ITALIAN OBSERVATORY

ON HEALTH CARE

Italian Observatory on Healthcare Report 2011

"Osservasalute Report 2011"

Health status and quality of care in the Italian Regions

Summary by *Dott.ssa Tiziana Sabetta* and *Dr. Roberto Falvo*

Osservasalute Report 2011– Summary

The Osservasalute Report (OR) is divided into two parts, the first describing health and population needs and the second analyzing Regional Health Systems and quality of services offered. The objective of the Report is to make available objective and scientifically rigorous data to decision makers in order to let them take appropriate, rational and timely actions, suitable to improve health and meet the needs of target populations.

Data analyzed in 2011 showed that the overall health status of Italians is good, although it is necessary to stimulate the provision of preventive services and *ad hoc* social and health policies in order to prevent citizens to become ill and reduce differences between geographical macro-areas, regions and gender that still remain, and in some cases increase.

Such heterogeneity is due to the lack of rational, organizational and management decisions that have determined, in some regions, bad and difficult to be solved financial scenarios, with consequences in terms of offer, access and quality of services provided. This is the reason why it is possible to face situations of inadequate health care in which both, supply and quality of services, are lacking and sometimes insufficient to meet users requirements; this occurs mainly in the South of Italy, where the most critical situations are observed. The above scenario is aggravated by the repercussions of the economic crisis that has affected and continues to affect our country influencing lifestyle and thus citizens quality of life, especially the poorest.

It is clear, therefore, the need and, in some cases, the urgency for action by all the institutions of the sector, both nationally and regionally, in order to avoid or at least try to mitigate the widening of health differential, ensuring adequate and equitable health care to all citizens, regardless of place of residence and socio-economic status.

The report is structured as follows:

- **92 Core Indicators**: describing the essential aspects of Italians' health and regional health services with the help of tables, graphs and pie charts as well.
- **11 Boxes**: where examples of good practices in some regions are proposed in order to be adapted to other regional contexts;
- **9 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 2009-2010) 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 has been also analyzed. This indicator showed that, in 2009, 28.3% of population over 65 is living alone (+0.5 % compared to 2008) and that women constitute the majority (38.0% vs. 15.1%). This is due both to the age difference between spouses and the higher male mortality that make women more at risk of experiencing the event of widowhood and living alone in the latter part of their life.

Nationally there is a growing trend in population mainly due to the growth of migratory component. The indices examined showed the trends in previous years, confirming the positive net migration, primarily thanks to the attractiveness of central and northern regions; also positive, even if value is lower than the previous two years (2008-2009) is the 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 and Campania. In these regions, in fact, the internal migration balance has reached the highest negative values (respectively, -3.5 ‰ and -2.9 ‰) while regions that mainly benefited from these flows were Emilia-Romagna, Friuli Venezia Giulia, the Autonomous Province (AP) of Trento, Toscana and Umbria.

As for the total fertility rate (TFT), in 2009, it remained lower than the replacement level (around 2.1 children per woman) that would ensure the generational change and decreased in respect to the previous year. The TFT has, in fact, decreased from 1.42 in 2008 to 1.41 in 2009 and first estimates for 2010 seemed to confirm this trend. In the current year the highest values are recorded in Valle d'Aosta (1.62 children per woman), the AP of Trento (1.58 children per woman) and the AP of Bolzano (1.55 children per woman), while regions that continue to be characterized by a very low TFT are Molise and Sardegna (respectively 1.11 and 1.13 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 (2.23 children per woman) in respect to women with Italian citizenship (1.31 children per woman). In 2009, a growth in terms of average age of mothers giving birth has been recorded with the national value growing up to 31.8 years (increase of 0.7 years compared to 2008). According to regional distribution, Sardegna showed a value of about 1

year greater than that recorded for Italy as a whole while Sicilia proved to be the region with the lowest mothers average age at birth (30.4 years). Thus, 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 (28.0 years) in respect to the Italian women (31.8 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.

