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Abstract

The paper develops a multi-stakeholder wellbeing analysis based on BES data (Benessere Equo e Sostenibile, namely "Equitable and Sustainable Wellbeing") on Health in South Tyrol, in order to highlight convergences and divergences among four selected classes of agents (citizens, local stakeholders, central administrations and for profit institutions). The statistical analysis is based on data of territorial accounting, the URBES report on the city of Bozen and data collected from the local statistical office (ASTAT) through citizens' satisfaction surveys. Specifically, we read the available data both in absolute and comparative terms, we analyze an *ad hoc* selection of subjective indicators on health, and we show the interdependencies among data on well-being and economic development. As a result, we obtain a logical framework that narrows the existing gap between an objective approach – mostly based on institutional indicators – and a subjective approach – based on satisfaction surveys. Furthermore, we propose a dashboard approach that pragmatically lead to a rich and extensive interpretation of the available data on well-being. Finally, we single out the most critical issues regarding the improvement of health conditions in South Tyrol, and we provide *ad hoc* policy recommendations for each class of decision makers. Due to the high level of standardization, we believe that the exercise developed might be easily replicated for other BES domains and other territories, contributing to move forward the research frontier on well-being in Italy (BES project and related analyses).

1. Introduction

In the last decades, the international debate on the inadequacy of Gross Domestic Product (GDP) as dominant measure of prosperity has highlighted the necessity to integrate the economic evaluations with an assessment of citizens' wellbeing (Stiglitz et al. 2009). This improved responsiveness has inspired several initiatives at national level aimed at developing alternative and complementary databases capturing the multidimensionality of wellbeing. At academic level, the debate focused on the use of both objective and subjective indicators, and this "enlargement" in the statistical landscape re-evoked the unexplained issue of their latent conflicting nature. Clearly, objective indicators measure observable circumstances in a given cultural or geographic area, while subjective indicators relate to individuals' subjective perceptions of the social environment. Therefore, from a methodological perspective, the latter imply to enquire directly with individuals about their life through surveys or stakeholders' engagement techniques.

The effort to understand citizens' subjective perspective is crucial in the policy making process. This issue has been clearly explained in the report of the Stiglitz Commission (2009), which stated that official statistic offices should include subjective measures in their outputs and consequently that public policies should consider the outcomes of their analysis. However, the debate is still open, and the literature reports two groups of arguments, in favor or against the use of subjective indicators (Veenhoven, 2001; Noll, 2013; Kroll & Delhey, 2013). The critical voices argue that subjective indicators are often unreliable and biased by social comparisons, norms and variability. On the other hand, the researchers who are in favor reply that subjective indicators complement objective data and contribute to narrow the gap among politicians, policy makers, stakeholders and citizens (Kroll & Delhey, 2013).

Considering the improved availability of data on wellbeing, we agree on considering the GDP as a weak indicator of social welfare, and we underline how sound public policies could be hardly implemented by observing only this variable (Stiglitz et al., 2010; Layard, 2011; OECD, 2013). This perspective is nowadays widespread, and has led to consider complementary measures for computing social welfare and wellbeing. The Stiglitz Commission considers wellbeing as a multidimensional concept involving: material living standards, health, education, activities including work, political voice and governance, social connections and relationships, environment (present and future), personal and economic insecurity. Moreover, measurement should not include only "the average levels of wellbeing within a given community" and could not be based solely on objective indicators, but should take into account people's own subjective assessments of their quality of life (Stiglitz et al., 2009).

Following Stiglitz-Sen-Fitoussi's recommendations, many countries, governments and international organizations begun to develop new statistical instruments to collect data on wellbeing. The BES ("Benessere Equo e Sostenibile", namely "Equitable and Sustainable Well-being") database for Italy and the URBES database for the metropolitan contexts produced by ISTAT, the Italian national statistical office, are data collections centered on well-being and sustainability. BES indicators measure objective as well as subjective dimensions of well-being, including people's perception of their quality of life.

