ITALIAN OBSERVATORY

ON HEALTH CARE

Italian Observatory on Healthcare Report 2012

"Osservasalute Tenth Report"

Health status and quality of care in the Italian Regions

Summary by *Dr. Tiziana Sabetta* and *Dr. Marta Marino*

Osservasalute Tenth Report 2012– Summary

For over 10 years, the National Observatory on Health Status in the Italian Regions has been monitoring the health status of the population and , according to scientific criteria, the state of health of the population and the impact of organizational and managerial determinants upon which, at present, the Regional Health Services are based, in order to transfer the results of the research to decision makers working in the health sector and to the national and international scientific community.

Analyzed data concerning the Italian People health status, included in the Osservasalute Tenth Report, showed that the overall health status of Italians is good, although it is necessary to stimulate the provision of preventive services and social and health policies able to ensure the maintenance and improvement of general health conditions of the population. Differences between geographical macro-areas (North versus South) are evident, both with respect to health conditions and lifestyles, to supply and quality of services. These differences reveal themselves through a lower life expectancy and lifestyles less attentive to the physical well-being of citizens living in the South than the rest of the country. With regard to the provision of services, differences reveal that the South has an endemic lack of facilities often inadequate and poorly targeted to the needs of users.

The above scenario could be worsened by the global financial crisis that has invested and continues to invest our country, impacting significantly on access to care, lifestyles and, consequently, on the health conditions and citizens quality of life, above all those with major economic problems and no family help networks.

In conclusion, it is necessary to maintain the attention of all the institutions that deal with health, at national, regional and local level, in order not to frustrate the good results obtained in terms of health and life expectancy of the population, and to reduce geographical differences that still persist in the health sector.

The report is structured as follows:

- 91 Core Indicators: describing the essential aspects of Italians' health and regional health services with the help of tables, graphs and pie charts.

- 10 Boxes: where examples of good practices in some regions are proposed in order to be adapted to other regional contexts;

- 4 In depths: where some prior issues are treated in detail and possible solutions are outlined; they are published on *www.osservasalute.it*

PART ONE – *Health and population needs*

Population – In order to assess social and health services demand and to adjust the local supply to the demographic differences, data on population dynamics have been updated (period 2010-2011) and analyzed with sections devoted to: 1) migration that, over the years, can change the nosologic and genetic heritage of populations involved, 2) fertility and 3) demographic structure of "elderly" (65-74 years) and "very old" people (75 years and older) who are the most exposed to the risk of serious and disabling diseases or dying. The indicator on the proportion of elderly people living in a single family nucleus on the total population of the same age group and the indicator on the educational level of the population have been also analyzed.

Nationally there is a growing trend in resident population mainly due to the growth of migratory component. The examined indicators showed the same trends of previous years, confirming the positive domestic net migration, primarily thanks to the attractiveness of central and northern regions, and the positive net migration in relation to other countries, which still sees the Northern and Central regions most affected by the phenomenon. The continuous flow of internal migration across the country, i.e. the outgoing flow from regions, involving mainly the southern regions (excluding Abruzzo), in particular, Basilicata, Calabria and Campania. In these regions, in fact, the internal migration balance has reached the highest negative values (respectively -3.0 ‰, -3.3 ‰ and -3.4 ‰) while regions that mainly benefited from these flows were Emilia-Romagna, Friuli Venezia Giulia, the Autonomous Province (AP) of Trento, Toscana and Lazio.

As for the total fertility rate (TFT), in 2011, the value is lower than the replacement level (around 2.1 children per woman) that would ensure the generational change. In particular, the process of recovery in fertility levels which began in 1995, when the TFT reached its minimum value of 1.2 children per woman, is due both to the foreign woman behavior and a "recovery effect" of women close to the end of fertile age. In recent years, however, this trend appears to stop.In fact, in 2011 too, the TFT remains at levels close to those recorded in recent years (1.39 children per woman). In the current year the highest values are recorded in the AP of Bolzano (1.60 children per woman), the AP of Trento (1.59 children per woman) and in Valle d'Aosta (1.57 children per woman), while regions that continue to be characterized by a very low TFT are Sardegna, Molise and Basilicata (respectively 1.14, 1.16 and 1.17 children per woman). It is important to emphasize that the reproductive behavior, recorded with reference to our country as a whole, is determined by both the behavior of Italian women and the foreign women. Specifically, the TFT for resident foreign women settled at higher levels (2.04 children per woman) in respect to women with Italian citizenship (1.30 children per woman). A light growth in terms of average age of mothers giving birth has been recorded with the national value set, in 2011, at 31.4 years. Specifically, the regional variations in the average age of mothers giving birth, which measures the pace of

fertility, appear to be relatively contained reaching the maximum value in Sardegna (32.3 years) and the minimum in Sicilia and Campania (respectively, 30.6 and 30.8 years). As noted for the TFT, once again the behavior of the female resident population is not homogeneous as the average age at birth of foreign women is lower (28.3 years) in respect to the Italian women (32.0 years). The knowledge of these fertility indicators allows a more effective organization of health care facilities such as, for example, dedicated services for monitoring of pregnancies and childbirth assistance.

Regarding the demographic structure, a characteristic of Italian people is the strong tendency to aging (one person aged 65 and over every 5 residents and almost a person aged 75 and over every 10 residents are present). In fact, the aging process is rather advanced, as the proportion of young people on the total population is extremely small, while the weight of the "old" and "very old" population is consistent. Furthermore, as for the relationship between genders, imbalance is evident for women who enjoy a higher survival. The presence of foreign residents in youth and middle age classes has to be highlighted. The region with the highest proportion of elderly, since long time, is Liguria, while Campania is the region where the population aging process is in a less advanced stage. Consequently, in these regions where the health services demand is quite different depending on the diverse demographic structure of residents, also social and health care facilities, programming plans and subsequent partition of costs could be unequal as well.