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 2010 (provisional data), can expect to live, on average, 84.4 years and men 79.2 years. It is maintained, therefore, the female advantage in terms of survival, but the gap continues to shrink despite being still significant (+5.2 years for women). Between 2006 and 2010, male life expectancy increased by 0.8 years (78.4 vs. 79.2 years), while female life expectancy increased by 0.4 years (84.0 vs. 84.4). Geographically speaking, Italy shows, in both genders, a 2.4 years differential between the best and the worst region. As for men, Marche retains the record for the most longevous region, with 80.1 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 85.5 years is the most longevous region. The second indicator showed that women, at the age of 65 years, according to 2010 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. Conversely to what had been observed for life expectancy at birth, Marche is at the top for women (22.7 years), while AP of Bolzano is at the top for men (19.1 years). 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 0.6 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 5.2 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 2006-2008, a slight decrease in men (112.56 vs. 110.92 per 10.000) and a minimal increase in women (68.73 vs. 69.46 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 both genders, the reduction in mortality is recorded in the first three age classes considered (0-18, 19-64 and 65-74 years) and this trend is prominent in men. Over 75 years, however, the opposite trend is observed and the rate increase is observed for women. These trends, which have a different intensity depending on age, are also observed 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 2010, the proportion of smokers among population aged 14 and over amounted to 22.8% and kept stable in recent years. The regions where the percentage of smokers was higher were Lazio (26.7%) and Campania (26.1%), while the percentage was lower in the AP of Trento (17.9%) and Valle d'Aosta (19.8%). A data comparison with 2009 did not reveal large regional differences, although a slight prevalence of smokers in the central regions was present. Between 2001 and 2010, slow, but steady has been the growth in the number of people who have stopped smoking (20.2% vs. 24.4%). The average number of daily smoked cigarettes has been decreasing. Smoking cigarettes was found to be more common in young adults, particularly in the age group 25-34 years (32.3%) and more prevalent among men (29.2%) than women (16.9%). 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 (64.7%) than in males (38.3%), while the percentage of former-smokers among men was almost double (30.7%) than among women (16.7%).

Alcohol - In general, in 2009, the highest consumption of alcohol was recorded in Friuli Venezia Giulia and Emilia-Romagna (both 73.9%), while Sicilia was the region with the lowest value (59.9%). Particularly, the prevalence of at risk consumers in adults (19-64 years) showed a marked gender difference (men 20.5%, women 5.3%). Also with regard to the types of at risk consumers, i.e., binge drinking and excessive daily consumption, statistically significant differences between men and women were present and to the detriment of men.

Food - Data on food consumption by type were analyzed to assess the quality of the diet. The analysis proved that, in 2009, the proportion of people who assumed at least "5 or more daily servings of vegetables, fruits and vegetables" (objective indicator) (4.8%) had decreased in respect to the previous year (-0.9%) and that the role of public

catering (canteen) and restaurants/taverns positively affects global food style. This decline, which occurred in a context of global economic crisis, deserves more attention since it highlights the importance of considering the quality of diet not only in respect with the prevalence of overweight and obesity, but also with the population distribution according to poverty thresholds.

Weight and Physical Activity - Taking into consideration the period 2001-2010, the proportion of people aged 18 and over being overweight or obese increased progressively (33.9% vs. 35.6% for overweight people, 8.5% vs. 10.3% for obese people). Data analyzed and related to 2010 showed a higher prevalence of overweight people in the southern regions (overweight: 41.8% Molise and 41.0% Basilicata; obesity: 12.7% Basilicata and 12.3% Puglia). Moreover, the proportion of overweight or obese people increased proportionally with age, before declining slightly in the elderly, and was more common among men. Gender differences may be attributable, in part, to the different behavior of men and women with respect to the frequency of weight control.

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. In general, in respect to 2001, latest data (2010) showed a positive trend since, in both genders, the proportion of people who practiced sports in a continuous manner increased (men 23.1% vs. 27.7%; women 15.3 % vs. 18.1%) and the percentage of sedentary people decreased, especially among women (men 34.2% vs. 33.5%, women 46.1% vs. 42.8%).

Cancer Screening - In our country the development of organized screening programs has been recording a slow but steady growth. 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 2009, the "theoretical extension", i.e. the proportion of target population that lives in an area where there is an active screening program was 93% for mammography, 77% for cervical cancer screening and 59% for colorectal screening, while the "actual extension", i.e. the proportion of target population that has really been invited, settled at 70.7% for mammography, 66% for cervical cancer screening and 40% 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 2009 data with previous years, a gradual and steady increase was evident for all types of screening considered.

Environment - Among several factors that may affect human health, a key role is played by the environment so that, in order to characterize the relationship between environment 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 produced, the volume disposed through the controlled landfill and / or incineration and the implementation of separate collection (recycling) have been investigated.

