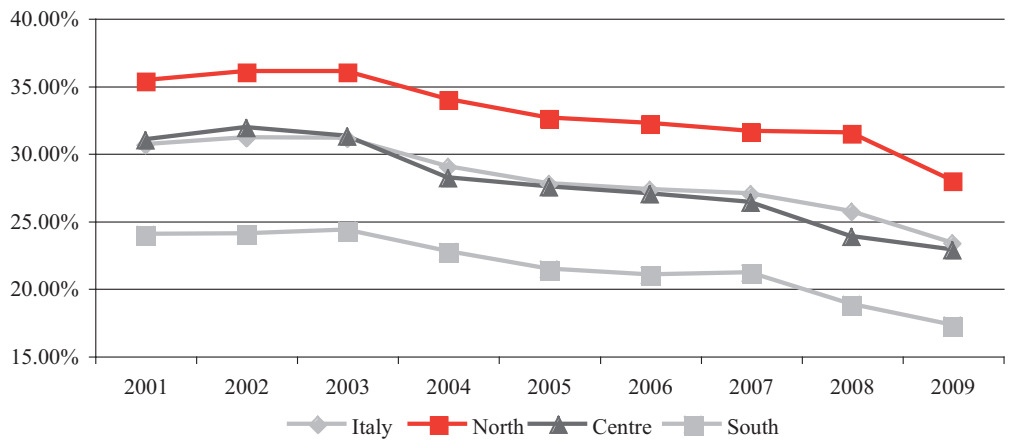
Table 4.1 - Trends in health care expenditure, both directly administered and that under agreement - % values 2001-2009

Regions	2006/2005	2007/2006	2008/2007	2009/2008	2010/2009
Under agreement					
Italy	5.03	-0.20	2.15	1.47	2.08
North	5.06	2.16	3.76	2.74	2.89
Center	7.60	-3.23	2.49	-1.59	1.68
South	3.55	-1.42	-0.12	1.54	1.19
Direct					
Italy	3.36	6.56	3.70	3.52	0.66
North	3.81	6.38	4.06	3.13	1.96
Center	4.12	6.50	2.01	5.83	-0.46
South	2.22	6.87	4.32	2.61	-0.48

Source: Health Ministry data workup

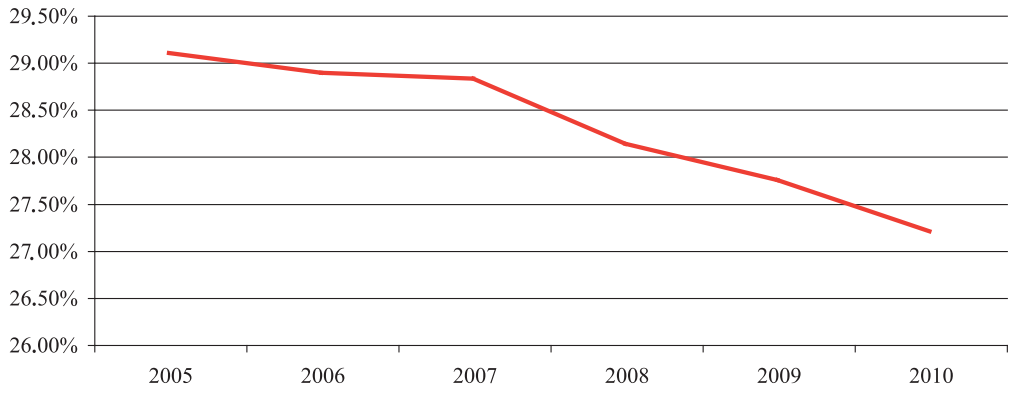
The public/private health-care ratio, if it remained more or less stable between 2001 and 2003, was decreasing, displaying a negative peak between 2008 and 2009, in correspondence with the onset of the financial crisis (especially in the North and South). The incidence of public health care on social protection (welfare expenditures) was also dropping consistently, starting from 2008.

Figure 4.6 - Ratio of private health care expenditures to public %Values . 2001-2009



Source: Health Ministry and ISTAT data workup

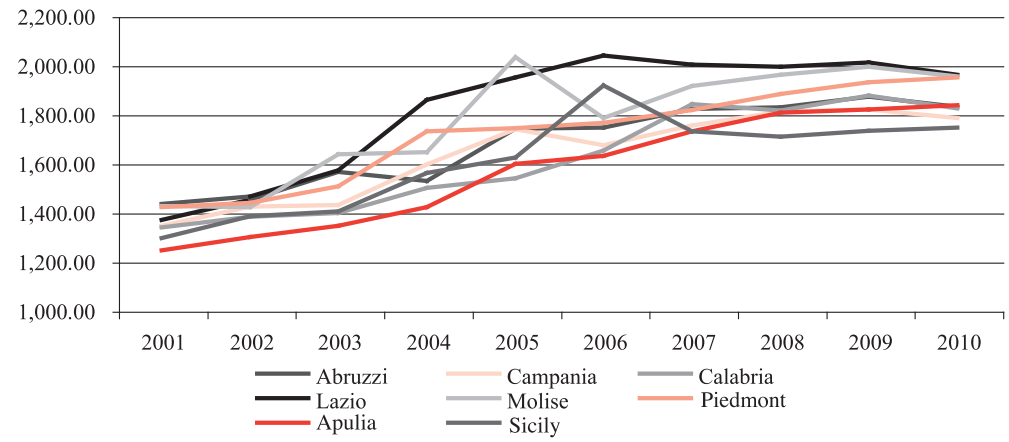
Figure 4.7 - Incidence of health-care expenditure on Social-protection expenditures - %Values. 2005-2010



Source: Health Ministry and ISTAT data workup

Contributing to the "cooling" of public expenditures during the period considered, was certainly the successful outcome of the Re-entry plans (activated in the Abruzzi, Campania, Calabria, Latium, Molise, Apulia, Piedmont and Sicily).
In the Regions mentioned public expenditure, which had grown considerably between 2001 and 2007 (4.9% annual average in Abruzzi, 4.5% in Campania, 5.5% in Calabria, 5.7% in Latium, 5.1% in Molise, 4.2% in Apulia, 5.6% in Piedmont and 4.9% in Sicily) slowed down its growth between 2007 and 2009 (1.3% yearly mean in Abruzzi, 1.8% in Campania, 0.9% in Calabria, 0.2% in Latium, 2.0% in Molise, 3.0% in Apulia, 2.5% in Piedmont and 0.1% in Sicily) to record a reduction in most of them between 2009 and 2010 (-2.2% n Abruzzi, -1.8% in Campania, -2.7% in Calabria, -2.5% in Latium, -2.0% in Molise, 1.0% in Apulia, 0.9% in Piedmont and 0.8% in Sicily).

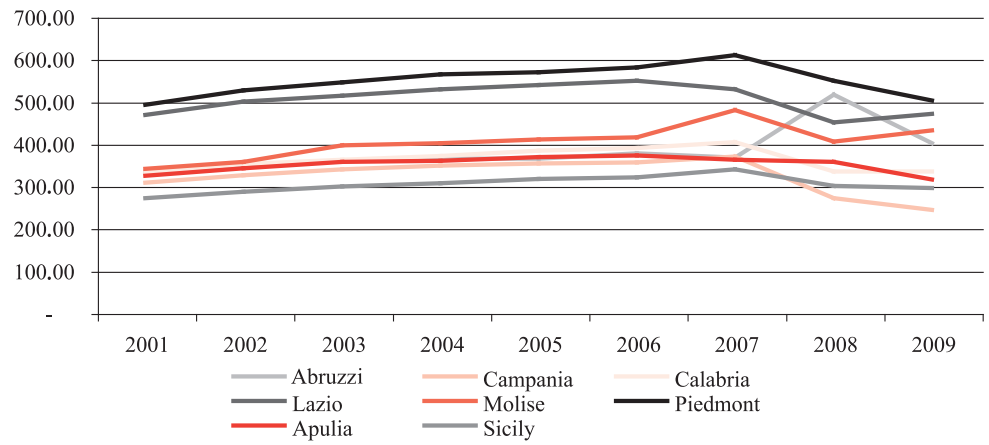
Figure 4.8 - Behaviour of per capita public health-care expenditure in the Regions subject to the Re-entry plan - Values in €. 2001-2010



Source: Health Ministry and ISTAT data workup

In those same Regions, private health-care expense too had grown between 2001 and 2007 but, after the economic crisis, it dropped between 2007 and 2009.
In real terms an overall reduction in expenditures during the years 2008 and 2009 can be seen in Abruzzi, Campania and Puglia (-2,0%, -0.6%, -0.6%).

Figure 4.9 - Behaviour of per capita private health-care expenditure in the Regions subject to the Re-entry Plan - Values in €. 2001-2009



Source: Health Ministry and ISTAT data workup

4.2. Health-care expenditure containment policies and fairness

One way of inferring the impact of health-care expenditure containment policies is to study the correlation between impoverishment and the so-called catastrophic health-care expenditures, and the health-care expenditure per weighted population (purged then of demographic effects).

To this purpose, it was chosen to carry out a comparison between the level of impoverishment and public health-care expenditure as well as between the incidence of catastrophic expenses and the level of health care expenditure.

The Regions having a greater incidence of impoverishment owing to health-care costs were Calabria, Basilicata and Sicily, while those having the least incidence were Lombardy, Emilia Romagna and Latium.

Table 4.2 - Relationship between impoverishment and public health care expenditure 2009

Regions	Ordering by incidence of impoverishment	Ordering by growing per capita health-care expenditures per weighted population	Departures from positions	Result
Calabria	1.00	4.00	3.00	+
Basilicata	2.00	1.00	-1.00	
Sicily	3.00	2.00	-1.00	
Sardinia	4.00	12.00	8.00	+++
Apulia	5.00	6.00	1.00	
Campania	6.00	9.00	3.00	+
Trentino Alto Adige	7.00	19.00	12.00	+++
Veneto	8.00	11.00	3.00	+
Piedmont and Valle d'Aosta	9.00	13.00	4.00	+
Marches	10.00	3.00	-7.00	---
Umbria	11.00	5.00	-6.00	---
Molise	12.00	17.00	5.00	++
Abruzzi	13.00	8.00	-5.00	--
Liguria	14.00	10.00	-4.00	-
Friuli Venezia-Giulia	15.00	15.00	0.00	
Tuscany	16.00	16.00	0.00	
Latium	17.00	18.00	1.00	
Emilia Romagna	18.00	14.00	-4.00	-
Lombardy	19.00	7.00	-12,00	---

Source: CEIS Sanità workup of ISTAT and Health Ministry data

+ 2-4 lower positions
++ 4-6 lower positions
+++ over 6 lower positions

- 2-4 higher positions
-- 4-6 higher positions
--- more than 6 higher positions

The Regions in which a high-on-average per capita health-care expenditure corresponds to a greater incidence of impoverishment are the Molise, but also the Piedmont and the Valle d'Aosta, Sardinia and Trentino Alto Adige.

On the other hand the Regions in which the impoverishment threshold is low on average relative to its per capita health-care expenditure per weighted population are Lombardy, Umbria, and the Marches.

As regards catastrophic health-related events, the Regions with a greater incidence of catastrophic expenditures were, in 2009, just as for impoverishment in 2009, Basilicata, Calabria and Sicily.

The Regions having, instead, a lower incidence of catastrophic expenditures are Lombardy, Abruzzi and Tuscany.

On analyzing the relationship between the incidence of catastrophic expenditures and per capita public-health-care expenditures per weighted population, it appears that the Regions in

which is observed a greater departure negatively (too high a catastrophic expense relative to the per capita public expenditure per weighted population) are Sicily, Apulia and Molise (all Regions that are subject to the re-entry plan).
On the other hand the Regions having a greater positive departure (low level of catastrophic expenditures and per capita health-care expenditures lower than the mean) are Lombardy and Abruzzi.

Table 4.3 - Relationship between catastrophic expenditure and public-health-care expenditure 2009

Regions	Ordering by incidence of catastrophic expense	In increasing order by per capita public health-care expenditure per weighted population	Position departures	Result
Basilicata	1.00	1.00	0.00	
Calabria	2.00	4.00	2.00	+
Sicily	3.00	16.00	13.00	+++
Sardinia	4.00	2.00	-2.00	-
Campania	5.00	9.00	4.00	+
Trentino A. A.	6.00	6.00	0.00	
Apulia	7.00	12.00	5.00	++
Molise	8.00	17.00	9.00	+++
Umbria	9.00	5.00	-4.00	-
Liguria	10.00	10.00	0.00	
Marches	11.00	3.00	-8.00	---
Emilia Romagna	12.00	14.00	2.00	+
Veneto	13.00	11.00	-2.00	-
Friuli Venezia-Giulia	14.00	15.00	1.00	
Latium	15.00	18.00	3.00	+
Piedmont and Valle d'Aosta	16.00	13.00	-3.00	-
Tuscany	17.00	19.00	2.00	+
Abruzzi	18.00	8.00	-10.00	---
Lombardy	19.00	7.00	-12.00	---

Source: CEIS Sanità workup on ISTAT and Health Ministry data

+ 2-4 lower positions

++ 4-6 lower positions

+++ over 6 lower positions

- 2-4 higher positions

-- 4-6 higher positions

--- more than 6 higher positions

4.3. Health-care-expenditure containment policies and citizen satisfaction

Investigated too was the relationship between its expense and citizen satisfaction with the service.

As things stand now information on customer satisfaction is little and fragmentary, also because of objective problems of measurement: the citizens' level of satisfaction in the health-care area is influenced not only by the quality of service offered, but also by his expectations, and by the mean effective level of his health. With the caveats set forth above, we limited our efforts to making a comparison between the level of satisfaction for hospitalizations by patients (medical assistance, nursing, meals and hygienic services) and the health-care expenditure. It was not possible to reconstruct an aggregate of total hospital expense, nor even to find data referring to overall satisfaction with health-care assistance. Nonetheless, we believe that satisfaction with hospital services can be a significant proxy, even if partial, for general customer satisfaction over the system.

The correspondence between the ordering of the Regions on the basis of citizens' satisfaction and health-care expenditure is low (Spearmen's correlation is 0.46).

The regions in which the highest satisfaction with hospital services was felt by the citizens are Trentino Alto Adige, Valle d'Aosta and the Veneto, while those in which the satisfaction was least are Apulia, Sicily and Campania.

The Regions in which a greater negative departure is observed (that is, the expense is not justified by the levels of satisfaction reached) are Molise, Latium, and Apulia. On the other hand where the expenditure appears to be particularly good value for the money spent is in the Veneto, Umbria and the Marches.

Table 4.4 - Relationship between citizens' satisfaction and public health-care expenditure. 2007

Regions	Ordering by citizens' satisfaction (hospital services)	Ordering by per capita public health care expenditure per weighted population	Position departures	Result
Trentino A. A.	1	1	0	
Valle d'Aosta	2	2	0	
Veneto	3	11	8	+++
Umbria	4	15	11	+++
Marches	5	16	11	+++
Emilia Romagna	6	7	1	
Lombardy	7	13	6	+++
Tuscany	8	9	1	
Abruzzi	9	19	10	+++
Friuli Venezia- Giulia	10	6	-4	
Piedmont	11	8	-3	
Basilicata	12	18	6	+++
Liguria	13	10	-3	
Latium	14	5	-9	
Calabria	15	21	6	+++
Molise	16	4	-12	
Sardinia	17	21	4	++
Campania	18	17	-1	

Source: CEIS-Sanità workup of ISTAT and HM data

+ 2-4 lower positions

++ 4-6 lower positions

+++ over 6 lower positions

- 2-4 higher positions

-- 4-6 higher positions

--- more than 6 higher positions

4.4. Health-care expenditure forecasts

In continuity with the preceding CEIS Sanità reports the behaviour of health-care expenditures in Italy and its determinants was analyzed, using a fixed-effects-panel model.

Following an approach that is rather broadcast in the literature, the hypothesis is that health-care expense is a function of

- Need,
- Income and prices,
- Institutional factors.

Regarding need, the variables that were taken into consideration are demographic and social in nature. The model considers the percentage of population over 75, as well as the generic death rate (this latter was inserted as a substitute for the so-called "costs of death", according to which it would not be ageing so much, as the costs sustained during the terminal phase of life, that would be the principal driver in the growth of health-care costs). Furthermore, introdu-

ced into the model is the variable *level of education*, in terms of percentages of individuals with degrees equal at least to the *laurea* to capture the impact of the social characteristics (obviously this variable is also closely correlated to economic level).
From the economic standpoint we have considered the relationship between expenditure and GDP. This latter variable is taken as a proxy for the national economic level, and as demonstrated in the econometric literature, represents in fact the most "important" determinant of health-care costs.
At the institutional level it is fundamental to understand the impact (in particular if expansive or restrictive) of public intervention in health care. In the specification of the model the financing envisaged (financing ex ante) was inserted. Furthermore, since the organizational systems of the NHS differ significantly, in particular as regards the participation of private suppliers, the quota of directly managed expense (that is on arrangement with private businesses accrediting) was introduced to analyze the effect of this system.
Still considered indirectly was the efficiency of the regional systems, by inserting variables regarding personnel cost, number of beds, expenditures for pharmaceuticals, levels of cost of the ticket and mobility.
The model estimated is a fixed-effects panel on the twenty Italian Regions for the years 1995-2009.
We define:
SST = total per capita health-care expenditure
POP_75+ = percentage of population over 75 years
M = generic death rate
TSL = quota of population having a laurea (AB-MA) or higher
PIL = per capita GDP
FIN = Per capita financing obtained through CIPE resolutions
SDSC = ratio of public expenditure to direct handling and handling by agreement with private firms
TPD = employee personnel per inhabitant
TPL = beds per inhabitant
TK = per capita expenditure for pharmaceuticals ticket
The model estimated is:
SST = f(SST; POP_75+; M; TSL; PIL; FIN;SDSC; TPD; TPL; TK)
The variables that turned out to be significant in the final model explain 81.3% of the variability of total per capita health-care expenditure. Both the temporal effect and the effect of variability between the Regions is explained more than satisfactorily (R^2 within 95.7% R^2 between 74.9%).
Turning out significant then, and with the expected sign, are the GDP, age, educational diploma, some institutional variables and, in particular, financing and the employee-personnel rate.
In particular ageing of the population influences the increase of health-care expenditure just as does a higher level of education.
Analogously an increase in the GDP brings with it an increase in health-care expenditure.
The institutional system exerts an impact in the sense that a greater public financing tends to expand total health-care expenditure. Considering that this effect is net of the effect of the sharings it may be supposed to be attributable to a substantial duplication of functions between

the private and public sectors, as too to a tendency of the regional system to "profit" from the greater resources placed at disposal centrally.
Also the variable *employee-personnel rate* is significant: a higher number of employees obviously brings with it higher costs.
On the basis of the estimated model a forecast of the health-care expenditure was produced.

Table 4.5 - Panel Model

Variables	Coefficients	p > | t |
POP_75+	3,588.409	0.009
TSL	24.032	0.000
PIL	0.039	0.000
FIN	0.541	0.000
TPD	2.867	0.017
Constant	-542.975	0.003

Source: ISTAT and Health Ministry data workup

The assumptions made are as follows:
- the demographic assumptions are borrowed from the forecasts worked up by ISTAT;
- the quota of persons having a degree of Laurea or higher was supposed to grow continuously, in line with the experience of the last few years;
- the GDP was assumed to be in slight increase after the recession foreseen for 2012;
- regarding the development of central financing the quantification contained in decree-law no. 98/2011 was adopted: for the year 2013, +0.5%, and for 2014, +1.4%;
- the personnel rate was assumed to be slightly decreasing (owing to the blockage of turnover).

The tendency that emerges is characterized by a substantial stability of total health-care expenditure relative to the GDP, i.e. around 8.9% of GDP.
Regarding public expenditure two assumptions were made:

Table 4.6 - Forecast of total health-care expenditure

	2011	2012	2013	2014
Trend in total health-care expenditure (bln)	140.7	141.9	144.0	147.1
Rate of change (%)	1.4%	0.9%	1.5%	2.1%
Quota of GDP (%)	8.9%	9.0%	9.0%	8.9%

1. the optimistic assumption: growth exceeds 0.5% relative to the mean yearly increase in total health-care expenditure between 2007 and 2009;
2. the pessimistic assumption: expenditure increases by 1.3% per year: a value equal to the mean gap relative to the growth of total expenditure for 2007-2009.

In the model adopted private expenditure is determined in residual fashion: should the developmental picture be that delineated, private expenditure would grow between 2012 and 2014, ending up between 1.4% and 1.7% of the GDP.

Table 4.7 - Forecast of public and private health care expenditures

	2011	2012	2013	2014
Public health-care expenditure trend (bln.)	114.2-115.7	115.7-118.3	117.2-120.9	118.7-123.6
Rate of change (%)	1.3%-2.6%	1.3%-2.2%	1.3%-2.2%	1.3%-2.3%
Quota of GDP (%)	7.2%-7.3%	7.3%-7.5%	7.3%-7.5%	7.2%-7.5%
Priv. health-care expenditure trend (bln)	25.0-26.5	22.7-25.3	22.2-25.9	22.5-27.4
Rate of change (%)	-4.2%-+1.6%	-9.2%- -4.4%	-2.3%-+2.3%	+1.4%-+5.8
Quota of GDP (%)	1.6%-1.7%	1.4%-1.6%	1.4%-1.6%	1.4%-1.7%

The resulting picture must be discounted by 2.5 billion € for 2013 and by 5.5 billion € in 2014 should the (government's) financial manoeuvre be fully complied with.

Table 4.8 - Forecast of public and private health-care expenditures after the financial maneuver

	2011	2012	2013	2014
Public health-care expenditure trend (bln.)	114.2-115.7	115.7-118.3	114.7-118.4	113.2-118.2
Rate of change (%)	1.3%-2.6%	1.3-2.2%	-0.9%-0.1%	-0.2% - -1.2%
Quota of GDP (%)	7.2%-7.3%	7.3%-7.5%	7.1%-7.4%	6.9%-7.2%
Priv. health-care expenditure trend (bln)	25.0-26.5	22.7- 25.3	22.2- 25.9	24.7- 29.6
Rate of change (%)	-4.2%-1.6%	- 9.2%- -4.4%	-2.3%- 2.3%	11.2%-14.3%
Quota of GDP (%)	1.6%-1.7%	1.4%-1.6%	1.4%-1.6%	1.5%-1.8%

With the introduction of the ticket for 2014 private expenditures would reach 1.8% of the GDP.

4.5. Conclusions

Italian health care expenditures in relation to the GDP are less than the OECD mean as well as those of Europe of the six and twelve (-1.3% and 0.9% respectively).
Also per capita Italian health-care expenditure lies between 15.5 and 20.6% less than that of her European partners, which implies that financial balance has a substantial social cost.
In particular the incidence of health-care expense on the GDP went from 9.1% to 9.6%, although this owed to the effect of the persistent stagnation-recession of the GDP. This "result" will lead, in financial terms, to increasing the gap in per capita expenditure (already significant today) separating Italy from the other European countries, but most especially to reducing the quota of public assistance and therefore, presumably, also reducing fairness and access to innovations.
The financial crisis that started between 2008 and 2009 obviously exerts, and so much the more for good reason, an impact on the public health-care system, on which the excess of debt weighs too and therefore the tightness of public finance.
In fact, if between 2001 and 2007 total health-care expense had increased by 4.2% as a yearly mean, after the start of the crisis in the succeeding years growth was only 0.7% on the average per year. In particular, it is the public expenditure that, despite the slowdown, has continued its increase (an average 4.7% per year between 2001 and 2007 as against the 2.1% between 2007 and 2009), while private health-care expense dropped (2.7% on the yearly average between 2001 and 2007 and 4.8% between 2007 and 2009).
The stabilization of the growth of public health-care expenditure, to which the good outcome of the Re-entry Plans certainly contributed, has anyway implied efficiencies and greater allocation effectiveness even if the risks increased on the side of quality and quantity of the services, as well as on the side of fairness.
The Regions in which a greater incidence of impoverishment is recorded, despite a per capita health-care expenditure that is high on the average, are the Molise first, then the Piedmont, the Valle D'Aosta, Sardinia and Trentino Altro Adige. The Regions in which are seen more catastrophic expenditures relative to the per capita public expenditure (per weighted population) are Sicily, Apulia and Molise. (Regions subject to the Re-entry Plan).
The Regions in which expenditures appear less justified in terms of citizen satisfaction are the Molise, Latium and Apulia. On the other hand the expenditures appear as particularly "good value for the money" in the Veneto, Umbria and the Marches.

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- OECD, Health Data 2011.

APPENDIX

Further investigations into "health care expenditure"
The principal statistical tables that can be found on the website of CEIS Rapporto Sanità.

TOTAL HEALTH-CARE EXPENDITURE

•International data

Per capita total current health care expenditure $PPA
Total current health care expenditure %Variations
Total current health care expenditure as % of GDP
Total current health-care expenditure as % of GDP %Variations
Correlation between level of current health-care expenditure and health-care expenditure increase
Correlation between current per capita health care expenditure and per capita GDP

•National data

Total health care expenditure. mln of €
Per capita total health-care expenditure €
Total health-care expenditure. %Variations
Total health care expenditure. Index numbers??
Total health-care expenditure as % of GDP
Total health-care expenditure as % of GDP. %Variations
Per capita total health-care expenditure per weighted population. €
Total health care expenditure. Determinants
Total health care expenditure. Forecast

PRIVATE HEALTH-CARE EXPENDITURE

•National data

Private health care expenditure. mln of €
Per capita private health-care expenditure. €
Private health care expenditure. %Variations
Private health-care expenditure. Index numbers
Private expenditure as % of total expenditure
Private health-care expenditure as % of GDP
Private health-care expenditure as % of GDP. %Variations
Per capita private health-care expenditure per weighted population. €
Correlation between private health care expenditure and GDP. per capita
Correlation between per capita private health care expenditure and per capita tickets
Private health-care expenditure. Forecast

•Sharings

Expenditure per ticket. mln of €
Per capita expenditure per ticket. €
Expenditure per ticket. %Variations

Expenditure per ticket. Index numbers
Expenditure per ticket as % of total health-care expenditure
Expenditure per ticket as % of public health care expenditure
Health-care expenditure per ticket as % of private health-care expenditure. % Values
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Current public health-care expenditure as % of total health-care expenditure
Public health-care expenditure as % of total public expenditure

•National data

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Current public health-care expenditure. mln of €
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Current public health-care expenditure. Index numbers
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Per capita health-care expenditure per weighted population, gross, and net of mobility. Ranking
Public health-care expenditure net of mobility. mln of €
Per capita public health-care expenditure net of mobility. €
Public health-care expenditure net of mobility. % Variations
Public health-care expenditure net of mobility. Index numbers
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Direct public health care expenditure in mln of €
Per capita direct public health care expenditure in €
Direct public health care expenditure. % Variations
Direct health care expenditure. Index numbers
Direct health care expenditure as % of total public health care expenditure

Direct public health care expenditure. composition

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Per capita expenditure for goods and services. €
Expenditure for goods and services. % Variations
Expenditure for goods and services. Index numbers

Expenditure for goods as % of expenditures for goods and services. Composition
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Health-care expenditure by agreements Index numbers
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Per capita expenditure for basic medicine. €
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Expenditure for pharmaceuticals by agreement. mln of €
Per capita expenditure for pharmaceuticals by agreement. €
Expenditure for pharmaceuticals by agreement. % Variations
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Expenditure for pharmaceuticals by agreement as % of expenditures by agreement
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Expenditure for other assistance as % of expenditure by agreement
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Per capita rehabilitation expenditure. €
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Per capita expenditure for prostheses. €
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Chapter 5a

Performance indicators: Updating on the impact of the financial crisis as regards fairness

5a - Performance indicators: Updating on the impact of the financial crisis as regards fairness

Daniela d'Angela[1]

5a.1. Introduction

The National Health Service is a social insurance of the universalized type, having as its aim not only to promote the safeguarding of the population's health, but also, and fundamentally, to ensure citizens against the onset of economic costs arising from illness.

The World Health Organization (WHO) has proposed an integration between the classical *ex ante* measures on the financing side, and the *ex post* factors (burden space), based on the comparison between out-of-pocket (OOP) health costs sustained by families and their capacity to pay them (CTP), in order to evaluate the system's degree of response to the safeguarding of citizens against economic risks arising from illness.

This contribution, in continuity with the preceding editions of the CEIS Health Report, analyzes the measurements of impoverishment and of castastrophe, privileged indicators of families' fragility[2], during the 2008-2009 two-year period. The data on the period just mentioned takes on especial importance, since it covers the first of the recent financial crises (2009), offering a possibility of discussing the system's real capacity to ensure coverage to the population even during a time that is critical from the economic standpoint.

Impoverishment concerns all those families that, owing to OOP health expenditures, descend below the threshold of relative poverty. In the calculation of the costs sustained by families there have been considered the items of the Istat investigation into family consumption, with the exception of that concerning life insurance policies, annuities, mortgages for the purchase of housing and the repayment of loans. The relative poverty threshold used was that published by Istat for the years being analyzed. The families subject to catastrophic expenditures are instead all those families that sustained health costs exceeding forty percent of their CTP. A family's CTP is the difference between the total expenditure sustained and the costs of subsistence, the latter costs being conventionally identified with the absolute poverty threshold. The absolute poverty thresholds adopted for the years of concern are those published by Istat during 2002, reevaluated using the consumer prices index, for the purpose of permitting homogeneous analyses in a historic series and of guaranteeing continuity with preceding analyses.

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[2] *A. Maruotti, F.S. Mennini, L. Piasini, F. Spandonaro, 2004 and M. Doglia and F. Spandonaro, 2005*

5a.2. Poverty, impoverishment and catastrophe

During the year 2008 the mean monthly family expenditure was € 28,620, of which 33.6% for housing (rental fees, ordinary maintenance, etc.) and durable goods (sundry household appliances, 19.6% for food and drink, 14.7% for transport and communications. OOP healthcare expenditures accounted for 4.2%.

Included in OOP healthcare expenditures, besides those for pharmaceuticals, physician's visits, clinical and radiological examinations, stays in hospitals and nursing homes, dental care, thermal treatment, and the leasing of equipment, were those for assistance for the disabled and the non-self-sufficient aged, even if these latter were not classified as strictly healthcare expenditures.

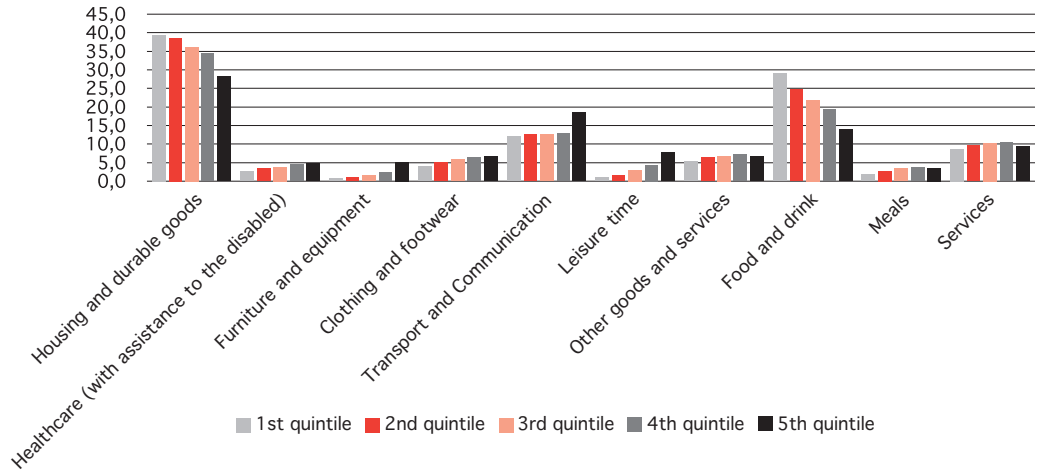
Considering the effective OOP healthcare expenditures, that is those that only the families sustain, they amounted during 2008 to € 1948.2 per year: the greatest cost item was pharmaceuticals, which account for 41.9% of the total. Next in line come spcialized treatments (medical visits, clinical examinations, X-ray examinations) for 19.9% and dental care for 19.3%. Assistance to the disabled and the aged reached 5.1%. The minor expenditures items are those for nursing homes (0.1%) and for thermal treatment (0.3%). The effective annual family healthcare expenditure for the individual items, limited to just the families that actually sustain them, for pharmaceuticals was € 508.68, for specialist care € 1412.49, for dental care € 4534.42 and for assistance to the disabled and the aged € 6,868.99.

As it was legitimate to expect, the distribution of the expenditure items is modified on the basis of the quintile (of equivalent consumption[3]) that the families belonged to: in particular, the mean portion assigned to health expenditures increases from 2.6% of the families in the first quintile (indicatively the poorest), to 4.6% of the families in the last quintile (…the "richest"). Considering the effective portion of the families that sustain OOP health-care expenditures, this increases, going from 5.4% of the families of the first quintile to 6.4% of the families of the last quintile.

[3] *By equivalent consumption is meant the consumption of the family divided by the equivalent number of members of that same family, where the equivalence is borrowed from the mean equivalent consumption borrowed from the evaluations of absolute poverty.*

Thus the families are indicatively ordered on the basis of their wealth as indicated by consumption levels.

Figure 5a.1 - Composition of the families' consumption Year 2008 – Values in %

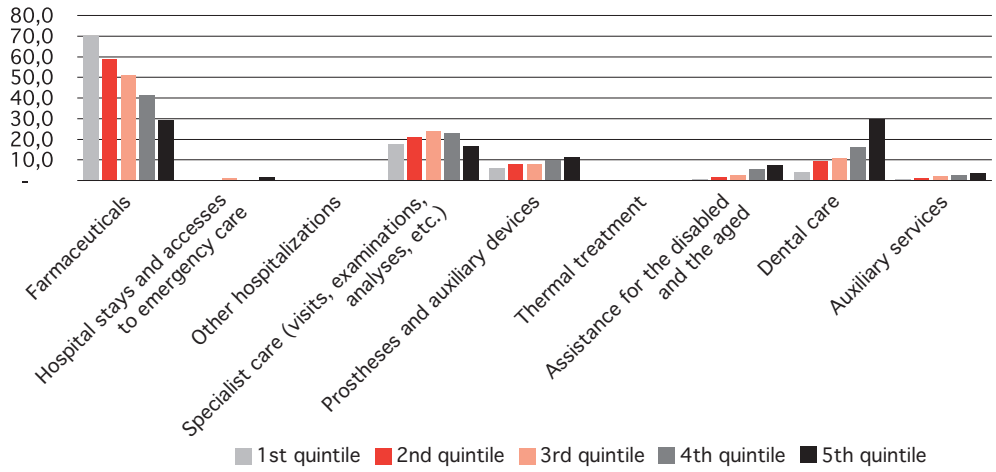


Source: workup of ISTAT data

Parenthetically it may be noted that while Housing and Food, as is typical of the primary goods, account for a decreasing share of the family resources as income rises, health costs behave like "luxury items", increasing their share.

From an analysis of the composition of family OOP health expenditures, differentiated by quintile of consumption, it appears that families belonging to the lowest quintiles spend prevalently for pharmaceuticals (70%) and specialist services (18%), but shifting towards the higher quintiles, these quotas decrease more and more, leaving room for prosthetic and auxiliary devices and dental care.

Figure 5a.2 - Composition of OOP healthcare expenditures by quintile of consumption - Year 2008 – Values in %

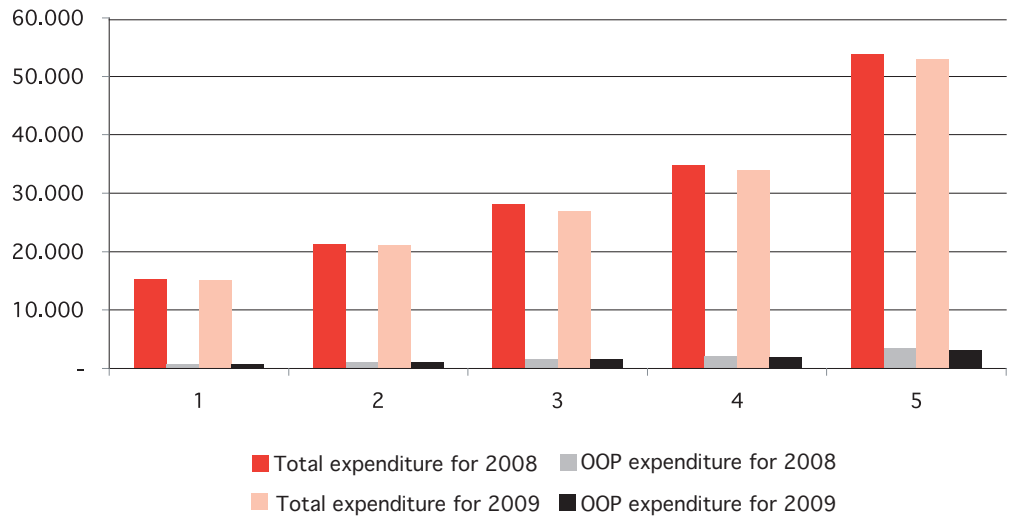


Source: workup of ISTAT data

In this case too it is interesting to see that dental care expenditures behave like those for "luxury goods", while pharmaceuticals typically behave like "primary goods".
In 2008 11% of families were "poor", and represent 55.8% of those belonging to the 1st quintile of consumption. Effective OOP healthcare expenditures sustained by poor families amounted to € 748.2 per year, they represent the 5.7% of their total consumption (€ 13,050.2): 71.3% of this goes to pharmaceuticals and 18.2% to specialist care. Only 2.8% goes to dental care.
During that same year 334,695 families became poor (i.e. fell below the poverty threshold) in order to sustain OOP healthcare expenditures, and they are distributed over the first three quintiles of consumption. In these families healthcare expenditures accounted for 12.6% of the total, and went as follows: 50.8% for pharmaceuticals, 17.9% for specialist care, 11.6% for prosthetic devices and auxiliary devices, and 8.7% for dental care.
The families subjected to catastrophic healthcare expenditures numbered 747,631, distributed over all quintiles, even if to a greater degree falling in the first one. For these families the healthcare expenditures accounted for 32% of the total. On an average yearly OOP expenditures of € 6,682, in this case the dentist accounted for the largest expenditure (37.6%), followed by pharmaceuticals (17.9%) and by assistance to the disabled and aged (15.7%).
Going on to the year 2009, corresponding to the economic crisis, the GDP dropped by -3% under that for the previous year. In parallel there was also a more than proportional reduction in family consumption, about 6%.
Family mean annual expenditure thus went from € 29,061 to € 28,615.