Given these general premises, we discuss the exercise illustrated in this paper. Our research focuses on the Province of Bolzano/Bozen. We have selected the health domain, considering its close relation with the economic measure of GDP per capita, and we have developed a framework that should narrow the gap between objective and subjective approaches by adopting a multi-agent perspective (specifically, in our research we distinguish four classes of agents: citizens, local stakeholders, central administration and for profit institutions). Indeed, as indicated by several

international organizations, United Nations Development Programme (UNDP), Word Health Organization (WHO), a good system of health services and policies should have significant impact on citizens' life expectancy at birth, longevity and life style, improving also quality of life. But in our exercise we want to stress the fact that, even by adopting a set of scientific criteria of analysis, the same data interpreted in a multi-stakeholder perspective might lead to conflicting views on the most important actions to be implemented. Finally, the framework proposed represents an effective and simple way to develop policy and research questions which can be furthermore discussed in a multi-stakeholder setting for the development of policy solutions and scientific theses supported by more effective empirical evidence.

The paper is organized as follows: paragraph two summarizes the state of research on the distinction between objective and subjective indicators in the well-being measurement and the highly debated question of the use of subjective measures in the policymaking processes; paragraph three focuses on the analysis of the health domain briefly summarizing the issues that inspired the structure of the Italian BES database; paragraph four presents the statistical analysis of the health domain for the Province of Bolzano; paragraph five concludes.

2. Literature overview

The distinction between objective and subjective measures traces back to the beginning of the research on Social Indicators. During Sixties, social scientists began to think that quality of life could be assessed solely from an individual perspective, as every objective circumstance is filtered through a subjective perception (Abram 1973; Campbell et al.1976). These indicators have been referred as quality-of-life indicators or key national indicators, and they differ from those social indicators that only capture an objective conception of wellbeing.

The Seventies gave birth to data collection programs resulting in several Quality of Life Surveys, like the pioneer "American Quality of Life Survey", the "Quality of Life in Britain Survey", the "Comparative Scandinavian Welfare Survey" and the "German Welfare Survey". In order to assess the quality of life, subjective social indicators became the prominent measure of well-being. The list of measured subjective indicators was broad, ranging from the measurement of satisfaction and happiness or the opposite feelings (e.g. stress or strain, anxiety, loneliness), to the expression of expectations, perceptions, assessments of risks and opportunities, values and preferences, importance ratings, concerns as well as trust in persons and institutions.

During Eighties the pioneering researches on Quality of Life (QoL) became part of a wider group of scientific works that abandoned the rationality hypothesis in favour of a more accurate analysis of the individual behaviour (consider, as an example the seminal work of Kahneman and Tversky in behavioural finance published in 1979). As regards QoL studies, the issue of comparing several measures of subjective and objective well-being to show convergences and divergences among observed and perceived "state of the art" became a major field of investigation. Indeed, the simple assumption that the better are the living conditions, the happier or more satisfied are people, revealed to be non-linear. A multitude of counterintuitive examples and paradoxes showing a misalignment of objective conditions and subjective perceptions were developed in most fields of research, and the well-known scheme provided by Zapf (1984) is still very useful to stylize the four possible welfare positions that can be achieved by crossing OWB and SWB (see figure 1)[1].

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[1] Indeed, today it is widely recognized that considering divergences or convergences between subjective and objective well-being might help the policy maker to select those strategies that increase both citizens' quality of life (intervening at the level of objective conditions) and well-being. A very interesting position is the "dissonance", as it clarifies that good objective conditions not necessarily lead to subjective well-being. This scheme allows also to better

Fig. 1 – Revisiting Zapf's logical framework

		Subjective well-being	
		Bad	Good
Objective well-being	Bad	Deprivation	Adaptation
	Good	Dissonance	Well-being

Source: our elaboration on Zapf (1984).

In late Eighties, QoL studies achieve a political relevance and become strictly related to human development studies. Examples of objective social indicators are those included in the Human Development Index (HDI), developed by the United Nations Development Program (UNDP) and based on Amartya Sen's (1999) theoretical work. Specifically, the HDI in its basic version considers three main dimensions (longevity and health, access to knowledge and decent standard of living) as potential dimensions of well-being (Anand et al. 2009). As regards subjective well-being, instead, probably the most interesting contribution is the checklist provided by Martha Nussbaum of ten essential capabilities for a good living. In brief, she fills the incompleteness of Sen's capability approach by elaborating an essential view on what constitutes human life and what deprives it of its human character (Alkire, Deneulin, 2009).