In 2009, the production of municipal solid waste is lower than in the previous years. Specifically, in terms of geographical macro-areas, a decrease of 1,6% in Central regions, 1,4% in the North and 0.4% in the South was found. This reduction and trend reversal, after a long period of growth registered in previous years, is due both to the activation of specific prevention measures and the economic crisis that, in 2008-2009, led to a decrease in GDP and household spending. Even per capita waste production showed a progressive decline.

As for the landfill management, landfill disposal as a share of total production of waste, faced a reduction from 2001 to 2009, passing from 66.7% to 40.6%, but even considering a decline in the number of landfills, this modality of waste management still remains the most diffused in the country. The most virtuous region disposing in landfills the lowest amount of waste produced was Lombardia (6.7%), while Sicilia (88.4%) and Molise (87.8%) were the regions showing the highest percentages. Regarding the other waste disposal modalities, i.e. the incineration, the value reached at national level (14.3%), although growing, is still far below the average of the major European countries (20%). Compared to the previous year, the number of incinerators operating throughout the territory remained unchanged (49 units) and most of them (57.0%) are located in the North of the country: for this reason incineration, at regional level, depends on the presence or absence of incinerators in each region.

The separate collection/recycling, in 2009, continued its increasing trend and reached a percentage equal to 33.6% of the total municipal solid waste production (+3.0% compared to 2008): Southern regions contributed mostly to this increase (+4.4%), but higher percentages of recycling are found in northern regions where the separate collection system had already been implemented for several years. Particularly virtuous were the AP of Trento (60.6%), Veneto (57.5%) and the AP of Bolzano (54.5%) that achieved the threshold of 50% set by the regulations for 2009; very close to the target were Friuli Venezia Giulia (49.9%) and Piemonte (49.8%) as well.

Cardiovascular and cerebrovascular diseases - Cardiovascular diseases (ischemic heart diseases 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 2009, 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 (1368.4 per 100.000 in men, 498.3 per 100.000 in women), while for cerebrovascular diseases, the AP of Bolzano presented the highest values for both men (876.6 per 100.000) and women (691.0 per 100.000). Overall, for these groups of diseases as a whole, the downward trend continues.

Mortality due to ischemic heart diseases, in 2008, almost hit twice as many men than women (14.75 per 10.000 in men, 8.22 per 10.000 in women) and at regional level, the negative record was held by Molise for men (18.43 per 10.000) and Campania for women (10.54 per 10.000). The most virtuous regions, however, were Puglia for males (12.38 per 10.000) and Piemonte for females (6.46 per 10.000). It has to be highlighted the increasing trend by age groups. This increase occurs mainly in women, whose mortality rate was found to be 148 times greater in the oldest age group (75 years and over) compared to the age group of 45-54 years, while in men the increase was smaller (34 times). This confirms that, in women, the effect of age is more important than in men.

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 (80.06 per 10.000) for both types of admission (Ordinary Admission-OA and Day Hospital-DH), while central and northern regions (except Liguria for DH) 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, 60.0% of people who annually undergo surgical amputation are affected by diabetes. In the period 2001-2008, the discharge rate for amputation has increased (12.0 vs. 14.6 per 100.000). Particularly, with regard to major amputations the trend was basically stable, while interventions for minor amputations are facing a growing trend. With regard to gender, amputations were more common among men, whose discharge rate increases sharply with age. At regional level no spatial gradient was observed.

Infectious diseases - Infectious Diseases represent a major public health problem despite the availability, for many of them, of effective preventive and therapeutic interventions.

In most regions the incidence of HIV infection presented a decreasing trend compared to previous years, except in Puglia and Lazio where an increase of new cases has been noted; moreover, the incidence has been found to be higher in the Centre-North of the country than in the South. It has to be highlighted the change that has taken place over the last 25 years in terms of transmission of HIV as the proportion of cases due to the exchange of syringes, decreased from 74.6% in 1985 to 5.4% in 2009; at the contrary cases attributable to sexual transmission as a whole increased (7.8% vs. 79.0%): heterosexual relations are currently the most common route of transmission. As for AIDS, however, the 2009 data confirmed the stable trend in the incidence and spread of the disease with a persistent North-South gradient.