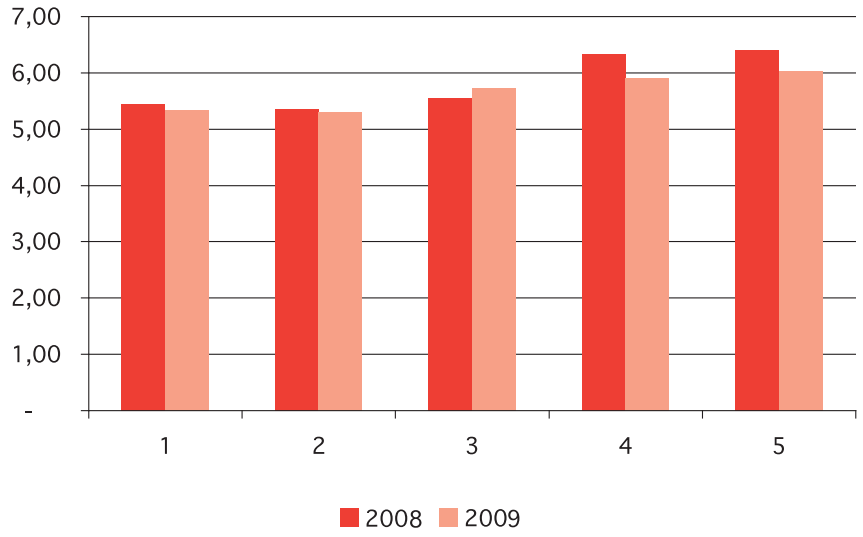
During this year there was a reduction relative to the previous year as well in the portion of families that sustained OOP healthcare expenditures: 60.7% (14,943,408) of resident famlies, as compared with the 15,045,325 core families of the year 2008 (62.2% of all resident families).
Mean annual family OOP healthcare expenditures also, € 1124.5, dropped by -8.6% below those for 2008, and thus more than the average of the other items of consumption, representing 3.9% of total consumption. Considering effective family healthcare expenditures these reach € 1839.6, that is 5.8% of family consumption.
The data thus shows that there is a significant elasticity in healthcare expenditures vis-a-vis income, and this could support a view of OOP costs as non-essential, even inappropriate, costs. The reduction was however most significant for the families having medium-to-high consumption, which required a supplemental investigation.

Figure 5a.3 - Mean annual family OOP healthcare expenditures per quintile of consumption - Years 2008 – 2009 – Values in €



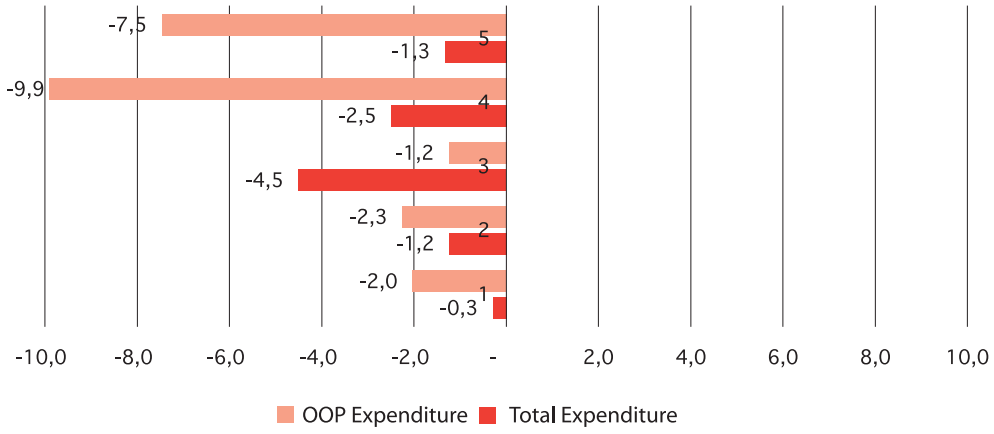
Source: workup of ISTAT data

Figure 5a.4 - Portion of OOP health care expenditures of the total per quintile of consumption - Year 2008 – 2009 – Values in %



Source: workup of ISTAT data

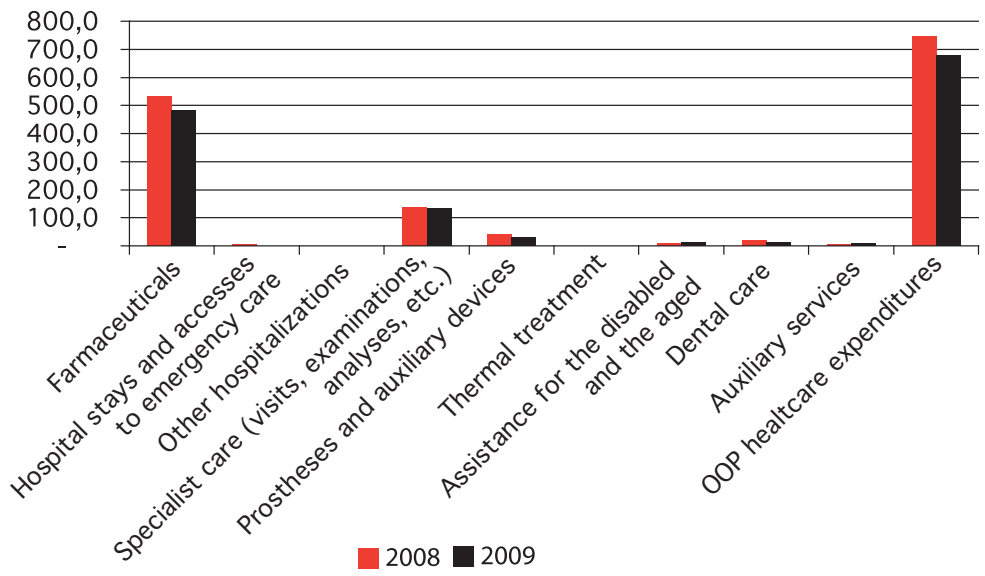
Figure 5a.5. - Variation in mean monthly family OOP healthcare expenditures - Years 2008 – 2009 – Values in %



Source: workup of ISTAT data

In 2009 the quota of poor families was sensibly reduced, going from 11.0% to 10.4%, a fact justified in the ISTAT yearly report on the *Labor market and deprivation – 2009* by the fact that 80% of the drop in employment struck young people who live with their families of origin, thus mitigating the effect of the crisis, and that the Earnings Supplement Fund (a form of compensation somewhat equivalent to US unemployment insurance) kept their parents from losing their jobs. During 2009 the yearly mean expenditures of poor families increased by +2% over the preceding year, but the value of OOP expenditures dropped from € 748.20 in 2008 to € 648.80, and its share of the whole dropped from 5.7% to 5.3%.

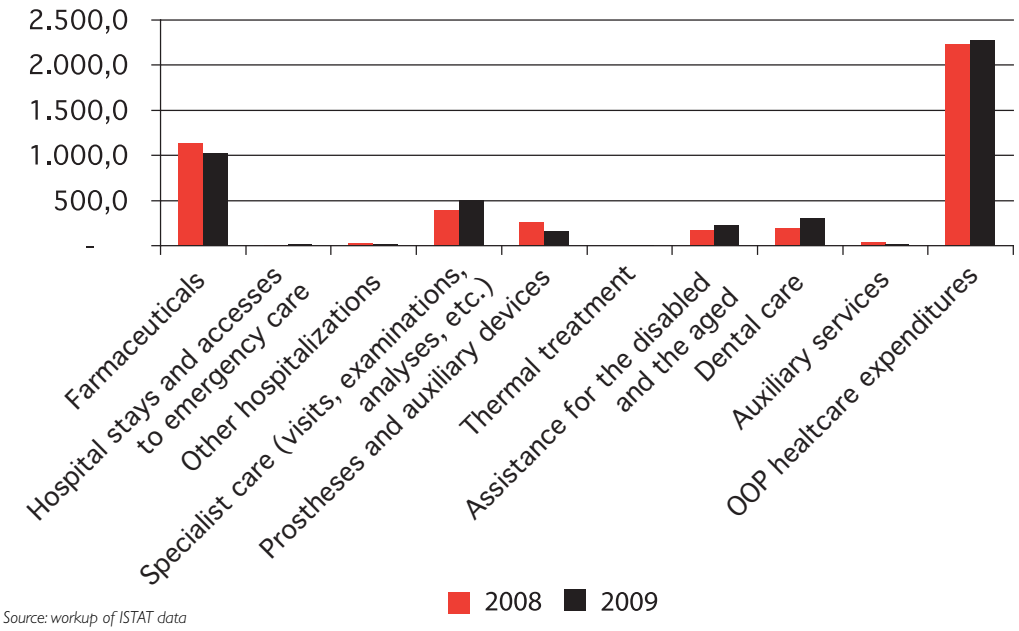
Figure 5a.6 - Effective OOP healthcare expenditures of poor-families Years 2008 – 2009 – Values in €



Source: workup of ISTAT data

A reduction in the incidence of impoverishment has also been recorded: 1.2% of resident families (297,670) are found to be impoverished (2.0% of those sustaining OOP expenditures) relative to the 1.4% (4.3% of those who spend for health care) of the preceding year (334,695). This is to be attributed to the more than proportional reduction, from 4.2% to 3.9%, of the portion of private OOP healthcare expenditures of the total expenditures of families that, considering the expenditure of only those families that have sustained it, has been reduced from 6.0% to 5.8%. While the portion of impoverished families is reduced, the amount of impoverishmment has increased: the mean expenditure of these families has undergone an increase of 2.2% over 2008. At the same time there has been an increase in the quota for OOP healthcare expenditures, representing in 2009 15,3% of total expenditures. In particular, the portion assigned to specialist care went from 18.0% in 2008 to 22.3%, and that for dental care from 8.7% to 13.4% while that for assistance to the disabled or the aged went from 7.8% to 10.2%.

Figure 5a.7 - Annual OOP healthcare expenditures of impoverished families Years 2008 – 2009 – Values in €



Source: workup of ISTAT data

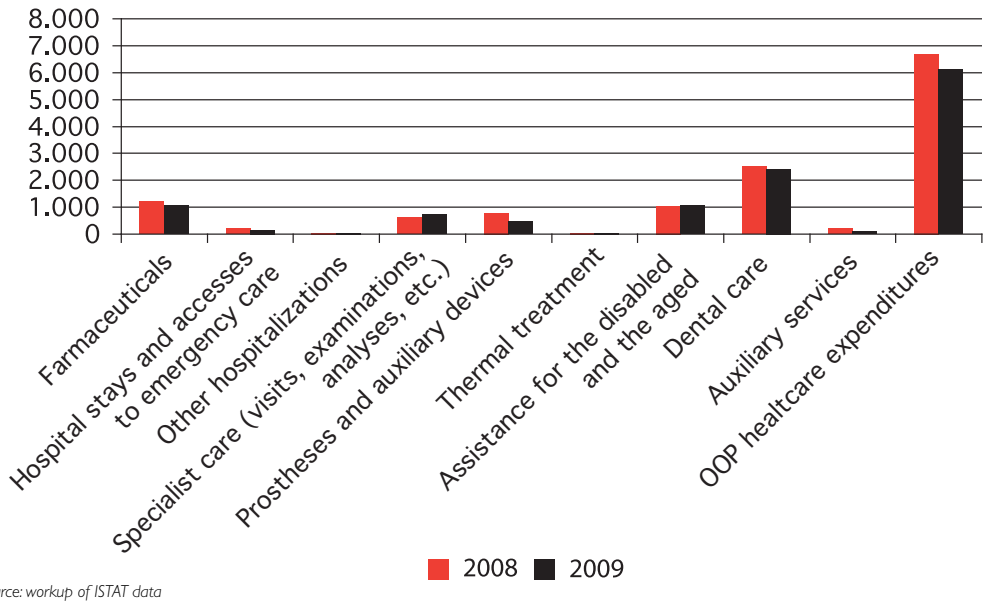
At the same time there was also a reduction in the quota of families subject to catastrophic expenditures, which in 2009 amounted to 2.7% (674,754) of those resident, i.e. 4.3% of those who sustained OOP expenditures, relative to 3.1% (5% of those who spent money for healthcare) of 2008.

The mean annual expenditure of families subjected to catastrophic expenditures dropped by -2.2%, with a mean value of expenditure of € 20,519.40 in the year 2009.

Healthcare expenditures too dropped by -9.0% below those of 2008, reaching € 6126.80 as the yearly average, or 30% of total family expenditures.

On analyzing the composition of the OOP expenditures sustained by these families, we note that in 2009 all expenditures items dropped, with the exception of that for assistance to the disabled and the aged, which went from € 1051.1 to € 1059.5 per year, and that for specialist care, which went from € 619.3 to € 719.7. Expenditures sustained for nursing, physiotherapists (-79.8%) prosthesis and auxiliary devices (-71.4%) and hospitalizations dropped significantly.

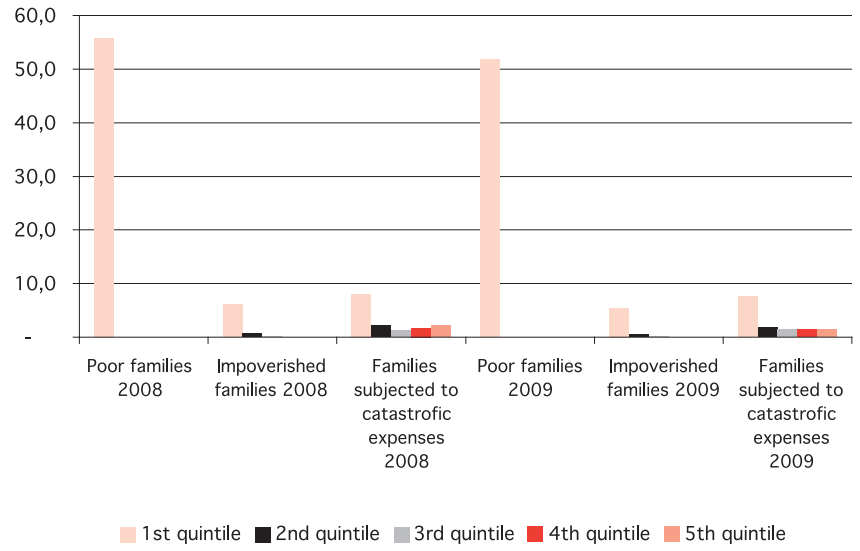
Figure 5a .8 - Annual OOP healthcare expenditures of catastrophic families Years 2008 – 2009 – Values in €



Source: workup of ISTAT data

To be noted on the whole is how the portion of families subject to catastrophic expenditures in the highest quintiles in particular dropped, these latter having reduced to a greater extent their consumption and also their portion of OOP expenditures.

**Figure 5a.9 - Distribution of poor, impoverished and catastrophic families by quintile of consumption
Years 2008 – 2009 – Values in %**



Source: workup of ISTAT data

For families in the fourth and fifth quintiles, besides seeing a significant reduction in their consumption, a reduction quite as significant was seen in the portion assigned to health-care expenditures. For families in the third quintile there was a reduction in consumption, the portion destined to OOP healthcare expenditures remaining almost unvaried. In families of the second quintile the reduction in consumption was minimal, just as was their portion for health-care expenditures. Finally, in families of the first quintile, there was a mininum drop in consumption and instead a slight increase in heatlhcare expenditures.

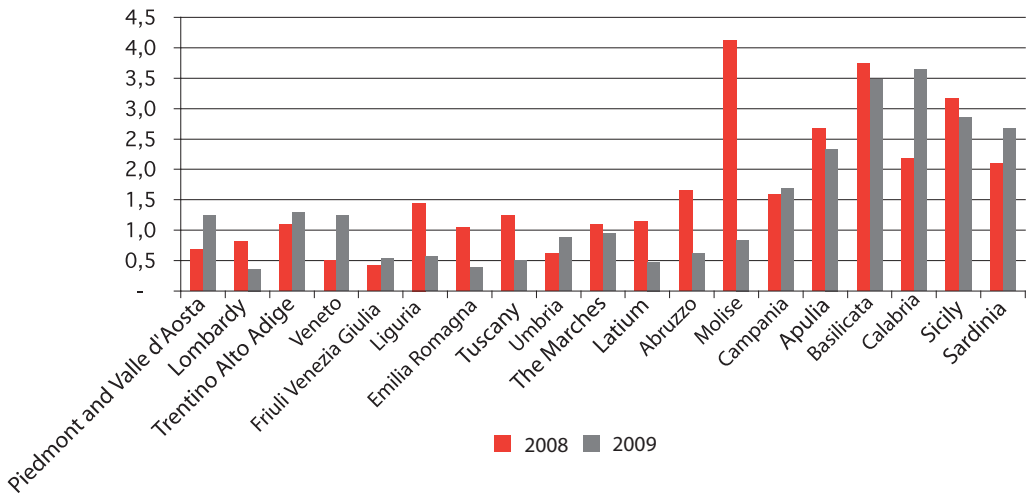
5a.3. The regional impact

Analysis of the regional data brings out that 2.3% of the families resident in the Italian South are impoverished, as are 0.6% of those resident in the central regions and 0.7% of those resident in the north.

Relative to 2008, an important reduction of this trend is seen in the Regions of central Italy: the portion of impoverished families drops by 0.5 percentage points, going from 1.1% to 0.6%. In 2009 there was a reduction in the portion of impoverished families in Molise, Abruzzo, Latium, Lombardy and Basilicata. The Molise's significant reduction, even if in part justifiable by the reduction in the portion of families in the low quintiles and by an increase in the medium-to-high ones, is to be taken with caution, owing to the possible distortions of the samplling due to the Region's small size. In Lombardy too, the reduction is to be attributed to the larger portion of families in the medium-to-high quintiles compared with the preceding year. A similar

situation holds for the Region of Latium. The regions of the Italian South go on being, in 2009, those having the largest share of impoverished families, this being intensified relative to 2008 in Calabria and Sardinia. This would be attributable to the increase in the portion of families in the first two quintiles and to its reduction in the higher ones.

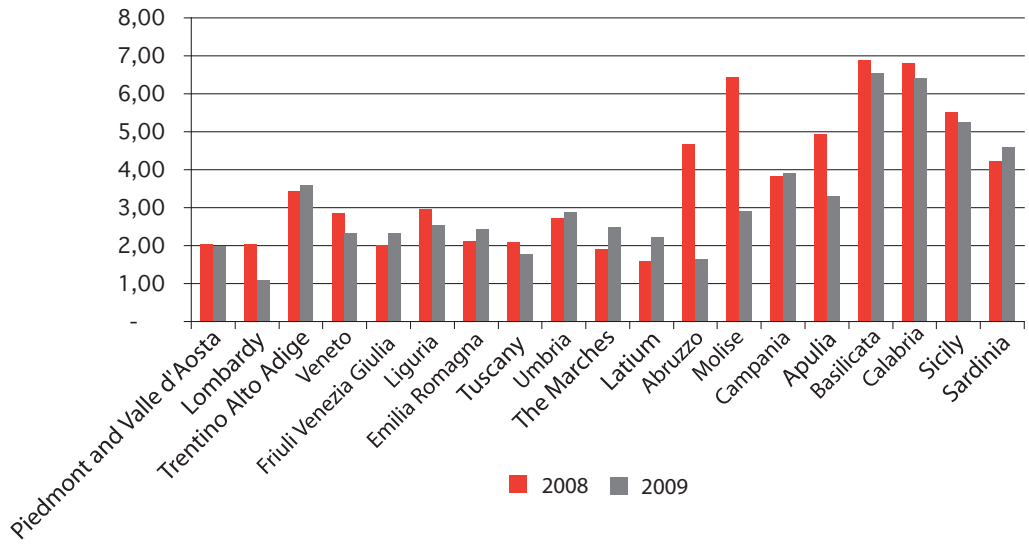
Figure 5a.10 - Incidence of impoverished families Years 2008 – 2009 – Values in %



Source: workup of ISTAT data

On analyzing the incidence of susceptibility to catastrophe in the various Regions, we note that the families subjected to catastrophic expenditures amount to 1.9% of the families resident in the North, 2.2% of those resident in the Central Regions, and 4.3% of those resident in the Italian South. Relative to the preceding year, despite the reduction in the incidence of families subject to catastrophic expenditures at the national level, in the Regions of the Center an increase was instead found, it going from 1.9% to 2.2%. In Abruzzo, Molise and Apulia, there was, in 2009, a significant increase in this type of expenditure, attributable to an increase, over 2008, in the portion of families in the quintiles most subject to catastrophic expenditures: in particular in the Abruzzo there was an increase of families in the third and fourth quintile, that is of those families that spend also a larger portion for health care. In this case too the data on the Molise is to be taken with caution owing to the possible distortion of the sampling due to its size. In Apulia the reduction is to be attributed to the significant lowering of the number of families in the second and fifth quintile, which if in 2008 represented 20% and 10% respectively of the catastrophic expenditures, in 2009 their portions had halved.

Figure 5a.11 - Incidence of families subject to catastrophic healthcare expenditures - Years 2008 – 2009 – Values in %



Source: workup of ISTAT data

Piedmont and Val d'Aosa – Lombardy – Autonomous provinces of Bolzano and of… Veneto – Friuli-Venezia Giulia – Liguria – Emilia Romagna – Tuscany – Umbria – The Marches – Latium – Abruzzo – Molise – Campania – Apulia – Basilicata – Calabria – Sicily - Sardinia-

5a.4. A forecast of impoverished families

In order to evaluate the impact of the feared increase in the cost of the ticket envisaged by Decree-Law no. 98/2011 concerning the impoverishment of families owing to healthcare expenditures, computer simulations were carried out using the data on family consumption for the years 2009.

The decree provides for an increase of two billion of euros in the total revenues from the *ticket* on pharmaceuticals, specialist care and emergency care.

In our simulations we assumed that 10% of this increase arose from emergency care and hospitalization care, 45% from specialist care (medical examinations, clinical analyses and radiology diagnostics, ECGs etc.), and 45% for pharmaceuticals.

The incidence of impoverishment was determined in two different cases:

Case 1. the families' total consumption does not change, that is, the families reduce their non-healthcare consumption to take on the increase in shared healthcare expenditures;

Case 2: the contrary of case 1, total consumption is increased by a portion equal to the increase in shared healthcare expenditure (thus imagining that a coverage be possible through a reduction in savings).

Considering case 1, 340,007 families were found to be impoverished, that is 1.38% (2.27% of those who sustain OOP expenditures), compared with 297,670 surveyed without the increase:

therefore, an increase of more than 42,000 families. In case 2 301,028 families were found to be impoverished, 1.22% (2.01% of those who sustain OOP expenditures), with an increase of a little more than 3000 families. Though having hypothesized the two extreme conditions, almost surely, to the increase in consumption for the year 2010 there will follow their reduction in correspondence with the second crisis of 2011, which will thus lead to a situation of expenditure for the famlies that is presumably similar to that found in the year 2009: thus the more pessimistic scenario would appear to be the one we shall probably have to deal with in future. From the simulations made it thus emerges that certainly the increase foreseen will exert a signficant impact on the incidence of impoverishment. This impact would be limited if the families have the capacity to sustain the greater expenditures (case 2) by reducing their savings. But this is improbable since the families concerned are of the first quintile of consumption. It will surely be significant if they must give up other non-health-care expenditures in order to be healed.

In order to minimize the impact of the co-sharing on impoverishment, taking it for granted that the overall consumption can not increase owing to the crisis, it appears fundamental to have resort to a remodulation of the *ticket* quotas, which might be progressive depending on the families' resources. To this purpose a further simulation was conducted, by increasing the ticket quotas depending on the quintiles of consumption. In order to obtain a result that is substantially analogous to that of simulation 2, it is necessary to call for a strongly progressive ticket quota. If the first quintile is taken to be exempt, the quotas of participation should increase by 5% for the second quintile, and so on up to the last, which should be 30%. In this case 305,103 families are found to be impoverished, or 1.24%, that is 7500 new impoverished families, significantly reducing but not nullifying the lost advantage.

When one considers that all the simulations are probably underestimates since, owing to lack of data, the ticket on hospitalizations could be considered only where a ticket had already been paid for access to Emergency care. Furthermore, also the progressiveness of the sharings could be aggravated still more, considering the fact that in reality evasion will be practiced.

5a.5. Conclusions

The reduction in the incidence of impoverishment and of catastrophe for healthcare expenditures during the two-year perod 2008-2009, describes a positive reply of the healthcare system during the crisis, even if it must be brought out that in this year the families have reduced their consumption and in particular that part of it given over to health care relative to the preceding year. There was also a reduction in the number of families that sustained healthcare expenditures, probably indicative of an a priori renunciation of them.

The data shows, at least for those families of the first quintile (the poorest) and for the aged persons of the subsequent quintiles, that private health-care expenditures are practically irreduceable, since prevalently limited to such primary health-related goods as pharmaceuticals and specialist care. That which instead is sustained by the "richer" families has undergone a greater contraction, especially compared with health care that could be postponed, such as dental care.

This in its turn implies, in the first place, that it would be useful to have greater protection of the families, especially those of the lower quintiles, and secondly that it is presumable that a

second crisis can not be absorbed in family budgets, which already in 2009 saw reduced healthcare expenditures by postponing that which they could.
Furthermore, the dreaded increase in the ticket envisaged by Decree-Law no. 98/2011 will surely exert an impact on the impoverishment of families, varying in magnitude depending on the families' savings capacity.
Should, as is very probable, since we are dealing with "fragile" families, the possibility of drawing on savings be limited, the impact on impoverishment will be significant: more than 42,000 new cases of impoverished families.
Evidently, to reduce this impact it will be necessary to introduce a progressive sharing in the expenditure relative to the families' resources. From our simulations the sharing quota should be significantly progressive, reaching values of the order of 30% for the "richer" families. Furthermore, no account has been taken of probable evasion.
In any case, in the simulation made the impact would be reduced but would not be nullified, it going from 42,000 to 7500 new impoverished families.

APPENDIX

In-depth studies on assistance "Performance indicators: fairness"
Statistical tables to be found on the site of the CEIS Health Report

•The socio-economic context: the macro-economic picture
Family expenditure
Family expenditure: percentage composition
Family expenditure: composition per quintile of expenditure
Family expenditure: percentage composition per quintile of expenditure
Family healthcare expenditure
Family healthcare expenditure: percentage composition
Family healthcare expenditure: composition per quintile of expenditure
Family healthcare expenditure: percentage composition per quintile of expenditure
Family healthcare expenditure: incidence on the total per quintile of expenditure
Effective "gross" family healthcare expenditure
Effective "net" family healthcare expenditure.

•Performance indicators: fairness
Families: poor, impoverished, subject to catastrophic healthcare expenditures
Families: poor, impoverished, subject to catastrophic expenditures: composition per quintile of expenditure

•Effective "gross" OOP healthcare expenditure of poor families
Effective "gross" OOP healthcare expenditure of poor families: percentage composition
Effective "gross" OOP healthcare expenditure of poor families: incidence on total expenditures
Effective "gross" OOP healthcare expenditure of impoverished families

Effective “gross” OOP healthcare expenditure of impoverished families: percentage composition
Effective “gross” OOP healthcare expenditure, impoverished families: incidence on total expenditures
Effective “gross” OOP healthcare expenditure of families subject to catastrophic expenditures
Effective “gross” OOP healthcare expenditure of families subject to catastrophic expenditures: incidence on total expenditures

Chapter 5b

Performance indicators: a single performance index for the SSRs

5b - Performance indicators: a single performance index for the SSRs

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5b.1. Introduction

Over the past few years the process of evaluating results, or performance, has greatly accelerated, pushed by the will, greatly to be appreciated, of the Health Ministry in particular, to outfit itself, and to outfit the Regional Healthcare Services (HRSs), with tools for achieving accountability.

It can be stated with perfect confidence that already today the healthcare sector is greatly ahead of other areas of the public administration in its performance-evaluation processes.

Just to mention two particularly meaningful experiences, the Ministry supports the state's knowledge of the healthcare system with the monitoring system (known as "targets") developed by the *Saint Anne Institute of Pisa* university, and the recent National Plan for the Evaluation of performance (PNE) managed by *Age.Na.S. (National Healthcare Agency)*.

One cannot help but express applause for this course, truly new, taken by the National Healthcare System, and express the hope that the possibility of evaluation extend into many (other) areas, and first of all to the so-called territorial, which in practice are so far entirely without one.

At the same time the growth (in number as well) of the evaluation models, characterized by different criteria and objectives, if it takes account of the complex multi-dimensionality of the healthcare sector, involves the danger of a loss of synthesis. In other words, the problem is posed of how to use the growing amount of information available to arrive at an overall evaluation of the performance of the regional systems. This is true especially now, since, federalism being in the stage of affirming itself, the differences in approach to safeguarding the right to health multiply.

Taking for granted the importance to be attributed to the opportunity deriving from the fact that each individual method offers to the administrators of the regional (and/or company) systems useful information for improving their own work, it appears useful to be able to express summarizing evaluations: it appears in fact evident that each system can, in principle, excel in one aspect and not in another. Nor can it be denied that to some extent tradeoffs can be created between objectives. Not by chance, and as example, at the international level one feels a strong regularity in the (inverse) relationship between expense and the responsiveness of the healthcare systems.

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The synthesis is furthermore made complex by the fact that it is presumable (and, probably, reasonably to be hoped for) that different stakeholders can attribute (for themselves, but even more in as much as they are bearers of interests of various categories) different scales of preference to the various objectives that can take shape.
For this reason it is deemed that a summarizing evaluation in the healthcare field cannot be based on an explicit, or worse yet implicit, application of technocratic criteria, but rather must be determined on the basis of a participative and democratic method.
It appears to us that we are supported in this proposition by the very formulation of the law establishing the NHS, and too by the afflatus placed by the reforms of the nineties on the role of the citizen/user, that is on the principle of the consumer's sovereignty.
In what follows, then, a methodological proposal will be made explicit for reaching the construction of an Regional Healthcare System's evaluation process (which can be repeated at the intra-regional level to evaluate company performance, which has the characteristics of simplicity, immediacy and – of top priority – democratic participation.

5b.2. Performance evaluation, general features

The two most critical factors in identifying a single performance index are: the choice of indicators that are representative of healthcare system performance, and, therefore, the choice of their composition function, that is the relative importance to be attributed to them.
As to the question of the choice of indicators, this is tied to the question of their standardization, an operation that absolutely cannot be done without the indicators being comparable and therefore suited to carrying out benchmarking operations. Standardization is to be understood as a method for purifying the indicators of every element of variability due to determinants not considered relevant for the purposes of performance evaluation: in our case typically, but not exclusively, differences in healthcare need of the various regional populations. For example, a greater expenditure may not signify lower efficiency, if it was sustained for a population that is older. In the same way a worse outcome could depend on a greater presence of risk factors, etc.
Not to be ignored either is the aspect of the characteristics and properties of the indicators. Criteria such as non-redundance, specificity, etc. are, even if with different intensities and cogencies, required of practically any composition technique, and therefore should be made explicit and analyzed.
One thing that seems important to underscore is non-redundancy: to use a large number of indicators does not add precision to the decision-making model. Rather it runs the risk of a redundancy that distorts the results in favor of the dimensions for which several indicators were envisaged.
Going on to the aspect of composition, and without going into an in-depth analysis of the concept of a healthcare system's performance, we limit ourselves here to noting that the literature is sufficiently in agreement in deeming that performance have a multi-dimensional nature, in deference to the complexity unanimously acknowledged to the health care sector.
Deriving from this assumption there are, at least, two interrelated consequences.
The first one, regards the identification of the various dimensions of performance, in such fashion as to guarantee that they be reasonably represented by the indicators.

By performance is substantially meant a synthesis, a sort of mean (composition) of the individual results obtained in each individual dimension. For example, efficiency, efficacy, and quality can be different dimensions of the overall performance.
The second consequence is that each dimension is, in general, measured in naturally different units, in principal not directly "summable" among themselves. Therefore, to arrive at a quantification of overall performance, they must be led back to a single measurement unit, independent of the characteristics of each individual dimension.
A further element for reflection is provided by the nature of the healthcare systems forming the subject of analysis. In the specifically Italian case, the public nature of the Regional Healthcare System is to be taken into account, it conditioning both the dimensions (for example fairness is a dimension peculiar to the performance of a public service and it would not necessarily be such for a private one), and the prospect of the analysis.
Various international experiences on the definition of a single performance index can be seen in the healthcare sector, among which we mention those of the United States, of Canada, of Great Britain, and of the World Health Organization (WHO). The methodology introduced by the United States' Medicare in 2000 and 2003 is based on the composition of twenty-two indicators of equal weights distributed over six clinical areas. The Canadian Regional Health Care's is based on the composition of fifteen indicators distributed over six categories (*Outcomes, Prenatal care, Community health, Elderly services, Efficiency and Resources*): the weight of the indicators on the interior of the category was defined by a system of expert opinions, while the composition of the six categories is instead obtained using a system of weights arbitrarily defined.
The British system in 2000 had instead developed a single index of performance based on the composition of six indicators using a system of weights based on public preferences, brought out using a survey applying the "budget-pie" method, that is, requesting the allocation of sixty chips over six indicators (Appleby & Mulligan, 2000). We mention further the method implemented in 2000 by WHO on 191 countries (*World Health Report, 2000*), whose composition is based on a summation of the rankings of relevant indicators regarding four macro-areas (*Overall health outcomes, Inequality in health, Fairness of financing and Health system responsiveness*). The weights were defined through a survey made on 2000 "key figures", who were requested to attribute a score to each individual indicator.

5b.3. The approach based on utility produced

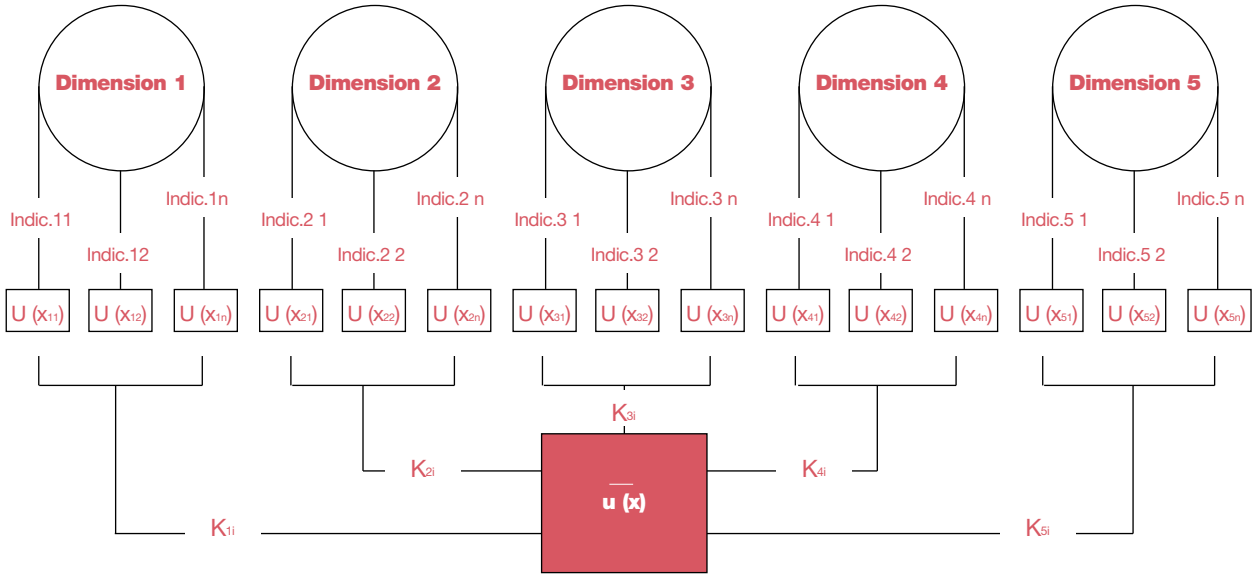
The methodology here proposed intends to repeat a decision-making process, just as takes place in the theory of demand in economics. It is based, then, on the idea that the stakeholders in the system pursue different objectives (dimensions) to which they attribute, on the basis of their personal preferences, a different degree of utility.
The stakeholders define as well a marginal testing of substitution of the objectives, that is they may deem that a better performance on one dimension can at least partially compensate for a worse performance on another one.
In practice it is assumed that not all the objectives provide for the same utility, and that they

can at least partially be substituted one with another in the composition of the overall performance.
The technique adopted draws forth a utility function from the preferences of the individual stakeholders (and then as we shall see generates the function of social utility), from which may be estimated the relative level of utility furnished by the performance of each individual Regional Healthcare System, making explicit a ranking corresponding to the structure of the underlying preferences.

Figure 5b.1 - Paradigm of decision-making analyses

As was premised, the objective of this proposal is to arrive at a democratic and participative decision-making process. Obviously, since at issue are public services, at the center of the system we shall have the preferences of the citizens (represented by the associations acting as their advocates or protecting them, and by the politicians). Arguments regarding the known problems of information asymmetry that characterize the healthcare sector seem to us to reasonably justify the consideration in the decision-making process of the "informed" preferences of technical people, such as healthcare professionals (physicians, nurses, etc.) and the managers of the healthcare systems (national, there being included therein the Health Ministry, and regional and Local Healthcare Systems). The considerable economic impact of healthcare systems justifies, in the writer's opinion, also the consideration in the decision-making process of the preferences of those representing the Economics Ministry, of the providers, and of the representatives of the industries involved in the healthcare sector (medical devices, pharmaceutical etc.). One virtue of the proposed method is also that of permitting the eliciting of preferences by subgroup, making it possible to bring out different rankings and therefore to compare the various evaluations of the performance expressed by different groups of stakeholders. The problem is posed, rather, of arriving at an aggregation of the preferences that generates a system of "social preferences".
In practice, in implementing the method of the arithmetic mean (*Harsanyi, 1986)* is ordinarily used, that is, adopting as values for the utility functions the arithmetic means of the values drawn from interviews with the individual decision makers involved.
In practice, the method envisages that given a set of indicators, with characteristics defined in what follows, a Utility function is associated with each indicator and therefore, by means of a mathematical function called the Multi-Attribute Utility, composition is achieved by expressing the utility, $U(\bar{X})$, of each possible performance thusly: $\bar{X}= (x_1,x_2,x_3,x_i,...x_n)$ (*Keeney and Raiffa,1976; Farquhar, 1984).*

Figure 5b.2 - Flow-chart methodology for the definition of a performance index for healthcare systems



In order to delineate the dimensions of the healthcare systems' performance the approach adopted was the *Balanced Scorecard* (*Kaplan e Norton*, 1992), this in consideration too of its already wide-spread use in the public healthcare system.