Since the beginning of the new Millennium, the academic debate focused on objective indicators as sole measures of wellbeing, arguing that it is rather arbitrary to decide how to best operationalize the wellbeing domains also considering inequalities within and "between" nations and cultures. But, combining objective and subjective approaches, thus including people' evaluations, perceptions or assessments soon became the frontier of well-being measurement (Veenhoven, 2001). Indeed, the development of subjective measure of wellbeing means to handle the complex problem of defining proxies for individual welfare and adopt an appropriate metric to capture judgments about individual welfare (Helliwell 2006; Kahneman et al. 2004). To overcome the problem, surveys on life satisfaction, which differ from quality of life surveys as they incorporate a subjective measure, focused even more on large-scale sampling of individual evaluations.

Having briefly summarized the historical background, we now try to encompass the major issues that characterize the state of the art of the discipline.

First of all, even though official statistics agencies were initially against the inclusion of subjective measures into their repertoire, today those measures have found their place into official statistical surveys carried out at national or supranational level. After the Stiglitz Commission work, economists, psychologists and philosophers have become increasingly interested in self-reported measures of well-being and surveys are growing in number (from the general data on

clarify the structure of our database and our multi-stakeholder interpretation of the statistics computed, as in order to analyze the potential dissonance among four kinds of assessment (the view of the local stakeholders, the view of central, or national, policy maker, citizens' evaluations and the economic assessment provided by the for profit sector or financial institutions) we tried to merge several and seemingly unrelated sources of data. Currently customer satisfaction surveys are the most popular way of measuring SBW, as they allow citizens to evaluate services offered by the public administrations. These typologies of surveys have the advantage that they provide information about what people value, but they also represent a quality feedback on services which the public administration takes for granted.

wellbeing worldwide, collected by the Gallup World Poll, World Database of Happiness, World Values Survey, to more specific topics like health, household conditions, youth problems, employee and employers like Gallup's surveys of workers and customers corporate clients, Social-Emotional Well-being Survey). In order to collect SWB measures sampling method are also improving to avoid biases of self-reporting data (Kahneman et al., 2004).

Another debated question regards the use of subjective indicators in the policy making process (Dolan & White, 2007; Dolan & Peasgood, 2008; Diener et al., 2009; Dolan et al. 2011; Forgeard et al. 2011; Adler & Seligman 2016). Doubts and reservations are raised for several reasons: first, there are methodological concerns against subjective indicators; second, it is asked what is the final goal of the policy maker, whether or not happiness or subjective well-being is generally considered as desirable and should be maximized, and finally, if governments are effectively able to improve happiness or subjective well-being (Duncan 2010). Eminent well-being researchers, like Easterlin, Layard and Veenhoven among the most known, support the idea that public policies can boost positively the average level of well-being in the society.

At methodological level, there is a vast literature about the construction of well-being subjective indicators and the pros and cons of their use in policymaking. General reservations against subjective indicators refer to: *i*) the provision of "soft" information and not "hard" statistical facts; *ii*) their reliability and validity; *iii*) their weak correlation to objective indicators (Noll 2013; Kroll & Delhey 2013). Arguments in favor of their use are: *i*) the achievement of a "complete picture"; *ii*) the provision of an overall assessment of objective information, overcoming also the so called "index problem", i.e. deciding which, among several welfare measures is the most relevant for citizens' wellbeing; *iii*) the provision of distinct information on wants and needs; *iv*) the revelation of preferences; *v*) the explicit consideration of the "voice" of citizens, fostering participation and empowerment (Kroll & Delhey 2013). As mentioned, the influence of the Stiglitz commission report (2009) has been decisive for the inclusion of SWB indicators in national surveys, as key information about people's quality of life.

Finally, we have recognized an old controversy and rather a philosophical question regarding the final goal of the policy maker (Duncan, 2010; Frey & Stutzer 2002; Frey and Stutzer 2010). On the one hand, there is the "paternalistic approach" of benevolent governments and political elites which repute to be well informed about well-being of society and citizens, and thus decide the best top-down policies. On the other hand, a "grassroots approach" of policy making is also limited somehow, as citizens' subjective perceptions could not constitute the sole information for the policy purpose.