Relatively to the spread of some sexually transmitted diseases, in the period 2000-2009, an increased incidence for syphilis (15-24 years +170.81%; 25-64 years +196.62%) and a decrease for gonorrhea (15-24 years -5.22% -24.39% 25-64 years) can be observed.

Among respiratory transmitted diseases, according to data obtained by mandatory reporting for 2009, in the age group 0-14 years the most common infections were: varicella/chickenpox (634.32 cases per 100.000) and scarlet fever (179.54 cases per 100.000), while less frequent were: mumps (9.92 cases per 100.000), pertussis (6.85 cases per 100.000) and measles (3.83 cases per 100.000). The incidence rate of rubella (1.31 cases per 100.000) was limited. At the contrary, in the age group 15-24 years, the chickenpox was the most frequent pathology (23.64 cases per 100.000). In general, all infections considered, in the period 2000-2009 and in both age groups under study (0-14 and 15-24), have shown a decreasing trend, except for measles in the age group 15-24 years, which showed an increased number of cases (+91.7%). This proved that immunization coverage against measles, although increased, has not yet reached the levels considered effective in order to achieve the elimination of the disease.

Viral Hepatitis B (HBV) showed a decreasing incidence rate and, at local level, higher rates are present in central and northern regions. This declining trend regards both men and women and, stratifying data by age, the decrease was particularly remarkable in groups (0-14 and 15-24) reached by the compulsory vaccination program.

The most common bacterial meningitis in Italy, in 2009, were those caused by pneumococcus with an incidence rate equal to 12.26 per 1.000.000, followed by meningococcal meningitis (3.11 per 1.000.000) and Hib meningitis (0.90 to 1.000.000). It must be underlined that the incidence of bacterial meningitis, with regard to the three causative agents examined, is one of the lowest in Europe. The temporal analysis (1994-2009) showed an exponential increase in pneumococcal meningitis, (1.89 vs. 12.26 for 1.000.000), a substantial stability of meningococcal meningitis (2.87 vs. 3.11 per 1.000.000) and a gradual decrease of Hib meningitis (1.50 vs. 0.90 per 1.000.000). Finally, at regional level a decreasing North-South gradient was noted.

Cancers - In Italy, approximately 28% of deaths are due to cancer, and considering the aging process, a growing number of individuals will have a significant probability of contracting the disease during lifetime. In recent decades, cancer epidemiology has greatly changed and factors that have contributed to this are the gradual introduction of effective therapeutic measures and the improved diagnostic care when the disease is at its onset. Incidence, mortality and prevalence classic indicators, by age group, have been analyzed to assess the frequency of cancer in populations. The incidence estimates indicate that, in 2010, in the age group 0-64 years colorectal cancer in the Centre-North and lung cancer in the South, showed the highest incidence in men, whereas for women, breast cancer showed the highest incidence in all geographical macro-areas. In the age group 65-74 years, lung cancer was still the most common among men of the South of Italy, while in the Centre-North the incidence of prostate cancer prevailed. As for women, however, once again breast cancer was the most frequent in all macro-areas. The same situation was present in the older age groups (75-84 years) except for men living in the southern regions, where lung cancer incidence was lower than the prostate cancer incidence.

With regard to mortality, in the age groups 0-64 and 65-74 years the highest mortality rates appear to be due to lung cancer in men and breast cancer in women in all macro-areas. In the age group 75-84 years, however, the highest mortality rate in men is always due to lung cancer, while in females the highest mortality rate is due to colorectal cancer.

With regard to prevalence, for the first two age groups considered (0-44 and 45-59 years) colorectal cancer was more prevalent among men and breast cancer among women. Even in the other age groups (60-74 and 75 years and over) the situation remained unchanged for women, while for men the highest prevalence was observed for prostate cancer. This situation was clear in all geographical macro-areas.

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.

The latest estimates showed an increase of population with disabilities due, primarily, to the increase of elderly people. At 1 January 2010, up to 5.1% of Italian population aged > 6 years turned up to have a severe disability (people who are not able to handle with at least one of the daily living functions) with South of the country being more affected.

Regarding healthy life expectancy, 2008 data showed that the average number of years a 65 years old man is expected to live free of disability is equal to 14.9 years, while for women is equal to 15.8 years. A North-South gradient is present with southern regions having a greater need for health. Since women show a greater life expectancy, they will experience a higher number of years lived with disability, during which they will need customized, integrated and efficient health services much more than men.