The public nature of healthcare systems has suggested the suitability of filling out the classical prospects proposed by Kaplan and Norton with a further prospect, represented by fairness (Fioravanti and Spandonaro, 2004) therefore the dimensions of performance adopted (parenthetically the specification of some classes of variables regarding each dimension) are:

- Economic-Financial (efficiency and economy, etc.);
- Customer (quality perceived, customer loyalty, etc.);
- Innovation and learning (quality, clinical appropriateness, etc.);
- Internal business (organizational appropriateness, filling out services, etc.);
- Fairness (of access, financial burden on families, etc.).

In order to obtain a model able to represent a coherent representation of the structure of social preferences, it is necessary that the indicators representative of the various dimensions be complete (that is, that they cover all aspects of the decision-making process), measurable, familiar, non-redundant, independent, etc.

In order to comply with the criteria set forth above a first set of 11 indicators was identified, to simulate the method's effects.

Table 5b.1 - Indicators and dimensions of Performance

DIMENSION	INDICATOR
Economic-Financial (efficiency, economy, etc.)	% of deficit
	Per capita total healthcare expenditure (public + 30% private)
Internal business (appropriateness, organizational quality, integration, etc.)	Rate of recovery for BPCC, diabetes and cardiac incompensation for residents of 50-74 years of age
	Standardized rate of hospitalization for acute cases in ordinary admission
	% of hospitalizations with inappropriate DRGs
Customer (quality perceived, willingness to be faithful etc.)	Rate of persons in good health
	Persons very satisfied of their hospital medical care
Innovation	% of surgical procedures in arthroscopy and laparoscopy as total of surgical DRGs
	Expenditure for training, quota of the total
Social (Equity)	% of impoverished families
	% families with catastrophic healthcare expenditures

The independence is the absolute condition for the purposes of implementing the method. Non-redundancy is quite as important, since not complying with it involves the duplication of preferences, distorting the results.
In prospect, there would be the intention to postpone as well the choice of indicators to a consultation among the stakeholders, asking them to identify the most representative items from a pre-selected set.

5b.4. A simulation of the evaluation of Regional Healthcare Systems Performance

In order to test the sensitivity of the algorithm three simulations were prepared, assuming at first that the value attributed to the indicators decreases linearly from the best performance to the worst performance and also that their contribution be equal within the dimension of relevance.
After which, three scenarios were formulated:

1. in the first one, all the dimensions contribute equally to the evaluation of overall performance;
2. in the second one three stakeholder profiles were defined: Profile A, which assumes him to be of an efficient bent and that he therefore gives most weight to the economic-financial dimension (60%, leaving the 40% equally distributed over the remaining); profile B, representative of healthcare professionals and of "technical" people, privileges the aspects of healthcare organization (31%), of innovation and equity (25%), and then the customer dimension (17%) leaving a very low contribution to the economic-financial (3%); profile C, representative of the citizens, instead attributes to the customer dimension a predominant

weight (70%), and an almost negligible weight to the economic-financial;

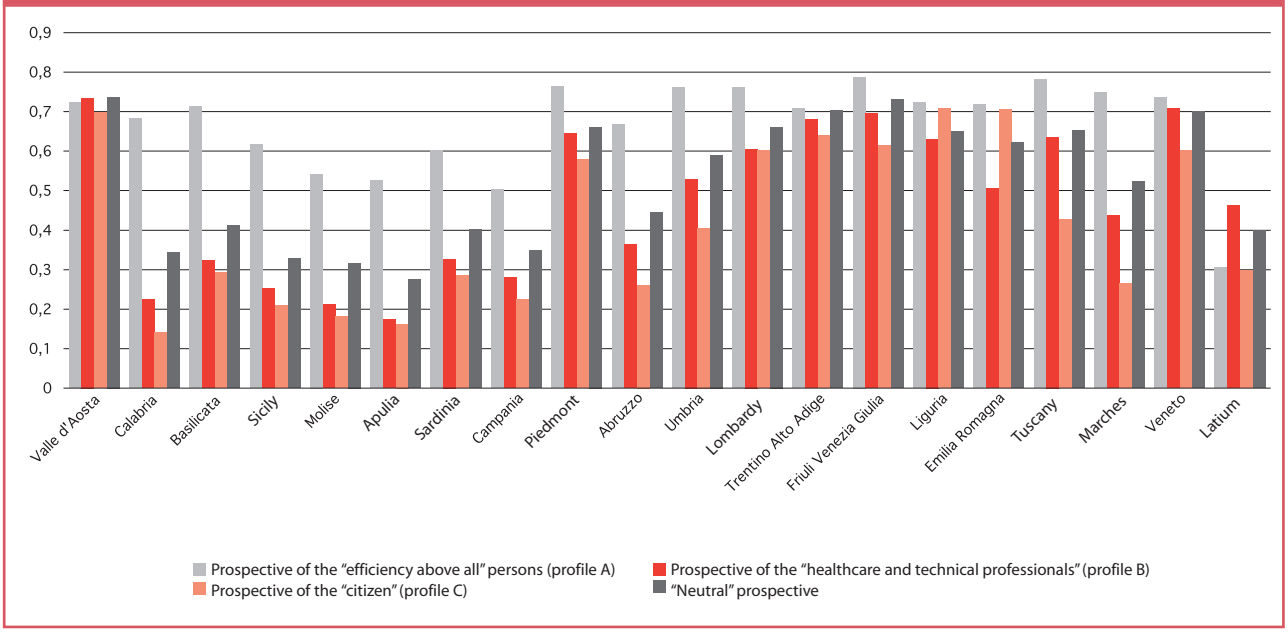
3. in the third scenario the determination of the single performance index takes place on the basis of the preferences on the average expressed by the three system stakeholder profiles as described above.

Bringing out that at issue are mere simulations, aimed at testing the sensitivity of the method, and not regional "rankings", in the graph below it is possible to appreciate how, with the indicators proposed, the Regions of the North and the Autonomous Provinces display on average a performance value that is significantly higher than that of the Regions of Central Italy and of the South. As the "weight" attributed to the various dimensions is changed the performance index of the Regional Healthcare System is modified and therefore the ranking too. By attributing a greater weight to the *economic-financial* dimension (profile A), relative to the base scenario of equal distribution of the importance of the dimensions, we note that Tuscany, for example, goes from seventh to second place, Piedmont from fifth to third, Umbria from tenth to fourth, Puglia from last to third-from-last, Campania loses three positions, becoming penultimate and Latium goes from fifteenth to twentieth.

By attributing a greater weight instead to the "technical" dimensions (profile B) we see that, for example, the Veneto goes from fourth to second position, Latium recovers four positions, going from fifteenth to eleventh.

But attributing a greater weight to the "customer" dimension (profile C) one sees that Regions such as Liguria, Emilia Romagna and Latium are significantly modified in position, going respectively from eighth to first, from ninth to second, and from fifteenth to eleventh. Calabria loses a position, becoming last.

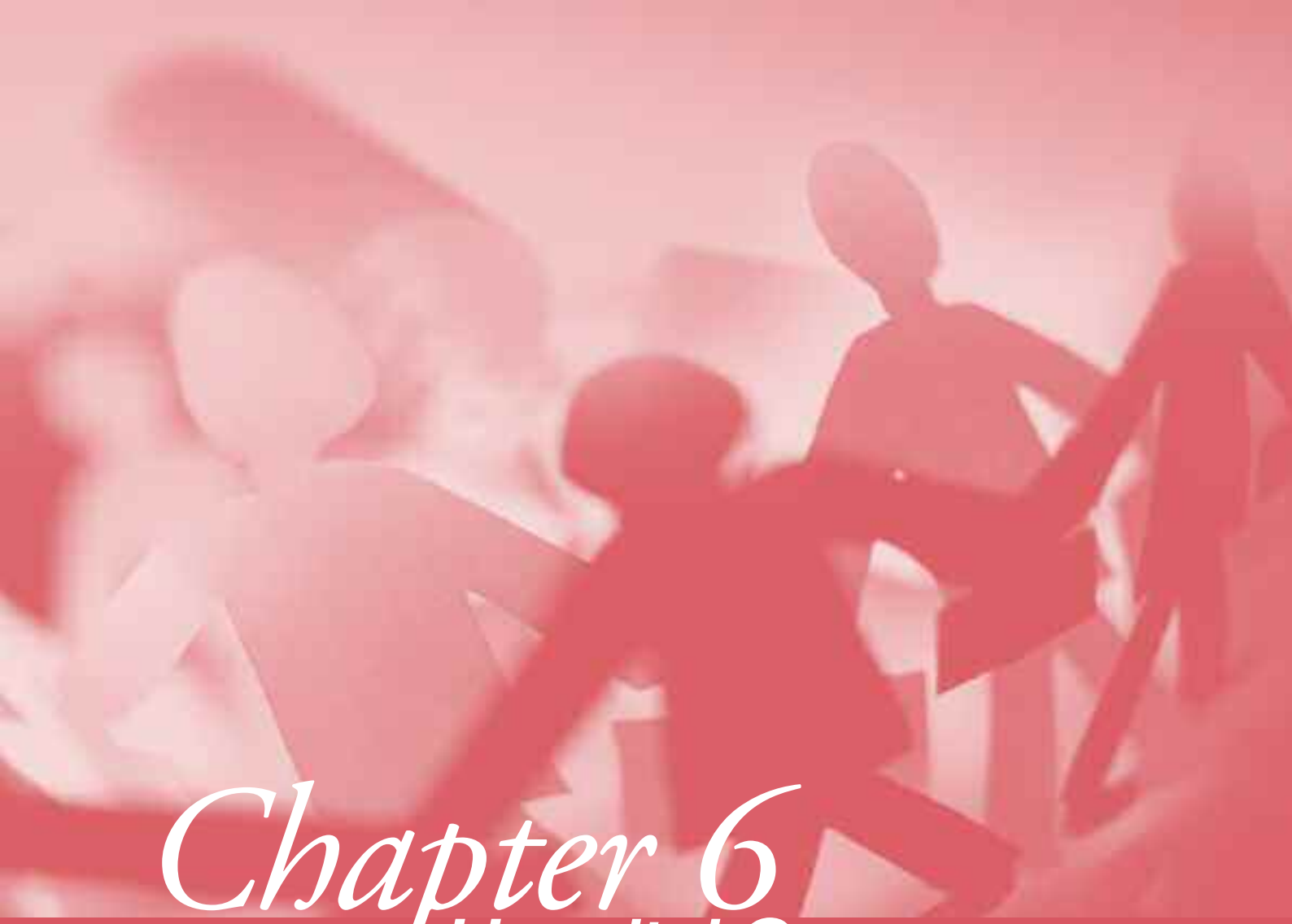
Figure 5b.3. Performance values of the SSRs as the prospects are varied



The rankings obtained, even if from a mere simulation exercise, appear to be convincing, both in the aggregate, and in the specifications that they take on by varying the importance of the objectives to pursue.
As it was legitimate to expect, and in justification of the importance of using a democratic method in drawing out the weights attributed to the various objectives/dimensions, the differences of the rankings can be significant, another demonstration of the complexity of the healthcare sector, but also in justification of the importance of evaluating as a whole healthcare policies, which can have legitimately different formulations and thus results that cannot be superposed on individual performance dimensions.

5b.5. Discussion

The simulations set forth, even with the limits as expressed at the first, make it possible to appreciate the relative simplicity of implementing the method, whose greater complexity remains that of the (democratic) drawing out of preferences, an activity however of great usefulness, since a fundamental element of knowledge and guide for healthcare policies seem to demonstrate the importance of pursuing the greatest transparency in the implementation of the evaluations.
The simulations made it possible to appreciate the sensitivity of the algorithm to the various "weights" attributed to the dimensions of the performance, without however producing distortions in the ranking. The results appear anyway convincing and reasonable.
The exercise "shows", finally, that the assumption of equal weights for each dimension is anything but to taken for granted. Absolute neutrality appears to be improbable. The preferences that can be elicited from various categories of stakeholder make the ranking of the Regional Healthcare Systems absolutely not "arbitrary", even if constructed on subjective preferences.
The proposed methodology is relatively innovatory, at least in its healthcare application. It takes advantage of a reduced number of elements and indicators (for the reasons set forth above), the method makes it possible to reach an evaluation of the performance of the healthcare systems by basing itself on a theoretical foundation (the theory of utility, widely used in the social sciences), by respecting the stakeholders' subjective preferences, eliminating the dangers of arbitrariness latent in the definition of weights chosen by the "manager" of the model of evaluation or, worse, of low transparency arising from the non-explicitness of the weights themselves. It is, furthermore, simple and flexible, since it makes it possible to implement various criteria for the determination of the "optimum" and "worst-case" values. The same algorithm can be used to make evaluations of performance and to monitor it at various levels: company, regional, national, etc. Finally, its application to one or more dimensions can permit carrying out a partial evaluation performance, relative to the dimension(s) considered.



Chapter 6

Hospital Care: planning standard and effective demand for hospitalization

6 - Hospital Care: planning standard and effective demand for hospitalization

Paolo Sciattella[1]

6.1. Introduction

Over the past decade there has been a reduction in the number of beds in our country, something common in the OECD area, where beds (per thousand inhabitants) have dropped from 5.8 in 2000 to 5.2 in 2009. In Italy this rate is 25% lower: on the basis of Health Ministry data, almost 45 thousand beds have been cut, so that the beds per inhabitant ratio has dropped from 5.1 per thousand inhabitants in 2000 to the current 4.2.

Attempts to put the number of beds on an efficient basis at the regional level have always been at the center of health policies. In what follows we shall summarily go back over the principal changes in the laws and regulations concerned:

- law no. 595/85, in its article 10 laid down the first standards for the hospital system: the mean outfitting of beds (6.5 per thousand inhabitants), an average hospitalization rate of 160 per thousand (acute and non-acute cases), and a minimum use rate of 70-75%, with an average stay of eleven days;
- Minister's Decree of 13 September 1988, issued by the then Health Minister Donat Cattin, set the "Hospital standards" for individual hospital specialties and for the set of services. These standards were defined, in the application of Law no. 109/1988, which prescribed the setting of same, limited to hospital personnel, separately by beds and by hospital typology, taking as reference organizational-type models which at a mean annual use rate of not less than 70-75%, with the exception of intensive care and for infectious diseases, and with mean hospital stays within the limits of the law for the various specialist functions, led to the optimal use of personnel;
- Decree Law no. 112/2008 (converted into law no. 133/1988) in its art. 79 "Scheduling resources for health-care expenditures" took into itself the agreement between the State, the Regions and the autonomous provinces of Trento and Bolzano, which called for a reduction of the beds standard, aimed at promoting the passage from ordinary hospitalization to day-hospital care, and from day hospitalization to care under outpatient clinic assistance;
- the "Pact for Health" 2010-2012 in its art. 6 "Placement of the hospital system on an efficient basis and an increase in the appropriateness of resort to hospitalization" has then envisaged a further reduction in beds from 4.5 to 4 beds per thousand inhabitants, of which 0.7 per

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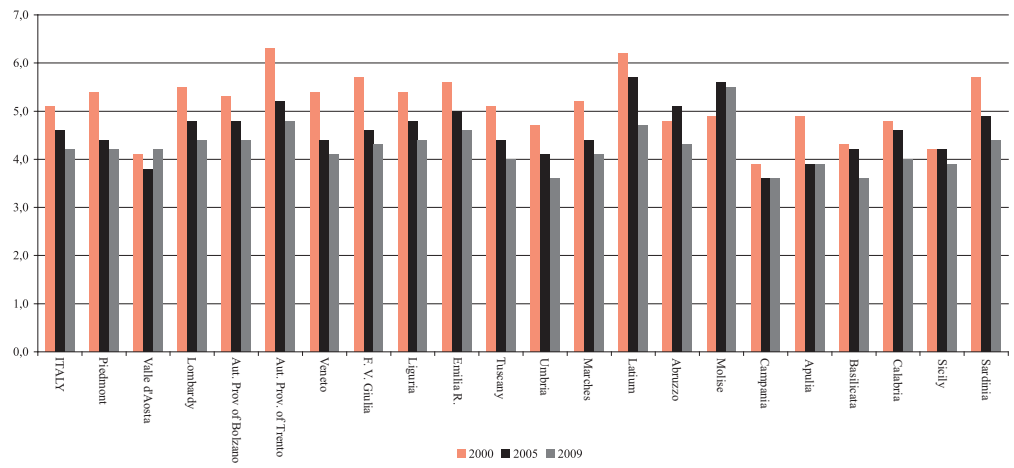
thousand to be devoted to long-term hospitalization. The standard of beds for acute cases per thousand inhabitants thus drops from 3.8 to3.3 per thousand inhabitants.

The progressive reduction of the supply of beds involved all the Regions, even if with different intensities: the sole exception was the Molise, for which the number of beds per inhabitant from 2000 to 2009 increased from 4.9 to 5.5 per thousand inhabitants, principally owing to the effect of the increase in accredited private beds (from 0.3 to 0.6 per thousand).

As is known, the northern Regions have a tendency to present a higher supply: all, in fact, with the exception of the Veneto, report higher values than the national mean. On the other hand, in the South, only Molise and Sardinia report a number of beds higher than the mean.

Figure 6.1 - Beds envisaged in public hospital structures and accredited beds Rates per thousand inhabitants – years 2000, 2005, 2009



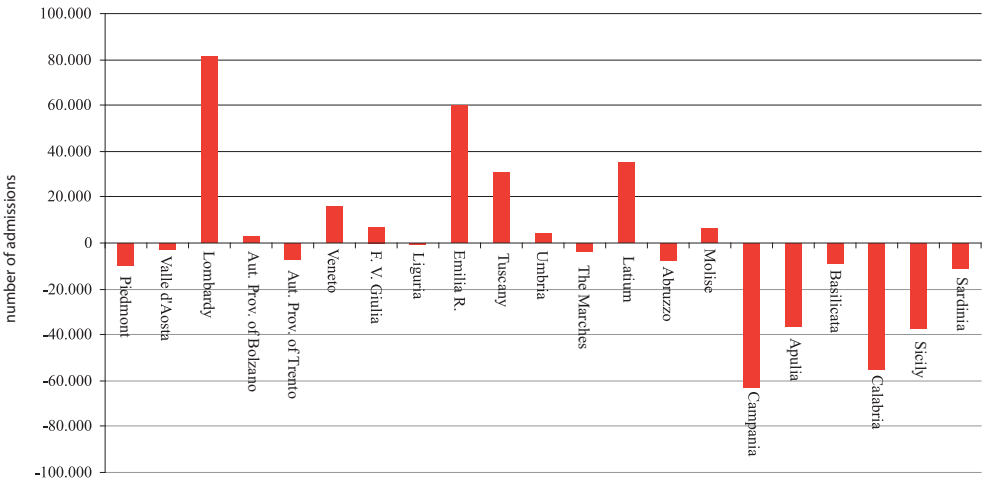
Source: Health Ministry data workups

6.2. The supply in relation to actual demand

Rendering the supply efficient has however come about by setting aside some components of the demand for hospital care, among which an important role is played by mobility.

The geography of hospital mobility (to make things easier and to ensure that the data is complete and reliable, we shall limit ourselves to considering the area of the acute cases) has been stable for years by now. The Regions of the South display on the average a negative balance of hospitalizations and therefore, obviously, those of the North a positive one. The exceptions are limited: in the South, the Molise Region, which has a positive balance, while in the North the only significantly negative balances are those of the Piedmont and of the Autonomous Province of Trento.

Figure 6.2- Regional mobility balances for hospitalizations of acute cases Number of hospitalizations - 2008



Source: Health Ministry SDO data Workups

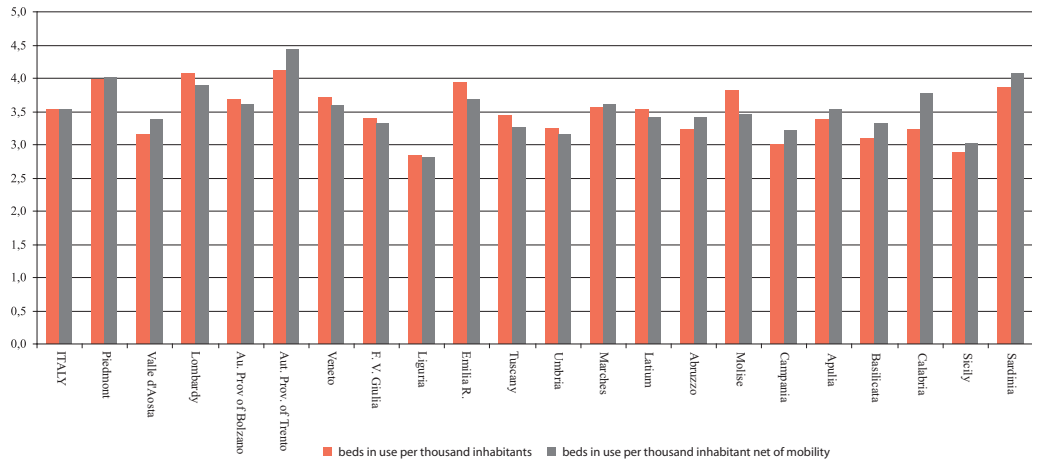
The mobility balances are relevant: on the whole the citizens move from the South to the Center-North to make 365,135 hospitalizations (8.3% of the hospitalizations of residents in the geographic distribution), which currently are estimated to have a value of 1.1 billion euros (3.2% of the total financing due the Regions of the South).

To get an idea of the effective weight of mobility on the beds supply, the number of beds per inhabitant on a regional population, estimated considering the mobility balance in terms of days of hospitalization, has been recomputed for 2009. The estimate was obtained by starting from the number of days of hospital stay of the residents in the individual Regions, from which were subtracted the days in mobility out of the region and added those in mobility in to it. In this way for each Region there were calculated the effective days of hospitalization supplied by the hospitalization structures. The passage from days of hospitalization to population was carried out through direct standardization, by applying to all Regions the rate of hospitalization in days of hospital stay.

The figure below brings out how, obviously, the effective availability of beds per inhabitant increases for the Regions with mobility out, and is reduced for those with mobility in, which see their supply met by the residents in other Regions.

In particular, considering the public and accredited-private beds used for the activities of hospital stay, a national rate of 3.5 beds per thousand inhabitants is recorded: but Calabria goes from 3.2 per thousand inhabitants ("effective") to 3.8, while Emilia Romagna goes from an availability of 4.0 to 3.8.

**Figure 6.3 - Beds used net of hospital mobility
Rates per thousand inhabitants - 2009**



Source: Health Ministry SDO data Workups

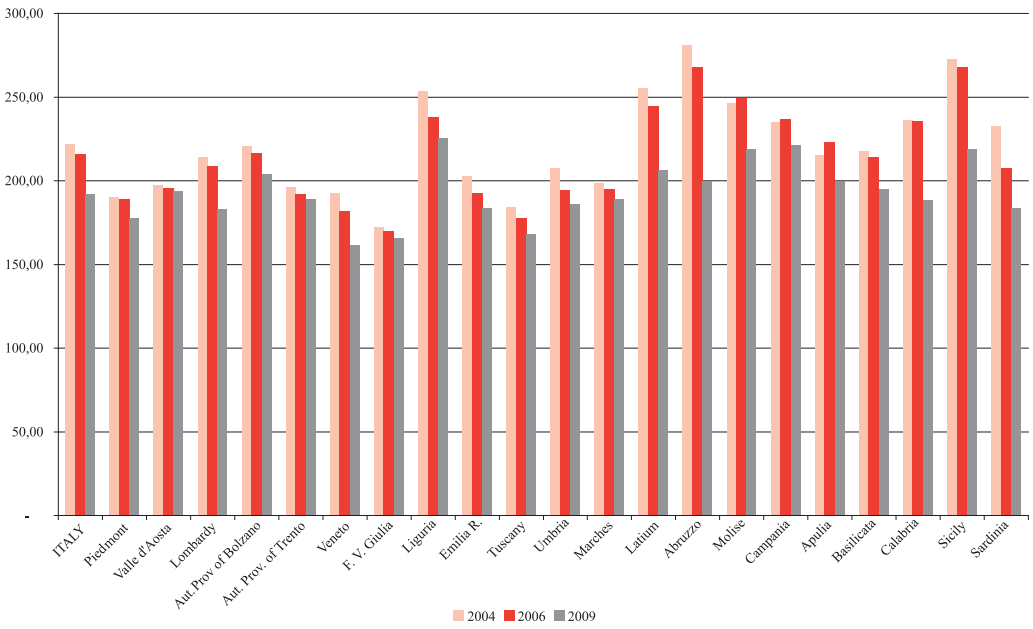
6.3. The development of hospitalization rates

In the last few years the action of national and regional policy aimed at reducing the hospital supply has been accompanied by a reduction in the resort to hospitalization. Action has been taken to reorganize hospital care, favouring first of all the passage from ordinary hospitalization to that of day-hospital care and then from day care to outpatient assistance.

Such maneuvers have led to a generalized reduction of hospitalizations. Suffice it to note that between 2004 and 2009 the total rate of hospitalization (acute cases, rehabilitation and long-term hospital care) in public and accredited structures went from 221.7 per thousand residents to 192.2 (-13.3%). This value is however still far from the reference of 160 hospitalizations per thousand inhabitants established by law no. 595/1985. On analyzing only those hospitalizations for acute cases, it is noted that the ratio of hospitalizations in day care to the ordinary ones is always more or less around a value of 1 to 3.

At the regional level, despite the fact that the reduction in hospitalizations was a feature of all areas, a definite geographic distinction is still obvious: the Regions of the North display rates of hospitalization that are lower than the national average, while the Southern Regions feature significantly higher rates.

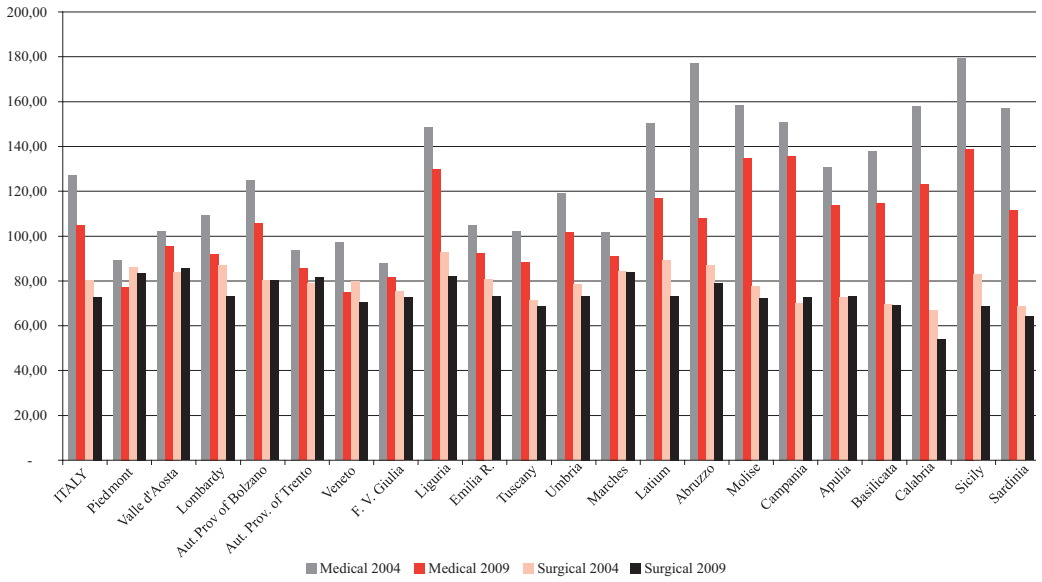
Figure 6.4 - Hospitalization rates
Rates per thousand inhabitants – 2004, 2006, 2009



Source: Health Ministry and ISTAT data workups

On separating hospitalization rates, for the acute cases, between medical and surgical DRGs, it is noted that the reduction concerned both categories, but greater intensity was seen in the hospitalizations that did not call for surgery, especially if carried out during day hospital. On the average between 2004 and 2006 the medical hospitalizations dropped by 17.7%, going from a rate of 127.1 per thousand to 104.6. For the day hospital the reduction was 22.7%.
For the surgical DRGs, instead, the reduction was lower: 9.2%, with a rate that went from 80.3 to 72.9 per thousand. In this case too the greatest reduction was seen for the day hospital (-14.9% relative to the -6.2% of ordinary hospitalization).
At the regional level it is seen that in the Center-North the reductions came about in both categories at about the same rate (16.0% for the medical DRGs and 10.7% for the surgical), while in the Regions of the South the medical hospitalizations dropped by 19.1%, while the surgical did by 6.5% owing to the increase in day surgery, which between 2004 and 2009 increased an average of 9.9%.

Figure 6.5 - Hospitalization rates for acute cases by type of DRG Rates per thousand inhabitants – 2004 and 2009



Source: Health Ministry and ISTAT data workups

6.4. Utilization Rates

As mentioned earlier the first standards on utilization rates were set in 1988, with reference to typical organizational modules, at an average yearly rate of utilization of not less than 70-75% with the exceptions of Intensive Care and of Infectious Diseases.

Table 6.1 - Rate of utilization for ordinary acute cases in public and accredited structures - Values in % – 2008

Region	Rate
ITALY	78.3
Piedmont	82.4
Valle d'Aosta	80.9
Lombardy	78.6
Aut. Prov. of Bolzano	77.5
Aut. Prov. of Trento	70.7
Veneto	81.3
Friuli Venezia-Giulia	79.1
Liguria	87.3
Emilia Romagna	77.8
Tuscany	77.6
Umbria	81.9
Marches	79.0
Latium	78.6
Abruzzi	81.4
Molise	87.8
Campania	75.0
Apulia	82.4
Basilicata	76.0
Calabria	76.9
Sicily	72.9
Sardinia	64.7

Source: Health Ministry

The nation's mean rate of utilization was 78.3%, but the regional variability is high: the values lie between 64.7% in Sardinia and 87.8% in Molise.

All Regions, with the exception of those mentioned: Sardinia, Sicily and the Autonomous Province of Trento, display values higher than the threshold of 75.0%, considered to be the minimum acceptable by national law. Furthermore, a good eight Regions display values exceeding 80.0%

To evaluate the effects at the regional level of the hospital efficiency policies, set forth below is a simulation on ordinary acute-case hospitalizations. At first excluded from the calculation were the days of hospitalization involving stays in mobility; in other words, the hospitalizations considered are, for each Region, only those of their own residents who resort to home structures. The national utilization rate drops to 72.9% (down 5.3 percentage points) and the reduction obviously concerns the Regions of small size, characterized by a strong plus-side mobility: Umbria (-10.6 points) and especially Molise, whose rate of utilization goes from 87.8% to 65.9%.

Table 6.2 - Utilization rate for acute cases in ordinary regimen, net of mobility Values in % – 2008

Region	Rate
ITALY	72.9
Piedmont	78.3
Valle d'Aosta	73.4
Lombardy	72.3
Aut. Prov. of Bolzano	72.9
Aut. Prov. of Trento	65.5
Veneto	75.0
Friuli Venezia Giulia	73.9
Liguria	78.8
Emilia Romagna	68.5
Tuscany	70.6
Umbria	71.3
Marches	72.9
Latium	72.1
Abruzzi	72.9
Molise	65.9
Campania	73.5
Apulia	79.5
Basilicata	66.2
Calabria	74.7
Sicily	71.7
Sardinia	63.8

Source: Health Ministry

In this scenario there are many Regions that display an excess of supply: Molise, Basilicata and Sardinia display a rate lower than 70.0%, but the Aut. Prov. of Trento and Emilia Romagna too feature a rate lower than the threshold, they displaying 65.5% and 68.5% respectively.
A second simulation takes into consideration, instead, the hospitalizations of residents, assuming the absence of health-care mobility.
In this case the national utilization rate remains, obviously, unchanged (78.3%), while it changes significantly among the various Regions.
It increases in the Regions having a negative migratory balance: particularly in Campania (80.9%), Basilicata (84.9%) and Calabria (89.6%). On the other hand it drops in the Regions having a positive migratory balance, in particular Lombardy (75.1%) and Emilia Romagna (72.2%).

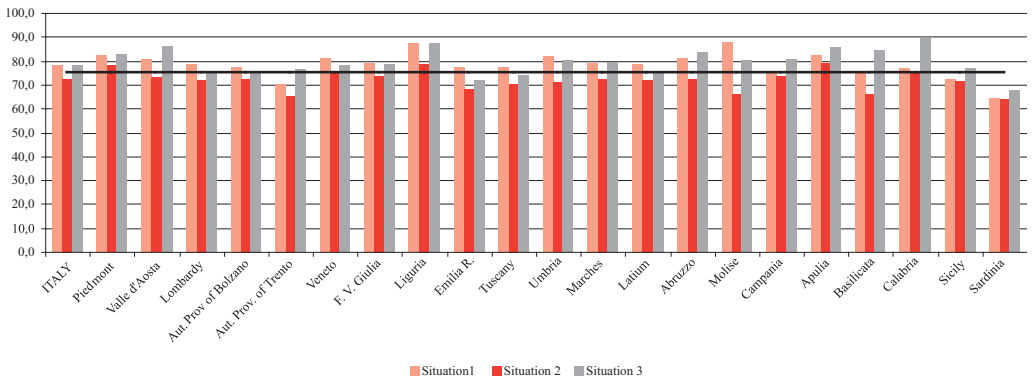
Table 6.3 - Utilization rate for acute cases in ordinary regimen (hospitalizations of residents) - Values in % – 2008

Region	Rate
ITALY	78.3
Piedmont	82.9
Valle d'Aosta	86.5
Lombardy	75.1
Aut. Prov. of Bolzano	76.2
Aut. Prov. of Trento	76.6
Veneto	78.0
Friuli Venezia Giulia	78.5
Liguria	87.2
Emilia Romagna	72.2
Tuscany	74.6
Umbria	80.1
Marches	80.0
Latium	76.2
Abruzzi	83.7
Molise	80.3
Campania	80.9
Apulia	85.7
Basilicata	84.9
Calabria	89.6
Sicily	77.1
Sardinia	67.5

Source: Health Ministry

A synthesis of the three scenarios is given in the graph below, which shows the departures of the utilization rates from the minimum level required: 75%. It appears obvious that by now all the Regions have a substantially adequate supply, which with the current hospitalization rates implies a utilization rate exceeding 75%: exceptions to this are Emilia Romagna and Sardinia, which evidently have an excess supply, with the difference that at least Emilia's is compensated for by the plus-side mobility. Quite surprising too is the data on Campania, which seems to display an excess of utilization rate. This (if there were no minus-side mobility) could throw the supply system into crisis.

Figure 6.6 - Utilization rates simulation
Values in % – 2008



Source: Health Ministry data workups

Situation 1: Utilization rates for acute-case hospitalizations in ordinary regimen
Situation 2: Utilization rates for acute-case hospitalizations in ordinary regimen net of hospitalizations in mobility
Situation 3: Utilization rates for hospitalizations of residents.

A final simulation takes into consideration the scenario in which the total rate of hospitalization is equal to the established rate of 160 hospitalizations per thousand inhabitants. In this case in the computation of the utilization rate there are inserted the ordinary estimated acute-case hospitalizations, so as to leave unvaried both the distribution of the total hospitalizations by type of activity, and the mean period of hospitalization recorded in the individual Regions for the ordinary acute-case hospitalizations.
Obviously the utilization rate for equal supplies would drop significantly. On the average it would be 62.8%. At the regional level only the Veneto would have a rate higher than 75% (76.8%), while a good fourteen Regions would show a utilization rate of less than 65.0% and six would be lower than 60.0%.

Table 6.4 - Simulation of the utilization rate for acute cases in ordinary regimen assuming a hospitalization rate of 160 per thousand inhabitants Values in % – 2008

Region	Rate
ITALY	62.83
Piedmont	71.92
Valle d'Aosta	74.72
Lombardy	64.36
Aut. Prov. of Bolzano	59.23
Aut. Prov. of Trento	63.14
Veneto	76.77
Friuli Venezia Giulia	72.94
Liguria	60.51
Emilia Romagna	61.67
Tuscany	69.63
Umbria	66.78
Marches	66.66
Latium	58.80
Abruzzi	62.28
Molise	55.56
Campania	54.62
Apulia	62.55
Basilicata	65.63
Calabria	63.29
Sicily	53.89
Sardinia	54.85

Source: Health Ministry

6.5. Conclusions

Over the past decade the reduction in hospital beds has been significant: the beds per inhabitant have gone from 5.1 per thousand inhabitants in 2000 to 4.2 in 2009. A value decidedly lower than the average for the OECD countries, which for 2009 is 5.2 per thousand.

The analysis has brought out furthermore how the scheduling of the supply founded on national indices can distort, since each Region is characterized by different dynamics in terms of demand and rate of utilization of the supply over its territory.

A significant example is that of Emilia Romagna, which has in reality an excess of supply of beds with respect to its population, compensated for by the component of plus-side mobility. The opposite discourse instead could be seen for such Regions as Calabria and Campania, which would display an excess of utilization of beds should their strong minus-side mobility be reduced.

With a view to satisfying the constraint introduced in 1985, that is a total hospitalization rate lower than 160 per thousand inhabitants, the current supply of beds would anyway be excessive: the utilization rate for ordinary acute-case hospitalizations would in fact settle to 62.8%,

a value far from the optimum.
So, the scheduling, although something that cannot be done without in governing the system, appears ineffective if not accompanied by a proper definition of the objectives to be pursued and does not adequately take into account the elements of demand that characterize the health system.