Laying on these premise, we observe how, even if QoL studies were already implemented during Seventies in US, researches on QoL flourished with a consistent delay in Europe, but also with less ambitious purposes, often confined in the sphere of the objective approach to well-being. The first countries conducting surveys and well-being data collection have been France, Germany, the Netherlands, Italy, Slovenia and Spain (Noll, 2008). Italy started the BES project in 2013, producing the first Report on Equitable and Sustainable Wellbeing (ISTAT 2014). This report explores twelve domains of wellbeing, including social relationships, economic wellbeing and subjective wellbeing (SWB), beyond more standard objective measures as Health, Education and training, Work and life balance, Politics and Institutions, Security, Landscape and cultural heritage, Environment, Research and innovation, Quality of services. The Italian initiative follows the purpose of the Stiglitz-Sen-Fitoussi Report, going beyond the economic measure of well-being and specifically understanding welfare deficiencies to inform policy makers.

3. A focus on the rationale of the BES and URBES project

In our research we have focused the analysis on the health domain of BES. As it has been recognized in the exploratory report prepared by the ISTAT-CNEL Scientific Commission on health, the effectiveness of the national Health system and the related services are at the basis of citizens' quality of life, as also clearly invoked by the WHO (2001) and by the European Commission (2000). Indeed, health is considered as a state of complete physical, mental and social well-being, and not merely the absence of disease (WHO, 1946), and it is represented right at the base of all the other fundamental human rights. Indeed, the health status of an individual has consequences that impact on all dimensions of his or her life at all stages, often affecting also familial and other empathic relations. As age grows, the expectations of good health conditions gain in importance in the pyramid of values, playing a pivotal role among the eldest, when the risk of illnesses is greater and the impact on quality of life can be severe.

At national level, the Italian National Health System, as stated in the Italian Constitution at the article 32, must ensure a universal and equal health assistance to all the Italian citizens. If the first principle has been satisfied, the equal opportunity to access health services nowadays is not fully guaranteed, especially since the beginning of the Great Recession. Indeed, the latter strengthened the already active processes of territorial peripheralization and social marginalization exacerbating spatial and social inequalities and raising new poverties (Ricciardi et al., 2011; Biggeri et al., 2011). Therefore, the implementation of a monitoring exercise aimed at revealing the most critical issues concerning the health dimension at national and local level has to be considered a priority both at political and a scientific level.

As already specified, health has a multidimensional and dynamic nature, as it varies according to several factors and over time. Therefore, the selection process defining the BES indicators for the health domain has involved several classes of indicators: global indicators of outcome providing a measure of life expectations and other related issues; risk-related-indicators for specific stages of the life cycle; lifestyle indicators (Commissione scientifica BES 2013). The final selection of the indicators led the BES Committee to adopt 14 indicators representing the different dimensions of population`s health, but the BES project is still open to define and include further information which depicts the big picture on population health (e.g. information provided by INAIL about accidents at work and professional diseases).

The BES project has been declined at metropolitan level in several URBES projects, which have been thought to analyze the state of well-being of the Italian cities, in order to highlight inequalities and trends that may affect the future development models. The data at this spatial detail indicate differences among the metropolitan areas involved, and in particular between central municipalities and Regions (or Provinces). The original purpose of the URBES projects has been the enhancement of the dialogue between administrators and citizens, to promote a periodic reporting on the state of the Italian metropolitan areas and an increased participation of citizens in the assessment of the results of the administrative action.

Considering that the state of health of a community in a territory depends on a variety of factors (the economic situation and the competitiveness of the production system, the natural and environmental context, people's behaviors and choices, and so on), policies should be evaluated and implemented accounting for a broader array of actions. Moreover, local governments' skills, resources and strategies are bounded to the choices made at other government levels and by other stakeholders and valueholders. In this perspective the integration of the URBES approach with the activities of policy making is an effective starting point to make a correct use of the statistical data,

by fostering communication and consultation of population through "citizen-oriented" tools and document promoting an assessment culture of the policy actions (Istat, 2015).

As the BES project, also the URBES experiences are still open to further improvements concerning both the set of indicators monitored and the definition of well-being at the metropolitan scale. Indeed, the state of the art is not well implemented as at the national level. As an example, for the Health domain, we observe a substantial reduction of the number of available indicators from 14 to 5. However, this short list might be considered as a starting point to begin a monitoring exercise that in the future might involve more accurate estimates.