For the share of elderly people living alone, data showed that in 2010, more than 1 in every 4 old lives alone (28.1%) and women represent the majority (37.6 % vs 15.1%). This is due both to the age difference between the spouses and the higher male mortality that make women more likely to be at risk of experiencing the event of widowhood and living alone in the latter part of her life.

The last indicator refers to the level of education of the population and shows, in the period 2001-2004, an increase in the share of people with higher qualifications. This is due, mainly, to the gradual extinction of the less learned older generation.

Survival and cause-specific mortality - In recent decades, in our country we have assisted to large increases in survival. Advancements in medicine, prevention, education and the increasing adoption of healthy lifestyles have been successful in determining the reduction of the risk of death even in advanced stages of life.

In order to describe the evolution of survival, life expectancy at birth and at age of 65 were analyzed. The first indicator showed that women, in 2011 (provisional data), can expect to live, on average, 84.5 years and men 79.4 years. It is maintained, therefore, the female advantage in terms of survival, but the gap continues to shrink despite being still significant (+5.1 years for women). Between 2007 and 2011, male life expectancy increased by 0.7 years (78.7 vs. 79.4 years), while female life expectancy increased by 0.5 years (84.0 vs. 84.5). Geographically speaking, Italy shows strong differences. In both genders in fact, a 2.8 years differential between the best and the worst region is shown. As for men, the AP of Bolzano retains the record for the most longevous region, with 80.5 years of life expectancy at birth, while Campania retains the negative record with a life expectancy of 77.7 years. As for women, the situation of greatest disadvantage is registered in Campania (83.0 years) while the AP of Bolzano with 85.8 years is the most longevous region. The second indicator showed that women, at the age of 65 years, according to 2011 provisional data, are expected to live, on average, 21.9 years; for men, however, life expectancy at the age of 65 years is equal to 18.4 years. The AP of Bolzano retains also the record for life expectancy at age of 65 for man and woman (19.2 and 22.8 respectively). The most disadvantaged region, once again and for both genders, is Campania. Even for the elderly, the increase in survival is sharper in men than in women (from 2006 to 2010, increase by 0.5 years in life expectancy at 65 years for men vs. 0.3 years increase for women). The distance between the two genders, however, remains large, and most of the 5.1 years gap that separates the average length of life of women and men, is attributable to older ages (3.5 years).

Regarding the evolution of mortality beyond the first year of life, in the period 2007-2009, a slight decrease in men (111.85 vs. 109.41 per 10.000) and a situation almost stable for women (69.44 vs. 69.31 per 10.000) was observed. The analysis of mortality by age allows highlighting the risks of death at different life stages. Results of this study found that, for man, the reduction in mortality is recorded in all the age classes considered, while for woman the reduction is recorded only in the first three age classes (0-18, 19-64 and 65-74 years). Furthermore, this trend is prominent in men. The analysis of mortality has also been calculated by correlating age classes with leading causes of death that characterize those age classes.

Risk factors, lifestyles and prevention - In this Chapter the main issues related to population key risk behaviors and the possibility of reducing them have been investigated.

Smoking - In 2011, the proportion of smokers among population aged 14 and over amounted to 22.3% and kept stable in recent years. The regions where the percentage of smokers was higher were Lazio (27.2%) and Abruzzo (24.0%), while the percentage was lower in Valle d'Aosta (16.3%) and the AP of Trento (17.8%). At the territorial level, in general, there are no large differences. Smoking cigarettes was found to be more common in young adults, particularly in the age group 25-34 years (30.6%) and more prevalent among men (28.4%) than women (16.6%). Data for non-smokers and former smokers were inversely distributed in the two genders. In fact, there was a higher prevalence of non-smokers in females (65.1%) than in males (39.4%), while the percentage of former-smokers among men was almost double (30.5%) than among women (16.7%).

Alcohol - In general, in 2010, the highest consumption of alcohol was recorded in the AP of Bolzano (73.1%) and in Valle d'Aosta (72.0%), while Campania was the region with the lowest value (58.3%). Particularly, the prevalence of at risk consumers showed a marked gender difference, with disadvantage of man. This condition is registered in all the age classes considered.

Food - Data on food consumption by type were analyzed to assess the quality of the diet. The analysis proved that, in 2011 too, the proportion of people who assumed at least "5 or more daily servings of vegetables, fruits and vegetables" (5+VFV) continues to be scarce. Moreover, considering the relationship between 5+VFV and the indicators of style food, especially lunch and dinner, it is observed that where the rates of consumption of 5+VFV are higher, the percentage of people dining at home is smaller. This type of association, however, is reducing over the years.

Weight and Physical Activity - In Italy, in 2011, more than a third of the adult population (35.8%) are overweight, while one in 10 is obese (10.0%); overall, 45.8% of people aged 18 and over is overweight. A higher prevalence of overweight people is registered in the southern regions (overweight: 40.1% Campania and 40.4% Puglia; obesity: 13.1% Basilicata and 13.5% Molise).

At national level, 2011 data seem to be almost indistinguishable in respect to 2010, confirming the last 10 years positive trend. Moreover, the proportion of overweight or obese people increased proportionally with age, before declining slightly in the elderly, and was more common among men.

Being the sedentary lifestyle and the poor diet responsible for weight increase, data on physical activity have confirmed the North-South gradient. In fact, in the southern regions, the prevalence of those who claim to perform physical activity on a continuous basis was lower than in the North. Latest data (2011) showed, compared with the previous year and in both genders, a reduction of the proportion of people who practiced sports in a continuous manner and a few physical activity and an increase of the percentage of sedentary people.

Vaccination Coverage - The so-called compulsory vaccination (Diphtheria, Tetanus, Polio, Hepatitis B) coverage rates are evenly distributed throughout the Country with a national average, in 2011, of approximately 96%; nevertheless there are still some regions where coverage does not reach the target of 95% provided by the ongoing National Vaccine Plan. To be stressed is the vaccinations coverages of Measles, Mumps and Rubella, that have not yet reached the optimum value of 95% specified in the National Plan for the elimination of Measles and congenital Rubella, with the exception of Sardegna (95.8%), Umbria (94.7 %) and Lombardia (94.6%), that are very close to the minimum target set. Given that Measles and Rubella are highly contagious infectious diseases, failure to achieve the threshold of vaccination coverage can not stop the movement of the two viruses and, periodically, there are small outbreaks at the local level that affect the susceptible population.