APPENDIX

Further remarks on "hospital care"
The principal statistical tables that can be found on the site of the CEIS Health Report

TOTAL HOSPITALIZATIONS
• **Supply**
Hospitalization structures by typology
Hospitalization structures by typology. Composition
Public hospital structures by typology
Nursing homes
Beds envisioned
Public beds envisioned
Accredited beds envisioned.
• **Utilization**
Hospitalizations by typology of activity
Hospitalizations by typology of activity. Composition
Hospitalization rate
• **Expense**
Value of production by typology of activity
Value of production by typology of activity. Composition

Per capita production value
ACUTE CASES
• **Utilization**
Ordinary hospitalizations by typology of hospital structure
Mean weight of ordinary hospitalizations by age
Mean number of days of ordinary hospital stays by age
Mean days of ordinary hospitalizations by structure typology
Day hospitalizations by typology of hospital structure
Mean weight of day hospitalizations by age
Mean day-hospital accesses by age
Mean day-hospital accesses by structure typology
Ordinary hospitalization rate
Ordinary hospitalization rate by age
Ordinary hospitalization rate by sex

Ordinary hospitalization rate by type of DRG
Ordinary hospitalization rate by type of DRG and age
Day-hospitalization rate
Day-hospitalization rate by age
Day-hospitalization rate by sex
Day-hospitalization rate by type of DRG
Day-hospitalization rate by type of DRG and age
Day-hospital access rate by age
Day-hospital access rate by type of DRG

• **Expense**

Production value, ordinary hospitalizations
Production value, ordinary hospitalizations by age
Per capita production value, ordinary hospitalizations by age
Production value for ordinary hospitalization
Production value, ordinary hospitalizations attributable to births
Production value, day hospitalizations
Production value of day hospitalizations by age
Per capita production value of day hospitalizations by age
Production value for day hospitalization

• **Mobility**

Mobility matrix, ordinary hospitalizations
Mobility matrix, ordinary hospitalizations – Values in percentage of total residents
Mobility matrix, day hospitalizations
Mobility matrix, total hospitalizations
Mobility matrix, day hospitalizations. Values in % of total residents
Mobility matrix, total hospitalizations. Values in percentages of total residents

• **Appropriateness**

Ordinary hospitalizations at risk of inappropriateness. Portion of total.
Rate of ordinary hospitalization at risk of inappropriateness.
Production value for ordinary hospitalizations at risk of inappropriateness
Day hospitalizations on Day Surgery hospitalizations.

RIHABILITATION

• **Utilization**

Hospitalizations by regimen. Composition.
Mean length of ordinary hospital stays, by age
Ordinary hospitalization rate, by age
Ordinary hospitalization rate, by sex
Ordinary hospitalization rate in days of stay, by age
Day hospitalizations, by sex
Day hospitalizations, by age

• **Expense**

Production value, ordinary hospitalizations

Production value, ordinary hospitalizations, by age
Production value, day hospitalizations
Production value, day hospitalizations, by age

LONG-TERM HOSPITALIZATIONS

- **Utilization**

Ordinary hospitalization rate
Ordinary hospitalization rate, by age
Ordinary hospitalization rate, by sex
Ordinary hospitalization rate in days of stay, by age

- **Expense**

Production value, ordinary hospitalizations
Production value, ordinary hospitalizations, by age
Production value, per capita ordinary hospitalizations, by age

Chapter 7

Primary care Incentives to taking on new patients and to quality of assistance in base medicine

7 - Primary care
Incentives to taking on new patients and to quality of assistance in base medicine

Valentina Lista[1]

7.1. Introduction

The need for supremacy in Primary Health Care is taken for granted in the discussion over the future sustainability of health-care systems. Ageing and chronic diseases, if not properly handled, run the danger of making the public health care system unsustainable, or anyway inadequate.

In Italy as a whole already in 2010 41% of its residents stated that they were affected by at least one chronic pathology and 21% stated that they had at least two chronic illnesses. It is interesting to break the data down by age: the quotient per hundred inhabitants with at least one chronic pathology goes from 21.7 in the 25-44 age band to 80.9 for those over 64 years of age and respectively from 5.4 to 58.6 for those affected by at least two chronic pathologies. On the whole 81% of those over 64 years of age stated that they had at least one chronic illness and 59% that they had at least two.

Table 7.1 - The population six years of age and older by condition of health, presence of chronic illnesses by age class. 2010

Age Classes	In good healh	With at least one chronic illness	With at least two chronic illness	In good healh	With at least one chronic illness	With at least two chronic illness
	Rates per 100 inhabitants			Incidence on total population (%)		
6-24	93.9	13.5	2.5	94%	13%	2%
25-44	84.6	21.7	5.4	85%	22%	5%
45-64	63.9	49.8	23.6	64%	50%	24%
≥65	30.9	80.9	58.6	31%	81%	59%
Total	69.2	40.6	21.3	69%	41%	21%

Source: ISTAT data workup

[1] *CEIS Sanità, Economics Faculty, University of Rome, Tor Vergata campus*

Despite the general opinion as to the importance of primary health care, an organizational and management model of this care is hard to define. Consequently, the systems giving incentives to the efficacy and efficiency of primary health care remain substantially unchanged.
Considering the central role that family medicine takes on in the primary health care system, in what follows a first analysis of the performance of family medicine is attempted, although limited to only the function of "gatekeeping" and to the activity of prescription. The model for remuneration is then analyzed, to indicate some unsatisfactory aspects of the current system.

7.2. The role of family medicine: the taking on of new patients and "gatekeeping"

The general practitioner (GP) and the pediatrician of free choice (PFC) play what is certainly a fundamental role in the NHS structure, through their function of taking on the patient, but they also act as "filters", that is they can grant or withhold access to reimbursement for the charges of medical assistance (gatekeeping).
Taking the patient on, in the case of non-acute pathologies implies that the GP/PFC has a very important function, one exerting a notable impact in terms of health.
In evaluating a "proxy" for the activity of the GP/PFC at the regional level, the data from 2005 was used as base, referred to the number of generic visits supplied at the regional level. This data is available only from the ISTAT Multiscope study of 2005, it not having been possible to find anything more updated.
To render the data comparable, in the calculation of quotients per inhabitant the weighted population was used, the weights being worked up on the basis of the data (visits per age of person assisted) furnished by *Health Search* (SIMG).

**Table 7.2 - Generic medical visits made
Rates per thousand over-14 residents (weighted population) – 2005**

Regions	Generic medical visits	The weighted population (over-14)	Quotients per resident over 14 (weighted population)
Italy	174,276,000	50,206,663	3,471
North	71,760,000	23,518,035	3,051
Center	36,684,000	10,027,517	3,658
South and Islands	65,832,000	16,661,111	3,951
Piedmont	11,952,000	3,980,738	3,002
Valle d'Aosta	240,000	107,916	2,224
Lombardy	22,248,000	8,093,422	2,749
Aut. Prov. of Bolzano	912,000	376,495	2,422
Aut Prov. of Trento	1,284,000	417,611	3,075
Veneto	14,172,000	4,019,696	3,526
Friuli Venezia Giulia	3,288,000	1,114,515	2,950
Liguria	4,104,000	1,581,118	2,596
Emilia Romagna	13,560,000	3,826,524	3,544
Tuscany	12,624,000	3,356,845	3,761
Umbria	3,336,000	798,147	4,180
Marches	4,812,000	1,377,401	3,494
Latium	15,912,000	4,495,125	3,540
Abruzzo	3,372,000	1,145,500	2,944
Molise	1,056,000	285,497	3,699
Campania	15,936,000	4,386,375	3,633
Apulia	11,892,000	3,268,050	3,639
Basilicata	1,884,000	503,762	3,740
Calabria	9,096,000	1,639,218	5,549
Sicily	17,136,000	4,059,047	4,222
Sardinia	5,460,000	1,373,661	3,975

Source: CEIS workup of ISTAT data and Health Search data

Table 2 shows the quotients per thousand residents (over 14) of generic medical visits at the regional level. In Italy, in 2005, an average of 3471 visits were made for every thousand inhabitants. The highest value reached was in Calabria, with a quotient of 5549. On the other hand, the minimum value was reached in the Valle d'Aosta with a quotient of 2224. On the whole the highest values were reached in the Regions of the South and the Islands, with a quotient of generic visits of 3951, followed by those of the Center (3658) and by the Regions of the North (3051).

In consideration of the significant differences described, it was wished to analyze the relationship between family medicine activities and:

- Resorts to Emergency Care
- Prescriptions for pharmaceuticals (number of prescriptions).

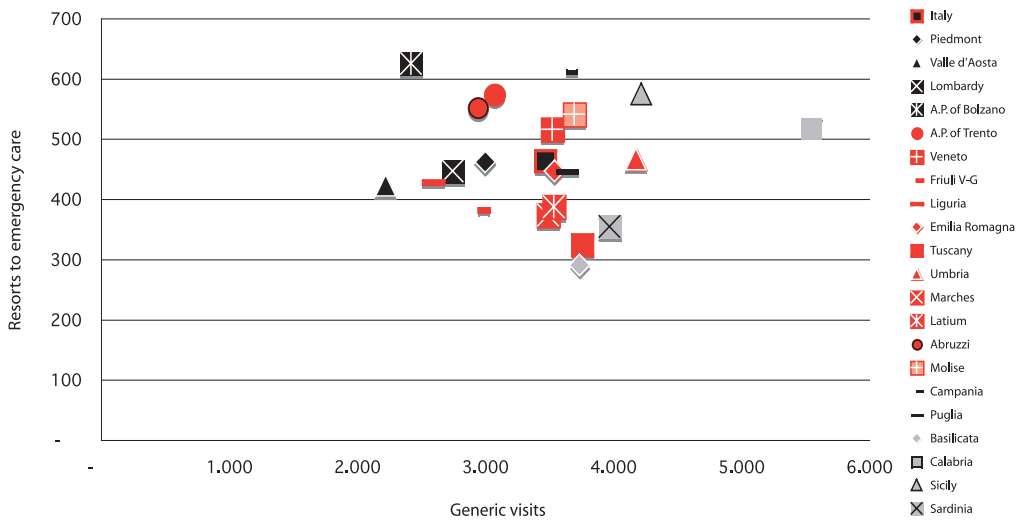
In the calculation of the quotients, in this case too the weighted population was used. For resorts to emergency care, the rates were calculated by using the hospital weights (CIPE – Interministerial Department for Economic Planning – decision) and for the prescriptions the pharmaceutical weights were used (OSMED, Health Ministry). To make the populations comparable, the band of ages ≥15 years was used for all three dimensions.

The figure below shows the relationship existing between the rate of visits and the resorts to emergency care.

Prima facie, there seems to be no detectable relation between quotient of visits (here evidently taken as indicator for the availability of the physician), and the quotient of resorts to emergency care.

The absence of a correlation between the two dimensions is confirmed by Pearson's[2] correlation index, which is close to zero (-0.024).

Figure 7.1: Generic medical visits vs. Resorts to Emergency Care Rates per thousand residents over 14 (weighted population) - 2005

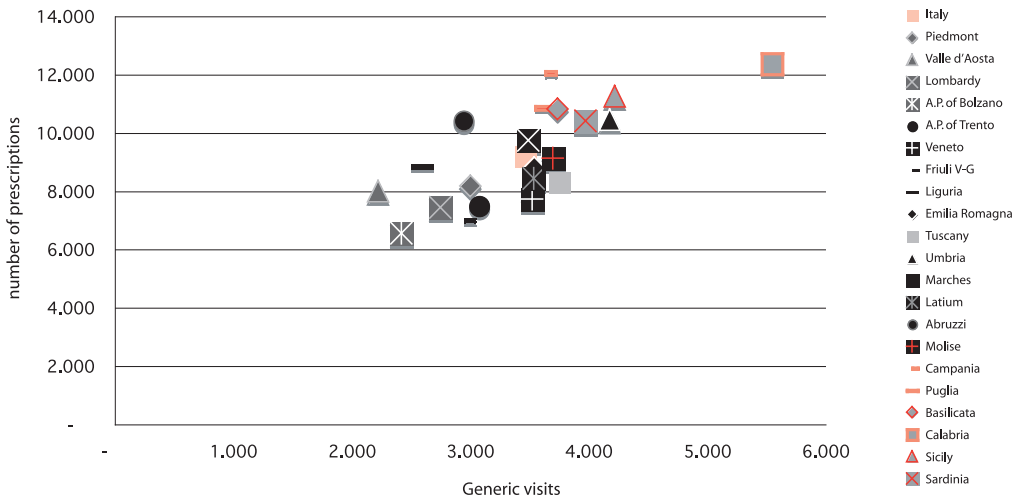


Source: CEIS workup of ISTAT data

[2] *The correlation evaluates the tendency that two variables have to vary jointly (or to co-vary). The index can vary between -1 and +1.*

As against this figure 2 shows the existence of a strong positive correlation between visits and prescriptions.
The strong positive correlation between the two dimensions is confirmed by Pearson's index of correlation, which is +0.724.

Figure 7.2 - Generic medical visits vs. Number of prescriptions Rates per thousand inhabitants (weighted population) - 2005



Source: CEIS workup of ISTAT data and Health Ministry data

The simple analyses made seem to suggest that in the professions of GP/PFC, prescriptions play a fundamental role and perhaps one that is out of proportion, considering that (since the population is weighted and therefore homogeneous) there seems to be no reason for such appreciable differences in the number of visits supplied (although the analysis is distorted owing to lack of data on the other activities of particular commitment that are supplied.
As against this the simple "presence" (here too the analysis is to be taken as merely a first suggestion, since the proxy for the number of visits is not exhaustive), does not seem to reduce resorts to emergency care.

7.3. The remuneration model for general medicine

The preceding seems to provide indications as to the fact that it is necessary to create more-adequate incentives in order that the family-medicine role of filter and of taking on patients properly evolve.
The remuneration system is a significant element in terms of incentives to more efficient activity.
The current model, founded on the system of the "per capita quota", in principle however

favours more the search for the "quantity of patients" than the quality of the care supplied.
The GP/PFC remunerative system should, instead, be in line with the pursuit of the objectives of programmed health, with a suitable balance between the part of the compensation tied to automatisms (per capita quota) and that tied to the objectives and to the services defined by the regional and ASL (local health unit) programmings (variable quota). In fact, with the most recent National and Conventional Regional (NCA and ACR) Agreements a variable components has in fact been set beside the fixed per capita quota.
The new per capita quota (envisaged by NCA 2009 and 2010) is 40.05 €, weighted for the years the doctor had an agreement with the state, with a contribution tied to the number of persons he assists. For each such person who has reached his 75th year of age an additional compensation is paid, of 20.29 €. While for those of his patients of age lower than 14 years, he is paid, with reference to the choices he has made, a yearly additional compensation of 18.95 €. This type of weighting responds to the assumption that age describes the greater absorption of professional and economic health care resources.
The variable quota of the physician's compensation is mainly tied to three aspects: the activity in one of the forms envisaged by law (medicine in association, medicine on line, group medicine, experimental forms), which permits an increase in compensation of an amount that can vary between 2.70 and 7.00 € per person assisted depending on the form of association of which the physician is part. The hiring of another doctor in his offices or of nursing personnel gives him the right to a further 3.50-4.00 € per person assisted. Adhesion to any information-technology systems implemented by the Region he belongs to gives the right to a lump sum compensation of 77.47 € per month. His remuneration is, then, distributed thusly:

Table 7.3 - The GP's remuneration – fixed quota + variable quota

Fixed quota			
Yearly per capita quota	Additional per capita entrance quota	Additional compensation (persons assisted older than 75 years)	Additional compensation (persons assisted younger than 14 years)
€ 40,05	€ 13,46	€ 20.29 Jan1st 2008)	18.95 (since Jan1st 2008)

Variable quota					
Computer technology indemnity	Group medicine	Medicine on line	Medicine in association	Indemnity for collaborating physician and for the offices	Indemnity per professional nurse
€ 77.47/mon	€ 7,00	€ 4,70	€ 2,58	€ 3,50	€ 4,00

Source: ACN 2009-2010

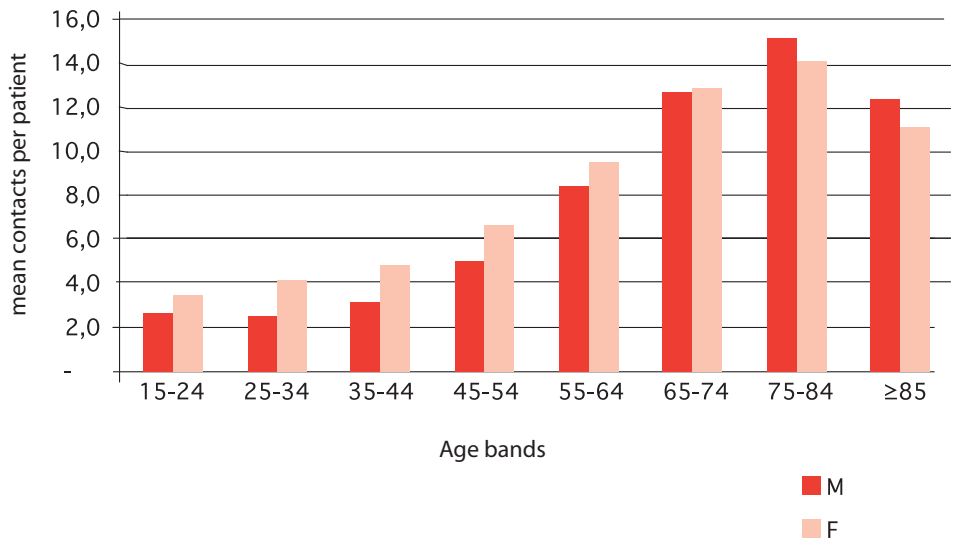
The last part of the GP's compensation refers to the quota regarding the services supplied and is computed on the basis of the type and of the volumes of services. This part, agreed upon at the regional level, includes additional services, scheduled assistance, scheduled home care, filled-out home care, scheduled assistance in protected residences, additional operations in protected release from hospital, services and activities in community hospitals or alternatives to hospitalization structures, computer-assisted services (not included in the quota of 77.47 € per month already defined), further activities or services requested by the local health units.
This quota is the one that involves the most bargaining at the regional level and, most especially, at the level of the individual ASL (local health unit).
To leave the nation's boundaries behind, the experiments conducted abroad have been directed towards greater incentives in the system of remuneration and a greater decentralization of assistance, from the hospital to the territory. In particular, deserving of mention is the English experience, which since 2003 has seen a series of policy initiatives carried out favouring an improvement in remuneration and in the evaluation of the competences of English General Practitioners (GP).
In particular, the *New Contract for General Practice Services* (2003), the nationwide contract for general medicine, has introduced a system of remuneration based on a weighted per capita quota for the fixed part and a variable part tied prevalently to measurements of the quality of the service supplied. The fixed part (Global Sum) is a sort of per capita quota, weighted on the basis of some geographic and socio-demographic factors of the persons assisted, such as:

- patients' age and sex;
- the presence of patients having home assistance needs;
- local death rates;
- the cost of living in the area in which the physician lives and works.

This first part of the remuneration, although with significant differences, can in some ways be superposed on that adopted in Italy.
But set side by side with this first quota are measures of performance to bring out and reward the level of service offered by the GPs. This is done through the use of a system of indicators, called "Quality and Outcomes Framework" (QOF). The QOF is broken down into four theme areas, to which are assigned points (up to a maximum of a thousand).
Parenthetically, note that another important new feature contained in the 2003 contract is the introduction of the so-called "additional services". Each GP is required to supply the essential services, like the other physicians, but he can also individually contract, with his own local health unit of reference, the supply of other services useful to the population, such as care of drug addicts or care of the homeless. In this way the Primary Care Trust takes on more and more the true function of NHS garrisons and points of reference for the population for its health-care needs.
Going back to the Italian NHS, and comparing the experience with the English NHS, we find confirmed the principal lack to be found in the current system of remuneration: that of its remaining anchored to a logic of financing the supply, without instead being capable of rewarding the meeting of the demand.
The remuneration of the Italian GP could certainly be conserved in the form of a per capita

quota. This, provided it be suitably broken down in such fashion as to reward both the effective work load (therefore by age bands of the persons assisted), and the quality of the taking on of the patient, according to a logic of pay per performance (P4P).
As to the first point we may observe that the existence of a positive correlation between age of persons assisted and work load is obvious. The figure below places the two dimensions in relation, distinguishing between males and females. The mean number of contacts per year, recorded in 2009 by the *Health Search* database, grows in proportion to the increase in age of the patients: from 2.9 contacts per patient recorded in the 15-24 age band we arrive at 11.6 contacts in the band of those over 84 years of age, with a peak in the 75-84 age band (14.5 contacts per year).
The concentration of the number of contacts in the over-64-year-olds is still more obvious from

Figure 7.3 - Distribution by sex and age-band of the mean number of contacts per patient – 2009

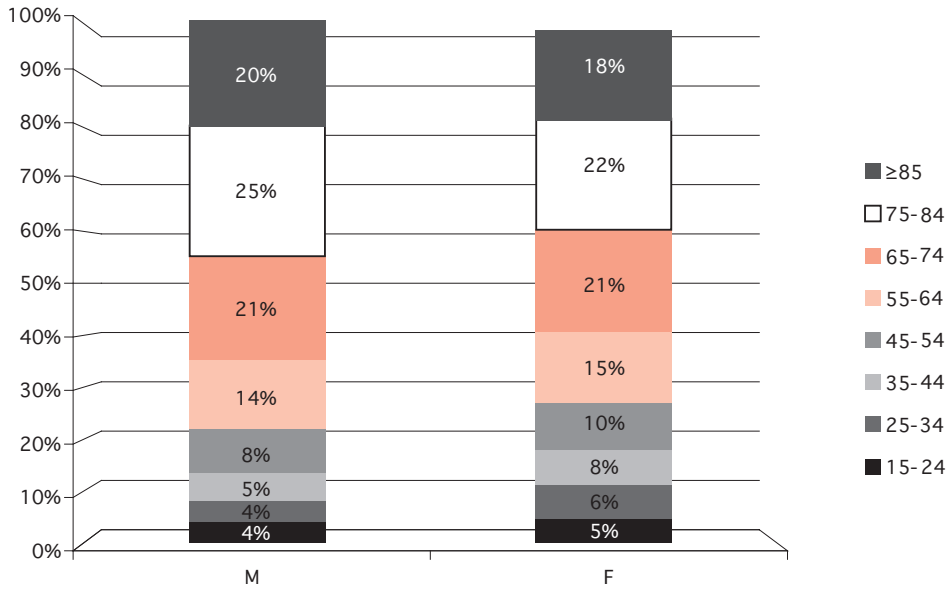


Source: 6th Health Search Report

the figure below, which shows the percentage composition of the mean number of contacts per patient on the basis of age band, during the year 2009. The percentage distribution is more or less homogeneous between males and females. Among the over-64-year-olds more than 60 percent of the number of contacts with the GP per patient are concentrated.

Clearly, the pathologies that have caused most of the contacts per year with the GP are pre-

Figure 7.4 - Composition of the mean number of contacts per patient per age and sex - %Values – 2009

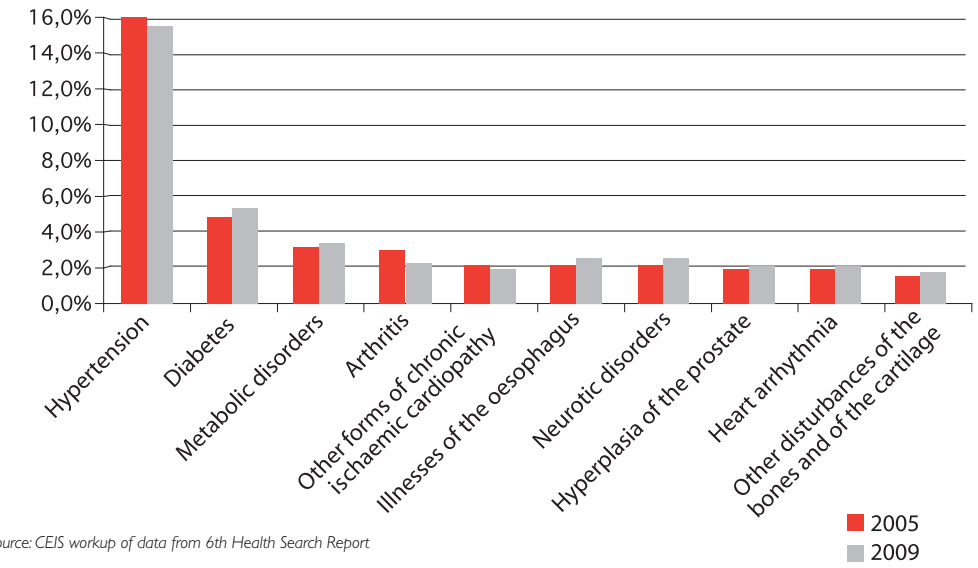


Source: CEIS workup of data from the Sixth Health Search Report

valently those of the chronic type: hypertension (from 15.9% of the total contacts in 2005 to 15.5% in 2009) represents the pathology that most engages the GPs, followed by diabetes (from 4.8% in 2005 to 5.3% in 2009) and by metabolism disorders (from 3.1% in 2005 to 3.3% in 2009).

Obviously chronic disorders and age are strongly correlated. Therefore, it is most likely that over

Figure 7.5 - Distribution of the first ten pathologies that caused the largest number of contacts - Values % – 2005 and 2009



Source: CEIS workup of data from 6th Health Search Report

the years the mean workload of the GPs will increase owing to the effect of ageing.
Finally, in the definition of the remuneration of the GP/PFC there seems to be an indication for a greater and better articulation of the base quota depending on the effective workloads, but also for a greater courage (following the English experience) in the introduction of P4P criteria, thus balancing quantitative and qualitative elements.

7.4. Conclusions

The General Practitioner (GP) is a key element in the NHS supply system, and a referent close to them in which the users repose great trust. The GP constitutes a figure that is certainly central to primary care: it is in his outpatient clinic that the patient is taken on under clinical care, in particular those patients who are bearers of multiple pathologies, typically chronic-degenerative diseases. The patient is followed during his entire health-care itinerary, from the manifestation of the need, to checking the procedures for the activation of the network of services for the process of rehabilitation of the patient himself.
The filter function (gatekeeping) and that of taking the patient on are of fundamental importance, underscoring the relevance of the role of the GP in safeguarding the patient's health, but also in keeping down health-care expense.
On analyzing the correlation between generic visits with resorts had to emergency care (a representative dimension for evaluating the GP's function of filter) and with the number of prescriptions (representative, instead, in the taking on of the patient) it came out that certainly something in the gatekeeping and in the prescription activity does not function as it ought. In fact, while figure 7.1 shows the absence of correlation between generic visits and accesses to emergency care, 7.2 instead shows a strong positive correlation with the number of prescrip-

tions.
A further element of in-depth consideration, because of the strong tie existing between generic visits and numbers of prescriptions, is the possible correlation between visits and expenditures on pharmaceuticals at the charge of the NHS. From statistical analysis there emerged the absence of correlation between the two dimensions, confirmed by the computation of Pearson's index, which is close to zero (+0.035). This shows, then, that a larger number of prescriptions does not imply induction of expense.
The foregoing seems to furnish indications on the fact that it is necessary to create more suitable incentives in order that the family doctor's role of gatekeeper and of taking on the patient properly evolve.
The system of remuneration is surely a significant element in terms of incentives aimed at making the activity efficient. The current compensation based on the per capita quota, although recently filled out by the latest NCAs, seems not to be suited to the new exigencies. It is not an exhaustive measure of the assistance picture that has by now been delineated, characterized by patients who are ever older and affected by chronic pathologies, not mirroring, then, the physician's true workload.
The GP's remuneration could certainly be conserved in the form of a per capita quota (the fixed part), provided that it be suitably articulated so as to reward both the effective workload (therefore by age-band of the persons assisted), and the quality of the taking on of the patient (the variable part). This, according to a logic of Pay for Performance, which balances the "quantity of assistance" with its quality.

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APPENDIX

In-depth discussion of Primary Care
Statistical tables to be found on the CEIS Health Report site:

SUPPLY

• Regional Health structures and services

ASL (Local Health Unit)
ASL Average size (with regard to inhabitants)
Districts
Districts: Average size (regarding inhabitants)
CSM
CSM. Average size (regarding inhabitants)
Consulting structures
Consulting structures, Average size (regarding inhabitants)
SERT (Drug Addiction Service)
SERT. Average size (regarding inhabitants)

• Emergency/Urgent-care network

Emergency-care wards
Emergency care wards. Quota of structures with Emergency-care ward per total public structures.
First-aid stations/Emergency wards
First-aid stations/Emergency wards. Quota of structures with emergency wards per total public structures.
Reanimation centers

• Basic health care

General practitioners (GP)
GPs per inhabitant
GPs per classes of date of university degree. Incidence on total.
GPs per classes of choices. Incidence on total
GPs beyond 1500 choices: GPs chosen by more than 1500 patients Incidence on total .
Paediatricians of free choice (PFC)
PFCs per inhabitant
PFCs per classes of date of university degree. Incidence on total
PFCs per classes of patient choice. Incidence on total
PFCs beyond 800 choices. Incidence on total.
Physicians' watches
Physicians' watches per inhabitant
Physicians' watches. Average size (regarding inhabitants)
Physicians' watches. % variations
Physicians' watches. Mean yearly % variations
Physicians' watch physicians

Physicians' watch physicians per inhabitant
Mean number of hours supplied per physicians' watch.

• **Home care**

ASLs (local health units) with Integrated Home Care service (ADI).
ASLs with Integrated Home Care service. % variations
ASLs with Integrated Home Care service. Mean size (regarding inhabitants)
Home hospitalization services
Home hospitalization services. % variations
Home hospitalization services. Mean size (regarding inhabitants)

USE

• **Emergency-Urgency Network**

Emergency ward activities – Accesses
Emergency ward activities – Accesses per inhabitant
Emergency ward activities - patients
Emergency ward activities – patients per inhabitant

• **Basic health care**

Resident adults per GP
Resident adults per GP. % variations.
Aged persons (over 75) per GP
Aged persons (over 75) per GP, % variations
Resident children per PFC (paediatrician of choice)
Resident children per PFC. % variations
Prescriptions
Prescriptions per inhabitant
Prescriptions per family physician (GP+PFC)
Mean cost per prescription

• **Home health care**

Supplementary Home Health care (ADI- SHH) – persons assisted.
Supplementary Home Health care (SHH) – persons assisted. % variations
Supplementary Home Health care (SHH) – Incidence of persons assisted on total population
Supplementary Home Health care (SHH) – incidence of persons assisted. over 65 on total
Home social and health care – persons assisted.
Home social and health care – persons assisted. % variations.
Home social and health care – Incidence of persons assisted over 65 on population

EXPENDITURE

• **Basic health care**

Expenditures for basic medicine as per agreements
Expenditures for basic medicine as per agreements, per capita
Expenditures for basic medicine as per agreements. % variations
Quota of expenditures for basic medicine as per agreements, of public health care expenditures.

Quota of expenditures for basic medicine as per agreements, of expenditures for public health care as per agreements.

• **Home care**

Expenditures of municipalities for home social and health care

Expenditures of municipalities for home social and health care, per user

Expenditures of municipalities for home social and health care. % variations.

Expenditures of municipalities for home social and health care. Incidence on total home expenditures

Expenditures of municipalities for supplementary home health care (SHH).

Chapter 8

Specialist care: Regulatory policies and inadequacies of information

8 - Specialist care: Regulatory policies and inadequacies of information

Esmeralda Ploner [1]

8.1. Trends in the sector

Analysis of the latest data on specialist care made available by the Health Ministry for the year 2009, confirms the trend of the preceding years: the distribution over the nation's territory of the structures (whether public or accredited private)[2] that distribute specialist outpatient services is not uniform, just as the distribution between public and private is quite as non-uniform. Specifically, in the southern Regions there is a greater concentration of outpatient clinics and laboratories compared with the other departments considered in the analysis.

[1] *CEIS Health, Economics faculty, University of Rome, Tor Vergata campus*

[2] *In the calculation the hospital structures are also included.*

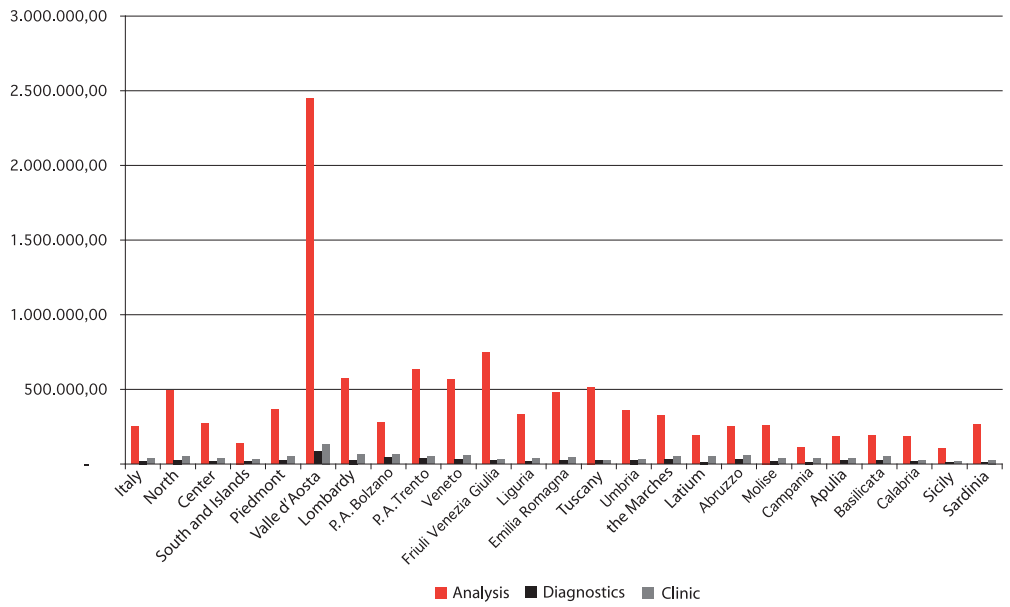
**Table 8.1 - Outpatient clinics and laboratories
Absolute and percentage values – 2009**

Regions	Total	% private
Italy	9658	60.17
North	2733	43.32
Center	1993	52.48
South and Islands	4932	72.61
Piedmont	454	19.38
Valle d'Aosta	5	60.00
Lombardy	767	61.67
Aut. Prov. of Bolzano	48	31.25
Aut. Prov. of Trento	39	46.15
Veneto	477	53.46
Friuli Venezia Giulia	135	31.11
Liguria	347	30.26
Emilia Romagna	461	40.13
Tuscany	830	37.95
Umbria	113	23.89
The Marches	200	52.00
Latium	850	70.59
Abruzzo	168	60.71
Molise	56	75.00
Campania	1452	79.96
Puglia	663	62.44
Basilicata	117	42.74
Calabria	423	56.74
Sicily	1701	81.36
Sardinia	352	53.41

Source: Health Ministry Data workup

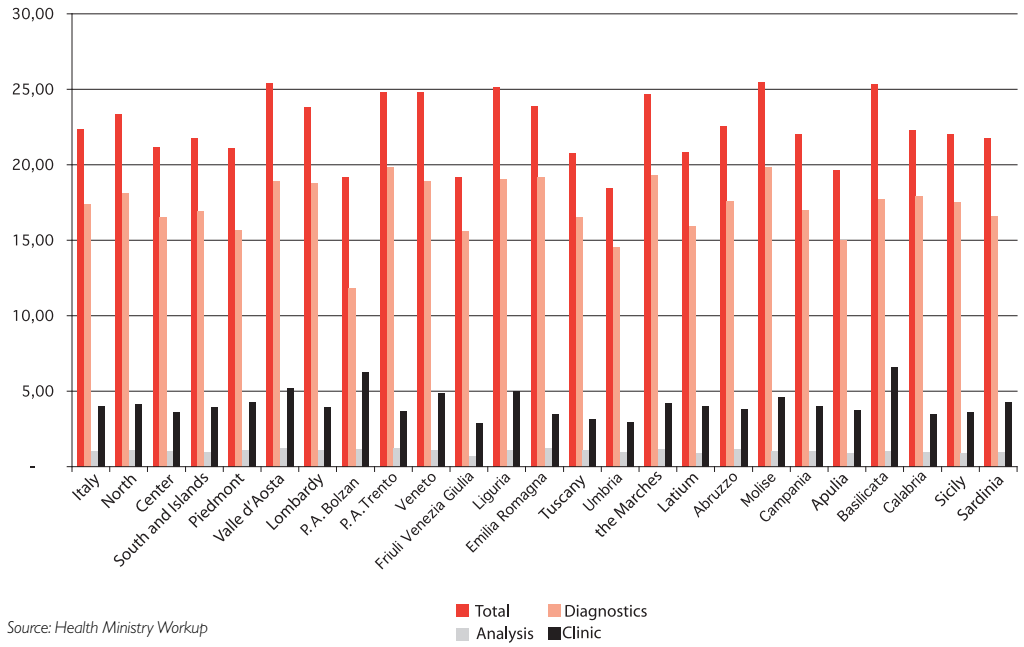
This lack of homogeneity translates into marked differences in the average volumes of activity handled by each structure, with obvious repercussions on the proper sizing of the structures themselves, and on the sector's efficiency.
The gap seen at the supply level, furthermore, finds no justification and consequent compensation on the side of utilization (see table 8.3): the number of services per capita per weighted population performed in the South and in the Islands is in line with the data coming from the Center, but lower than that of the northern Regions.

Figure 8.1- Mean number of services for structure and for type of activity Absolute values – 2009



Source: Health Ministry Workup

Figure 8.2 - Per capita services for a weighted population Absolute values - 2009



Source: Health Ministry Workup

If on the supply side the data published suffices to delineate an exhaustive summarizing picture, on the utilization side the availability of information is partial – owing to the availability of the production volumes by branch only but not for each individual service – and in fact prevents any inferences as to what specific services the Region's production is most greatly concentrated on.
On the expenditure side, meaning by this the cost sustained by the NHS for the acquisition of specialist outpatient services administered by accredited entities, whether public or private, the information available is still sketchier. In effect, analysis of the costs associated with the outpatient specialist services at the system-Italy level is quite complex, if not actually impossible. The data to be gathered from the models of regional CEs do not permit, in fact, displaying the amount of expenditure generated by the outpatient services when they are performed in-house to the NHS.
Finally, it is to be observed that the outpatient sector, though in terms of economic importance it is second only to the hospital and pharmaceutical sectors, is in fact the one on which statistical information useful for the purposes of its effective governance is most lacking. The effects of this lack are seen too in the policies governing access to the services and in the rate policies, which display very significant "dyscrasias" at the regional level, with the risk of inefficiency and risky guarantee of performance of the Essential Levels of Assistance (LEA).
These lacks appear quite worrisome considering the probable future sharpening of the ticket, dictated by the well-known financial problems afflicting the NHS, which, if ill handled, could initiate serious problems of Fairness.
In what follows, then, we shall concentrate the analysis on the status of the regional policies in terms of ability to supply, rate-setting and joint participation (sharing) in the specialist outpatient services.