4. A statistical analysis based on a multicriteria approach

The statistical analysis lays on the results of the literature overview, concerning the importance of both subjective and objective indicators for measuring people's wellbeing and for planning sound welfare policies. Specifically, we build a logical framework in order to find an internal coherence among the multiple layers that can be adopted to investigate the connections citizens' wellbeing and macroeconomic stability in South Tyrol. Indeed, we focus on four levels of analysis, that roughly coincide with people's subjective wellbeing and people's objective wellbeing, the relative efficiency of South Tyrol's local administrations compared to other Italian local administrations (at provincial and municipal level), the level of South Tyroleans' economic wellbeing measured in terms of per capita GDP and other macroeconomic measures.

Specifically, in this paper we analyze peoples' level of health in South Tyrol, by exploring the available data collected by ISTAT in the URBES project regarding both South Tyrol Province and the Municipality of Bozen. The latter are part of a wider database that contains data on the URBES indicators for all 110 Italian Provinces and for 117 Municipalities (the Provincial capitals plus few other relevant Municipalities that adhered to the URBES Project).

We begin the statistical analysis with a simple exercise consisting in representing the available data using appropriate graphs and reading the observed levels and changes of the time series. Specifically, we focus on gender gaps, as data allow only to measure this kind of asymmetry. Clearly, the conclusions drawn by this basic interpretation of data are subjective, at most referred to common sense, as we did not use any benchmark in the analysis. Anyway, we associate this "subjective interpretation" of descriptive statistics to the widely-observed stakeholders' perspective: provided an initial scenario, the idea is that when observing a "good", positive changes imply an upgrading, while negative changes imply a downgrading in the average level of wellbeing.

Secondly, the available data on health in South Tyrol can also be used to obtain a comparative measure of wellbeing, by observing the relative position of South Tyrol and Bozen respectively in the ranking of the Italian provinces and municipalities. Specifically, we have ordered data (descending if the indicator monitors a "good item", ascending if it monitors a "bad item") and we have assigned a score to each observation corresponding to the position achieved in the overall ranking. In general, data refer to all 110 Provinces and to the 117 Municipalities that adhered to the URBES project, but the number of observations varies across time due to missing values and changes in the overall number of provinces. To obtain a more precise measure of South Tyrol and Bozen's position in the final rank, we use the following normalization criterion:

$$\text{dis.\%} = 100 - (\text{pos. \%}) = 100 - \left(\frac{n-1}{N-1-\text{m.v.}} \times 100\right),$$

where, "dis. %" indicates at which distance (in percentage points) South Tyrol (or Bozen) is from the bottom of the rank (therefore, 0% means the bottom, while 100% means the top of the rank), while "pos.%" is a number included in the interval [0, 100], and indicates at which level from the top of the overall rank South Tyrol (or Bozen) is positioned (0 means on top, 100 means at the bottom). The value "*n*" indicates the position of South Tyrol (or Bozen) in the ranking, "*N*" indicates the overall number of municipalities ranked (usually 100 if they are Provinces, or 117 if they are Municipalities) and "m.v." indicates the number of missing values. We associate this "comparative interpretation" of rankings to a widely observed social planner behavior (in this case, national policy makers): given the initial distribution of data, we assume that the central administration is interested in fostering some sort of convergence at population level toward an equitable level of well-being.

As data only refer to objective measures wellbeing, interpreted both in absolute and comparative terms, we integrate URBES data with data collected by ASTAT on South Tyrol citizens' satisfaction for health services, that we use as proxies of subjective wellbeing. As widely debated in QoL and SBW literature, surveyed data on satisfaction might refer to several kind of judgements (feelings, expectations, common sense…), therefore their interpretation might be biased. However, we include the available data collected by regional surveys in order to provide at least a rough picture of citizens' habits and self-assessment on health.

Finally, we investigate the economic performance of South Tyrol using ASTAT available economic data regarding GDP and other macroeconomic variables of interest.