The indicator on occupation has been updated and its temporal analysis (2003-2009) showed an increase in the number of people registered as unemployed into social security lists. This increase was recorded in all regions and it shows that people having the right are more aware of this possibility but also that the welfare system is taking care of them. In order to verify the effectiveness of the subscription to the social security lists, the percentage of met demand was calculated. A clear territorial gradient is present since job placement policies for disabled people in the Centre-South are less effective.

A final indicator concerning the number of beneficiaries of disability benefits that include: disability allowances, retirement compensations and other compensatory indemnities and benefits. The analysis of data showed, in the three-year period (2006-2008), a decrease in the number of beneficiaries of disability pension equal to 1,1%, while the average amount delivered increased by 7,0%. The increases in the expenditures were predominant for those who were beneficiaries of two or more pensions, and for those who profited of a disability support pension; a decrease in expenditures regarded disability allowances and no change resulted for indemnity benefits. Finally, the analysis by age groups showed an increase of collectors among younger age groups (0-49 years) and very old people (85 years and over) and a decrease in the remaining age groups. The average amounts, however, increased in every age group, with major increases in the age group of 65 years and over.

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

Among neurodegenerative diseases admissions for Alzheimer's disease and Parkinson's disease have been calculated; they present a steady trend over the years considered (11.67 per 10.000 in 2007 vs. 11.15 per 10.000 in 2009) and stratifying data by gender, rates in all regions are higher in men than women, except in Sardegna.

Among chronic conditions, however, we calculated the discharge rate for alcohol related illnesses that in the period 2007-2009, showed a reduction (8.49 vs. 7.48 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, in 2010, a decrease in their use over the previous year was found (3.01 vs. 2.80 DDD/1.000 inhabitants day) confirming, thus, the continuous decrease observed since 2001. A North-South gradient is present with some southern regions (Abruzzo, Calabria, Sicilia and Sardegna) showing values twice those of the North. 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.

This year, for the first time, the suicide rate has been calculated since this phenomenon is related to the mental health of the population even if it can be read as an indicator of discomfort and lack of social integration and cohesion. In the period 2007-2008, the annual mortality rate due to suicide was equal to 7.26 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. The indicator also showed a quite marked geographic variability with rates generally higher in northern regions.

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 7.93% of births in 2009, 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, in 2009, a slight decrease (-0.48%) over the previous year was found. Data showed a marked interregional variability with values tending to be lower in the north (AP of Bolzano 23.61%) and higher in the South (Campania 61.96%). It should also be noted that the use of Caesarean section increase with age, particularly in age group 45 years and older.

In 2009, Neonatal Intensive Care Units were present in 129 out of the 548 birth centers taken into consideration and 102 of these were located in birth centers where at least 1.000 deliveries per year take place, 11 in birth centers where 800-999 deliveries occur annually and 16 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. With regard to infant and neonatal mortality, decreases over time were observed, in fact the infant mortality rate, from 2005 to 2008, declined from 3.6 to 3.3 (per 1.000 live births), while neonatal mortality rate passed from 2.6 to 2.4 (per 1.000 live births). There remain, however, significant geographic differences to the detriment of the Southern regions where the highest mortality rates can be found.

Finally, voluntary abortion showed, from 2004 to 2009, a uniform and continuous decline. All age groups were involved by this declining trend and the highest rates were recorded in Liguria (10.98 per 1.000) and Molise (10.21 per 1.000), while the lowest rates were found in the AP of Bolzano (4.89 per 1.000) and Sardegna (5.61 per 1.000). To be kept under control is also the abortion rate in women of 15-17 years, (4.1 per 1.000) as an active prevention targeted to them may be helpful for future fertility planning.

Immigrants and Health - Data analysis regarding the presence of foreigners in Italy shows that, at 31/12/2009 the relative weight of foreigners out of the total residents is 7.0%. 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 21.0%. 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.

Regarding voluntary abortion among foreigners, it shows an increase especially in the age group 20-24 years that is, in fact, the most involved. Again regional differences are remarkable and follow the geographical distribution of foreigners across the country. Indeed, regions with a higher proportion of abortions are, in general, those with a higher percentage of foreign women as residents and vice versa. Moreover, since Romania, Albania and Morocco represent the first three countries of origin, 28.5% of all abortions performed by women with foreign citizenship are attributable to Romanian women, followed by Albanian women with 6.7% and Moroccan with 6.1%.