8.2. The services' Nomenclator

On July 22nd 1996 the Health Ministry, by its decree *specialist outpatient services that can be supplied within the National Health service*, in its art. 1 identified the list "of specialist assistance services, there being included therein instrument and laboratory diagnostics, that can be supplied within the National Health Service, and rates involved". The subject decree offered, as well, to the Regions and Autonomous Provinces the possibility to provide for the supply within own territory of further services beyond those contained in the Decree or to join two or more into one. The measure mentioned above establishes as well the rates, underscoring that they represent the maximum remuneration that can be paid to the distributor bodies.
By a subsequent measure[3], the Health Ministry furnished indications as to the possibility of modulating the rates at the regional level. In effect, after the publication of this last-named instrument the Regions have obviously displayed quite diversified attitudes concerning the possibilities that the Decree offered them. Specifically, some applied the Decree without making to it any modifications, others, on the other hand, intervened with a heavy hand, inserting new services, eliminating others, and often modifying their conditions of supply.

[3] *Health Ministry Decree of July 22nd 1997.*

Table 8.2 - Number of services in the national and regional nomenclators (as per Ministerial Decree of 1996) - Absolute values – 2009

Regions	No. of services as per Ministerial Decree 1996 present in the Regional nomenclators	No. of services as per Ministerial Decree 1996 present in the Regional nomenclators	New services introduced by the individual Regions
Italy	**1,713**		
Piedmont	1,443	270	282
Valle d'Aosta	1,688	25	116
Lombardy	1,702	11	258
Aut Prov. of Bolzano	1,713		210
Aut Prov. di Trento	1,515	198	208
Veneto	1,663	50	145
Friuli Venezia Giulia	1,643	70	462
Liguria	1,713		21
Emilia Romagna	1,694	19	58
Tuscany	1,511	202	203
Umbria	1,713		150
The Marches	1,569	144	664
Latium	1,694	19	86
Abruzzo	1,691	22	12
Molise	1,711	2	
Campania	1,676	37	36
Puglia	1,698	15	17
Basilicata	1,704	9	558
Calabria	1,713		
Sicily	1,694	19	94
Sardinia	1,683	30	24

AgeNaS data workup

It appears obvious, however, that the number of services as per Ministerial Decree 1996 eliminated because deemed no longer susceptible of being supplied is not correlated with the number of new services introduced. In fact, in some Regions the high number of new services introduced finds no correspondence in a change to opposite sign among the Ministry's services. It follows, then, that the reason for which some Regions do not adopt the full national Nomenclator, does not owe so much to the elimination of some services deemed no longer useful or appropriate, but, rather, in most cases, owes to their replacement with others that depart from them in a multiplicity of variables: different methods, unification with others, different measurement units employed and, lastly – not certainly in importance – by the use of different codes to identify the same service, or else by the use of equal codes for different services.

Table 8.3 - Examples of different code numbers for the same services - 2009

Service	Code	Region
Trichloroacetic acid	90.0291	Friuli Venezia Giulia
Trichloroacetic acid	9002406	The Marches
Other operations on nasal sinuses	22.9.1	Valle d'Aosta
Other operations on nasal sinuses	22.9	Friuli Venezia-Giulia
Antiphospholipid antibodies	90.49.7	Piedmont
Antiphospholipid antibodies	90.49.6	Lombardy
Lesion truing with scintiscanning	92.16.9	Aut. Prov. of Trento
Lesion truing with scintiscanning	92.20.7	Basilicata
Chromogranine	90.33.6	Valle d'Aosta
Chromogranine	90.1841	Friuli Venezia Giulia
Chromogranine	90.18.8	Tuscany
Chromogranine	9004109	The Marches
Chromogranine	90.57.6	Basilicata
Chromogranine	90.04.6	Piedmont
Chromogranine	90.16.8	Lombardy
Homocysteine	90.34.6	Valle d'Aosta
Homocysteine	90.3441	Friuli Venezia Giulia
Homocysteine	90.65.8	Basilicata
Oto-microscopy	18.19.1	Valle d'Aosta
Oto-microscopy	18.19	Lombardy
Oto-microscopy	18.19	Friuli Venezia Giulia
Oto-microscopy	18.19	Basilicata
Oto-microscopy	18.30	Aut. Prov. of Bolzano
Oto-microscopy	18.11.1	Veneto

Source: AgeNaS data workup

Table 8.4 - Examples of equal codes for different services - 2009

Codes	Service	Region
89.01.1	Periodic evaluation and certification during pediatric ages (health balance sheet)	Piedmont
89.01.1	Homeopathic check-up examination	Valle d'Aosta
89.01.1	Anaesthesiologist's checking visit for pain therapy	Lombardy
89.01.1	Diet evaluation and diabetic therapy.	Basilicata
89.01.2	Diet check	Valle d'Aosta
89.01.2	Angiological check visit	Lombard
89.01.2	Home consulting and artificial nutrition	Basilicata
89.05	Visit at reception and services center (CAS)	Valle d'Aosta
89.05	Day service concluding evaluation	Umbria
90.10.6	Biotinidase	Piedmont
90.10.6	BNP or PRO-BNP	Valle d'Aosta
90.10.6	Buprenorphine	Tuscany
90.17.6	Disoxypyridinoline	Lombardy
90.17.6	Determinations of prenatal risk for Down's syndrome (1st quarter) hcg free fraction and papp-A	Friuli Venezia Giulia
90.17.6	De-hyalo transferrin	Tuscany

Source: AgeNaS data workup

The above tables constitute a photograph that suffices to delineate the confusion that currently characterizes the criteria governing the supply of outpatient specialist assistance services in Italy. First of all, the lack of a centralized system of maintenance and updating for the rates nomenclator has in substance delegated to the Regions this activity, bringing about a modification of the typology of services that can be supplied that varies from Region to Region and, thus, rendering absolutely non-homogeneous the definition of the services included in the LEA. What follows, then, on the one hand, is a deep-lying diversity in the level of guaranteed assistance, meaning by this not only the thing that is supplied, but also the procedures by means of which this is carried out and, on the other hand, enormous problems in making comparisons among the various Regions.

This fragmentation of competences, involving, therefore, different degrees of access to the services, poses considerable problems on the level of fairness as well. The application of this decision-making decentralization (typical of federalist designs), if on the one hand it should ensure choices that adhere more closely to real necessities of the populations, encounters its biggest limit in the danger of seeing the system's substantial unity corrupted, which finds in the LEAs its principal referent. The proper balancing between autonomy and fairness is surely one of the main problems that our system should deal with. Furthermore, another critical element is the capacity for checking that the autonomy granted to the Regions brings to the creation of distributive models that are truly efficient and appropriate.

In conclusion, the lack of coordination not only between the central level and the regional

systems but also between the Regions themselves, has generated non-homogeneities that besides differentiating the effective level of specialist assistance guaranteed to the citizens, can both make complex the interchanges among the Regions as regards the determination of the compensation for interregional mobility and impede the effective monitoring and control of this type of assistance over the nation's territory.

8.3. Rate Policies

The 2006 Ministerial Decree mentioned has set as well the maximum rates for specialist outpatient services, establishing that "The rate figures established by regional provisions that are higher than the maximum rates… remain at the charge of the regional balance sheets as regards the portion exceeding the rates". Each Region has, then, had the possibility either to stay with the reference national rate or to adopt, on the other hand, its own rate-setting mechanism.

We might add that evidently the various providers (whether public or accredited private) present in the marketplace have different interests vis-à-vis the rate system. In fact, while for the private bodies the rates are substantially the sole form of financing relative to the services rendered at the charge of the NHS and, therefore, the setting of rates at levels that do not permit coverage of their effective production costs could force them to forsake the market, as regards the public bodies, on the other hand, the level of the rate, representing only a portion of the financing of the services included in the LEA should not substantially modify their offer, since they are anyway required to provide the services independently of their cash value. From this it follows that in particular in those realities where the market is represented, to a substantial extent, by the accredited private sector, the Regions must pay attention in setting rates in such fashion so as to ensure anyway an adequate remuneration for the services rendered.

The comparison between the regional rates and the national rates with regard to just the services as per Ministerial Decree 1996, however, has brought out that there are services rates that, while envisaged in all Regions, display differences relative to the minimum rate of as much as sixty-one times. But, contrary to what might be expected, it is not the Regions in which the accredited private party possesses the major part of the structures that are those in which the major rate increases have come about relative to the national value, but rather those areas where the private party relative to the public occupies a lower market quota. This can be attributed to a dual set of reasons: first of all, the enormous deficits of some Regions, whose repayment imposes on them the application of expenditure limits on those supplying the services, which in their turn translate both into a reduction in services purchased, and into the adoption of rate regressions, to the detriment, in some cases, of the "golden rule" according to which the rate should cover the production cost. Secondly, it can be attributed to "structure selection" mechanisms: some "realities" display on their territories a considerable number of outpatient clinics and accredited private laboratories in excess of actual need – the South and the Islands have a number of accredited structures that is treble that of the Center, for equal per-capita services – and consequently the rate regression mechanism should permit survival only of the most efficient.

Table 8.5 - The top twenty services as regards the relation between maximum and minimum rates - Absolute values – 2009

Rank	Service	Max	Min	Max/Min	Mean	a)[4]	b)[5]	c)[6]
1	THERAPEUTIC							
	PHOTOPHERESIS	665.00	7.70	86.36	73.70	7.75	10.00	5,00
2	ARTIFICIAL INSEMINATION	475.15	7.78	61.07	98.21	77.47	21.00	10,00
3	MOTHERS' MILK	94.00	1.70	55.29	8.48	3.98	20.00	8,00
4	INJECTION OR INFUSION OF CHEMIOTHERAPY SUBSTANCES FOR TUMOR	400.00	9.50	42.11	30.52	9.71	19.00	11,00
5	LANCING OF PERI-ANAL ABSCESS	220.63	6.66	33.13	43.87	34.86	21.00	10,00
6	ULTRAVIOLET LIGHT THERAPY	42.00	1.55	27.10	10.41	8.78	19.00	10,00
7	PRENATAL TRAINING	175.76	6.80	25.85	123.29	122.56	20.00	11,00
8	TRANSDERMIC ANGIOSCOPY	84.80	3.75	22.61	59.40	59.29	21.00	10,00
9	FRACTIONATED GASTRIC PROBING	125.60	6.02	20.86	88.54	87.80	21.00	14,00
10	PORPHYRINE (qualitative and quantitative research)	17.10	0.85	20.12	13.10	13.32	21.00	7,00
11	DELAYED READING EPICUTANEOUS TEST (PATCH TEST (up to 20 allergens)	41.60	2.12	19.62	32.26	32.54	21.00	10,00
12	OTHER REMOVAL OR LOCAL DEMOLITION OF ANUS LESION OR TISSUE	223.80	12.19	18.36	51.00	41.83	21.00	10,00
13	CLOSED REDUCTION OF LUXATION OF HAND AND OF DIGITS OF THE HAND	97.64	5.55	17.59	39.99	36.15	21.00	11,00
14	OTHER DIAGNOSTIC PROCEDURES ON THE LACHRYMAL APPARATUS	58.50	3.40	17.21	39.29	40.90	21.00	13,00
15	SUCROSE HEMOLYSIS TEST	41.30	2.58	16.01	4.71	2.79	21.00	9,00
16	RECONSTRUCTION OF TOOTH BY INTARSIO	200.00	12.76	15.67	56.94	34.86	21.00	10,00
17	BIOPSY OF THE SKIN AND OF THE SUBCUTANEOUS TISSUE	29.00	1.86	15.59	14.63	13.94	21.00	10,00
18	TYING OF HAEMORRHOIDS	175.23	11.33	15.47	48.65	41.83	21.00	10,00
19	CHROMOCYSTOSCOPY	211.12	13.89	15.20	64.70	56.81	21.00	10,00
20	RETROBULBAR INJECTION OF THERAPEUTIC SUBSTANCES	51.70	3.46	14.94	36.29	36.15	21.00	12,00

Source: Data workup

[4] *Rates as per Ministerial Decree 1996.*

[5] *Number of Regions envisaging the Service.*

[6] *Number of Regions adopting the Ministry's rate*

In effect, although it is obvious how the Regions should modulate their rate systems, taking due consideration of the updating of the classifications, the verification of the consistency between rates and production costs, the verification of consistency between rates and behaviours (increase or reduction of the relative weight of given services on the basis of the rate level), the instruments for the identification and criminalization of opportunistic behaviour by given suppliers, the Regions in fact often adopt rate policies influenced by rules dictated by the need to contain deficits or anyway not tied to the actual costs of production.

8.4. Sharing measures

After last July's reform of the measures calling for sharing in the expenses of outpatient specialist services, carried out by decree of the Health Ministry, the Regions saw to remodulating the sharing sums requested of the citizens.

Table 8.6 - Ticket for outpatient specialist services Values in euros – in force as of December 2011

Regions	*Ticket* on services	Application of 10.00 euro *ticket*	Added cost	Total cost
Piedmont	36.15	Yes, progressively on the basis of the service	From 0.00 to 30.00	From 36.15 to 66.15
Valle d'Aosta	36.15	No	-	36.15
Lombardia	36.15	Yes, progressively on the basis of the service	From 0.00 a 30.00	From 36.15 a 66.15
Aut. Prov. of Bolzano	36.15	No	-	36.15
Aut. Prov. of Trento	36.15	No	-	36.15
Veneto	36.15 (computed on the basis of a rate system different from that used for the purposes of remuneration of the suppliers, not burdened by the increases as per DGR DPR 430/2004 and 917/2006	From 36.15 to 46.15	Yes, progressively on the basis of income	Up to 10.00
Friuli Venezia Giulia	36.00	yes	10.00	46.00
Liguria	36.15	yes	10.00	46.15
Emilia Romagna	36,15	Yes, progressively on the basis of income	From 0.00 to 15.00 (up to 70.00 for CAT and NMR)	From 36.15 to 51.15 (up to 70.00 per CAT and NMR)
Tuscany	36.15	Yes, progressively on the basis of income	From 0.00 to 15.00 (up to 34.00 for CAT and NMR)	From 36.15 to 51.15 (up to 70 for CAT and NMR)
Umbria	36.15	Yes, progressively on the basis of income	From 0.00 to 15.00 (up to 34.00 for CAT and NMR)	From 36.15 to 51.15 (up to 70 for CAT and NMR)
Marche	36.15	yes	10.00	46.15
Latium	36.15	yes	10.00	46.15 (up to 61.15 for TAC and NMR)
Abruzzo	36.15	Yes, a fixed € 10 above € 36,000.00	Up to 10.00	46.15
Molise	36.15 to which are added: a) € 15.00 for NMR/CAT; b) € 5,00 per FKT; per FKT; c) € 4,00 for all other services and for the outpatient "packages"	yes	10.00	46.15 (up to 61.15 for TAC and NMR)
Campania	36.15 (up to € 50.00 for the "outpatient packages") Besides a fixed portion of € 10.00 per prescription (€ 5.00 for thei exempt citizens. not due for some classes of exempt persons).	yes	10.00	56.15 (Up to 70.00 for the outpatient packages)
Puglia	36.15	yes	10.00	46.15
Basilicata	36.15	Yes. progressively on the basis of the service	From 0.00 to 30.00	From 36.15 to 66.15
Calabria	45.00 + 1.00 (fixed quota).	yes	10.00	56.00
Sicilia	36,15	yes	10.00	46.15
Sardegna	46.15	yes	1.00	47.15

Source: Quotidiano Sanità

The sharings adopted by the various Regions were not, however, uniform. There were those that applied the "super ticket" of 10.00 euros without making any modification, those that instead did not apply it and, finally, there were those that decided to modulate it either on the basis of income or on the basis of type of service.
The Regions that decided to modulate the ticket on the basis of income, certainly sought to pursue a fairer policy. Nonetheless, the conditions for exemption owing to income were not retouched in analogous fashion, they remaining rigidly tied to a single income source.
Certainly less informed with fairness criteria, but rather with reasons of efficiency or appropriateness, were the choices of those Regions that decided to model the ticket progressively on the basis of type of service, whatever be the income conditions[7]. Consider too that the 36.15 euro exclusion, plus the 10.00 euro fixed sums added to the maneuver are paid for each prescription, which by law may not contain more than eight services, which themselves, most especially, must be homogeneous. The outcome could be a sharpening of the effective sharings, such as to induce the citizens who are not exempt to give up using the NHS prescription, or at the limit to give up on using certain services. If the first option translates into a saving for the NHS, it is nonetheless true that it brings about a strong incentive to opt out, or a tendency to be dissatisfied with the services of the public health service.

8.5. Conclusions

This brief study has made it possible to bring out the lacks of information that, to date, exert their weight on the outpatient specialist assistance system. The lack of data on some fundamental aspects, such as the use and the cost of the specialist services supplied in the public hospital structures, together with the absence of a governance and of a "central strategy" whether on the services that can be supplied, whether on the rate policies, but also on the sharing measures, have brought about:

- a modification in the type of service supplied differing from Region to Region, with obvious repercussions on the level of fairness;
- a low capacity for checking that the delegation granted to the Regions on the services to be supplied and the rates involved may lead to the creation of models that are both efficient and appropriate;
- an objective difficulty in determining interregional compensations;
- a probable sliding of a part of demand towards the private market.

In substance, the lack of common and well-defined rules does not guarantee uniform responses in terms of safeguarding the citizens' health.

[7] *In the Regions that adopted a similar procedure, the non-exempt citizens were required to pay a figure proportional to the value of the service itself. For example, in Lombardy, for prescriptions up to € 5.00 no increase in cost was called for, while the increase of the ticket is gradual for the other services, up to a maximum of €30.00 more for the more complex, and thus less frequently made, examinations (to around €36.00 for the ticket at present must be added €30.00, so that the total to be paid is €66.00)*

In-depth studies on outpatient specialist assistance

Statistical tables that can be found on the website of the CEIS Health Report

- **The supply**

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Public outpatient clinics and laboratories by type of assistance
Public outpatient clinics and laboratories by type of assistance. Mean yearly variations.
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Public hospital outpatient clinics and laboratories. Percentage variations.
Extra-hospital outpatient clinics and laboratories
Public extra-hospital outpatient clinics and laboratories. Percentage variations
Accredited private outpatient clinics and laboratories, by type of assistance
Accredited private outpatient clinics and laboratories, by type of assistance. Incidence
Accredited private hospital outpatient clinics and laboratories.
Accredited private hospital outpatient clinics and laboratories. Percentage variations.
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Accredited private extra-hospital outpatient clinics and laboratories. Percentage variations.
Accredited private hospital outpatient clinics and laboratories, by holder of the relationship
Accredited private hospital outpatient clinics and laboratories, by holder of the relationship
Accredited private hospital outpatient clinics and laboratories, by holder of the relationship. Percentage variations.
Outpatient clinics and laboratories by type of assistance. Medium size.
Outpatient clinics and laboratories by type of assistance. Medium size. Percentage variations.
Outpatient clinics and laboratories by type of assistance. Medium-size user basins (regarding inhabitants)
Outpatient clinics and laboratories by type of assistance. Medium-size user basins (regarding inhabitants). Percentage variations
Outpatient clinics and laboratories by type of assistance. Medium-size user basins (regarding inhabitants) by weighted population.
Outpatient clinics and laboratories by type of assistance. Medium-size user basins (regarding inhabitants) by weighted population. Percentage variations.

- **Utilization**

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Services by type of assistance. Percentage variations.
Per capita services by type of assistance.
Per capita services by type of assistance. Percentage variations.
Per capita services by weighted populations by type of assistance.
Percapita services for weighted population by type of assistance. Percentage variations.

- **Expense**

Expense for accredited specialist services. Thousands of €
Expense for accredited specialist services, per capita in euros
Expense for accredited specialist services. % variations.
Expense for accredited specialist services. Index of numbers
Expense for accredited specialist services on an agreed-upon expenses. %
Expense for accredited specialist service on public espense. %
Per capita expense for accredited specialist services, for a weighted population. Euros
Expense for accredited specialist services. Ranking of Regions (by simple and weighted populations)
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Services present in the Nomenclators. Composition.
Services not present in the Nomenclators
New services
New services. Composition.
New services. Same code for various services.
New services. Different codes for same service.
Services aggregated by category.
Services in the diagnostic category. Incidence.
Services in the laboratory category. Incidence.
Services in the rehabilitation category. Incidence.
Services in the therapeutic category. Incidence.
Services in the medical-visits category. Incidence.
Services aggregated by branch.
Services aggregated by branch. Incidence.
Services. Maximum and minimum rate ratio.
Services. Minimum difference between maximum and minimum rate.
Sharing.

Chapter 9
Pharmaceutical Care

9 - Pharmaceutical Care

Anna Chiara Bernardini[1]

9.1. Introduction

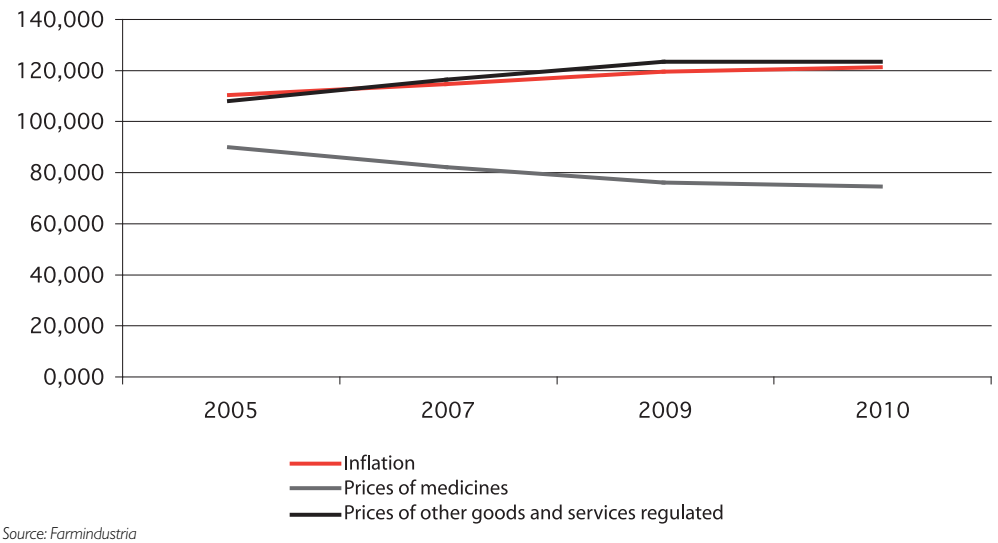
The pharmaceutical sector is in continuous development: both on the industrial side (research, innovation, efficacy, competition, etc.) and on the side of care. The financial problems of the National Health Service (NHS), as is well known, put the sector always at the center of national and regional legislation, making the logic of the policies of efficiency and cost containment prevail over everything else.

This contribution aims to analyze some of the dynamics taking place in the Italian market, and in particular the complex effects of the policies of expenditures containment (price reductions, ceilings, payback, etc.). To this purpose it is fundamental to compare these trends with the international ones, taking care to keep the analyses from being distorted by a vision that is closed to the problems that are specifically Italian, characterized by administrative-type policies.

9.2. The prices of medicines

According to ISTAT statistics on consumer goods prices, from 2001 to 2010, although inflation increased by 20.6%, the prices of pharmaceuticals heavily decreased, the reduction amounting to 26.2%, which would mean a differential of 46.8%

Figure 9.1: Inflation, prices of medicinals and of regulated goods and services Italy (2001 index =100)



Source: Farmindustria

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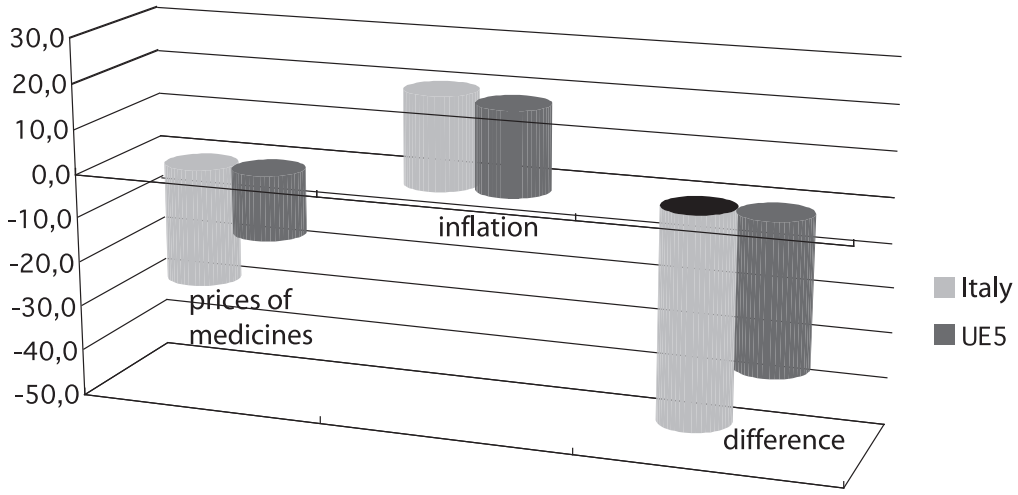
The mean differential between pharmaceuticals prices and inflation, according to data made known by *Farmindustria*, is found to be higher in Italy relative to the mean of the great EU countries (France, Germany, United Kingdom and Spain), where it stops at 33.2%, and would follow only Spain's (57.9%).
The latest ISTAT data (February 2012) confirms this trend, showing that, despite the fact that the national index of consumer prices (NIC) for the entire community rose by 3.3% (compared with the corresponding period of the preceding year), the price of pharmaceutical products still diminished by 3.9% (7.6% for the pharmaceuticals that can be reimbursed).

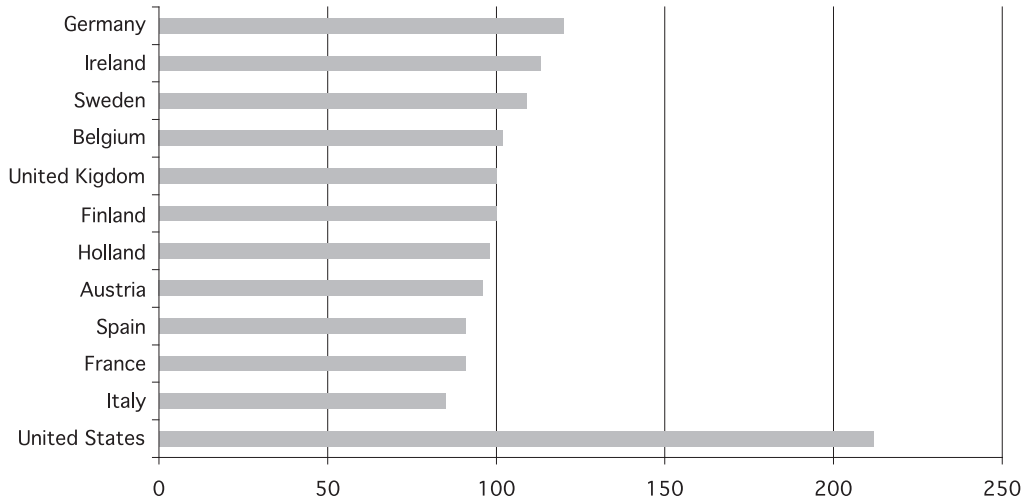
Figure 9.2 - Inflation and price variations for medicinals in Italia and in UE5* - variations in % – 2010-2001



**: EU5 countries: France, Germany, Italy, United Kingdom, Spain*
Source: National Associations and Eurostat data workups

In confirmation of the above, an English NHS study, conducted on the first 150 molecules sold in the UK, confirms that the average price applied in Italy is today largely the lowest among the principal EU countries, and very far below that of the USA.
The difference in price for this "shopping basket" (up to 25% among the countries considered) can be attributed mainly to the differences in terms of national and regional legislation on pharmaceuticals (price and refund, sharing, incentives on generic (i.e. non-brand) drugs, reference prices, margins, etc.).

Figure 9.3 - Comparison of prices between the EU states and the USA 150 principal UK pharmaceutical products Index numbers (UK 2008 = 100)



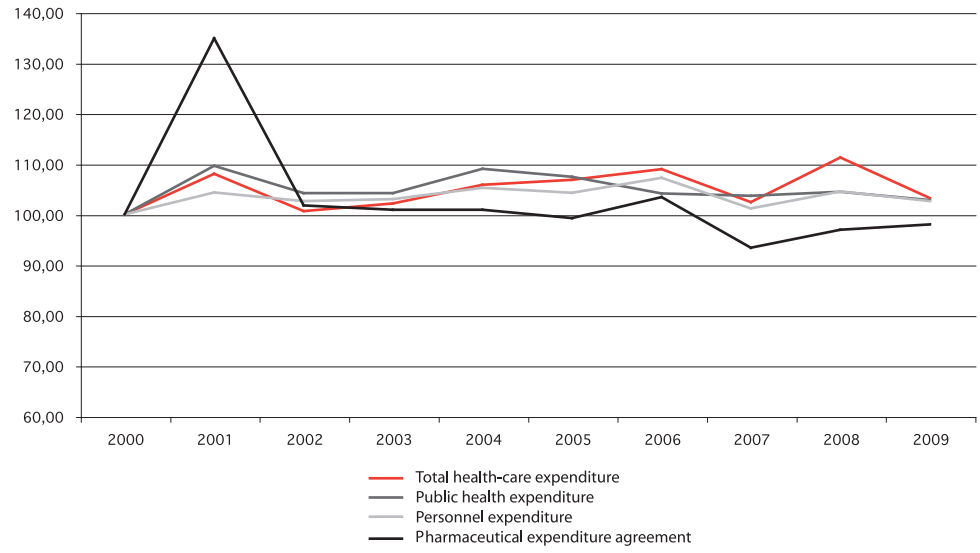
Source: UK Department of Health

The study referred to brings out too that the average price of pharmaceuticals in fact follows the mean per capita income in the various countries, and therefore the Italian exception can in part be explained by the growing gap in wealth between Italy and many of her European partners.

Obviously to be considered too are other dynamics, such as those of hospital pharmaceuticals, which, being those most often having high innovatory content, are also the most expensive, as too the increases due to trends in the amounts sold.

However, it cannot be doubted that if we compare the principal cost items of health-care expense, pharmaceuticals are the only item whose cost is decreasing. The total health-care expense, the public health-care expense and the expense for the personnel of public health agencies, record a trend that is similar for all of them, with an increase of 3% from 2000 to 2009, while the pharmaceuticals sold under agreements with the state record a 2% reduction in price.

Figure 9.4 - Comparison of variations in the principal health-care expense items - Index numbers (2000=100)



Source: Workup of data from the State Audit Court, Health Data 2011 and ISTAT

This result bears witness to the effect of mainly three factors: the impact of the reduction in prices tied to the onset of equivalent medicinals following the expiry of patents, and that of the measures applied at the regional level (such as the reintroduction or increase in amount of the ticket, and the distribution, directly or through pharmacies, of medicinals acquired by the ASLs). But also, and above all, to the continuous reductions in prices of medicinals imposed by AIFA[2]

9.3. Per capita expenditures for pharmaceuticals

That the repeated cuts and the other policies tending toward efficiency have reduced the prices of pharmaceuticals in Italy and contributed to the slowdown of the growth of health costs and to the reductions in the public deficits seems then beyond discussion.

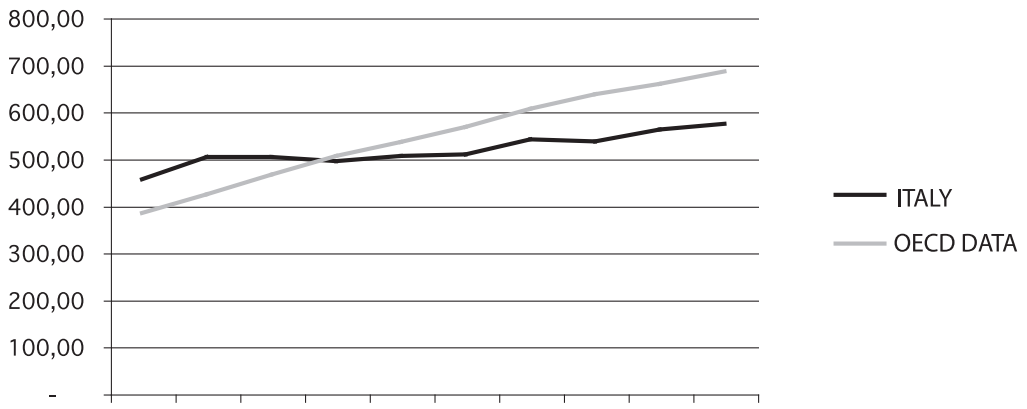
Nonetheless, it is obvious that the continuous cuts in the prices limit the possibilities of industrial development of the pharmaceutical sector in Italy.

Faced by this obvious trade-off, it is worthwhile understanding what the impact of pharmaceutical costs is on the citizens.

[2] *The last reduction launched by AIFA during April 2011, which drastically cut the reimbursement prices for the equivalent medicines inserted in he transparency list.*

In 2000 the per capita Italian pharmaceuticals cost exceeded 19%, relative to the OECD average, falling to 8% in 2002. Already from 2003, and then for the succeeding years in increasing fashion, this situation was reversed, placing per capita expenditures for Italian pharmaceuticals below the average of those in the OECD countries.
In 2009 the difference was found to be around 16%, not far from the difference in the per capita GNP.

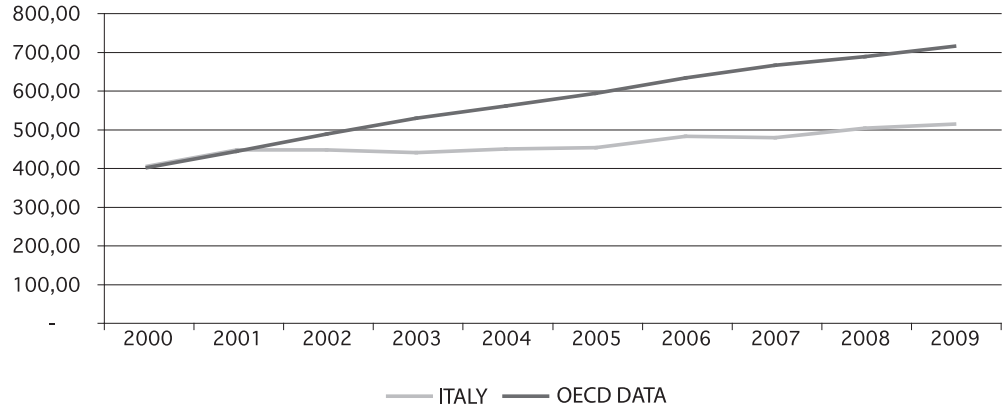
Figure 9.5 - Per capita pharmaceutical costs in Italy and OECD countries (US$)



*Average excluding Italy
Source: OECD data workup

The comparison appears, however, distorted by the different composition of the populations by age.
To make a more significant comparison, the per capita pharmaceutical expenditure in the OECD countries was recomputed, "weighting" it, however, to take account of the different need expressed by the populations, as in any event it is the custom to do in the Italian Healthcare system, when data at the regional level are compared.
The weights per age adopted are those of the Health Ministry, used as well by OsMed (National Observatory on the Use of Medicinals).
Evidently the use of the Italian weights takes for granted the hypothesis that the relative differentials of consumption by age, recorded in Italy, can be superposed on those of the individual countries. Certainly this can not perfectly correspond with the truth, but the simulation, even with this important limit, seems useful for obtaining more homogeneous data.

Figure 9.6 - Weighted per capita pharmaceutical expense in Italy OECD countries * (US$)



Source: Health Ministry and OECD data workup

By making the "corrections" indicated above, pharmaceutical expenditures in Italy would be superposable on the average for the OECD as far back as 2000. It follows that with the numerous maneuvers that have intervened afterward, in 2009 a differential of 39% would be reached, much greater than that set forth earlier and hard to explain by differences in economic condition.

9.4. Conclusions

The data set forth above demonstrates that the average price of pharmaceuticals in Italy is undoubtedly below that in its fellow countries. This gap (in terms this time of per capita pharmaceutical expense) is maintained even despite a greater consumption. Considering too the demographic factor, however much the analysis may suffer from important limits, a truly important gap is arrived at: it would graze 40%.

The above should raise a caution signal on pharmaceutical policies of the last few years. Clearly the sector lends itself to health-care policy interventions that are typically administrative in nature, such as unilateral cuts in the reimbursement prices, or the delays in recognition of the susceptibility to reimbursement of new pharmaceuticals, and historically this ease of intervention has always placed the sector at the center of maneuvers aiming at placing health care costs on a rational basis.

Finally, the recent maneuvers of decree-law no. 98/2011 and the prospects of sharpening the *tickets* make it seem likely that despite repeated assurances, the sector is not definitively safe from further restrictive-type operations.

On the other hand, as set forth in chapter 11 of the volume, in the meanwhile signs of deterioration of the industrial fabric in the pharmaceutical area in Italy have been observed.

A "cost" that does not seem any longer justified by an expense gap, which, as we have seen, had already been in fact nullified between 2000 and 2003.
It is necessary then to ponder very carefully the quality of the next maneuver, to keep any savings from being swallowed up by losses in employment, possibilities of development etc., of which Italy too has great need considering the prolonged stagnation of her economy. Without then counting the access of innovation to the market that, when delayed or excluded, would cause damage to the citizens and therefore to society in terms of quality of care and therapeutic opportunities.

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- Eurostat, 2010.
- Farmindustria, 2010, Indicatori Farmaceutici.
- ISTAT, 2011, Indici dei prezzi al consumo, this can be viewed on Internet at: http://dati.istat.it.
- OECD Health data 2011.