In the season 2010-2011, the 17.9% of the population received the flu vaccine and no special regional differences are showed. In almost all regions and in all age groups considered in the study, however, a significant decrease can be observed. Specifically, in the group aged 65 and over, the vaccination coverage has decreased by about 3 percentage points from the previous season and no region, with the exception of Umbria (77.2%), reached the minimum target of 75% expected for the elderly.

Cancer Screening - The examined indicators, relating to mammography, cytology, and colorectal screening, concern both the programs dissemination (existence of the program) and the ability to invite and the levels of participation (program operation). In 2010, the "theoretical extension", i.e. the proportion of target population that lives in an area where there is an active screening program was 92% for mammography, around 80% for cervical cancer screening and around 66% for colorectal screening for both gender. The "actual extension", i.e. the proportion of target population that has really been invited, settled at 69% for mammography, 68% for cervical cancer screening and 51% for colorectal screening. The differences between the "theoretical extension" and the "actual extension" are due to the fact that the operational phase and the invitation phase are more complex. Moreover, comparing 2010 data with previous years, a slight decrease in the data for screening mammography can be observed, while there is a slight increase in the extension of screening for cervical cancer and a more marked increase for colorectal cancer screening.

Accidents - The monitoring of indicators regarding road, work and home accidents is of outstanding importance, not only considering the relatively high mortality, but also the temporary or permanent invalidity.

The phenomenon of road accidents, which has a downward trend, represents a major public health concern for which, both social and economic costs, are enormous. The predominance of males mortality rates compared to the females' has to be highlighted and at regional level, the highest total rate in 2009 was recorded in Trentino Alto Adige (1.04 per 10,000).

Analyzing accidents and mortality at work, regional differences are evident. The accident rate is higher in the North (the 2009-2011 average for the AP of Trento was 8953.01 per 100,000), and the fatal work related accidents are higher in the South and Islands (2009-2011 average for Molise was 13.18 per 100,000).

With regard to domestic incidents, the most affected are women, children and the elderly, ie those who spend more time at home. Among children up to 6 years old, accidents prevail among male, while later in life women are the most involved, both for a greater permanence at home and for a more frequent contact with at injury risk objects, tools and household electrical appliances (stab or burn wound form etc.). Among women, generally the most exposed population group is represented by housewives. As women, the elderly (> 74 years) are also at risk. No territorial gradient is present and, in 2010, domestic accidents involved 805.000 people.

Environment - Among several factors that may affect human health, a key role is played by the environment. In order to characterize the relationship between urban solid waste and health, indicators related to solid waste were examined. In order to describe the potential risk in the population due to urban solid waste, the amount of separate collection/recycling has been investigated, and, in 2010, it continued its increasing trend and reached a percentage equal to 35.3% of the total municipal solid waste production (+1.7% compared to 2009). Northern regions, where the separate collection system had been highly implemented for several years, kept the record of the highest percentage of recycling municipal solid waste products, rising from 48.0% in 2009 to 49.1% in 2010 (+1.1 percentage points). The Centre, however, from 24.9% in 2009 to 27.1% in 2010, recorded the largest percentage increase (+2.2 percentage points), while the South and the Islands increased from 19.1% to 21.2% (+2.1 percentage points). Particularly virtuous appear the AP of Trento (60.8%), Veneto (58.7%), the AP of Bolzano (54.5%) and Piemonte (50.7%) who achieved the target of 50 % set by the law for 2009. Very close to the target is also the Friuli Venezia Giulia (49.3%).

The analysis of fine particulate pollution show a so strong heterogeneity that a valid comparisons is not allowed, because the regional monitoring stations, despite the increase compared to previous years (PM_{10}: from 457 in 2008 to 543 in 2010, $PM_{2,5}$: from 76 in 2008 to 140 in 2010), are insufficient and have a non-uniform distribution throughout the country. That said, the 2010 data, covering both the daily average concentrations (PM_{10} and $PM_{2,5}$), and the average number of days exceeding the limit value for particulate matter (PM_{10}), show an improving trend.

Cardiovascular and cerebrovascular diseases - Cardiovascular and cerebrovascular diseases are one of the most important public health problems. In fact, they are among the leading causes of morbidity, disability and mortality since, those who survive an acute form, become chronic patients with significant impact on quality of life and economic and social costs that society has to face. Cardiovascular diseases are also considered among the major determinants of aging related diseases, resulting in physical disability and impaired cognitive ability.

Hospitalization rates for ischemic heart diseases and cerebrovascular diseases showed a marked gender difference resulting higher in men. Specifically, in 2010, ischemic heart diseases rates in men were more than twice those of women, while as for cerebrovascular diseases rates were greater than about 38%. The highest hospitalization rates for ischemic heart diseases were found in Campania for both genders (1301.6 per 100.000 in men, 468.6 per 100.000 in women), while for cerebrovascular diseases, Campania for men (820.8 per 100.000) and the AP of Bolzano for women (677.9 per 100.000) presented the highest values. Overall, for these groups of diseases as a whole, the downward trend continues.

Mortality due to ischemic heart diseases, in 2009, almost hit twice as many men than women (14.07 per 10.000 in men, 7.79 per 10.000 in women) and at regional level, the negative record was held by Campania for both gender (17.13 per 10,000 in men; 10.43 per 10,000 in women). The most virtuous regions, however, were Sardegna for males (11.81 per 10.000) and Valle d'Aosta for females (5.34 per 10,000). It has to be highlighted the decreasing trend in both genders and the increasing rate by age groups. In fact, in men group the mortality rate increased from 3.09 (per 10,000) in the age group 45-54 to 114.53 (per 10,000) in aged 75 and over, while in women the rate increased from 0.55 (per 10,000) in the age groups 45-54 years to 87.52 (per 10,000) in aged 75 and over.