In order to assess the impact of migration on hospital services, the immigrants' hospitalization rate has been calculated and in 2008, amounted to 4.7% 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 the distribution of the foreigners across the whole territory and are higher for men.

Finally, in 2008, inequalities in terms of infant and neonatal mortality among Italians (2.4 and 3.3 per 1,000) and foreigners (respectively 2.5 and 3.8 per 1,000) confirmed their downward trend; analyzing regional differences South of Italy is more disadvantaged.

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

Economic-financial framework - In this chapter, traditional indicators on expenditures and deficit were presented as well as a new indicator concerning the health services specialization degree.

The current public health expenditure as percentage of Gross Domestic Product (GDP) shows an increasing trend and in 2008 the national value was equal to 6.87%. At regional level the indicator showed significant differences ranging from a minimum of 5.24% of Lombardia to a maximum of 10.46% in Campania. Clear, then, is the North-South gradient with the southern regions devoting to health care higher portion of their GDP.

The indicator regarding per capita public health expenditure showed, at national level, an increase between 2009 and 2010, rising from € 1.821 to € 1.833 (+0.66%). At regional level the lowest expenditure was recorded in Sicilia (1.690 €), while the highest in the AP of Bolzano (2.191 €). In general, in respect to the previous year, northern regions, except Liguria, increased per capita expenditures as well as southern regions such as Basilicata, Puglia, Sicilia and Sardegna and central regions as Umbria and Marche. In other regions, however, a trend inversion took place.

In 2010, the NHS confirmed to be in deficit (39 € 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.

The new indicator measures health services specialization degree of both public and private institutions that have the opportunity to specialize on a specific set of services rather than choosing to deliver them all indiscriminately. The health services specialization index is for public authorities, in 2009, equal to 487 and in comparison with the previous year showed a reduction not only at national level (-5.0%), but also at regional level. Compared to public authorities, the specialization index of Private Institutions was much higher (1845) and slightly higher than last year. Particular and interesting was the situation in Lombardia, Lazio and Campania, where public authorities resulted to be more "specialized", i.e. they focused on a narrower range of services, while private institutions were more "generalist".

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 issues relating to the organization of the emergency/urgency system have been investigated.

In 2007-2009 per capita expenditure at national level has grown by € 30.1, rising from € 571.6 to € 601.7. This difference has been recorded in almost all regions. The major expenditures were found in the AP of Bolzano, Valle d'Aosta, AP of Trento and Friuli Venezia Giulia, all regions with a special status, while regions with lower per capita expenditures were Lombardia, Lazio and Puglia.

The analysis on the age structure of NHS employees showed that nationally, in 2009, 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 was similar to the percentage of staff aged ≥ 60 years, while in the South the component of staff aged ≥ 60 years prevailed. Analyzing the demographics of employees it is important to emphasize that 63.0% of staff was represented by women and 37.0% by men, 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 2009 showed a strong regional gradient as all Northern and Central regions (excluding Lazio) were well above the national average (103.1%), while Southern regions, with the exception of Puglia, Calabria and Sardegna, showed values lower than the national average, indicating a situation of shrinking workforce.

As for human resources, an indicator concerning fixed and temporary employment, in the time period 2007-2009, was calculated and no substantive changes were found. In particular, in 2009, employees with a fixed working contract represented 94.4% (5.6% with a temporary working contract) of the entire NHS staff, the highest percentages of personnel with fixed working contract (lower % of temporary working contracts) were found in Veneto and Piemonte, while the lowest percentage (higher % of temporary working contracts) were observed in Valle d'Aosta and Sicilia.

Regarding the organization of the emergency/urgency system, indicators investigating the number of "118"operating centers, Emergency and Urgency Departments and helicopter rescue service bases were proposed.

"118" is the universal number to be dialed to get fast access, nationally, to the operating centers which organize and manage, within a specific territory of reference, all the medical emergency activities; 118 operating centers ensure coordination of all interventions, from the occurrence of the event until the placement of the patient at the final destination and they are responsible for the 24 hours hospital response activation. During the period 2001-2010, the number of operating centers throughout the country, at provincial level, slightly decreased (1.00 vs. 0.93). At regional level a North-South gradient was present at the expense of the South, where, with the exception of Campania and Calabria, 118 operating centers coverage was below the national average; particular concern arouses from the situation in Sardegna, where only a quarter of the region is covered by the 118 network.