4.1. The analysis of South Tyroleans' health

4.1.1 A descriptive analysis of the available data focused on level and changes

URBES data on South Tyroleans' health refer to five indicators that provide an overview of the dimension under inquiry. Specifically, data show how:

- life's expectancy at birth is high (on average, 80 years for male and 85 years for female in the interval 2004-2013) and slightly increasing over time (+3,5% for male and +1,5% for female in the same interval);
- infant mortality rate is low (on average, 32,7 deaths in the first year per 10.000 born alive in the period 2004-2011) and rapidly decreasing over time (-61,9% since 2004); moreover, it is lower for female than for male (on average, 24,9 against 40,0 deaths in the interval 2004-2001), and rapidly decreasing for male while increasing for female over time (-86,1% for male and +28,5% for female since 2004);
- the age-standardized mortality rate for traffic accidents for people aged 15-34 is low (1,2% in 2011) and decreasing over time (-23,4% since 2006); moreover, it is higher for male than for female (2% against 0,2% in 2011), and stationary for male while rapidly decreasing over time for female (respectively, +1,6% and -80% since 2006);
- the age-standardized cancer mortality rate for people aged 19-64 is relatively high (32,2% in 2011) and increasing over time (+43,6% since 2006); moreover, it is higher for male than for female (32,9% against 30,1% in 2011) and increasing over time for both sexes (respectively, +44,6% and +46,6% since 2006);
- the age-standardized mortality rate for dementia and related illnesses for people aged 65 and over is low (7,4% in 2011) and decreasing over time (-19,1% since 2006); moreover, it is higher for male than for female (7,9% against 7% in 2011), and decreasing over time for male

while almost stationary for female (respectively, -27,9% for male and -5,2% for female since 2006).

As all indicators monitored are measured for both sexes, is it possible to highlight the existence of several gender gaps. Specifically:

- there is a consistent gap in terms of life's expectancy at birth in favor of women, but the spread among the two sexes is narrowing over time (6,3 years in 2004 and 4,8 years in 2013, with a percent change across time of -23,5%);

- the gender gap in favor of women in terms of infant mortality rate reversed during time, and it is now in favor of men (from 38,1 percentage points less for women to 12,1 percentage points less for men);

- there is a slight but persistent gender gap in favor of women in terms of mortality rate for traffic accidents among people aged 15-34 (from 1,1 percentage point less in 2006 to 1,9 percentage point less in 2011, with a percent change over time of +69,9%);

- the gender gap in favor of women in terms of mortality rate for dementia and related illnesses for people aged 65 and over narrowed over time and it is now not significant (from 3,6 percentage points in 2006 to less than 1 percentage point in 2011).

In brief, it seems that South Tyrolean level of health is high and increasing, even if some critical issues remain concerning the slight increment in female infant mortality rate, and the increase in cancer mortality rate for both sexes. Moreover, data highlight the existence of several gender gaps in favor of women, but in the period 2006-2011 many of them has narrowed over time, becoming not significant or in favor of men. The only gender gap that is persistent and significant is that one in favor of women's life expectancy at birth. Unfortunately, all the indicators are measured only at provincial level, therefore it is not possible to assess the existence of territorial gaps between the Municipality of Bozen and the rest of South Tyrol.

4.1.2. A comparative analysis of South Tyroleans' level of health with respect to the other Italian Provinces

In this paragraph we analyze the level of health in South Tyrol compared to other local Italian administrations both at provincial and at municipal level. The ascending/descending order according to which we ordered data is summarized in the following table.

Figure 1. Criterion used to order the available data for each indicator.

Indicator	Criterion
1. life's expectancy at birth	Descending
2. infant mortality rate	Ascending
3. age-standardized mortality rate for traffic accidents for people aged 15-34	Ascending
4. age-standardized mortality rate for dementia and related illnesses for people aged 65 and over	Ascending
5. age-standardized cancer mortality rate for people aged 19-64	Ascending

A first exploration of data showed how:

- women had relatively high life's expectancy at birth for the whole period of observation (the peak is reached in 2008, at the 96,8% of the ranking); on the other hand, the relatively low

initial life's expectancy at birth of South Tyroleans male (53,2% of the rank in 2004) improved during time, reaching the 87,1% of the rank in 2013;

- South Tyrol's position in the ranking of infant mortality rate improved during time (South Tyrol was at the 52% of the ranking in 2004, while reached the 88,1% of the ranking in 2011); however, from 2004 to 2011 it increased for male from 21,6% to 93,6%, while it decreased for women from 88,2% to 59,6%;