Metabolic diseases – Diabetes has been representing, for years, one of the major health issues for its considerable economic and social impact.

With regard to hospitalization, southern regions and islands showed higher discharge rates compared to the national average (77.00 per 10,000) for both types of admission (Ordinary Admission-OA and Day Hospital-DH), while central and northern regions held lower rates. Considering separately the admission types, it has to be emphasized that a high rate of DH admissions may not necessarily represent a bad territorial care, but rather be due to a particular organization of care for diabetic patients. Compared to previous years, the declining trend was confirmed probably thanks to an overall quality of care improvement at local level. As for the distribution by gender and for both types of hospitalization, rates were higher in men.

One of the major chronic complications of diabetes mellitus is the amputation of the lower limbs. In fact, in the period 2001-2010, 60.7% of people who annually undergo surgical amputation are affected by diabetes. In this period, the discharge rate for amputation has increased (12.0 vs. 13.3 per 100,000). Particularly, with regard to major amputations the trend observe a slight reduction (4.3 vs 3.7 per 100,000), while interventions for minor amputations are facing a growing trend (7.1 vs 9.2 per 100,000). Moreover, the discharge rate increases with age in both genders, in all age groups and it is more common among men. At regional level no spatial gradient was observed.

Health and disability - Aware that an effective planning of social and health care systems can be realized only through a correct understanding of the size of the population who, potentially, refer to them, some indicators regarding disability have been updated, confirming a spatial heterogeneity favored by the absence of national standards.

With regard to economic aid, those provided by the informal network are confirmed to be wider disseminated at national level. The proportion of families who receive this type of support is 21.5%, although a decrease of nearly 10 percentage points is registered comparing to 2003. The aids provided by the formal network, whether public or private, also decreased: only 13.1% and 12.0% of families with at least one member with a disability respectively receives help from the private or public formal network, compared to an average of 15.3% recorded for both kind of help in 2003.

The low use of formal and informal support may be due to the economic situation of our country, with local authorities having limited financial resources and a lower use of the caretaker.

Regarding the expenditure of municipalities and associations for social welfare, in 2009 there was an increase of 5.1%, if compared to the previous year. At the regional level, with some exceptions, the analysis of social expenditure shows a North-South gradient with higher values in the North. This high variability may be partly due to a real difference in the allocation of Municipalities resources, also reflecting different organizational and delivery of services mix chosen by the individual municipal policies.

A slight increase (+1.9%) in 2009 and over the previous year, was also recorded for the municipalities and associated Entities expenditure designed for home care social welfare, for vouchers, checks for care , social health vouchers and residential facilities.

The last indicator analyzed concerns professionals made available by the Local Health Authorities and Local Authorities to promote the integration of students with disabilities. The most commonly used in schools is the cultural teaching assistant followed by a communication facilitator, the volunteers and the communicator for the deaf.

Mental health and addictions - Diseases that were examined in this chapter are important issues for public health because of their severity and frequency.

On the whole, the number of hospitalization rate for mental diseases shows a general lower trend in the years (men: -14.4% registered from 2003 to 2010; women: -12.7% registered from 2003 to 2010). Although the situation is generally improving, differences among regions still remain very high. Moreover, considering the hospitalization rate by main areas (North, Central, South and Islands regions), no substantial differences are remarkable and the rates higher than the national average are observed both in the northern regions than in the South.

Among chronic conditions, we calculated the discharge rate for alcohol related illnesses that in the period 2007-2010, showed a reduction (8.49 vs. 7.44 per 10,000); the discharge rate was higher in males and according to age distribution, for both genders, age group 55-64 years was the most interested by this chronic condition.

As for the antipsychotic drugs consumption (2.80 vs. 2.51 DDD/1.000 inhabitants day), in 2011, a decrease in their use over the previous year was found, confirming, thus, the continuous decrease observed since 2001, apart from the light increase registered in 2009. A North-South gradient is present with some southern regions (Abruzzo, Sicilia) showing high values compared to the national rate. In contrast, antidepressant drugs consumption increased in all regions equally. This trend may be attributable to several factors such as the use of this class of drugs for milder forms of depression (anxiety and depression) or not strictly psychiatric disorders such as the pain therapy. North-central regions, especially Toscana and Liguria, but also AP of Bolzano, Emilia-Romagna and Umbria, appeared to have a significant higher consumption in respect to those of the South; the only exception is represented by Sardegna where consumption is close to that of northern regions.

Finally, the suicide rate has been calculated and it can be read as an indicator of discomfort and lack of social integration and cohesion. In the period 2008-2009, the annual mortality rate due to suicide was equal to 7.23 (per 100,000) residents of 15 years and over and in 77.0% of cases the one committing suicide was a man. It is important to emphasize that the distribution of rates by age showed an increase proportional with age, for both genders, with a marked increase, especially for men over 65 years, reaching the maximum values in the older age groups. For women, however, the suicide mortality rate reaches the highest value in the age group 65-69 years and then decreas in older age groups. The indicator also showed a quite marked geographic variability with rates generally higher in northern regions. With regard to the trend, after the historical minimum reached in 2006, there was a new upward trend in recent years, mainly focused on men aged 25-69 years.

Mother and child health - Mother and child health is an important part of public health as pregnancy, childbirth and the puerperium are, in Italy, the leading cause of hospitalization for women.

With regard to the supply network of birth centers, which is significantly diversified throughout the country, data examined show that more than 7.37% of births in 2010, took place in birth centers with an activity volume of <500 deliveries per year, i.e. those centers where the activity volume is not considered satisfactory in order to ensure an acceptable quality standard to the hospital perinatal care. The analysis of this phenomenon, not considering specific regional situations such as Valle d'Aosta and the AP of Trento and Bolzano, showed a clear North-South gradient to the detriment of the southern regions that have values significantly above the national average.