The main function of the Emergency Departments (DEA) is to stabilize the patient through medical, surgical, orthopedic, obstetric and pediatric emergency diagnostic-therapeutic interventions. In 2010, the number of DEA was equal to 332 and the average users base amounted to 181.935 inhabitants (reference range corresponds to 1 DEA per 100.000/200.000 inhabitants). At regional level, range varied from 95,665 inhabitants / per DEA of Abruzzo to 272,768 inhabitants / per DEA in Sardegna.

Helicopter rescue service is an important resource of an emergency/urgent health system, allowing a safe transport of critical patients without interruption of care, and also covering areas otherwise unreachable by road. In 2005, nationally, 44 helicopter bases were present and only 5 of them were well-equipped for night flying; over the previous year both values decreased. Analyzing the situation by region, Piemonte and Lombardia held the largest number of bases (5), followed by Sicilia and Emilia-Romagna (4), not provided with bases were Umbria, Molise, Puglia and Sardegna. Only Sicilia, Toscana and Lazio were provided with bases enabled for night flights

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 2009, an increase of 6.2% compared to 2008 was found. This increase in the number of patients treatable in a HC setting is linked to the reduction in the hospitalization rate. There remains, even comparing data with previous years, a considerable variability of the indicator related to regional heterogeneity: a minimum rate of 130 patients assisted in HCs (per 100.000) was found in the AP of Bolzano and a maximum rate of 2.064 patients assisted in HCs (per 100.000) in Emilia-Romagna. It is remarkable the difference in terms of percentage of HCs treatments for terminal patients between northern and central regions compared to the South (respectively 89.6%, 86.5% and 61.0%).

In terms of supply, the number of beds destined to disabled and elderly users is equal to 553.1 (per 100.000). Most of these beds are specifically dedicated to elderly people (478.4 per 100.000), while only residual portions are intended for disabled users aged <65 years (74.7 per 100.000). The territorial analysis showed that the highest number of beds for the elderly was in the AP of Trento (867.0 per 100.000) and the lowest in Campania (30.7 per 100.000), while as for the number of beds dedicated to people with disabilities the highest rate was recorded in Molise (166.8 per 100.000) and the lowest in Campania (30.2 per 100.000).

With regard to residential nursing houses, 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 1.743 (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. 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.

Finally, concerning chronic patients management, indicators on discharges due to potentially avoidable hospitalizations for diabetes mellitus, COPD and cardiac insufficiency were defined. As for diabetes mellitus, in 2009, a saturation of the capacity of the most virtuous regions to further improve has been detected, while in other regions (southern and central) the positive trend still continues with few exceptions; as for COPD, all regions, except the AP of Bolzano, have improved, especially in central and northern regions, while the indicator for cardiac insufficiency has increased in some regions of the Centre-North and decreased in the others.

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 is constantly raising and in 2010 the increase was equal to 2.8% over the previous year and 41.3% over 2001. At national level, in terms of consumption, the prescription of defined daily doses (DDD) was equal to 952 (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 17 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 (47.4% of the total drug consumption).

In 2010, territorial pharmaceutical expenditure at the expense of the NHS fell by 0.1% compared to 2009, but increased by 2.5% in respect to 2001. 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 since age is the most important predictive determinant of drug use. Clear is the North-South gradient at the expense of southern regions that maintain higher expenditures in respect to the national average (€ 215.1).

The consumption of generics/out of patent drugs, from 2002 to 2010, has more than tripled passing from 14.0% to 51.5%. In parallel, during the same period, the expenditure increased from 7.0% to 30.4%. Toscana is the region presenting the largest increases, both in terms of usage (+45.0%) and expenditure (+31.0%). Compared to 2009, nationally, the increases in expenditure and consumption were, respectively, 5.3% and 2.4%.

In general, with regard to ticket spending and cost sharing sustained by citizens, every year starting from 2003 an increase has been noted and comparing 2003 with 2010, expenditures increased by 46.0% (€ 11,3 versus € 16,5).

The analysis on antibiotics consumption at the expense of the NHS, which places Italy among the countries with the highest consumption in Europe, showed a wide regional variability with significant differences in the use of these drugs between North and South of the country, in fact, in 2010, Campania (32.8 DDD/1.000) presented the highest consumption, while the AP of Bolzano the lowest (12.6 DDD/1.000). Finally, analyzing data from 2002 to 2010, consumption resulted to be grown by 4.2%, although, between 2009 and 2010, there was a reversal of the trend (-7.0%).