- South Tyrol's position in the ranking of the age-standardized mortality rate for traffic accidents among people aged 15-34 is low and worsened during time (from 54,7% in 2006 to 34,6% of the ranking in 2011); however, while it decreased for male from 68,9% to 24,5%, it increased for women from 24,5% to 90,1%;

- South Tyrol's position in the ranking of the age-standardized cancer mortality rate for people aged 19-64 is high and increasing over time (98,2% in 2011, in 2006 it was 67%); however, it increased relatively faster for male than for female (from 64,2% to 100% and from 69,8% to 76,1%);

- South Tyrol's position in the ranking of the age-standardized mortality rate for dementia and related illnesses for people aged 65 and over was already low in 2006 and worsened over time since 2011 (from 30,2% to 6,4%); indeed, the indicator worsened for both sexes, but male have lost their very high position in the ranking (from 99,4% to 11,8%), while women basically follow the overall trend (from 34% to 8,3%).

In brief, the comparative analysis shows how, while life's expectancy at birth improved during time also in comparative terms, the other indicators often follow alternating or decreasing trends for the two sexes. While in absolute terms cancer among people aged 15-64 seemed the major issue to address among the target-specific causes of mortality, in relative terms it emerges the relative relevance of dementia and related illnesses for people aged 65 and over.

Having observed several diverging trends in the available data on South Tyroleans health, it is important to identify also the most relevant existing gender gaps and their dynamic. Specifically:

- the initial gap in favor of women in terms of relative life's expectancy at birth (+26,6 percentage points in 2004) sharply decreased until 2013 (+4,6 percentage points);

- the initial gap in favor of women in terms of relative infant mortality rate (+66,6 percentage points for women in 2004) sharply decreased and turned in favor of male (+34 percentage points for male in 2011);

- the initial gap in favor of men in terms of relative age-standardized mortality rate for traffic accidents for people aged 15-34 (+44 percentage points for male in 2006) sharply decreased and turned in favor of female (+66 percentage points for female in 2011);

- the initial slight disadvantage of male in terms of relative age-standardized cancer mortality rate for people aged 19-64 (-6 percentage points for male in 2006) sharply turned in a significant gender gap (+24 percentage points for male in 2011);

- the initial gap in favor of male in terms of relative age-standardized mortality rate for dementia and related illnesses for people aged 65 and over rapidly narrowed over time (from +65 percentage points in 2006 to +4 percentage points in 2011).

In brief, in relative terms there is less evidence of an overall gender gap in favor of female. Indeed, in many rankings the gap is in favor of male.

4.1.3. South Tyroleans' perceived health and habits

In this paragraph we present the results of a survey published by ASTAT in 2013 concerning South Tyroleans' subjective perception of their level of health and other information on their habits

of life. First of all, South Tyroleans' perceived health is good: more than 80% of people declared to have a good level of health, while only less than 3.5% of the total population self-assessed a bad health. Indeed, chronic diseases exhibited a negative change between 2005 and 2013, both for total population and for people aged over 65.

These findings might be connected also to the slight fall between 2005 and 2013 in the preventive health-care checkups regarding cholesterol, glycaemia and BP. However, the absolute demand of preventive health-care services remains high, as only less than 30% of people aged 18 or more did not ask for preventive check-ups, and the population share among those one aged 65 or more falls to less than 15%. On the other hand, even if data shows high levels in relative terms, only one quarter of people aged 50-70 did colonoscopy, while the majority of people aged 45 or more never checked for osteoporosis. Finally, prevention seems to be an important issue for women aged 25 or more, as more than 85% of them did at least a pap test, while 58% did at least a mammography during life.

As regards South Tyroleans' habits, the survey provides data on smoking and on BMI, but also on more specific issues as dental care and use of drugs. Specifically, the share of heavy smokers (more than 20 cigarettes each day) among people aged 14 or more decreased, while the number of early smokers slightly augmented. Moreover, it seems that male begin to smoke earlier than female (in 2013, the modal value was 16 years for male and 17-18 years for female). Secondly, as regards BMI, the share of obese on total population is very low, but there is a wide share of over-weighted male and a consistent share of under-weighted female. Indeed, less than 10% of people follow some kind of diet controlling for one among sugar, fats, salt or it is vegetarian. Thirdly, most of South Tyrolean people (almost 80%) regularly go to the dentist, while only a minority (less than 4%) seems not to care at all about dental health. Fourthly, more than one quarter of South Tyroleans use drugs daily, and the frequency increased both for total population and for over 65 in the period 2005-2013. Finally, the share of people that make use of unconventional therapies is relatively high, but we observed a negative change between 2005 and 2013.