One of the most alarming data regards the proportion of caesarean sections even if, from 2007 (39.29%) to 2010 (38,71%), a slight but continuous decrease was found. The positive trend is due, on the whole, to the reduction of primary caesarean sections. However, the trend of the repeated caesarean sections is different, with an increase of 1.69% in 2010 over the previous year. Data showed a marked interregional variability with values tending to be lower in the north (Friuli Venezia Giulia 23.99%) and higher in the South (Campania 61.72%).

In 2010, Neonatal Intensive Care Units were present in 124 out of the 528 birth centers taken into consideration and 102 of these were located in birth centers where at least 1.000 deliveries per year take place, 12 in birth centers where 800-999 deliveries occur annually and 10 in birth centers with less than 800 deliveries per year. This

may determine that infants at high risk of death are provided with a qualitatively not adequate care and, secondly, an improper use of resources and technological expertise.

The last indicator examined concerns the Medically Assisted Procreation and the presented data refer to the 2010 activity, that is all cycles started with a stimulation or a thawing in the period between 1 January and 31 December 2010. In our country, 20.9 per 1,000 live births is born from pregnancies obtained with the application of artificial insemination procedures. This rate is slightly increased if compared to 2008 (20.1 per 1,000). Also crucial, referring to the security of techniques, is the reduction that has been observed of triplets, a fundamental requirement to bring the Italian centers to the same safety standards that are found in other European countries.

Immigrants and Health - Data analysis regarding the presence of foreigners in Italy shows that, at 31/12/2010 the relative weight of foreigners out of the total residents is 7.5%. The incidence of legitimate foreigners showed an increasing trend and varies across the country with higher rates in northern and central regions and smaller rates in the South. The largest communities, for both genders, are represented by Romanians, Albanians and Moroccans.

It has to be noted the steady increase over time of child-births either with one or two foreign parents. In particular, children born with foreign mother regardless of the nationality of the father represented the highest proportion of births. Regional differences are considerable and follow the territorial distribution of foreigners throughout the country. Therefore, the incidence of foreign births is higher in the North of the country, and in particular in Emilia-Romagna, Veneto and Lombardia. In these regions the proportion of births with foreign mother and father is higher than 22.0%. In contrast, in almost all southern regions, the proportion of births with at least one foreign parent is not only lower than the national value (13.6%), but extremely moderate.

Among infectious diseases, we analyzed the incidence rate of AIDS, tuberculosis and viral hepatitis. During the period 1992-2009, the proportion of AIDS cases diagnosed in Italy to foreigners increased from 2.6% to 24.5%. This increase, however, does not depend on a worsening of the epidemic, but on the increase of the immigrant population, since the incidence rates trend is steadily declining. Even concerning the incidence of Tuberculosis (TB), analyzed data show that in our country over the past 10 years, the number of cases in foreign-born people has increased significantly, simultaneously with the increase of their number. In fact, from 2003 to 2009, the number of TB cases registered in citizens born abroad rose from 37% to 48% of the total reported cases. Finally, relatively to the viral hepatitis, the same situation as the previous indicators is observed, i.e. an increase in the years (2004: 10.9%; 2010: 17.9%) and, depending on the type of hepatitis diagnosed in foreigners, more than 81% of cases are attributable to virus A and B. Hepatitis C, however, represents only 4% of cases among foreigners, compared with nearly 9% in the Italians.

With regard to the area of maternal and child health of foreign women, Voluntary Interruptions of Pregnancy (VIP) are increasing, also as a result of the growing foreign population size, and the age group 20-24 years is more involved. Even in this case, regional differences are significant and closely follow the spatial distribution of foreign presence in the Italian area. In fact, the regions with a higher proportion of VIP are, in general, those with a higher percentage of foreign women residents and vice versa. This increase (21.2% in 2003, 30.0% in 2009) leads to make considerations on prevention activities that increasingly need to reach this women group, often more disadvantaged than others in the use of health services.

In order to assess the impact of migration on hospital services, the immigrants' hospitalization rate has been calculated and in 2010, amounted to 5% of the overall hospitalization. Obviously, the geography of hospital discharges is strongly determined by the different foreign presence across the territory (more consistent in the Centre-North and less consistent in the South). With regard to gender, women showed a greater hospitalization rate than men mostly for reasons associated with reproduction (pregnancy, childbirth, and voluntary abortion).

Immigrant mortality rate was calculated to measure the immigrant population health status; regional values, therefore, reflect in 2009 the distribution of the foreigners across the whole territory and are higher for men (19.51 vs 11.14 per 10,000).

Last indicator examined on the infant and neonatal mortality show that, in the period considered (2005-2009), the mortality rate 0-29 days, both for Italians and foreigners, decreased until 2008 and then slightly increased in 2009 (Italian: 2.5 per 1,000 live births; foreigners: 2.7 per 1,000 live births), while the mortality rate <1 year shows a trend for foreigners equal to the neonatal mortality however, for the Italians, decreases from 2005 to 2007 remaining stable until 2009 (Italian: 3.3 per 1,000 live births; foreigners: 4.0 per 1,000 live births). Analyzing regional differences, is evident the disadvantage of the South, even though in some regions of the Centre and North there are higher values than the national average.

PART TWO – *Regional Health Systems and quality of services*

Economic-financial framework - In this chapter, traditional indicators on expenditures and deficit were presented.

The current public health expenditure as percentage of Gross Domestic Product (GDP) shows an increasing trend from 2003 to 2009, changing the value from 6.09% to 7.22%. At regional level the indicator showed significant differences ranging from a minimum of 5.42% of Lombardia to a maximum of 11.02% in Molise. Clear, then, is the

North-South gradient with the southern regions that have an expenditure relative to GDP higher than the national value, while the regions of the Centre-North, with the exception of Liguria and Umbria, have an expenditure to GDP less than the Italian value.