APPENDIX

In-depth studies on pharmaceutical care
Statistical tables that can be found on the site of CEIS Health Report

PHARMACIES

- **International data**

Pharmacies
Pharmacies. %Variation
Pharmacies. User basin
Pharmacists
Pharmacists. %Variations
Pharmacists. Composition by sex

- **National data**

Pharmacies
Pharmacies. %Variation
Pharmacies. User basin
Quota of public and private Pharmacies
Pharmacies, public
Pharmacies, public. %Variation
Pharmacies public. User basin
Pharmacies, private
Pharmacies, private. %Variation
Pharmacies, private. User basin

Parapharmacies
Parapharmacies. %Variation
Parapharmacies. User basin
Graduates chemical-pharmaceutical group

PHARMACEUTICAL CONSUMPTION

• Ethical medicines

Medicines made to order, by classes of susceptibility to reimbursement
Medicines made to order, by classes of susceptibility to reimbursement. Quotas
Territorial consumption of pharmaceuticals Class A-SSN. DDD
Territorial consumption of pharmaceuticals Class A-SSN. DDD. %Variation
Territorial consumption of pharmaceuticals Class A-SSN. DDD weighted
Territorial consumption of pharmaceuticals Class A-SSN. DDD weighted. %Variation
Territorial consumption of pharmaceuticals Class A-SSN. DDD weighted. Regional departure from the mean
Territorial consumption of pharmaceuticals Incidence of therapeutic class on such. Class A-SSN. DDD weighted
Territorial consumption of pharmaceuticals Class A-SSN by class of therapy. DDD
Territorial consumption of pharmaceuticals Class A-SSN by class of therapy. DDD. % Variation
Territorial consumption of pharmaceuticals Class A-SSN by class of therapy. DDD weighted
Territorial consumption of pharmaceuticals Class A-SSN by class of therapy. DDD weighted. % Variation
Territorial consumption of pharmaceuticals of equivalent medicines Class A-SSN. DDD
Territorial consumption of pharmaceuticals of equivalent medicines Class A-SSN. DDD. % Variation
Territorial consumption of pharmaceuticals of equivalent medicines Class A-SSN. DDD weighted
Prescriptions Class A-SSN
Prescriptions Class A-SSN. % Variation
Prescriptions Class A-SSN. per capita
Prescriptions Class A-SSN. Per capita. % Variation
Medicines made to order Class A-SSN
Medicines made to order Class A-SSN. % Variation
Medicines made to order Class A-SSN. Per capita
Medicines made to order Class A-SSN. Per capita. % Variation
Territorial consumption of pharmaceuticals Class C. DDD
Territorial consumption of pharmaceuticals Class C. DDD. % Variation
Territorial consumption of pharmaceuticals Class C. DDD weighted
Territorial consumption of pharmaceuticals Class C. DDD weighted. % Variation
Territorial consumption of pharmaceuticals Class C by class of therapy. DDD
Territorial consumption of pharmaceuticals Class C by class of therapy. DDD % Variation
Other Medicines
Territorial consumption of pharmaceuticals for self-administered medicines. DDD

Territorial consumption of pharmaceuticals for self-administered medicines. DDD. % Variation
Territorial consumption of pharmaceuticals for self-administered medicines. DDD weighted
Territorial consumption of pharmaceuticals for self-administered medicines. DDD weighted. % Variation

PHARMACEUTICAL EXPENDITURE

• International data

Total pharmaceutical expenditure. Per capita
Total pharmaceutical expenditure. Per capita. % Variation

• National data

Total pharmaceutical expenditures
Total pharmaceutical expenditures. %Variation
Gross territorial pharmaceutical expenditure Class A-SSN
Gross territorial pharmaceutical expenditure Class A-SSN. %Variation
Gross territorial pharmaceutical expenditure Class A-SSN. Per capita
Gross territorial pharmaceutical expenditure Class A-SSN. Per capita. % Variation
Gross territorial pharmaceutical expenditure Class A-SSN by prescription
Territorial pharmaceutical expenditure Class A-SSN for level I ATC
Territorial pharmaceutical expenditure Class A-SSN for level I ATC. % Variation
Territorial pharmaceutical expenditure Class A-SSN for level I ATC. Composition
Territorial pharmaceutical expenditure for class A-SSN equivalent medicinals
Territorial pharmaceutical expenditure for class A-SSN equivalent medicinals. % Variation
Pharmaceutical expenses, public structures
Pharmaceutical expenses, public structures. % Variation
Ticket – per capita
Ticket – per capita. % Variation
Ticket per prescription
Ticket per prescription.% Variation
Territorial pharmaceutical expenditure at the charge of the NHS
Territorial pharmaceutical expenditure at the charge of the NHS. % Variation
Territorial pharmaceutical expenditure at the charge of the NHS. per capita
Territorial pharmaceutical expenditure at the charge of the NHS. per capita. % Variation
Territorial pharmaceutical expenditure at the charge of the NHS per prescription
Territorial pharmaceutical expenditure t the charge of the NHS per prescription. % Variation
Discount
Discount. % Variation
Territorial pharmaceutical expenditure, private
Territorial pharmaceutical expenditure, private. % Variation
Territorial pharmaceutical expenditure, private. per capita
Territorial pharmaceutical expenditure, private. per capita. % Variation
Territorial pharmaceutical expenditure, Class C with prescription
Territorial pharmaceutical expenditure Class C with prescription. % Variation
Territorial pharmaceutical expenditure Class C with prescription. Per capita

Territorial pharmaceutical expenditure, self medication for level I ATC
Territorial pharmaceutical expenditure, self medication for level I ATC. % Variation

Chapter 10

Care for the non-self-sufficient, its financing, and the definition of the requisites and of the LIVEASs

10 - Care for the non-self-sufficient, its financing, and the definition of the requisites and of the LIVEASs

Giorgia Battaglia[1]

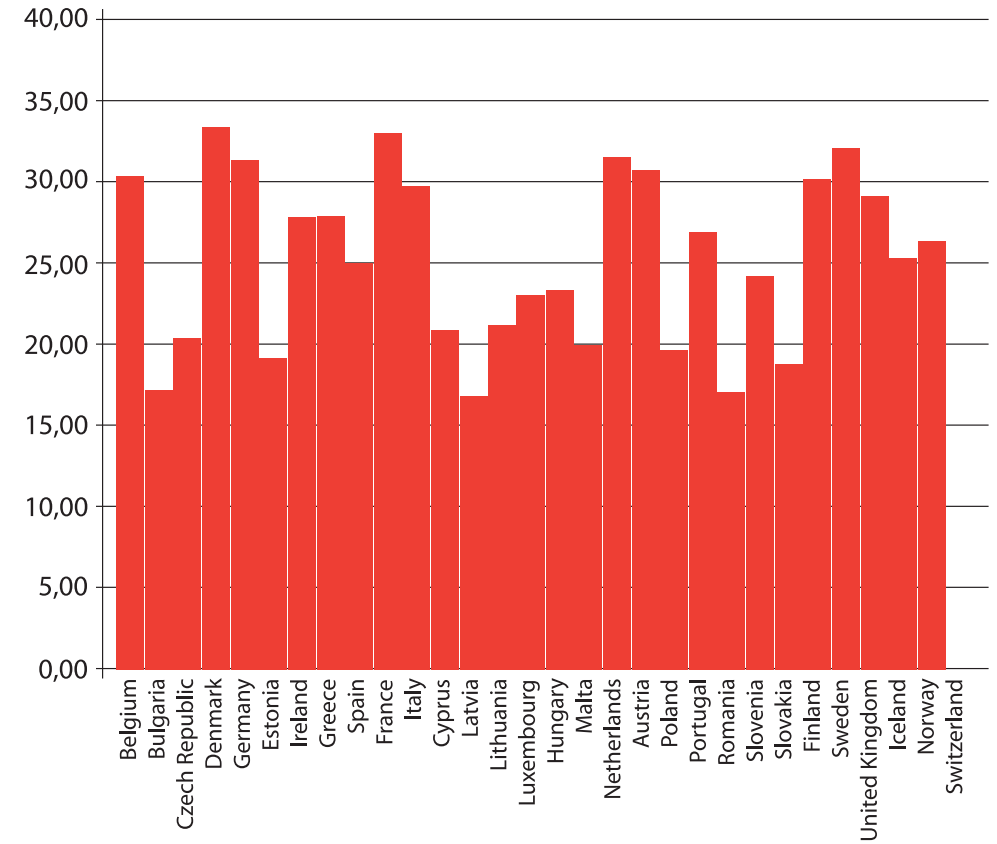
10.1. Introduction

The health-care service is an integral part of the welfare system and therefore in every country it is strongly conditioned by the complex of social-protection responses supplied. The disparity of the assistance in the various national contexts generally reflects the difference in tenor of life, but is also indicative of the diversity of the national health-care systems and of the demographic, economic, social and institutional structures peculiar to each state.

On the whole, Italy assigns a quota of resources (computed on the GDP) for welfare that is in line with the European average. As can be seen from figure 1, in 2009 Italy assigned 29.8% of her GDP to social-protection services. In that same year the mean European expenditure was 25.3%.

[1] *CEIS Sanità, University of Rome, Tor Vergata campus*

Figure 10.1 - Social protection services in EU countries
Values in % of GDP – year 2009

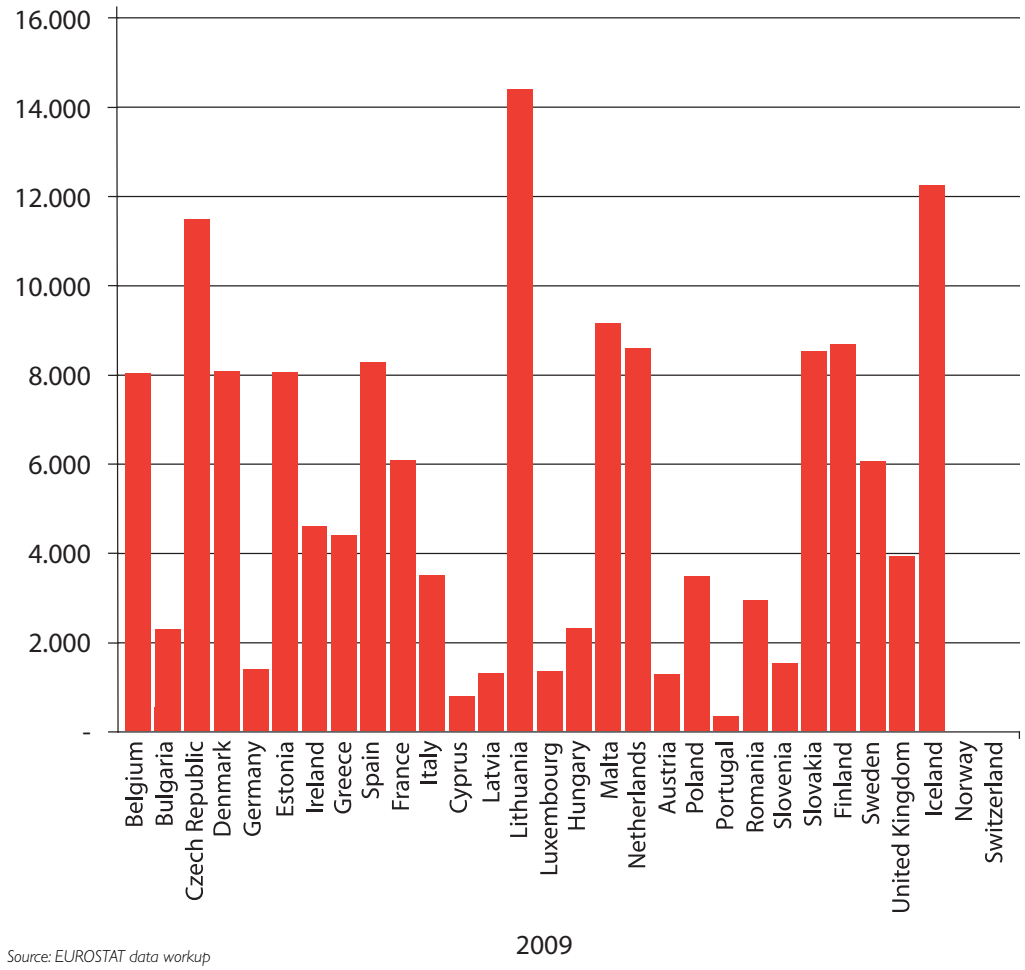


Source: EUROSTAT data workup

The differences between the various European Union countries are however important. Among those that have recorded an expenditure lower than the mean we find the Baltic countries, with Latvia having an incidence on her GDP of 16.9%, Estonia 19.2%, Lithuania 21.3%. In that same band is located Rumania too, with an incidence on her GDP of 17.1%. As against these there are the countries that during that same year recorded an incidence on the GDP higher than the European mean. They were Denmark, with an incidence of 33.4%, Sweden with an incidence of 32.1%, and Finland, with 30.2%.

Considering the per capita data it appears that Italy placed, in 2009, in an intermediate position relative to the other European countries and, anyway, above the mean. In particular in 2009 our country's yearly per capita expenditure was 6000 euros. At one extreme we find countries that recorded a decidedly-slender per capita expenditure, such as Rumania and Latvia, with per capita expenditures of 331 and 785 euros respectively. On the other hand there is Luxembourg that in the same year recorded a per capita expenditure for welfare of 14,000 euros, followed by Denmark, which exceeded 11,000 euros.

Figure 10.2: Social protection services in the EU countries per capita values – 2009



Source: EUROSTAT data workup

Of the entire area of so-called welfare, in this section we shall be concerned with the quota of it that best fits in with the health service. We are referring to the item assistance, and in particular to the so-called services for those who are not self-sufficient.

The Report on assistance for the non-self-sufficient-aged in Italy (2009) defines Non-Self-sufficiency (NSS) as *the bio-psychosocial condition consequent on disability (whether of mental, physical or sensory nature) that induces in the individual affected a state of permanent dependence on outside parties in carrying on one or more essential recurring functions in daily life, a dependence that is not influenced by the presence of any prostheses or auxiliaries in use*.

The disadvantage for a non-self-sufficient person takes shape principally in all those activities that require additional resources over those that the person has available. In this regard, what should be gone into in depth when making evaluations is the different nature of the need for assistance of every individual subject, which is to say to define what the needs are of each one in relation to age, to his needs and to the activities of daily living.

Non-self-sufficiency has, finally, an aetiology that refers to the outcomes of illnesses or accidents, to the natural decline tied to ageing (which however is closely correlated with chronic diseases and therefore still to Health) and to congenital disabilities. According to an ISTAT survey 38.8% of residents in Italy state that they are affected by at least one of the principal chronic pathologies, while 57.2% of the residents between 55 and 59 years, and 86.9% of those over 75, suffer from at least one chronic degenerative disease.
Note that in what follows, partially departing from the definition set forth above, in order to avert duplications we shall not consider those services for the non-self-sufficient that have health characteristics, but rather only those that are seen to by social services, and therefore should fall among the so-called LIVEAS (Essential Levels of Social Assistance). Furthermore, we shall not consider either those social services that cannot be traced back to conditions of non-self-sufficiency, such as assistance to minors or generically to families. As against this we shall consider as non-self-sufficiency also that of short periods and not only the so-called LTC (long-term care).

10.2. Financing

The financing of non-self-sufficiency (NSS) measures in the Italian welfare system is extremely non-organic owing to the lack of an adequate legal and institutional framework. It is therefore necessary to refer both to the resources identified at the central level, and to those at the regional, and finally municipality, levels.
At the central level the National Fund for Social Policies (FNPS), as defined by law no. 328/2000 (Assistance reform law), is the national source of specific financing for operations and services of assistance to persons, to families and to communities programmed and regulated by Regional Social Plans and by the Zone Plans of municipalities, which describe, for each territory, an integrated system of services aimed at the prevention of discomfort, at the social inclusion of those in difficulty, or anyway at raising the level of quality of life.
Through the financing law there are attributed yearly to FNPS the national resources for operations of social assistance, that is, for fighting poverty, for the promotion of the rights of childhood and of adolescence, of subjective rights (payments to nuclear families having three minor children, for maternity, facilitations for the disabled and for thalassaemic workers) and for safeguarding the condition of the aged.
Obviously, some of these funds, for example those for the aged, but also those for the disabled, can at least in part be made to fall within the area of non-self-sufficiency services. At the national level there are also defined the resources assigned to a series of funds instituted by laws, as well as the appropriation for the distribution of payments, pensions and indemnities supplied by INPS (National Institute for Social Welfare – the pension authority) to civil invalids, the blind and the deaf.
Within this picture, by an interministerial decree of the Labour and Social Policies Ministry and of the Ministry for the Economy and Finances, together with the Unified Conference of State, Regions, Cities and Local Autonomies, there is then determined the annual apportioning of such appropriations to the Regions and Autonomous Provinces, as well as of the quotas at the charge of the Ministry of Labour and of Social Policies. The Regions and the Autonomous provinces in their turn provide a share to the Municipalities.

The assistance to persons having a more or less serious degree of non-self-sufficiency, although with uncertain and incomplete results, has always been inserted among the objectives of the Italian welfare system, based on principles and values sanctioned by clear constitutional provisions (articles 3 and 32 of the Constitution), taken back up in the most recent laws reforming the national health-care system (Decree-law no. 229/1999) and also of the social interventions (law no. 328/2000): selective universalism, fairness of access, solidarity, and the proper division of tasks over governmental authorities.

To guarantee assistance to the non-self-sufficient is a strategic objective and one of growing priority for our country's social and socio-health policies. A country that, like all the economically and socially advanced countries, is going through, in recent years, a gradual process of ageing of the population. Over 20% of its more than sixty million inhabitants is, in fact, by now over 65 years of age. Almost six million have reached the goal of 75 years and by now 17 thousand persons are over a hundred years old.

All the more recent estimates (CENSIS, ISTAT) are in agreement in estimating at more than 2.7 million the persons (of every age band) having serious disabilities or that need continuing support and assistance, with a growth trend projected toward three million in 2015. A substantial and growing share of them require continuing social and health-care assistance.

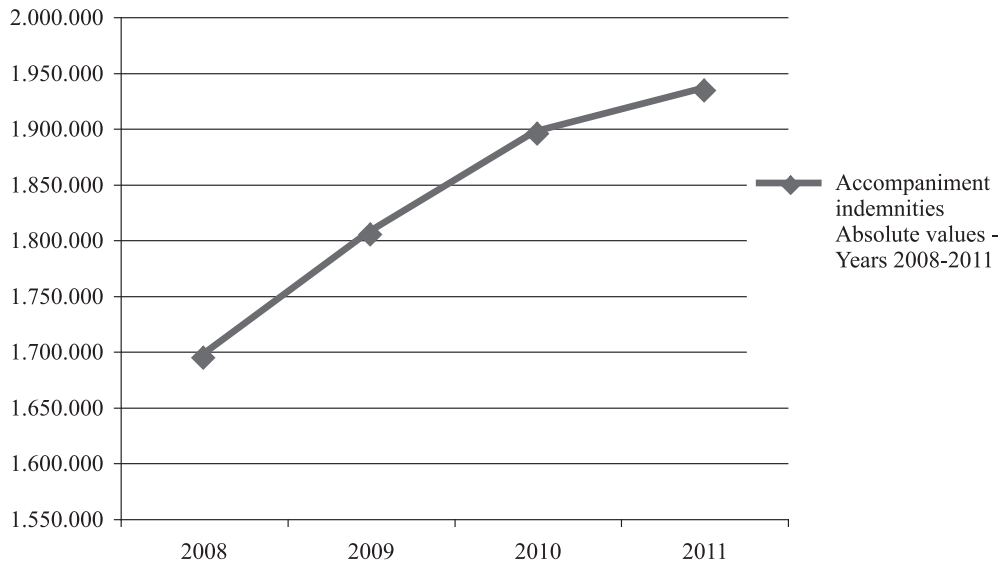
A difficult situation, that tends to be aggravated as time goes on and that presents itself, furthermore, with strongly different variations in the local realities, within a picture of a rapidly changing composition of nuclear families and of relations within the sphere of such.

These estimates find confirmation in the most recent INPS data on the number of disabled persons, whether physically or in the senses, and non-self-sufficient aged that receive an allowance for accompaniment, as per law no. 18/1980 et al.

The number of payments has greatly increased over the past few years, going from 1.7 million in 2008 to more than 1.9 million in 2011.

To these numbers are to be summed more than 7000 non-self-sufficient invalids owing to on-the-job accidents (source: National Institute for assistance for on-the-job accidents – INAIL) and some two thousand owing to service causes, as well as those who cannot receive the emolument because they are patients in assistance structures totally at the charge of the public finances.

Figure 10.3 - Complex of accompaniment indemnities 2008 – 2011



Source: INPS data workup

These are significant increases that characterize all regional situations. In Latium, for example, in 2008 153,851 accompaniment indemnities were distributed, which became 170,000 in 2009 and grazed 200,000 in 2011. The same trend is recorded in the Region of Sicily, which went from a total of 149,297 indemnities of accompaniment in 2008 to more than 176,000 paid out in 2011, and in Apulia where from 117,676 assisted persons in 2008, in 2009 this reached more than 132,000 persons assisted, to reach the peak of 150.247 in 2011.

The whole amounts to an overall national expenditure that is by now stably above twelve billion euros. Also on the basis of demographic trends and of the growing demand for assistance services Parliament has assigned, starting from the 2007 national budget law, resources dedicated to non-self-sufficiency through the formation of a specific fund.

Law no 296/2006 (Provisions for the formation of the yearly and multi-yearly state budget), with article 1, paragraph 1264, has instituted through the Ministry for Social Solidarity the National Fund for non-self-sufficiency (FNA) having as its purpose to guarantee, over the entire territory of the nation, the maintenance of the essential levels of assistance services for non-self-sufficient persons. Assigned to the FNA was a sum of 100 million euros for 2007 and of 200 million euros for the succeeding years 2008 and 2009, increased by successive budget laws to 300 and 400 million euros.

By the successive decree of the Ministry for Labour, Health and Social Policies the resources assigned to the FNA for the years 2008 and 2009 were attributed for a sum of 299 million euros in 2008 and 399 million in 2009 to the Regions and to the Autonomous Provinces of Trento and Bolzano. Maintained on the other hand within the available funds of the Ministry for Welfare

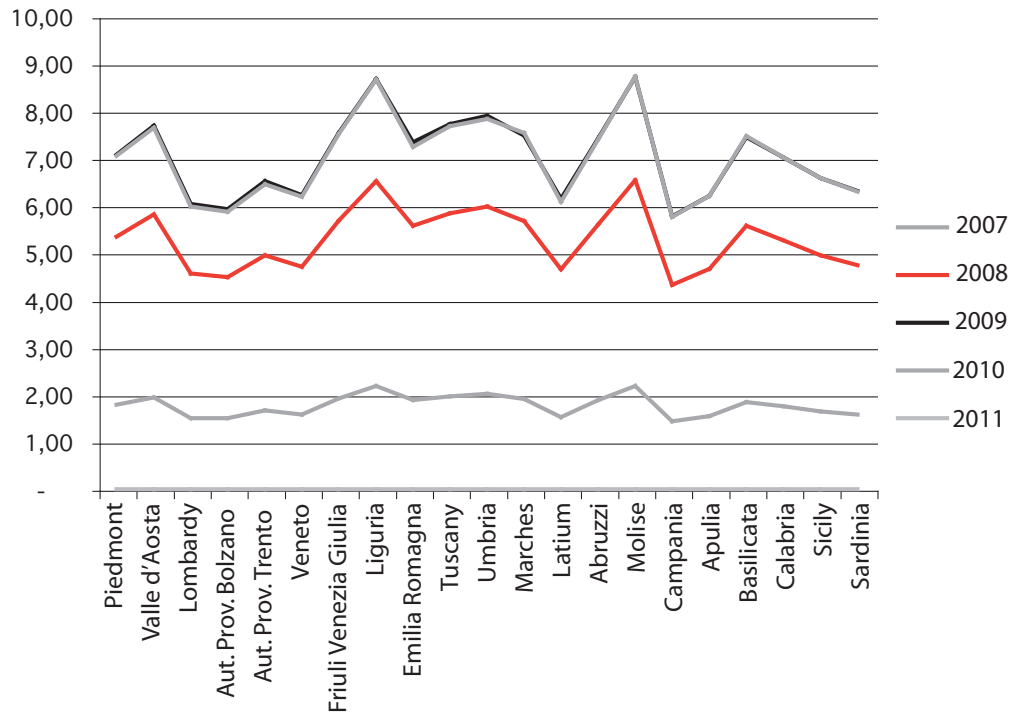
was one million euros for each year, for functions having as their purpose to verify the effective handling of the resources, as well as their destination starting from the following functions and activities:

- the definition of methodologies for analysis of social demand having as its aim a broader awareness of the need throughout the territory;
- analysis of poverty in Italy;
- analysis of the impact of federalism on social policies.

For the year 2010 the state guaranteed a financing of 400 million euros for the FNA (art. 1, paragraph 1264, law 296/2009), resources that have made it possible to develop various kinds of assistance activities for more than 50,000 persons.

If we consider the distribution of the Fund at the regional level it is possible to recognize a distribution in conformity with the number of residents and with the demographic picture. The Lombardy Region in fact has received over the years a substantial sum of resources, 14 million euros in 2007, 44 million in 2008, and more than 58 million in 2009 and in 2010. Another regional reality that has received a substantial quota of resources is the Region of Latium (25 million euros in 2008 and more than 34 million in 2009 and in 2010. On the whole all the regional quotas have increased over the years.

Figure 10.4 - Fund for non-self-sufficiency -Per capita values – 2007-2011



Source: CEIS workup of data from the Ministry for Labour and Social Policies

In the analysis of the Fund's per capita values, we note that in 2007 the figure went from 1.43 euros in Campania to 2.18 in Liguria, with a mean per capita expenditure at the national level of 1.77. In 2008 with a national fund equal to 300 million euros (200 million more over the preceding year) the mean per capita expenditure was 5.31 euros. In the immediately succeeding years, 2009 and 2010, relative to a fund of 400 million euros and a population that counted over sixty million inhabitants the mean per capita expenditure had reached 7.00 euros.
The budget manoeuvre for 2011 has however wholly cancelled all appropriations assigned to the non-self-sufficient.
We must still add that at the local level a large part of the Italian Regions have instituted over the past years their own Funds for non-self-sufficiency, for the purpose of sustaining, in particular as regards the home, the families that care for the disabled person or the non-self-sufficient aged in the home. The purposes of the financing to the Regions indicated in the Interministerial decree of October 4th 2010 are:

a) the activation or strengthening of the territorial and extra-hospital network of assistance and services to aid the personalized taking on of care for non-self-sufficient persons, encouraging stays in the home and in any case the appropriateness of the aid, and with the scheduling of the social help filled out with health programming;
b) the activation and strengthening of support for the non-self-sufficient person and for his family, also through the increase of the number of hours of tutelary assistance or the increase in the number of persons taken on in the territory of the Region. Any transfers of money are conditional on the acquisition of services of care and assistance or on the direct supply of same by family members or neighbours on the basis of a personalized project that is monitored as such.

Reported in detail is a summarizing picture of the more significant measures and initiatives regarding the matter seen to by the Welfare Area of the Region of Tuscany.

- Abruzzi: the region has instituted the Fund for non-self-sufficiency with resources of 2.5 million euros by DGR 866/2006. This fund has been increased to more than 8 million euros in 2007 (DR 1281/2007) for the purpose of sustaining the quality of life of those over sixty-five years of age and in a condition of non-self-sufficiency. On the whole, in 2007 the Region envisaged 28.7 million euros as the aid given to non-self-sufficiency.
- Basilicata: the Region has approved by its LR 4/2007 the appropriation to the Fund for non-self-sufficiency of the sum of 2 million euros, to which are summed those provided by the national Fund.
- P.A. of Bolzano: the Autonomous Province of Bolzano, in concert with the Region and the trade unions, has instituted the fund for non-self-sufficiency with a provincial bill. The resources are paid out through the provincial Agency for social insurance. Gaining access to the fund are all citizens who have resided for at least five years in Trentino Alto Adige.
- Calabria: has not instituted the Fund nor has it adopted any specific measures on non-self-sufficiency.
- Campania: the Region has instituted the specific regional Fund for non-self-sufficiency by its LR 8/2004. By DGR 204/2005 it has dictated specific lines of action for carrying out home aid operations on the basis of personalized projects, and by its DGR 679/07 and 1403/07 has

identified for the three-year period 2006-2008 the personalized project having as objective the strengthening of the system for taking on non-self-sufficient persons, by requiring that 70% of the resources be attributed on the whole to the three areas of Aged, Disabled and Tutelary assistance, to involve carrying out aid operations on the basis of personalized projects. The regional Fund for 2008 is 8.3 million euros.

- Emilia Romagna: this was one of the first Regions to call for the institution of the Fund for non-self-sufficiency by its DGR 509/2007, with which it appropriated, starting from 2007, 311 million euros, of which 295 million were paid out in economic contributions and services vouchers.
- Friuli Venezia Giulia: the Region instituted the Fund for possible autonomy and for long-term assistance (FAP) by DPR 35/2007. In 2007 the FAP was 17.2 million euros.
- Latium: The Region instituted the Fund with LR 20/2006 ("Setting up of the regional fund for non-self-sufficiency") and by Resolution 601/2007 (Regional Fund for non-self-sufficiency"). In 2007 almost 13 million euros were committed on the whole and for 2008 another 12 million were envisaged in services and aid in favor of the non-self-sufficient aged and disabled.
- Liguria: this Region was among the first to institute the Regional Fund for non-self-sufficiency by its LR 12/2006. It is a Fund having a locked-up assignment, while awaiting the government to adopt the LIVEAS. The Region appropriated 10 million euros in 2007, 12 million for 2008 and 21 million for 2009.
- Lombardy: the Region has not instituted the Fund for non-self-sufficiency but has envisaged economic aid operations for the non-self-sufficient through, mainly, the distribution of socio-health-care "vouchers", which permit the purchase of nursing, rehabilitation, specialist-medical services or obtaining the support of a caregiver (attendant) through public or private bodies. The voucher is for a variable monthly amount divided into three bands, depending on the intensity of need. They are good for: 362, 464 and 619 euros. To gain access to the voucher no income or age limits are set.
- Marches: this fund has been set up by resolution 1493/2008 with reference to article 37 of its LR 25/2008. The Fund for 2008 amounts to 6.5 million euros, of which 4.5 million for shelter and the remaining 2.0 million for housing.
- Piedmont: the Region has not seen to instituting a specific fund for non-self-sufficiency since it envisages financings for manager bodies that supply the services of socio-health-care assistance for the aged and the disabled regulated by DGR no. 34/5493 of March 12th 2007 "Activation of the procedures for carrying out the three-year regional plan for aid operations and social services" and with DGR no 37-6500 of July 2007 "Criteria governing the co-participation of the non-self-sufficient aged in the cost of their board and lodging".
- Apulia: the town councillorship of Apulia and the trade unions: CISL, CGIL and UIL signed in 2007 a protocol of understanding having a life of three years for setting up a regional fund for the non-self-sufficient, in part already envisaged by LR 19/06 and by DRG 583/2007. The amount of this fund will be 10 million euros which will be summed with those distributed by the FNA.
- Sardinia: the Region has set up a Fund for the non-self-sufficient by its LR 4/2006 "Guidelines for setting up family assistants (caregivers) for the support of non-self-sufficient persons", and then with the subsequent resolutions no. 27/41 of July 17th 2007, 34/8 of September

11th 2007, and 44/13 of October 31st 2007, in compliance with the provisions of art. 34 of LR of May 29th 2007. The size of the fund as a whole is 120 million euros.

- Sicily: the Region did not provide for a fund devoted to the non-self-sufficient for 2007. It did however identify the resources for the non-self-sufficient, by its resolution DDG 4151/S2 and by presidential decree of July 7th 2005 "Definition of the criteria for the distribution of the socio-sanitary voucher for nuclear families with non-self-sufficient aged persons or seriously disabled persons as per article no. 10 of regional law no. 10 of July 31st 2003". The resources assigned sum to a total of 15 million euros.
- Tuscany: Tuscany has approved a regional law that establishes the regional Fund for non-self-sufficiency starting from 39 million euros in 2008 and 80 million in 2009 and in 2010, in order to give assistance to the 40,000 non-self-sufficient in the region's territory and to eliminate the waiting lists for the RSA. The supply of services favours the maintenance of the non-self-sufficient within the family context. Since 2009 there has been provided as well a monthly care payment in a sum of up to 1500 euros to sustain the activities of a "care giver".
- Umbria: this Region approved through its LR 9/2008 the establishment of the regional Fund for non-self-sufficiency. The Fund for 2008 amounted to 31.8 million euros. The person assisted's participation is ensured, along with members of his family, the full application of the PAP (Personal Assistance Program) coordinating the health-care and social-assistance services, by filling out services to the person and to his core family with other, possibly economic, measures.
- Valle d'Aosta: the Region makes use as yet of LR 22/1993 "Provisions for aged, handicapped, alcoholic, drug addict, HIV-infected and AIDS-affected persons", but has not passed a law specifically for the non-self-sufficient or a law dedicated to a specific fund.
- Veneto: by its DGR 827/2007, and resolutions 464/2007 and 394/2007 the Region has identified resources for the non-self-sufficient of 62.4 million euros, 9% over those assigned in 2006. Furthermore, for the year 2007 the regional resources assigned to territorial and home aid operations envisioned in the Local Plans for disability amount on the whole to 10 million euros.
- To the resources of the state and the Regions, as well as those distributed by INPS and by the other bodies competent for accompaniment indemnities, there are finally to be summed those directly appropriated by the local administrations, and in particular by the municipalities.
- The resources appropriated by the municipalities can be estimated starting from the amount of the expenditures for services and assistance distributed by them to the categories falling among the non-self-sufficient, the aged and the disabled, by subtracting the state and regional funds that were received.
- During the year 2008 the municipalities, individually or in association, assigned to social aid and services 6.7 billion euros (source: ISTAT). It is estimated that of the 6.7 billion euros appropriated by the municipalities only 3 billion refer to assistance for the disabled and the aged, and, that is, the two categories falling within the non-self-sufficient. If to these are summed the accompaniment indemnities and the pensions to civil invalids distributed by INPS (11.8 billion euros) the social cost for non-self-sufficiency reaches the sum of 15 billion euros, that is 0.95% of the GDP. This sum, which leads us to conclude that the complex of the

socio-health-care sector takes today ten percent of the GNP, in reality is not dissimilar from those declared in other countries, showing that the problem, more than being one of resources, is one of assignment of same, that is of efficient allocation.

10.3. Definition of the requisites of non-self-sufficiency

In order to discuss the end distribution of the resources for the non-self-sufficient, we shall start with the observation that while, as regards the subject of the medical and legal recognition of invalidity, the specific commissions can refer to tables made up nationally, the criteria of definition of non-self-sufficiency used by the individual Regions are instead not always homogeneous and often the laws leave the matter to the free will of the municipalities, or to the ASLs (local health units) or the Evaluation Units, be they Geriatric, Multidisciplinary or regarding the Handicapped, in the determination of the parameters used to identify when a person is effectively non-self-sufficient. In general, in the regional laws, when non-self-sufficiency is spoken of reference is being made to:

- the aged non-self-sufficient (65 years old and older in the case of Emilia Romagna, 75 years and older, in the case of Lombardy, and 80 years and older in the case of Umbria);
- persons having a civil invalidity pension or an indemnity of accompaniment (in the case of the Autonomous Province of Trento and Bolzano, and in the case of Umbria);
- persons who have been evaluated as non-self-sufficient by special commissions or persons having serious disabilities (in this case reference is made to “minors having family care problems” in Liguria, to “disabled and other non-self-sufficient persons affected by serious pathologies in terminal or irreversible phase” in Emilia Romagna, to “persons with physical or psychic disabilities” in the Marches, and to “persons with serious handicaps” in Sardinia).

To date there does not yet exist a point-by-point definition of non-self-sufficiency, nor much more does there even exist a criterion for recognizing the non-self-sufficient person. There does exist an exhaustive medico-legal definition of permanent invalidity and a statistic of disability, but not of non-self-sufficiency. This means of course difficulty in correctly integrating such into the welfare system and into the procedures for defining the assistance routes individually envisaged by law 328/2000.

In many regions the criteria regarding the sphere of health are often set side by side, for the purposes of distribution of the services, with criteria regarding the person’s or the family’s economic situation. In all Regions there are always present indications and objectives aimed at strengthening the network of territorial services and, first of all, the home care system.

The uncertainty in the criteria of identifying the non-self-sufficient subject is for these reasons still today an open problem, which can be revisited within a picture of the necessary reordering on the whole of the system. Seen properly, even the definition itself of disability changes depending on the statistical survey and on who makes it.

Finally, imprecise use is often made of such terms as non-self-sufficient, disabled, bearer of handicap, invalid, and unfit.

Within the sphere of the law, for example, the safeguarding of the disabled citizen by state assistance is carried out first of all through the notion of invalidity: civil, or relative to work, for reasons of service. In particular, for the most numerous category, the civil invalids, starting from the end of the sixties laws were developed oriented towards assistance, toward insertion into

society and toward placement in a job (art. 38 of the Constitution), toward facilitations in the work environment for family members, the last being law 104/1992 (the framework law on handicaps). There was then added and defined over time, by succeeding laws, a system managed by INPS and having as its aim to distribute indemnities of an economic nature, recognized under the heading of disablement, for the care both of the disabled, and of minors, and of the aged over sixty-five years. On the whole, to persons acknowledged as civil invalids there are assigned:

- benefits of an economic nature (invalidity allowance, inability pension, monthly indemnity of attendance for minors and an accompaniment indemnity);
- benefits of a socio-assistance nature (assistance in rehabilitation and with prostheses, aimed placements in particular jobs and exemption from participation in health expenses: "exemption from the ticket" for clinical-diagnostic and instrument diagnostic services[2];
- Within this framework non-self-sufficiency can be identified as "the bio-psychosocial condition consequent on disability – of mental, physical or sensory nature – that induces in the individual a permanent state of dependence on outside parties in carrying on one or more essential and recurrent functions of daily life[3].

Regarding the system for protection of non-self-sufficient persons and the typologies of assistance, these are based on three types of aid:

[2] *IThe benefits that are recognized to civil invalids depend on the percentage of civil invalidity acknowledged:*
- a percentage of invalidity between 34% and 45%: the right to obtain prosthetic devices and auxiliaries from the ASL;
- a percentage of invalidity between 46% and 66%: the right to obtain prosthetic devices and auxiliary items and registration for obligatory placement;
- a percentage of invalidity between 67% and 73%: the right to obtain prosthetic devices and auxiliaries and registration under obligatory placement and exemption from the health-care ticket, but excluding the fixed quotas per prescription;
- a percentage of invalidity between 74% and 99%: the right to obtain prosthetic devices and auxiliaries and registration under obligatory placement and exemption from the health-care ticket, but excluding the fixed quotas for prescriptions; health requisite for the monthly invalidity allowance;
- a percentage of invalidity of 100%: the right to obtain prosthetic devices and auxiliaries and registration under obligatory placement and exemption from the health-care ticket, but excluding the fixed quotas for prescriptions; health requisite for the monthly invalidity allowance; health requisite for obtaining the disability pension;
- a percentage of invalidity of 100% with the impossibility to walk without the permanent assistance of an accompanying person, or to perform the daily actions of life; the right to obtain prosthetic devices, auxiliaries, registration with the obligatory placement, total exemption from the ticket, health requisite for receiving both the disability pension and the indemnity of accompaniment.

[3] *The court of cassation, in its decision no. 133 of September 11th 2003, refers to some essential characteristics of non-self-sufficiency: the permanent nature of the aid furnished by the person accompanying, the daily nature of the actions that the subject is not able to perform on his own, the continuing nature of the need for assistance.*

- forms of assistance of the home or social-residential type;
- forms of home assistance, on a daily or residential basis, of the socio-health-care type;
- monetary subsidies and services vouchers.