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 2008-2009 time analysis evidenced a 4.5% overall rate reduction, a 2.4% reduction for the OH modality of treatment and a reduction of 9,1% for DH admissions. In 2009, the overall standardized hospitalization rate at national level was equal to 179.4 (per 1.000), 126.4 (per 1.000) of which were attributable to OH and 53.0 (per 1.000) to DH. In general, Southern regions, with the exception of Sardegna, showed an overall hospitalization rate higher than both the mandatory standard (180.0 to 1.000) and the national average, while Central-Northern regions showed a lower rate, with the exception of Lazio, Liguria and AP of Bolzano. It must be underlined that all regions overcame the standard reference rate set for DH (36 per 1.000).

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

Among the indicators concerning the demand met by hospital network, hospital discharge rates by type of DRG were also examined: in 2009, the discharge rate for medical DRG was equal to 99.5 (per 1.000) and specifically, 27.8 (per 1.000) were DH discharges and 71.7 (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, with few exceptions, and lower rates in central and northern regions. Discharge rate for surgical DRG, instead, was equal to 71.2 (per 1,000), of which 23.5 (per 1.000) under the DH modality and 47.7 (per 1,000) as OH. Compared to medical DRGs, the regional variability in the discharge rate for surgical DRGs, as a whole, was significantly lower with values generally higher in the Centre-North of the country.

Analyzing the indicators on healthcare facilities productive efficiency, in 2009, the average length of stay at national level was equal to 6.7 days and, in recent years (2006-2009), remained stable with a slight decrease in the last year considered. The distribution of values throughout the country showed a North-South gradient, with a decreasing trend for northern regions. The greatest length of stay, equal to 7.7 days, was recorded in Valle d'Aosta and Veneto, while the lowest was found in Campania and Umbria with 6.2 days. In contrast, the preoperative average length of stay (DMPO in Italian), during the same period (2006-2009), 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. 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 2009, to 34.1%. 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 (34.1%). The region with the lowest percentage was Piemonte (24.5%), while the highest value was recorded in Calabria (51.4%).

In order to evaluate hospitals organizational appropriateness, the utilization of DH modality for DRGs at risk of inappropriateness was quantified. In 2009, the percentage of hospitalizations in DH modality was, nationally, equivalent to 47.2% with a range going between 64.9% of Liguria and 32.5% 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 2009, in terms of number of admissions, the national values were equal to 3.75 admissions in DH and 1.58 in DS. The regional distribution showed greater variability for DH modality due to both disorders treated and different administrative and organizational procedures involved in this setting. 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 2009, 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 45.35%. The regional variation was particularly significant and denoted a different use of hospital care schemes with values appearing higher in the Centre-North of the country. Even "One Day Surgery" discharges, that at national level represented 18.87% of the total hospitalizations in the ordinary regime, showed a high variability at regional level.

The indicator concerning the interventions for hip fracture performed within 48 hours in patients aged 65 and over was used in order to assess the organizational and clinical appropriateness. In the period 2001-2009, the percentage of interventions performed within 2 days after admission showed a slight increase (31.2% vs. 33.6%), 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 82, 8% of the AP of Bolzano and 15.8% of Campania.

Websites and waiting lists - The phenomenon of waiting lists is one of the most critical in modern health care systems as it might compromise the accessibility and usability of services as well as the assistance delivered to citizens, undermining, sometimes, patients' health and effectiveness of interventions. This chapter, presented this year for the first time, is dedicated to the analysis of the online use of information systems by local health authorities (LHA - ASL in Italian) and hospitals/Trusts (AO in Italian) that publish on their own websites data on waiting time (considered as the time elapsing between the manifestation of the need to NHS and its satisfaction.

Latest data (2011) on waiting times for the provision of medical treatments by LHAs and hospitals, showed a North-South gradient with a greater availability of information on the websites of LHAs located into northern regions, although some exceptions were present. It should be remarked that in the period considered (2005-2011), a growth in the use of the Internet as informative tool on waiting times has been recorded, both by LHA and Hospitals: in this period, in fact, many institutions that previously did not use the web, now are provided with such a service.