The indicator regarding per capita public health expenditure showed, at national level and between 2010 and 2011, an increase rising from € 1.831 to € 1.851 (+1.09%), also increasing from 2005 (12.59%). At regional level the expenditure per capita ranges from a minimum value recorded in Calabria (1.704 €), to a maximum value in the AP of Bolzano (2.256 €). In general, in respect to the previous year, northern regions, except for Piemonte and Marche, increased per capita expenditures, while southern regions reduce per capita expenditure, except for Sardegna, Abruzzo, Basilicata and Sicilia.

In 2011, the NHS confirmed to be in deficit (29 € per capita) showing a trend of steady decline. Compared to previous years geographical differences are still considerable with a North-South gradient to the detriment of the southern regions where most of the deficit is concentrated. Specifically, all the central and northern regions have a positive result, with the exception of Liguria, while all the regions of the Centre-South are in deficit, with the exception of Abruzzo, although many of them have, in recent years, significantly reduced their losses. The most critical situations are still occurring in Lazio (152 €) and Molise (123 €).

Institutional and organizational structure - In this Chapter, economic and financial aspects regarding the human resources that play a crucial role within the National Health Service (NHS) and the availability of technologies have been investigated.

In 2007-2010 per capita expenditure at national level has grown by 6%, rising from € 571.6 to € 606.9. This difference has been recorded in almost all regions, with the exception of Lazio, Molise, Campania, Calabria and the AP of Bolzano. In general, the major expenditures were found in all regions with a special status (the AP of Bolzano and Trento, Bolzano e Trento, Valle d'Aosta and Friuli Venezia Giulia), while regions with lower per capita expenditures were Lombardia, Puglia and Lazio.

The analysis on the age structure of NHS employees showed that nationally, in 2010, the staff was composed mostly by people aged between 40-59 years. Data also showed that the percentage of people aged ≥ 60 years was higher than the one aged <30 years and geographical distribution showed a marked North-South difference. In fact, in the North of the country the percentage of employees aged <30 years is higher, while in the South the component of staff aged ≥ 60 years prevailed (particularly in Campania, Molise and Calabria). Analyzing the demographics of employees it is important to emphasize that 64.1% of staff was represented by women, 35.9% by men and female staff was younger.

With regard to the turnover compensation rate, which is a flow indicator whose calculation is crucial in human resources planning, data of 2010 showed a strong North-South regional gradient, with Central and Northern region showing higher rates than Southern regions.

With regard to the technologies area, we calculated the availability of CAT (Computerized Axial Tomography) equipment, MRT (Magnetic Resonance Tomography) and PET (Positron Emission Tomography). Obvious is the limited diffusion of PET and a greater spread of CAT over MRT at national level and, in particular, in the Centre-South. Furthermore, as regards the number of devices per million inhabitants, the data show an increase, but they are not distributed and usable by the population homogeneously throughout.

Local and community care – This area includes a series of services to communities that are developed in a predominantly outpatient context. Indicators refer to fragile/not self-sufficient and chronic patients' management.

In general, the number of patients treated in an Integrated Home Care setting (HCs - in Italian ADI) is growing as, in 2010, an increase of 11.7% compared to 2009 was found. There remains, even comparing data with previous years, a considerable variability of the indicator related to regional heterogeneity. A minimum rate of 141 patients assisted in HCs (per 100,000) was found in the AP of Bolzano and a maximum rate of 2.867 patients assisted in HCs (per 100.000) in Emilia-Romagna, followed by Umbria and Friuli Venezia Giulia (respectively, 2.030 and 1.820 per 100,000). It is remarkable the difference in terms of percentage of HCs treatments for terminal patients between central regions (the maximum rate, 107.4 per 100,000, is registered) and Northern/Southern and Island regions (respectively 79.7%, 87.7% per 100,000).

In terms of supply, the number of beds destined to disabled and elderly users, in 2010, is equal to 567.8 (per 100.000). Most of these beds are specifically dedicated to elderly people (484.3 per 100.000), while only residual portions are intended for disabled users aged <65 years (83.5 per 100.000). The territorial analysis showed that the highest number of beds for the elderly was in Valle d'Aosta (1387.2 per 100.000) and the lowest in Campania (125.6 per 100.000), while as for the number of beds dedicated to people with disabilities aged <65 years the highest rate was recorded in Liguria (147.2 per 100.000) and the lowest in Puglia (45.1 per 100.000).

With regard to residential nursing houses, around 84.0% of total guests are elderly people and, in most cases, not self-sufficient. Nationally, the rate of institutionalized not self sufficient elderly guests is equal to 1727.8 (per 100,000) and higher values are recorded in the North of the country, while in the southern regions rates appear to be significantly lower, excepted for Molise. The North-South dichotomy is also evident in relation to the institutionalization of minors and disabled adults. This regional variability, indicating a greater use of institutionalization in the northern regions, is due to the geographical distribution of residential nursing houses supply.

Concerning chronic patients management, indicators on discharges due to potentially avoidable hospitalizations for diabetes mellitus, Chronic obstructive pulmonary disease (COPD) and cardiac insufficiency were defined. In 2010, as for diabetes mellitus, the lowest rate was registered in Central and Central-Southern regions, followed by the Northern and Southern regions; as for the COPD, however, smaller values are observed in the regions of the Centre-North, while the community care for heart failure shows no geographic trend. This year, indicators for potentially avoidable hospital discharge, in children, for asthma and gastroenteritis were also included. As for asthma, in the period 2008-2010 a slight decrease is recorded (0.60 vs. 0.52 per 1,000) and the risk of hospitalization is higher in the age group 1-4 years. In contrast, over the same period, the rate for gastroenteritis increases (2.40 vs. 3.96 per 1,000) and the risk of hospitalization, as for asthma, is greater for the lower age groups. In fact, stratifying by age group, it can be noticed that hospitalization rates decreased with increasing age, both nationally and in each singular region, most affected age groups are 0 and 4-11 years.