Regarding payments in money, the principal aid in the area of non-self-sufficiency remains the accompaniment indemnity. This is undoubtedly an aid appreciated by the usership, which however, since it is only a money payment, does not always ensure quality of assistance, nor an effective aiming of resources at the beneficiary's support and autonomy. The sum paid, furthermore, 487 euros per month, is not always enough to sustain assistance costs, especially for subjects having serious or complex disabilities. The institution of the accompaniment indemnity refers to law 18/1980 "Accompaniment indemnity for totally unfit civil invalids". The accompaniment indemnity is due the total civil invalids that owing to physical or psychic problems find it impossible to walk without the permanent aid of a companion, or, not being able to perform the daily actions of life, needs continuous assistance.

The indemnity is not incompatible with the performance of a job and is granted also to the handicapped relative to whom the ascertainment of the prescribed conditions has come about subsequent to the demand filed after the sixty-fifth year of age has been completed.

With regard to those older than sixty-five years, who can no longer be evaluated on the level of work activities, the right to the indemnity is subordinate to the condition that they have persistent difficulties in performing the tasks and functions of their age (art. 6 of decree-law 509/1988): the impossibility of walking independently and the absolute lack of self-sufficiency.[4]

The Health-care System too, in particular the National Health-care Plan 2011-2013, reserves attention to the non-self-sufficient and identifies the subjects who most need continuity of care. These are:

- post-acute-case patients discharged from hospital that run high risks, when not adequately assisted, of an improper return to hospital. They need clinical and nursing competences, these being entrusted to a case manager, in a dedicated structure or at home;
- chronic patients, stabilized on the territory, with great need of assistance and the risk of inap-

[4] *According to the law the right to receive the accompaniment indemnity must respond to precise requisites: acknowledgement of a total and permanent invalidity of 100% accompanied by the impossibility of walking without the permanent assistance of a person accompanying or by the impossibility of performing the daily actions of life and the consequent need of continual assistance. Excluded from the right to indemnity for accompaniment are those invalids who are hospitalized free of charge in an institute and those who receive an analogous indemnity for invalidity owing to causes of war, of work or of service, without prejudice to the right of option for the most favourable treatment.*

propriate hospitalization when not adequately assisted. Their cure route requires a strong integration between multidisciplinary treatment teams (physician, nurses and social worker), with the place of care being the patient's home or a protected structure;

- chronic patients in good conditions of health on the whole who have as their objective the monitoring of their state of health, who live at home and have the characteristics necessary to be educated to self-care and to empowerment (diabetes, asthma);
- ongoing assistance, in terms of supply, is strengthened by new formulas of "intermediate" residence that are ever more important to speed up the processes of discharge from hospital, such as: ìCommunity hospitals (managed by GPs and nursing personnel), intermediate post-acute-case rehabilitation structures, nuclei at RSA, protected discharges and other similar services.

10.4. Conclusions

It being premised that the system of protection against events tied to illness, chronic illness, disability, in Italy sums to 157 billion euros of which 135 billion regarding the NHS, 18.5 billion corresponding to assistance services supplied by the municipalities and by social security bodies and 5 billion regarding illness indemnities, it is by now ascertained that a growing percentage of such resources,15 billion euros of social expenditures, to which is added a significant quota of health-care expense for a total sum of 30 billion euros, corresponding to 20% of the total (source: *Quotidiano Sanità* – Health-Care Daily), is aimed at non-self-sufficiency.
But it should be brought out that the fragmentation of the aid that characterizes this sector of the assistance system does not put our country in a condition, although the employment of resources is significant, to guarantee a complete and real safeguarding of non-self-sufficient persons, in particular those afflicted with the more complex disabilities and the aged, as holds true instead throughout a large part of Europe.
In Northern Europe the home services reach up to 13% of the aged. In Germany, sustained by an obligatory public insurance, a strong increase in home assistance has been recorded: taking advantage of it is almost 10% of the aged population, double that of the average of the Italian Regions. But also in Spain, after the measures adopted for non-self-sufficiency in 2006, which brought about in the home-care sector an increase of a further 300,000 jobs. An analogous process is by now consolidated in France, where the services, financed by a tax to the purpose, reach at home more than 8% of the aged population.
These are all countries that have seen services and employment in the sector grow, even if with the emergence of irregular work, and that have defined new operational models and new professional figures, starting from the family assistant.
In conclusion, we could affirm that despite the fact that all the Regions are working to increase integration and to facilitate the taking on of the non-self-sufficient person, what is fundamentally lacking is a definition of the LIVEAS. From analysis of the various regional experiences it has emerged that if "general rules" are not respected regarding: institutional systems and the presence of bodies that favour communication between ASLs and municipalities, the processing of the aid, the relations between professional people in the health-care and social disciplines and the proper attribution of expenditures among the various sectors, the risk will be run of making vain or even of altering the result of the integration, but especially of not appropria-

tely meeting the citizens' demands.
As regards then the financing of the cost of the services for the non-self-sufficient in Italy, it would be hoped that a mixed model would be opted for, which envisages the participation both of the subjects and of the competent authorities. In this regard the mechanism of the voucher is to be privileged, more than elsewhere, considering the intermediate characteristic of the needs of the non-self-sufficient.

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APPENDIX

Further discussion of Social Assistance
Statistical tables to be found on the site of the CEIS Sanità report:

INTERNATIONAL DATA
Expenditure for social protection in the EU countries
Expenditure for social protection in the EU countries. Values per inhabitant
Expenditure for social protection in the EU countries. Values per inhabitant. % variation.

NATIONAL DATA
Expenditure for social protection in Italy
Expenditure for social protection in Italy % variation.
Expenditure for social protection in Italy. Five-year variation.
Expenditure for social protection in Italy Values per inhabitant
Expenditure for social protection in Italy Values per inhabitant % variation.
Expenditure for social protection in Italy sustained by the public administrations
Expenditure for social protection in Italy sustained by the public administrations. % variation
Expenditure for social protection in Italy. sustained by the public administrations Values per inhabitant
Expenditure for social protection in Italy. Incidence on the GNP of expenditure for Social

Protection

SOCIAL ASSISTANCE AND POLICIES

- **Financing**

National social funds.
National social funds. % variation.
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- **Expenditure**

Expenditure by cities for services in money. Absolute values
Expenditure by cities for services in money. % variation.
Expenditure by cities for services in money. Values per inhabitant.
Expenditure by cities for services in money. Values per inhabitant. % variation.
Expenditure by cities for aid and services. Absolute values.
Expenditure by cities for aid and services. % variation.
Expenditure by cities for aid and services. Values per inhabitant.
Expenditure by cities for structures. Absolute values.
Expenditure by cities for structures. % variation.
Expenditure by cities for structures. Values per inhabitant.
Expenditures by cities for the aged. Absolute values
Expenditures by cities for the aged. Values per inhabitant.
Expenditures by cities for addicts Absolute values
Expenditure by cities for addicts Values per inhabitant
Expenditure by cities for the disabled. Absolute values.
Expenditure by cities for the disabiled. Values per inhabitant.
Expenditure by cities for families and minors. Absolute values.
Expenditure by cities for families and minors. Values per inhabitant.
Expenditure by cities for immigrants and nomads. Absolute values.
Expenditure by cities for immigrants and nomads. Values per inhabitant.
Expenditure by cities for multi-users Absolute values.
Expenditure by cities for multi-users Values per inhabitant
Expenditure by cities to fight poverty. Absolute values..
Expenditure by cities to fight poverty. Values per inhabitant.
Complex of accompaniment indemnities.
Variazione % Complex of accompaniment indemnities. % variation.

Chapter 11a
Pharmaceutical industry

11a. Pharmaceutical industry

Anna Chiara Bernardini[1]

11a.1 Introduction

It is unquestionable that the pharmaceutical industry, in addition to its relevance for public health, is one of the economic sectors that play a crucial role in the development, growth and competitiveness of a Country.

The continuous technological evolution and the resulting increase in therapeutic opportunities, in the face of limited public resources, have brought the cost-effectiveness analysis of technologies and substances into the limelight. This public function aims at controlling the public health expenditure while protecting health. Besides, technological development represents also an opportunity for the growth of the economic system as a whole.

In fact, according to Confindustria (Confederation of Italian Industries)[2], within the context of the national economic system, greater relevance is being progressively attached to the health supply chain, meant as:

- manufacture of pharmaceutical, chemical and botanical products for medicinal uses;
- manufacture of medical, surgical and orthopedic devices, lenses and glasses;
- wholesale trade of pharmaceutical products, healthcare tools and devices;
- retail trade of drugs, medicines, therapeutic devices and materials;
- hospital services;
- outpatient treatments.

The health supply chain produces over 11% of Italy's GDP and two industrial sectors (namely, the production of pharmaceutical products and the manufacture of medical devices) account for 6.2% of our Country's export of goods, a percentage that is not too far from that of a few leading sectors of the *Made in Italy* products.[3]

This article aims at offering an improved understanding of the contribution given to the national and international economic system by the pharmaceutical sector in terms of value added, research and employment.

11.2. Production

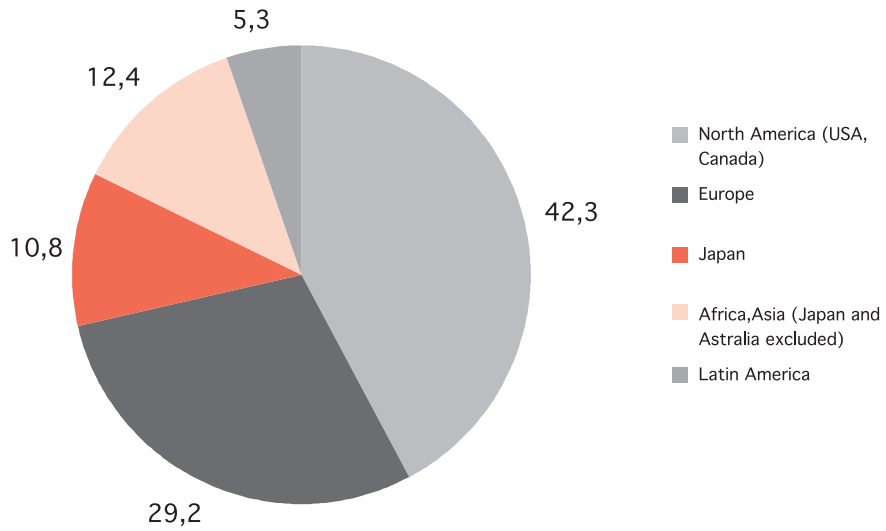
The worldwide pharmaceutical industry has witnessed a 3% increase with respect to 2009 in terms of ex-factory price value (€ 597 billion). The North American market (USA and Canada) proves to be the largest in the world with a 42.3% share, followed by Europe with 29.2%.

[1] *CEIS-Sanità, Faculty of Economics, University of Rome, Tor Vergata campus*

[2] *Refer to the Confindustria study (2006).*

[3] *Confindustria, 2007-2020, structure and performance of the health supply chain.*

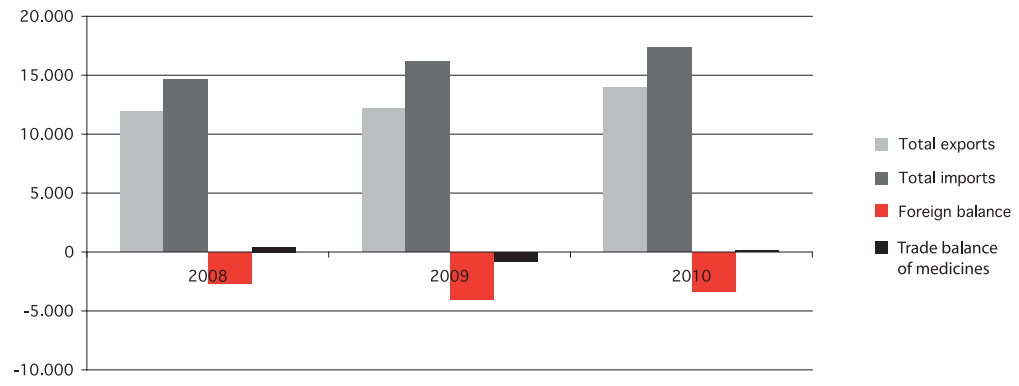
Figure 11a.1: Shares of the worldwide pharmaceutical market – 2010



Source: IMS MIDAS, 2011

The total value expressed in ex-factory prices confirms that Italy is one of the leading world markets, with a total turnover (pharmacies + hospitals) amounting to € 19 billion. In 2010, notwithstanding its drop in the international ranking, it ranked sixth with respect to the world's most advanced economies (5th in 2005) and third in Europe, after France and Germany.
The pharmaceutical production amounted to € 24,996 million (+6.8% with respect to 2009), a figure that has been affected by the growth of exports (+14.9%).
The situation of the trade balance differs depending on whether we consider just the trade of medicinal products (whether packed or loose) or the total trade (trade of medicinal products, pharmaceutical raw materials and other finished products). In the former case, the balance of trade points to a trade surplus of € 0.6 billion; in the latter, it points to a trade deficit of € -3.3 billion (imports amount to € 17.3 billion, while exports amount to € 13.9 billion).

Figure 11a.2 - Balance of trade of the Italian pharmaceutical sector – Million €



Source: Processing of Farmindustria data

11.3. Pharmaceutical firms and workers

The USA rank first in the world by number of firms (1,268) followed by Japan (1,062)[4].
In Europe (EU15) there are 1,749 Firms, with a 4% reduction with respect to 2009.

[4] *Latest data available: 2008.*

Table 11a.1 - Firms and workers in the pharmaceutical sector - EU15

Countries	Firms 2010	% variation of firms 2009/2010	Workers 2010	% variation of workers 2009/2010	Workers by firm 2010	% variation of workers by firm 2010/2011
Germany	358	0.0%	104,605	-1.2%	292.2	-1.2%
France	299	0.0%	100,355	-2.9%	335.6	-2.9%
Italy	334	0.3%	66,700	-1.2%	199.7	-1.5%
United Kingdom	142	-35.2%	72,000	8.2%	507.0	46.4%
Spain	225	1.3%	39,155	-3.0%	174.0	-4.3%
Belgium	48	0.0%	31,966	8.0%	666.0	8.0%
Ireland	54	0.0%	24,500	0.0%	453.7	0.0%
Sweden	41	-7.3%	14,766	-6.1%	360.1	0.8%
Denmark	26	-11.5%	20,223	18.8%	777.8	32.5%
Netherlands	65	-15.4%	16,900	5.6%	260.0	21.9%
Greece	35	0.0%	14,000	3.7%	400.0	3.7%
Portugal	65	-3.1%	9,761	-4.7%	150.2	-1.8%
Austria	40	0.0%	10,555	0.2%	263.9	0.2%
Finland	17	-5.9%	5,623	-6.3%	330.8	-0.8%

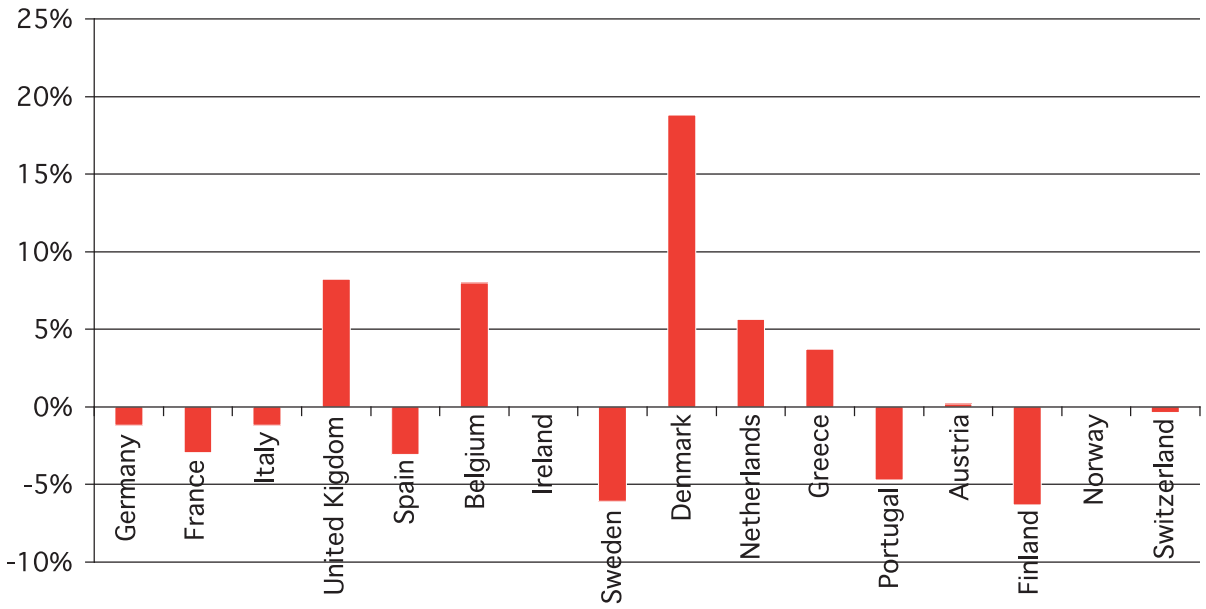
Source: Processing of Farmindustria data

Germany ranks first with 358 firms, followed by Italy (334), France (229) and the United Kingdom (142, -35% with respect to 2009). The workers per firm are on average 369, with values ranging from 778 in Denmark to 150 in Portugal.

Analyzing the employment data relative to the worldwide market, the USA and Japan still rank first with respect to the number of the employed in the sector, even though the average number of workers by firm proves lower than the mean figure for Europe (195 and 155 workers per firm, respectively - 2008 data).

It is a number of years since the Italian pharmaceutical sector has been witnessing a drop in the number of workers it employs. Considering the situation in Europe, particularly with respect to 2009 and 2010, the resulting trend is quite uneven. On the one hand, Countries such as Germany, France, Italy, Spain, Sweden, Portugal and Finland report a reduction of the number of the employed (with values included between -0.34% in Switzerland and -6.3% in Finland), while the United Kingdom, Belgium, Denmark, the Netherlands, Greece and Austria are characterize by an increase in the workforce employed in that sector (increases ranging from 0.20% in Austria to 18.83% in Denmark).

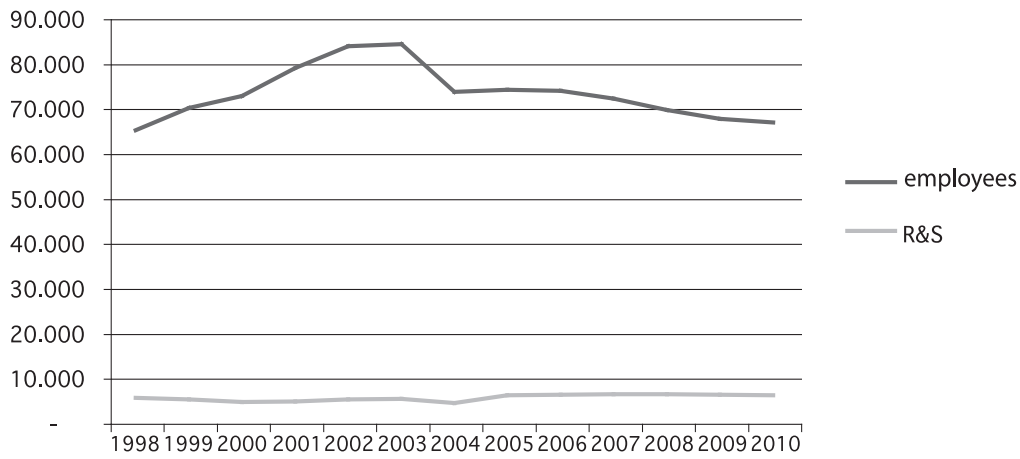
Figure 11a.3: Percentage variation of pharmaceutical workers – Italy, Europe 2009-2010



Source: Processing of Farmindustria data

Extending the analysis to a longer timeframe, Italy's pharmaceutical sector has witnessed two different employment phases: an initial phase up to 2003 substantially on the increase, and a second phase from 2004 to 2010 of substantial decline in the employment rate (with a nearly stable number of Research and Development workers).

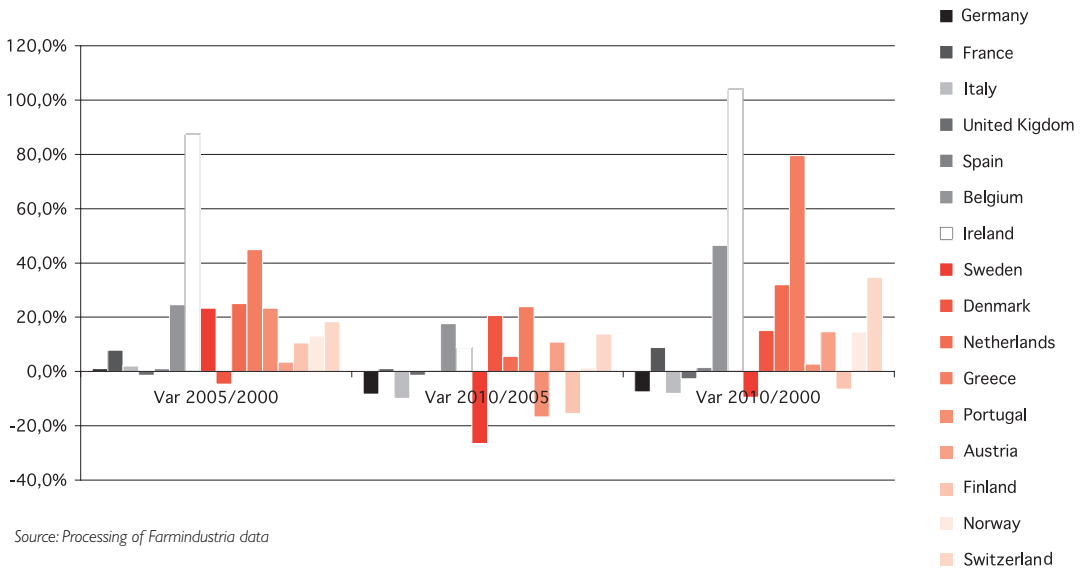
Figure 11a.4: Workers employed by the pharmaceutical sector Italy (1998-2010)



Source: Processing of Farmindustria data

Comparing the employment levels with other Countries, it turns out that, between 2000 and 2005, nearly all the European Countries being considered (including Italy) reported an increase in the employment levels, except for United Kingdom and Denmark, while, between 2005 and 2010, six Countries reported a negative change (Italy -10%).
Considering the entire period from 2000 to 2010, the Countries witnessing an overall drop in the employment levels are Italy, Germany, France, Sweden, United Kingdom and Finland (Italy ranks second in terms of higher reduction).

Figure 11a.5: Workers employed by the pharmaceutical sector Italy, Europe (1998-2010)



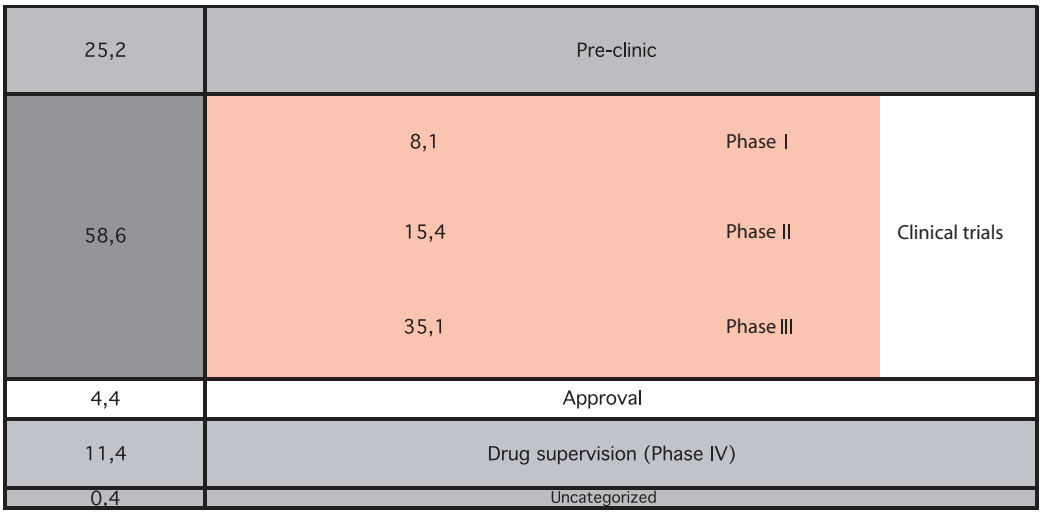
Source: Processing of Farmindustria data

11.4. Innovation

Considering the various industrial contexts, the pharmaceutical/biotechnological sector reports the highest spending in R&D. In 2010, Europe's pharmaceutical industry has invested nearly 27,000 million euro in research (-1.6% with respect to 2009 and +51.3% with respect to 2000)[5]. In the USA, the related spending has amounted to 37,371 million dollars (+6% with respect to the previous year).

[5] *EFPIA, L'industria farmaceutica in cifre, 2011 edition.*

Figure 11a.6 - Distribution of investments in R&D – % values



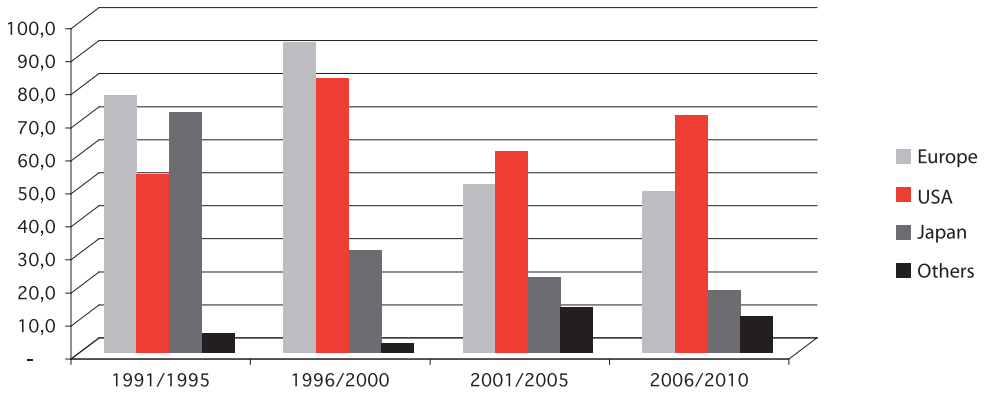
Source: PhRMA, Annual Membership Survey 2011

According to PhRMA (Pharmaceutical Research and Manufacturers of America), the R&D costs of a new molecular entity are broken down in various phases: the pre-clinical phase absorbs 25.2% of the resources, the clinical trials (phases 1, 2 and 3) 58.6%, the approval phase 4.4% and phase 4 (ongoing studies and monitoring) 11.4%.
Between 1991 and 2010, the investments in R&D allowed the introduction on the worldwide market of 722 new pharmaceutical entities.
Between 2006 and 2010, 151 new chemical and biological entities (NCE) were put on the market, showing a substantial stability with respect to the period 2001-2005 (+1%), even though on a lower level than in the 1990s.
In fact, the total variation in the four periods being considered shows a definite reduction in the quantity of new entities (-28%). In fact, they have dropped from 211 in the period 1991-1995 to 151 in the period 2006-2010. The situation differs depending on the various markets: Europe and Japan report a drop (-37% and -74%, respectively) while the USA report a 33% increase (from 54 entities in 1991-1995 to 72 in 2006-2010).

11.5. Clinical trials in Italy

In 2010 (the latest data available), 660 clinical trials were under way in Italy (a 15% reduction with respect to 2006). In particular, 45.4% of them fell within the 1st and 2nd study phases and 69.3% fell within the 3rd and 4th phases, while the remaining part (0.8%) was devoted to bioequivalence/bioavailability studies.
Analyzing by therapeutic area the total trials (3,871) carried on between 2006 and 2010, it may be noted that over 29.9% of the studies addressed the oncologic area, 9.3% the cardiologic area and 9.1% the neurologic area.

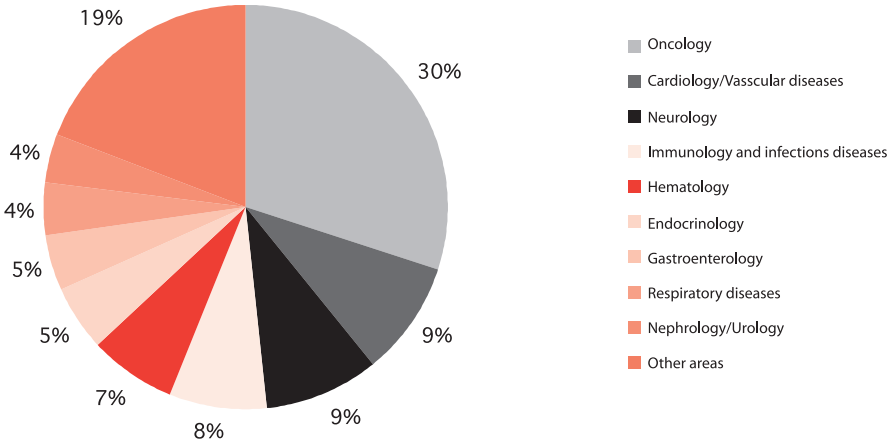
Figure 11a.7 - New entities put on the worldwide market (1991-2010)



Source: EFPIA

Even the trials involving biotech products – with 155 products in the clinical phase and 82 in the preclinical phase – prove to address for the most part the oncologic sector with 66 products that account for 43% of the total; 11% relate to the treatment of neurologic diseases, and the rest (10%) involve products for treating inflammatory and autoimmune diseases, as well as metabolic, hepatic and endocrine diseases.

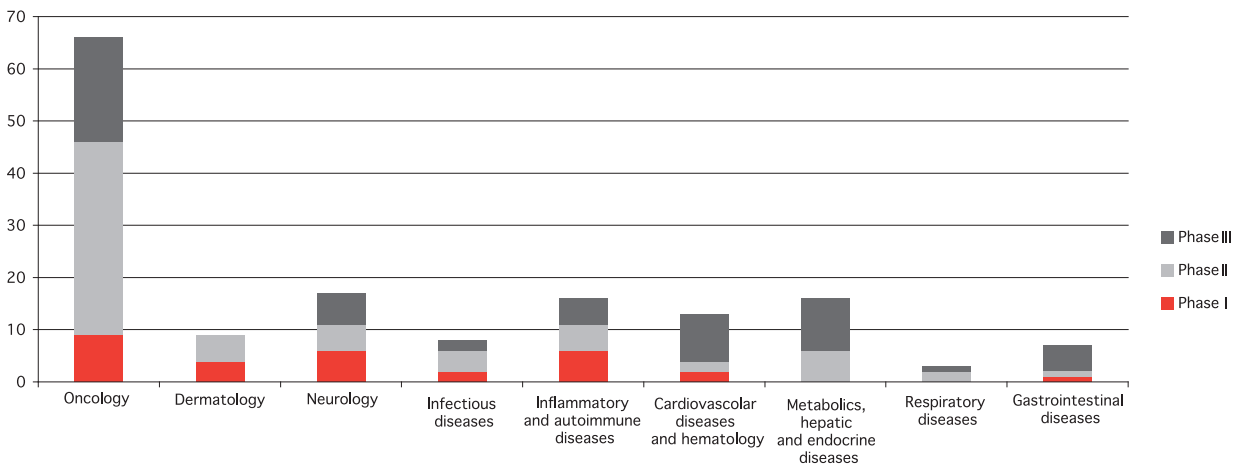
Figure 11a.8 - Biotech research – Number of products by therapeutic area and phase



Source: Report on Biotechnologies in Italy 2011 (Ernst & Young-Assobiotec)

The weight of the clinical studies of biological/biotechnological active principles is constantly on the increase; their incidence rises from 0.3% in 2001 (that is to say, 2 trials out of a national total of 610) to 31.7% in 2009 (235 trials out of a total of 742).

Figure 11a.9 - Incidence of the clinical studies of biological/biotechnological active principles



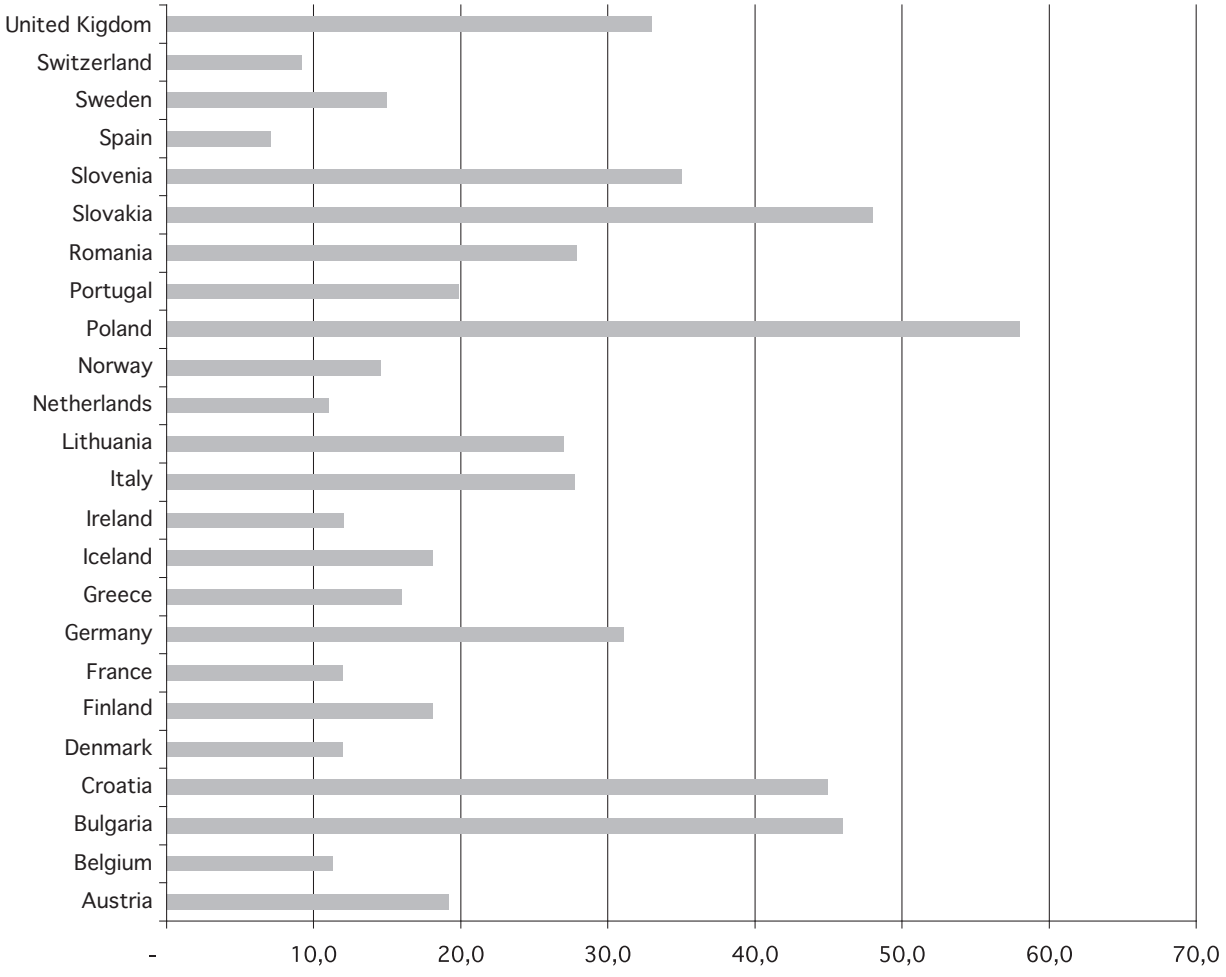
Source: Farmindustria

11.6. The industry of generic drugs

Within the context of the pharmaceutical sector, the generic drug component should be set apart from the rest.

In any event, it is hard to make an international comparison given that the term “generic drug”, although extensively used, fails to have a definition that applies consistently to all the Countries.

Figure 11a.10 - Share of generic drugs in the European pharmaceutical market 2009 (ex-factory prices)



Source: EFPIA

The generic drugs market share is significantly higher in the new EU member Countries, that is to say, Countries characterized by historically low levels of intellectual property protection.
Over the past ten years, Italy has witnessed a slow but constant growth in the recourse to generics, with a share of the market in terms of packages that increased from 1% in 2000 to 14% in 2011.
In Italy, the industry of generic drugs comprises nearly 50 companies, but most of the generics market is covered by 6 companies (Teva, Mylan, Sandoz, DOC GENERICI, EG and Ratiopharma) that account for 87.1% of the total market.

11.7. Conclusions

The sector is bound to face real challenges. In addition to the rising R&D costs and the employment crisis, it has been severely affected by the impact of the austerity measures introduced in 2010 and 2011 by the governments of most of Europe.
In fact, the national governments are trying to cope with the economic-financial crisis through the implementation of measures that are to curb spending.
In view of the relevance of the pharmaceutical sector for a Country's development, such initiatives run the risk of discouraging investments on the part of pharmaceutical firms, with the consequent risk of losing opportunities in terms of economic returns, employment, and technological know-how.
Hence, we are facing a vicious circle that gives rise to the definite need to redefine – in synergy with the relevant stakeholders of the sector – models of action that are likely to act as a stimulus as well as to contribute to coping with the health challenges by investing on biomedical and clinical research and innovation.

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APPENDIX

Further notes on the pharmaceutical industry
Statistical tables that may be retrieved from the site of the CEIS Sanità Report

PHARMACEUTICAL FIRMS AND WORKERS EMPLOYED IN THAT SECTOR
- **International data**

Pharmaceutical firms
Pharmaceutical firms – percentage variations
Workers employed by pharmaceutical firms

Workers employed by pharmaceutical firms – percentage variations
Research and Development workforce
Research and Development workforce – percentage variations

- **National data**

Pharmaceutical firms
Pharmaceutical firms – percentage variations
Workers employed by pharmaceutical firms
Workers employed by pharmaceutical firms – percentage variations
Research and Development workforce
Research and Development workforce – percentage variations

INNOVATION AND PRODUCTION

- **International data**

Pharmaceutical industry's production value
Pharmaceutical industry's production value – percentage variations
Medicine exports
Medicine imports
Pharmaceutical market shares – percentage values
Share of generic drugs in the European pharmaceutical market
Distribution of the R&D investments – percentage values
New entities put on the market

- **National data**

Pharmaceutical industry's production value
Pharmaceutical industry's production value – percentage variations
Medicine exports
Medicine imports
Balance of trade of the pharmaceutical sector
Clinical trials by phase
Clinical trials by therapeutic area
Biotech clinical trials by therapeutic area
Incidence of biological/biotechnological active principles.