Pharmaceutics - In Italy, the NHS drug delivery occurs primarily through two channels: local/territorial pharmaceutical care and hospital pharmaceutical care. At national, regional and local health authorities (LHA- in Italian ASL) level, drugs consumption provided by the Regional Health Service is constantly monitored by a specific information system capable to produce the latest information on consumption and expenditures of each type of drug delivered. This monitoring system, active since 2000, places Italy among the most advanced European countries capable of monitoring in an analytical way and real time, the evolution of pharmaceutical consumption and expenditure.

The local pharmaceutical consumption show a light increase, and in 2010 the increase was equal to 1.2% over the previous year and 42.9% over 2001. At national level, in terms of consumption, the prescription of defined daily doses (DDD) was equal to 963 (per 1.000) and higher values were recorded in the Centre-South of the country. Stratifying data by age was important to emphasize that elderly (75 years and over) consumed, on average, a quantity of drugs 19 times higher than adults aged 25-34 years. Furthermore, the consumption analysis showed that the most prescribed drugs were those acting on the cardiovascular system (47.1% of the total drug consumption).

In 2011, territorial pharmaceutical expenditure at the expense of the NHS fell by 5.0% compared to 2010 and by 2.7% compared to 2001. This decrease is probably due to the increase in availability and use of out of patent drugs. Even in the case of expenditure, data analysis on drugs prescription by age group showed that an enrolled patient of 75 years and over has a higher per capita expenditure level of about 13 times the one of an individual aged 25-34 years. Age is indeed the most important predictive determinant of drug use and the elderly have a high probability of taking more than one drug at the same time, increasing the possibility of harmful interactions between different active principle. Clear is the North-South gradient at the expense of southern regions, except for Basilicata, that maintain higher expenditures in respect to the national average (€ 204.3).

The consumption of generics/out of patent drugs, from 2002 to 2011, increased from 14.0% to 55.7%. In parallel, during the same period, the expenditure increased from 7.0% to 32.2% and Toscana is the region presenting the largest increases, both in terms of usage (+49.4%) and expenditure (+32.8%).

With regard to ticket spending and cost sharing sustained by citizens, if compared to 2010, in 2011 an increase by 34% (national value 22,1€ per capita) has been noted.

The analysis on antibiotics consumption at the expense of the NHS showed a wide regional variability with significant differences in the use of these drugs between North and South of the country, and the highest consumptions are observed in the extreme age groups (0-4 years and> 55 years), generally considered frail age groups. Campania is the region presenting the highest consumption (31.7 DDD/1.000), while the AP of Bolzano the lowest (12.7 DDD/1.000). In addition, the consumption of antibiotics have increased steadily during the period 2001-2009, while, starting from 2010, the trend in consumption begins to show a trend reversal. In 2011, domestic consumption showed a decline by 2.2% compared to 2010, and 7.0% compared to 2009. This trend is common in almost all regions.

In this chapter we have also included the indicator on antibiotics consumption and spending in hospital. In 2010, the value of national consumption of these drugs in hospitals is equal to 6396 (DDD/1.000 inpatient admissions) and there is a wide variation between regions. In addition to total consumption, strong regional differences are observed also in the consumption of the various therapeutic classes. Specifically, the 3/4 of the total consumption of antibiotics in public facilities is represented by penicillins (36%), quinolones (21%) and cephalosporins (17%). With regard to expenditure on antibiotics, the value is approximately € 30,000 nationally. Even in this case, there is a wide variability between regions and 84% of the total expenditure is represented by other antibacterials (38%), by quinolones (28%) and other beta lactam antibacterials (18%).

Hospital care – In order to monitor changes and compare results and current trends in the different regions in relation to the objectives set by the national planning, we analyzed a series of indicators on the demand met by the hospital network, the productive efficiency of healthcare facilities and the organizational and clinical appropriateness.

The picture that emerges by analyzing the hospitalization rates confirmed the downward trend of hospitalization in both modalities: Ordinary Hospitalization (OH) and Day Hospital (DH). Specifically, the 2007-2010 time analysis evidenced a 11.0% overall rate reduction, a 8.3% reduction for the OH modality of treatment and a reduction of 16.8% for DH admissions. In 2010, the overall standardized hospitalization rate at national level was equal

to 172.4 (per 1.000), 122.2 (per 1.000) of which were attributable to OH and 50.2 (per 1.000) to DH. In general, Southern regions showed an overall hospitalization rate higher than both the national average and, concerning some regions, the mandatory standard (180.0 to 1.000), while Central-Northern regions showed a lower rate, with the exception of Lazio, Liguria, AP of Bolzano, AP of Trento and Valle d'Aosta. It must be underlined that all regions overcame the standard reference rate (36 per 1.000) set for DH (29.1% of the total), with the exception of Lombardia.

The downward trend is also confirmed for the indicators referred to acute discharges. Furthermore, stratifying data by age, high hospitalization rates were noted in the "extreme" age groups, and at regional level there is a considerable variation at the expense of the southern regions, presumably due to the different design of hospital networks and territorial outpatient services. Essentially stable, however, are the rehabilitation and long-term care admissions.

Among the indicators concerning the demand met by hospital network, hospital discharge rates by type of Diagnosis-Related Group (DRG), appearing in decrease, were also examined. This analysis showed that, in 2009, the discharge rate for medical DRG was equal to 95.1 (per 1.000) and specifically, 26.3 (per 1.000) were DH discharges and 68.8 (per 1.000) OH discharges. The data analysis showed a clear geographical gradient, for both the OH and the DH, with much higher rates in southern regions and island and lower rates, with few exceptions, in central and northern regions. Discharge rate for surgical DRG, instead, was equal to 68.8 (per 1,000), of which 22.3 (per 1.000) under the DH modality and 46.5 (per 1,000) as OH. Compared to medical DRGs, the regional data in the discharge rate for surgical DRGs, for both the OH and the DH, do not show a defined geographical gradient.