Chapter 11b

The impact on the economic system The medical device industry: production, innovation and expenditure

11b - The impact on the economic system
The medical device industry: production, innovation and expenditure

Daniela d'Angela[1]

11b.1 Medical devices

Medical devices (MD) compose together with pharmaceuticals, the principal "healthcare technologies". According to directive 47/07/EEC, the *medical device* is any instrument, device, system, software, substance or other product used alone or in combination, including the software included by the manufacturer, to be used specifically with diagnostic or therapeutic aims and necessary to the proper functioning of the device, assigned by the manufacturer to be used on human.

The medical devices sector is, then, characterized by great heterogeneity, considering the great variety of products that are included within its definition: from the simple syringe to the complex endoprostheses, on up to the great imaging diagnostic machines, characterized by high technological and managing complexity.

The variability of the dynamics in the MD sector in the world, in terms of innovation, of production, of expenditure and of availability of the technologies themselves, very much feels the effects of the local policies for regulation of its introduction into the market, access to risk capital for companies, distribution networks, and supply procedures.

11b.2. Production

The world production of medical devices, according to the *United States International Trade Commission* (USITC), in 2010 amounted to € 172 billion, +18.6% over 2005, with a mean annual variation of +3.5%. American production accounts for 40% of it, followed by European (30%) and Japanese (10%). From production data of the years 2009 and 2010, taken from the *U.S. Department of Commerce* (USDOC), a growth trend emerges in the Eastern medical-technologies markets: in particular, those of China, Asia, India and South Korea, which all together represent, in 2010, 5% of the value of the world's production.

The value of European production in the medical device sector, according to data reported by the European Association of the medical device industry (*Eucomed*), grew by 11.4% over 2005, going from € 44 billion to € 49 billion in 2009.

In 2010 Europe's production was concentrated in Germany (23%), England (16%) and France (13%), which together account for more than 50% of European production. In these three

[1] *CEIS Sanità, University di Rome, Tor Vergata campus*

countries a drop in the value of production of 7.5% relative to 2005 was observed on the whole, where however Germany recorded a dip of 14%, while France and England reported increases of 3.7% and 1.3% respectively.

Italy's share amounts to 12% of the European market and is slightly lower than France's, and has undergone no significant modifications in the past few years. The growth of production is associated with an increase in the number of companies and of employed. An exception to this is Germany, which, according to *Eucomed* data, had an increase in the number of companies and of employed of +601% and +55% respectively, but a 14% drop in the value of production[2].

Still according to *Eucomed* data, in Europe during the two-year period 2007-2009, there was a significant increase in the number of companies dealing in medical devices, which went from 11,000 to 22,500 (+105%).

The 71% of these companies are located in just four countries: Germany (49%), England (12%), France (5%) and Spain (5%).

Taking the ratio of number of companies to population, Switzerland turns out to have the largest density (174 per million inhabitants, followed by Germany (135 per million inhabitants), England (44 per million inhabitants), Spain (24 per million inhabitants) and France (18 per million inhabitants).

Still according to *Eucomed* data, in Europe, in 2009, the employment in the companies producing medical devices amounted to 500,000 persons, 15% more than in 2007. Almost 50% of them work in companies located in Germany (34%) and in England (11%), while only 4% of the employed work in companies in Italy.

The mean growth in Europe of the number of those employed in the sector owes principally to the significant increase that Germany (+55%) and Denmark (+43%) enjoyed. In Italy there was instead a reduction in the employed of 33% below 2007's, as there was in Switzerland and in England.

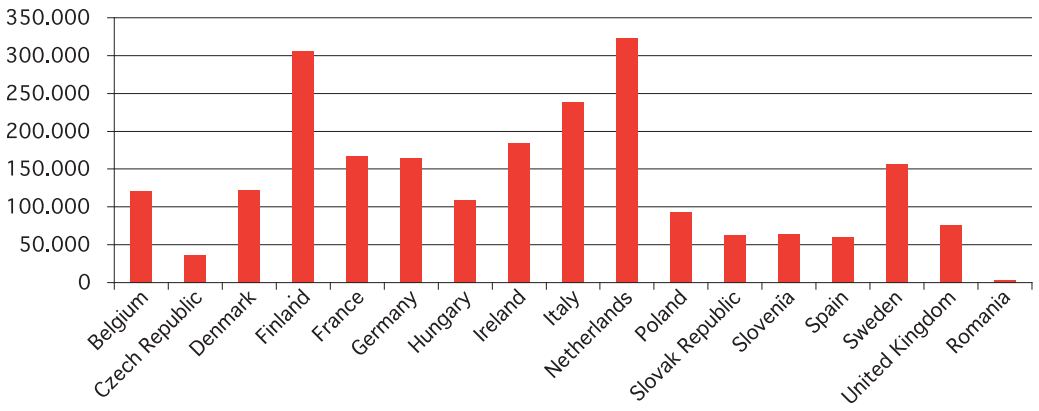
On relating the number of employed to the population, we note that the MD industry absorbs a considerable share of employment in Ireland (5,607 employed per million inhabitants), followed by Switzerland (3,874 per million inhabitants), Denmark (3624 per million inhabitants) and Germany (2,076 per million inhabitants).

In Italy in 2007 there were only 502 employed per million inhabitants.

The European country with the greatest productivity per employee is Holland, with € 323,263, followed by Finland and Italy with € 305,333 and € 238,370 respectively; France and Germany stop at € 168,000 and € 164,473.

[2] *This item is reported by EUCOMED, but will demand in-depth study to understand its genesis*

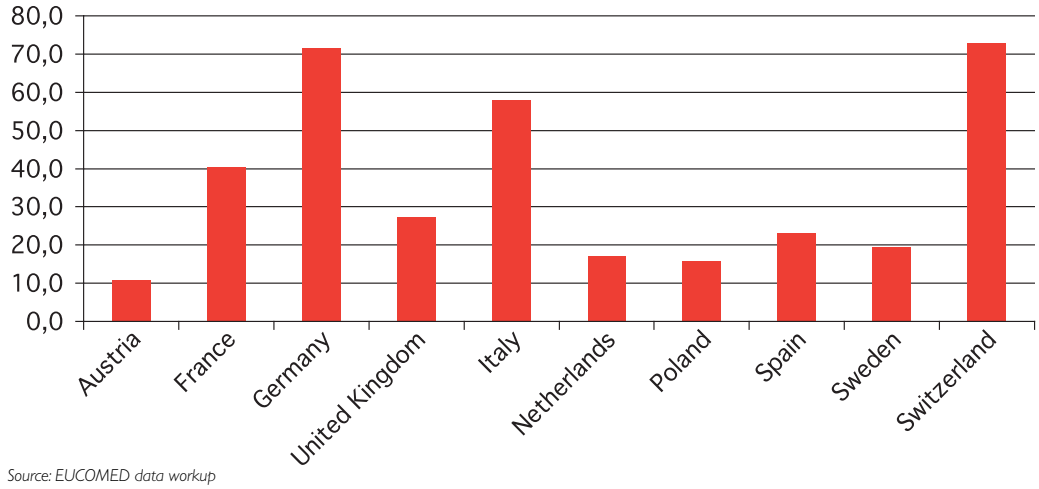
Figure 11b.1 Production value per employee
Values in € – Year 2007



Source: EUCOMED data workup

The European countries having companies of larger dimensions are Switzerland and Germany with 72.7 and 71.4 employees per company, respectively. Italy has 57.9 and France 40.4.

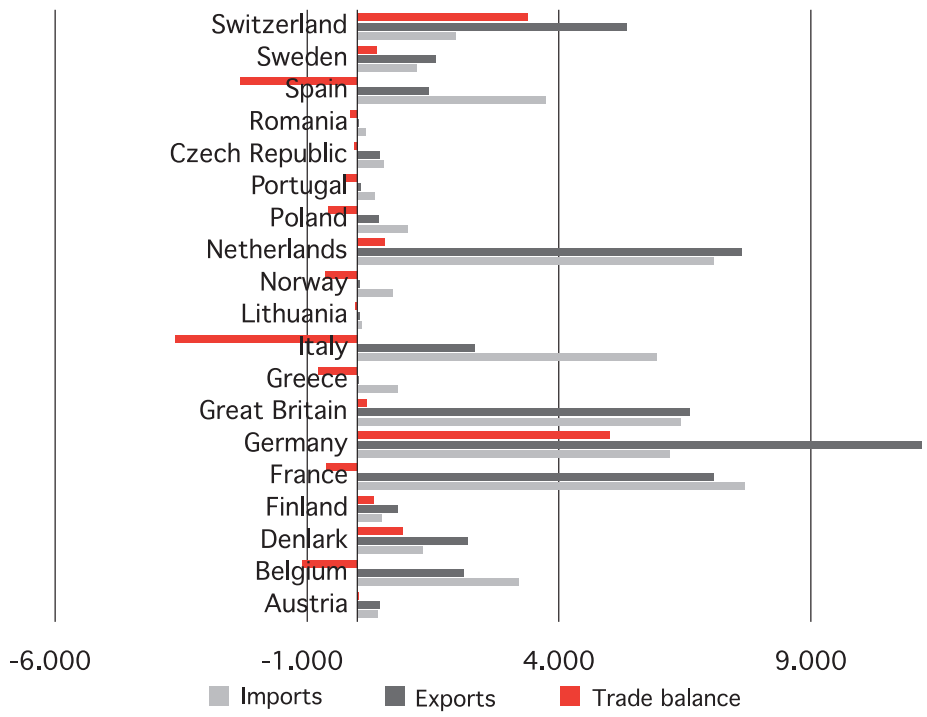
Figure 11b.2 Number of employees per company
Absolute values – Year 2007



Source: EUCOMED data workup

Germany and France are also the countries having the largest quota of export: in 2009, according to data reported by *Espicom Business Intelligence,* Germany exported a value of € 16.0 billion, followed by France with € 7.0 billion. Germany and France are also the European countries having the greatest value of imports, these being, respectively, € 10.1 billion and € 7.5 billion in 2009. In the same year Italy had an export value of € 2.5 billion, but almost double that figure for imports (€ 4.5 billion).
On analyzing the import and export dynamics of the medical device sector, we can see that countries like Germany, Switzerland, Sweden, Finland, Denmark show a positive trade balance of payments: the largest is seen in Germany, followed by Switzerland and Denmark. Countries like Italy, Spain, France, Greece and Belgium recorded instead a negative balance: among them, Italy's balance was the worst.
On comparing the trade balance of payments with company average size, it can be seen that countries with the greatest number of employed per company (Germany, Switzerland) ordinarily display positive balances.

Figure 11b.3 Imports, exports and trade balance
Values in billions of € – Year 2007



Source: Eucomed Member Associations and Medista

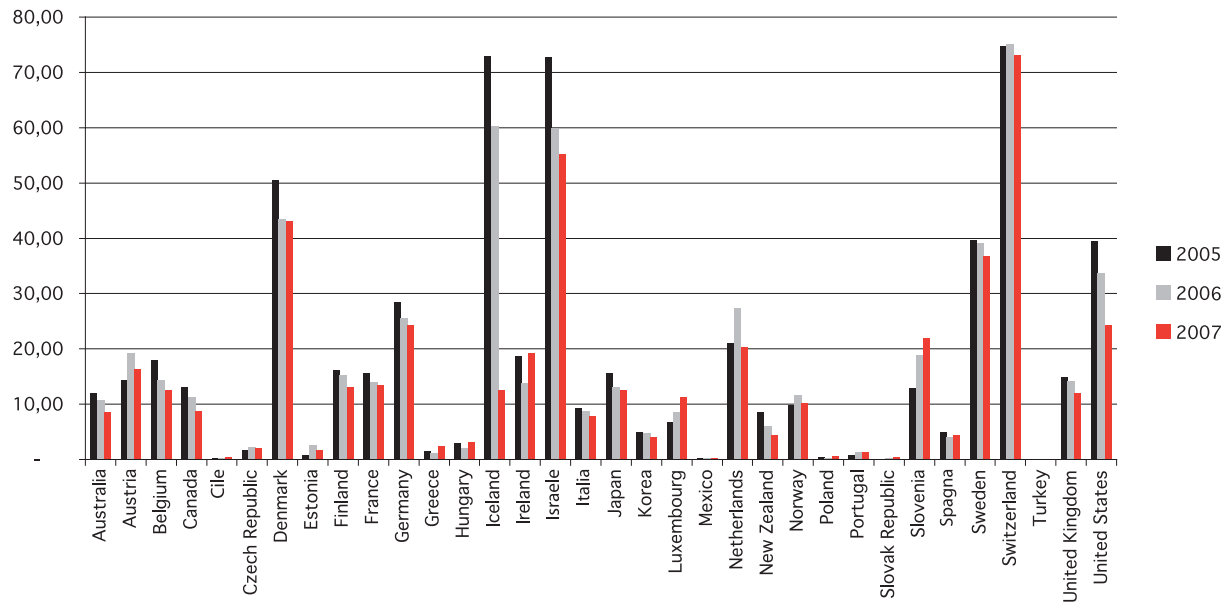
11b.3. Innovation

To deduce the capacity for technological innovation of the various countries, an analysis was made of the number of patents, these being taken from EPO (*European Patent Office*) and from USPTO (*United States Patent and Trademark Office*), produced in 2007 in the medical device sector (IPC group, section *A Human necessities*) in the individual European countries. It appears that Germany, with 2003, France, with 836, England with 725, and Switzerland with 552 are the countries that hold the largest number absolutely. Thus there is still a clear association between size of company and number of patents filed.

In 2007 Italy held 468 patents.

With reference to data from the year 2007, the countries with the largest number of patents per inhabitant were Switzerland (73.08 per million inhabitants), Israel (55.33), Denmark (43.09), Sweden (36.89), Germany (24.35) and France (13.49). The level of innovation of the United States is equal to Germany's. Italy has a level of innovation of about a third of Germany's (7.9 patents per million inhabitants).

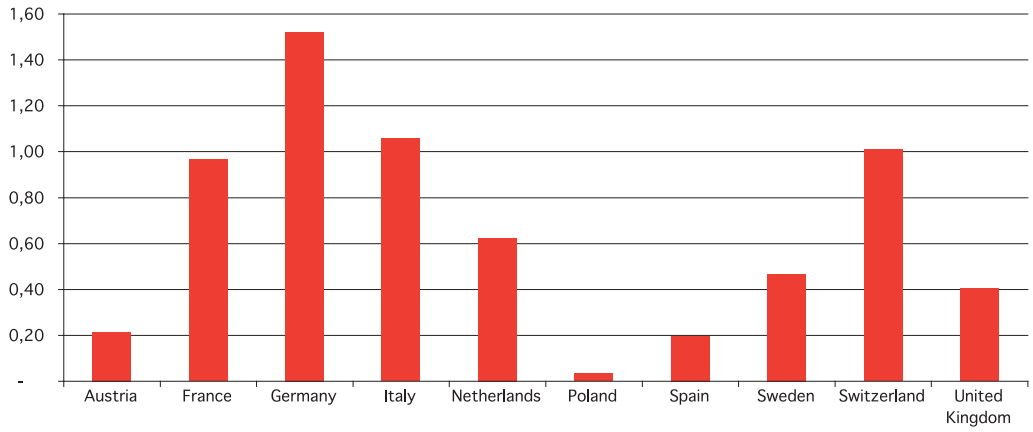
Figura 11b.4 Number of patents for medical devices in relation to population. Values per 1,000,000 inhabitants – Years 2005-2007



Source: OECD, EPO, USPTO data workups

Taking the proportion of the total number of patents (recorded in the *European Patent Office* and the *United States Patent Office*) to the number of companies in the sector as reported by *Eucomed*, for the year 2007 it emerges that in Europe Germany holds the largest number of patents in relation to the number of companies (1.52), followed by Italy and Switzerland (1.06 and 1.01) and by France (0.97).

Figure 11b.5 Number of medical device patents in relation to companies Absolute values – Year 2007



Source: EPO, USPTO and Eucomed data workups

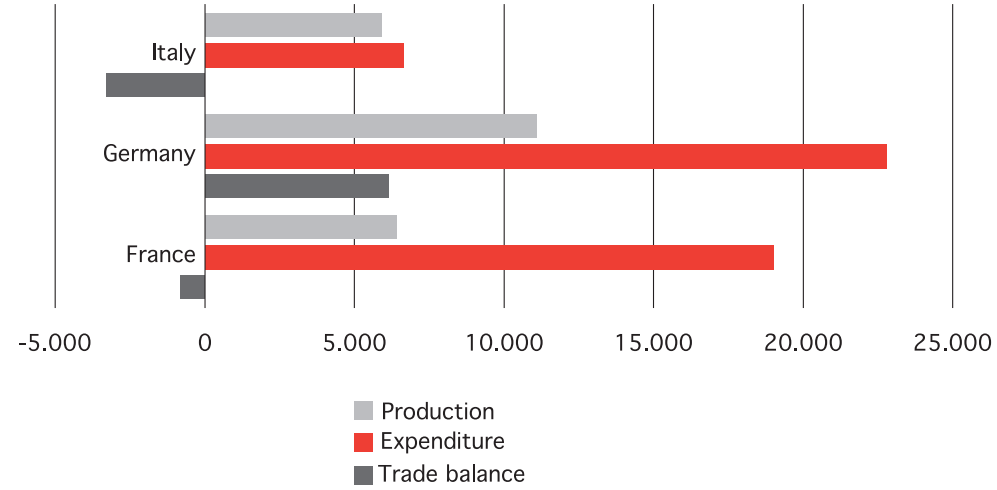
On analyzing the data on individual production sectors it appears that Germany, France, England and Holland hold the largest number of patents in sector IPC 61B *Diagnosis, surgery, reconnaissance*; Germany in IPC61C *Dental applications*; Germany, France and Switzerland in IPC 61F *Filters that can be planted in blood vessels, prosthetic devices, orthopedic prosthetics, ocular and acoustic prosthetics, first aid kit, bandages and gauzes*; Germany and France for IPC 61G *Aids for patient transport, dentists' chairs*, etc., Germany and England in sector IPC 61H, *Equipment for rehabilitation, artificial respiration*, etc.; Germany in IPC 61J *Devices for transport and administration of medicinals*, etc.; Germany, France and England in sector IPC 61K *Preparations for medical and dental applications*; Germany, England and France in IPC 61L *Devices for sterilization, surgical instrumentation, bandages*, etc.; Germany and England in IPC 61M *Devices to be introduced into the body, to conserve or administer blood or medicinals*, etc.; Germany and Sweden in IPC 61N *Equipment for magnetotherapy, ultrasonic therapy, electro-therapy*, etc; Germany, England and France for sector IPC 61P *Medical preparations*.
Unfortunately, Italy does not appear in any of the IPCs as being among the countries with the most patents.
Note that the reduction in the number of patents for the United States during the three-year period 2005-2007 came side-by-side with a reduction in the value of production.
The reduction in the number of patents in the medical sector in Europe over the past few years,

and therefore in the country's level of innovation, despite the increase in value of production, is probably to be attributed to the size of the companies in the sector, for 80% of them are small-to-medium-sized companies.
Consider too that in Italy the problem of delays in payments must be added. This problem is not aggravated in every country. Germany for example in 2009 had mean payment times of thirty days and France 65. Then comes Italy with 259 days and Greece with 500.
In Italy, where most purchasers of devices are public structures and the delay in payments to suppliers is high, the companies' lack of immediate financial availability can depress investments in Research and Development, substantially braking innovation.
Consider furthermore that in Italy, in 2008, the medical device sector counted 1,735 companies, of which however 59.9% are distributors, 29.2% Italian producers, 7.6% foreign commercial transnationals, the 3.1% Italian transnational producers and 0.4% foreign transnational producers.
Thus, the companies that see only to marketing products are in the majority.
They are mostly located in the North (53.6%), and especially in Lombardy and Emilia Romagna. Coming afterward with 25.4% are the central Regions (Tuscany and Latium) and 21% of them are in the Italian South, prevalently Sicily.
The quota of distribution companies increases as the Center (62.7%) and the South (72.7%) are approached, and the quota of Italian producers drops, accounting for only 27.7% in the Center and 25.7% in the South.

11b.4. The healthcare systems' expenditures on medical devices

Analysis of the expenditure sustained by the different countries for medical devices indicates that it is greater in the countries having a greater value of production. In 2007, according to *Eucomed* and the US Trade Commission, the United States accounted for 51% of world production and 45% of total expenditures, followed by Europe with 30% of production and 33% of expenditures, and by Japan, with 10% of production and 11% of expenditure.
These facts find their reflection at the level of the individual European countries: Germany contributes to 23% of European medical device production and has a quota of expenditure of 24% (2009), although this latter is reduced by 7.3% relative to 2005. France follows, her production running 16% of European and her expenditure 20%. Finally, England has a quota of production and of expenditure both at 13%. These last two, having, together with Belgium, increased their quota of expenditure by 4.4% and 2.5% respectively over 2005, have considerably reduced their gap with Germany.
Analysis of the data on production, expenditure and the trade balance for the year 2009 brings out that Germany is the European country having the greatest expenditure, greater than her production value, it too the highest, and anyway displays a positive overall trade balance. Finally, a picture descriptive of a situation of solidity in the sector. But France's and Italy's situations are different, they having expenditures higher than their productions, but anyway lower than the German, and have negative trade balances.

Figure 11b.6 Production, expenditure and trade balance
Values in millions of € – Year 2009



Source: EUCOMED data workup

According to *Eucomed*, Italy is the only country that looks to reduce her expenditure, a trend that could be placed in relation to the straitened circumstances of her public health budget.
In terms of per capita expenditure for medical devices, the United States shows the highest value, € 325.16; Japan follows with a per capita expenditure of € 180, and Europe (on the average) € 144. Among the European countries the differences are considerable: France's per capita expenditure is € 303.34, Germany's follows with € 278.38 and Denmark's with € 238.21. Then comes Switzerland with € 221.95 and Norway with € 220.42. In Italy, according to expenditure data reported by *Eucomed*, per capita expenditure is € 112.81, 22% lower than the European mean.
In order to estimate data, at least indicatively, concerning expenditure at the regional level, even if limited to that sustained by the public health structures, the Ministerial Economic Accounts (EA) were analyzed. Specifically, four items were identified: surgical staffs and healthcare material, prosthetic materials and materials for hemodialysis, surgical materials, healthcare and diagnostic materials for veterinary use and diagnostic materials, X-ray plates, means of contrast, etc. These items cover most of the medical devices used by the structures, but not all.
Considering the extension of the definition of medical device, introduced by the European directive 2007/47/EC to the software as well, and of the ever greater dissemination of e-Health solutions (*Clinical Health Record, Radiology Information System, Laboratory Information System,* etc*., e-prescription, remote medicine systems*, etc.) supporting clinical activities, the current structure of the EA is inadequate to measuring the effective expenditures for medical devices. For one thing, evading notice are the contributions of the acquisitions of all electromedical devices, from the large machines (TAC, PET, etc.) to the small instrumentation (electric

scalpels, electrocardiographs, etc.) which are amortized. Limiting our survey then to only the four items of the EA mentioned first, we may state that, between 2001 and 2008, healthcare expenditure for medical devices would appear to have increased by 63.5%, with a mean yearly increment of +7.3%.

Mean per capita public expenditures for medical devices obtained from analysis of the EA, in 2008, turns out to be € 73.20, it having undergone an increase of 56.2% over 2001, with a mean annual increment of 6.6%. The increase was most significant in the Regions of the Italian South (+102,8%). Next came the Regions of the Center (+50.6%) and those of the North (+38.2%). The Regions having the highest per capita expenditure were the Valle d'Aosta (€ 115.2), Tuscany (€ 102.3), Friuli Venezia Giulia (€ 97.8), the Aut. Provinces of Trento and Bolzano (€ 91.4), and Umbria (€ 97.5%). Those instead having the lowest per capita quotas were: Campania (€ 48.3), Sicily (€ 51.9), Calabria (€ 53.3) and Molise (€ 58.4).

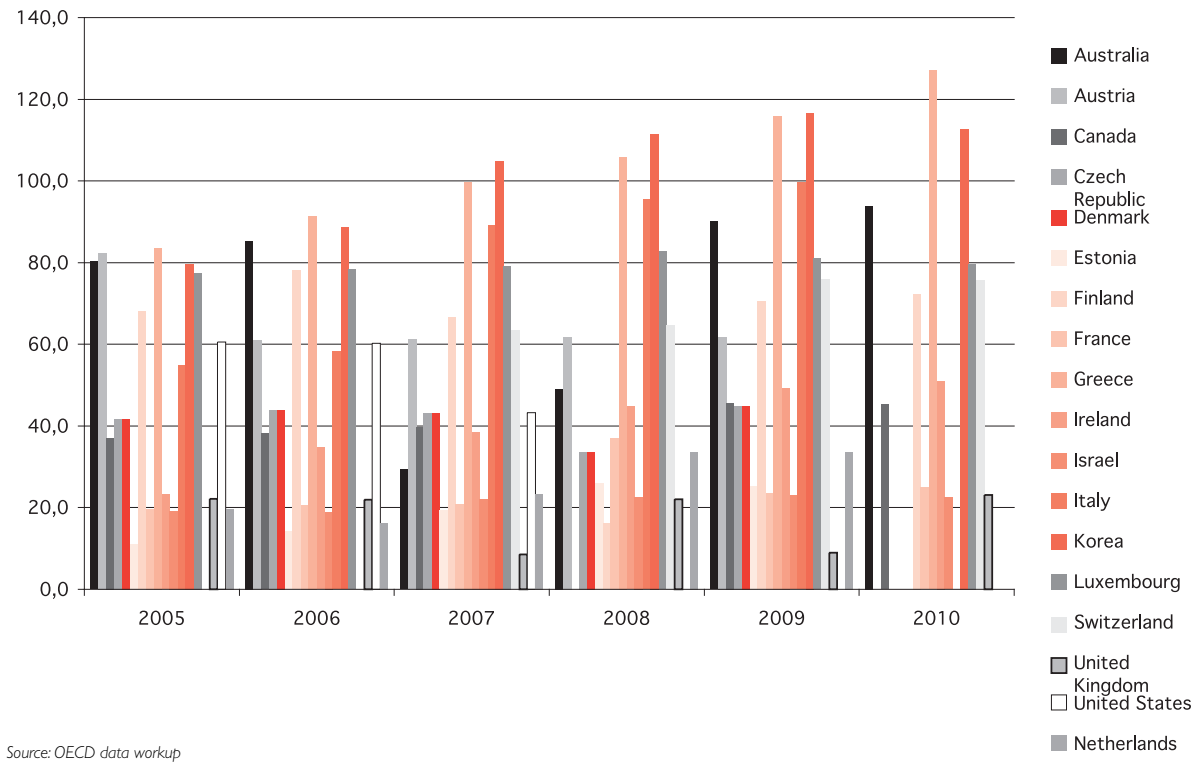
The *caveats* set forth above explain why the above per capita expenditure data for Italy is an underestimate of the real case, that, according to what was reported first, should be around € 113. In any event the lower expenditure values are found apparently in Regions having a tendency to be in structural deficit.

In 2008 expenditures for medical devices sustained by public structures accounted for 3.9% of the public healthcare expenditure for directly supplied services, having undergone a -35% reduction under 2001 (6.1%).

11b.5. The availability of big equipment items

Limiting the inquiry to only equipment items of high technological and managing complexity, such as TAC, PET, NMR and Gamma chamber, in the graph below a trend can be described, for the five-year-period 2005-2010, in the increase of supply, expressed as number of technologies available per million inhabitants.

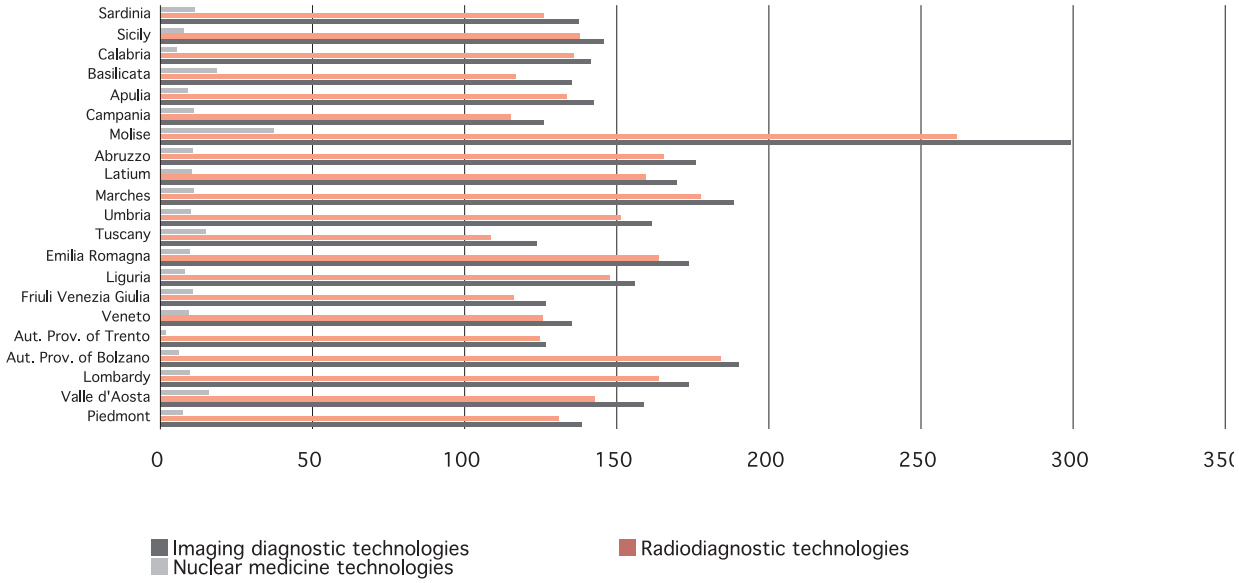
Figura 11b.7 Number of medical technologies in the world
Values per million inhabitants – Years 2005-2010



Source: OECD data workup

The regional availability of high-complexity equipment has been evaluated, but only for such equipment as the digital angiograph, the radiological group, the mammograph, TAC, PET, PET-TAC, gamma chamber, TAC-gamma chamber and NMR. These equipment items have been broken down into two macrocategories: nuclear medicine and radiodiagnostics, in order to determine their relative contribution to the total of technologies involving imaging diagnostic. In Italy 152.1 imaging diagnostic technologies per million inhabitants are available, of which 142.2 of radiodiagnostics (TAC, NMR, digital angiograph, the radiological group and the mammograph) and 9.9 of nuclear medicine (PET, PET-TAC, gamma chamber, TAC-gamma chamber). The availability of these equipment items is greater in the North and Central Regions (157.28 and 157.17 per million inhabitants) and lower in those of the South (142.51). The regional distribution, expressed in technologies per million inhabitants is set forth in the graph below.

**Figure 11b.8 Number of imaging diagnostic technologies
Values per million inhabitants – Year 2008**



Source: Health Ministry data workup

Even if the data regarding Molise is excluded, since anomalous, although it can be explained through the Region's peculiar characteristics and those of its healthcare supply, a strong variability emerges: the greater availability of these items of equipment is seen in the Regions of the northwest and center (161.9 and 157.2 per million inhabitants), then in those of the northeast (150.8) and finally in those of the South (142.5). The Molise is the Region having the highest number of technologies in relation to its population, with 299.2 equipment items per million inhabitants, followed by the A.P. of Bolzano (190.3), the Marches (188.7) and the Abruzzi (175.9). Tuscany and Campania with 123.7 and 125.9 equipment items per million inhabitants respectively are the Regions having the least number of imaging diagnostic technologies per million inhabitants.

11b.6. Conclusions

Medical devices (MD) have made a dominating entry into the discussion on healthcare policies, having attracted increasing attention over the past few years.

The medical device sector is of great industrial interest, bearer as it is of socially important innovations, with fallout on the quality of life of the population, but also in terms of incidence of public expenditures, where the MDs take a position right after personnel costs (strongly "controlled" through reiterated hiring blocks) and pharmaceutical expenditure (over the past few years the subject of continuous "cuts" in their prices, which have made their further containment difficult by now and anyway subject to discussion). This last aspect has brought it about

that the MDs too enter the discussion on containment of public healthcare expenditure.
Despite the fact that with the financial maneuver of 2011 the legislator arrived at the prudent decision to self-regulate itself, by imposing expenditure ceilings (5.2% of total expenditures) also for medical devices, the incapacity to survey the expenditure sustained by the structures for these latter, whether because of the current structure of Economic Accounts, whether because of the ever greater resort had to bidding contests for goods and services, which prevents the survey of the cost of the good by itself, represents an obstacle to the implementation of policies of expenditure restriction.
In fact then, the MD industry is largely sheltered from attempts to regulate it made by the public healthcare system. But this does not mean that it is a "winner". The conditions of uncertainty as to public control of the budgets, and then as to payment time delay etc., end up by penalizing the business anyway. The legal form of small-to- medium-sized companies, which prevail in the MD sector, unlike that of capitalized companies, typical of the pharmaceutical industry, if on the one hand it permits a greater specialization and flexibility, on the other one it heavily feels the effects of the country's economic dynamics. The growing delay in payments that Italy is undergoing is a clear example of a "brake" on growth and therefore on innovation for the companies in the medical device sector.
The penalization of the MD sector is seen in the fact that, though not undergoing cuts in prices *ex lege*, the sector displays trends that can be superposed on those of the pharmaceutical one. In any event the need appears obvious for greater attention to be paid to the sector in terms of industrial policy: in fact it appears evident from the international comparisons set forth how the growth in size of companies is an essential condition for the creation of innovation and therefore of development. And on the other hand as is seen an inverse correlation between solidity of the production sector and expenditure (which in Italy seems lower than the European average and therefore is an item of data that is not particularly critical). In other words, the more industry has a positive trade balance, the more is spent in those countries for MDs, with obvious benefits in terms of assistance. On the contrary, and Italy appears to be a paradigmatic example of this, the more the sector depends on abroad, the more restrictive are its expenditure policies (typically public), with the result of a dual loss of social wellbeing.

APPENDIX

Further remarks on assistance. "The impact on the economy: the medical-device industry"

Statistical tables that can be found on the site of the CEIS Health Report

The impact on the economy: the medical device industry

INDUSTRY
COMPANIES AND EMPLOYEES IN THE MD SECTOR
• **International data**
Companies producing medical devices
Companies producing medical devices in relation to number of inhabitants
Employees in companies producing medical devices
Employees in companies producing medical devices in relation to number of inhabitants
• **National data**
Medical devices companies
Medical-devices companies in relation to number of inhabitants
Medical-devices companies in relation to number of inhabitants – distinguished by typology

INNOVATION AND PRODUCTION
• **International data**
Value of production of medical devices in the world
Value of production of medical devices: contribution of OECD countries
Value of production of medical devices: Europe's contribution by categories
Quota of sales of medical devices reinvested in R & D
Export of medical devices
Export of medical devices: values and destinations
Imports of medical devices
Imports of medical devices: value and provenance
Medical device patents in the world
Medical device patents in the world: European patents
Medical device patents in the world: American patents
Medical device patents in the world: incidence on total patents
Medical device patents in relation to number of inhabitants
Medical device patents: distinguished by IPC sector
• **National data**
Invoiced sales of medical devices companies
Invoiced sales of medical devices companies: contribution of GMDN categories

EXPENDITURES

• **International data**

Expenditure for medical devices in the world
Expenditure for medical devices in the OECD countries
Expenditure for medical devices in the OECD countries: incidence on GDP
Expenditure for medical devices in the OECD countries: incidence on total health expenditure
Expenditure for medical devices in the OECD countries: per capita value
Expenditure for medical devices in Europe
Expenditure for medical devices in Europe: mean annual variation

• **National data**

Expenditure for medical devices in public health structures
Expenditure for medical devices in public health structures: mean annual variation
Expenditure for medical devices in public health structures by typology of goods
Expenditure for medical devices: incidence on GDP
Expenditure for medical devices: mean annual variation of the incidence on the GDP
Expenditure for medical devices: incidence on total healthcare expenditure
Expenditure for medical devices: per capita values

AVAILABILITY

• **International data**

Medical devices of high complexity in the world: availability per inhabitant

• **National data**

Highly complex medical devices: availability per inhabitant
Highly complex medical devices: availability of radiodiagnostics and nuclear-medicine technologies per inhabitant.

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The CEIS (Center for Economic and International Studies), founded in1987 by the Economics faculty of the University of Rome, Tor Vergata campus, promotes research, carries out post-university training projects, organizes seminars and conferences, and reaches cooperation agreements with other universities and national and international bodies.
Its research activities, drawing their inspiration from interdisciplinary criteria, are concentrated on the analysis of European economic integration within globalization processes, in the role of institutions undergoing economic growth. The Center gives top priority to the development of methodologies and tools for the quantitative analysis of phenomena and of economic policies. CEIS publishes the CEIS Working Papers bulletins, the quarterly magazine Labour, along with books, monographs and a Newsletter.

The CEIS Tor Vergata University Economics Foundation came into being in December 2008, drawing on the experience accrued by CEIS, Center for Economic and International Studies, based at the Tor Vergata campus of the University of Rome. Its raison d'etre is:

- to develop the Foundation's approach, founded on internationalization and interdisciplinary activities, placing the analysis of rules, technology and institutions within an economic perspective;
- to create a network structure capable of being a place of effective meeting and cooperationon on projects taken up jointly by public and private institutions, and academic and non-academic competences;
- to create procedures for the transfer of knowledge that are capable of integrating the local into the global;
- to sustain and to give impulse to the relationship between the world of research, civil society and institutions, an impulse capable of promoting innovation and sustainable development.

The CEIS Health Report, now in its eighth edition, is a project launched in 2003, with the two-fold aim of disseminating the activities of the researchers at the University of Roma Tor Vergata, in the fields of health economics, policies and management, while at the same time providing useful information in support of health policy-making, out of the convinction that governing so complex a system such as the health system requires ongoing – scientifically sound and independent – analysis and investigation.
The approach adopted in the Report is of a quantitative nature, reflecting the prevalent vocation of its authors and ensuring a strictly economic and statistical perspective.

The paper document also features the possibility of accessing all the statistical tables online, developed in support of the Report; the relevant database can be consulted at www.rapportosanita.it or via the specific links in the websites of CEIS (www.ceistorvergata.it/sanita/rapporto) or 4 Health Innovation Srl (www.4hi.it or directly at http://rs-ceis.4healthinnovation.org).

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