Analyzing the indicators on healthcare facilities productive efficiency, from 2006 to 2010, the preoperative average length of stay (DMPO in Italian) faced a small reduction (2.00 vs. 1.88 days) and the highest values, also above the national average, were recorded in Lazio, Liguria and in all southern regions, with the exception of Abruzzo that has a given value in line with the national one. Furthermore, stratifying data by gender, the preoperative average length of stay was found to be higher in men than women.

Among the indicators on organizational appropriateness, discharges with medical DRG from surgical units were calculated and amounted, in 2010, to 33.3%. This indicator showed, since 2006, a slight but steady decline. Data indicate a high regional variability and a clear geographical gradient with all regions of the South and the islands having inappropriate discharges above the national value. The region with the lowest percentage was Piemonte (24.7%), while the highest value was recorded in Calabria (48.3%).

In order to evaluate hospitals organizational appropriateness, the utilization of DH modality for DRGs at risk of inappropriateness was quantified. In 2010, the percentage of hospitalizations in DH modality was, nationally, equivalent to 48.1% with a range going between 65.0% of Liguria and 32.1% of Veneto. According to the spatial distribution the regional variability is uneven and no geographic gradient is present.

Other indicators related to the hospital admissions in DH and Day Surgery (DS) modality have been considered as well as hospitalizations in DS and "One Day Surgery". In 2010, in terms of number of admissions, the national values were equal to 3.79 admissions in DH and 1.60 in DS. The regional distribution shows a greater variability in medical procedures, affected by both the kind of treated disorder and the different administrative modality. It must be noted, however, the misuse, sometimes abuse, of DH modality for activities that could instead be performed in the outpatient setting. With regard to hospitalizations, in 2010, the percentage of hospitalizations in DS regimen in respect to the total diurnal hospitalizations showed a decrease in respect to the previous year and stood at 45.54%. The regional variation was particularly significant and denoted a different use of hospital care schemes. In general values appear to be higher in the Centre-North of the country. Even "One Day Surgery" discharges, that at national level represented 18.90% of the total hospitalizations in the ordinary regime, showed a high variability at regional level.

The last indicator analyzed, used in order to assess the organizational and clinical appropriateness, concerns the interventions for hip fracture performed within 48 hours in patients aged 65 and over. In the period 2001-2010, the percentage of interventions performed within 2 days after admission showed a slight increase (31.2% vs. 35.1%), but these percentages are still too low compared to those recorded in other Western countries and validated by the literature. At regional level there is a marked variability ranging from 86.6% of the AP of Bolzano and 16.1% of Sicilia.

Transplants – The selected indicators monitored organ donation and procurement, transplantation activities and evaluation of outcomes.

Regarding the donation activity, the North-South gap is particularly sharp even if no epidemiological reasons could explain this phenomenon. In general, the two main factors influencing the success of the donation process are, apart from the clinical suitability, the ability to identify the potential donor throughout the care process and the "system" ability to positively impact on the percentage of opposition to donate. In 2011, the highest levels of used donors were recorded in Friuli Venezia Giulia (35.6 per million population-PMP), followed by Toscana (33.3 PMP), while lower values are observed in Molise and Basilicata (respectively, 6.3 and 6.8 PMP).

The regional gap between the Centre-North and South continues to be both in the graft activity and in the transplantation centres distribution by type of organ; this gap generate patients mobility towards the northern regions, as evidenced by the percentage and the number of transplants performed on subjects coming from a different region. In particular Emilia-Romagna is the region with the highest percentage of extra-regional transplants (46.2%).

As for the outcomes evaluation, data on patient and graft survival at 1 and 5 years after transplantation were examined. It is important to emphasize that the differences in survival are due to different types and complexity of the transplant. Particularly, percentage of patient survival at 1 year for heart and liver transplants is over 80% (respectively 83.6%, 85.9%), while for kidney the recorded value is 97.1% and for bone marrow is 57.7%.

Avoidable mortality – Greatly interesting for the NHS evaluation is the indicator on avoidable mortality amenable to health care, that is premature deaths not occurring in the presence of effective and timely care, or deaths attributable to conditions usually managed by diagnostic and therapeutic interventions and/or effective secondary prevention. This indicator allows to report at risk situations, to study possible remedial actions and timely verify their success.

The analyzed data show, between 2006 and 2009, a slight rate reduction (63.86 vs. 61.69 per 100,000) and higher values in men than women. In general, at the regional level, Calabria, Campania and Sicilia are the regions with the worst performance during all the years considered.

Assessment of certain dimensions of health performance - The dimensions considered for the performance assessment are the efficiency, appropriateness, effectiveness and satisfaction and accessibility.

For the efficiency, the indicator only refers to the ability of regional governments to maintain balanced budgets. With respect to this particular dimension, the most virtuous are essentially the Centre-North regions, with some exceptions (Liguria, Lazio, Marche and Piemonte show low or medium-low levels).

For the appropriateness, the northern regions show the highest levels, with the exception of Emilia-Romagna. A high level was also recorded in the Marche. Tail of the list, with low and medium-low level, are the Southern regions of Italy, Umbria and Lazio.

The regions excellent if compared to the dimension of effectiveness are Piemonte, Valle d'Aosta, the AP of Trento, Liguria and Toscana. Medium to high level, however, are observed in some regions of the Centre-North and Basilicata. At the bottom of the list we find the South of Italy with the AP of Bolzano, Lombardia and Friuli Venezia Giulia, the only regions of the North to be located at a medium level.

Finally, the regions with the highest level of satisfaction and accessibility are the AP of Bolzano, Veneto, Friuli Venezia Giulia, Emilia-Romagna and Marche. On the contrary, Sicilia, Calabria, Puglia, Campania and Umbria are located in the lower part of the ranking. The Sardegna region, with an upper-middle level, and Piemonte, Valle d'Aosta and Toscana with a lower-middle levels, place themselves outside the traditional North-South gradient.