On the supply side, it is worth noticing how physicians benefit of the highest level of trust among professionals in South Tyrol (88,2% of people trust them). Also the health-care system as a whole generates a high level of citizens' satisfaction (80,7% of citizens aged 18 or more are satisfied with its performances), but compared to other welfare services, this result is less appealing (as an example, the urban public transport is the "best in class", and it generates a level of satisfaction of 91%).

4.2. An analysis of the interdependence between health and GDP in South Tyrol.

We conclude the explorative analysis of data on South Tyroleans' health with a correlation analysis involving the available data associated to a set of economic and wellbeing indicators. As regards wellbeing, we consider all the available URBES indicators, while at economic level we consider GDP measured at market prices, per capita GDP measured at current prices, GDP growth, per capita GDP growth, households' health care expenditure and public sector's healthcare expenditure.

At economic level we notice how:

-        as expected, GDP and per capita GDP trends are highly correlated (0,997), and the same happens to GDP growth and per capita GDP growth (0,997); on the other hand, GDP and per capita GDP levels and growth rates exhibit a negative (but weaker) correlation (-0,41 and -0,32 respectively);

- Households' and public administration's health-care expenditure are highly and positively correlated (0,887), therefore they seem to be additive rather substitutive; moreover, they are both highly and positively correlated to GDP and per capita GDP levels (more than 0,9 in all cases), and therefore negatively correlated with GDP and per capita GDP growth.

When analyzing wellbeing, instead, first of all we notice:

- a high and positive correlation between male and female's life expectancy at birth (0,90);
- a weak negative correlation between male and female infant mortality rates (-0,21);
- a weak and positive correlation between 15-34 years old male and female age-standardized mortality rate for traffic accidents (0,28);
- a weak negative correlation between 65 or more years old male and female age-standardized mortality rate for dementia and related illnesses (-0,31);
- a high and positive correlation among 15-64 years old age-standardized cancer mortality rate (0,56).

Therefore, it seems that while in general there is a co-movement between sexes toward better life conditions, in some cases (infant mortality, cure for dementia and related illnesses) there might be a trade-off between gender-specific treatments that should be taken into account at administrative level.

Secondly, we notice how:

- female and male life expectancy at birth are similarly correlated (at least in sign, but often also in magnitude) to the causes of death considered, except that for over 65 age-standardized mortality rate for dementia and related illnesses (correlation are 0,27 for male and − 0,10 for female);
- 15-64 years old people cancer mortality rate is the only cause of death that is positively associated with life expectancy at birth both for male and for female; for female, also infant mortality rate exhibits a weak positive association, while for male also mortality for traffic accidents is positively correlated.

Therefore, it seems that beside a cooperation among sexes for achieving a better life, there might be fields of competition. Secondly, it seems that some causes of death (an increase in middle-age cancer mortality) might reflect the achievement of better and longer lives for both sexes. Finally, it seems that excessive care in some gender specific causes of death might have counterintuitive effects on life expectancy, but this issue is more controversial.

Thirdly, among the major causes of death we notice how:

- there is almost no association between infant mortality and people aged 15-34 mortality rates for transport accidents, even if by disaggregating data for the two sexes it can be noticed how the association is positive for female and negative for male; instead, infant mortality rate is positively and highly correlated with 65 or more years old age-standardized mortality rate for dementia and related illnesses, and negatively and highly correlated with 15-64 years old age-standardized cancer mortality rate for both sexes (interesting inferences can be obtained also by disaggregating both data for gender differences)
- people aged 15-34 mortality rates for transport accidents are weakly correlated with all the other causes of death but male 65 or more years old age-standardized mortality rate for dementia and related illnesses (0,36, that influences also the total population score, that is 0,39);
- there is a high and negative association between 65 or more years old age-standardized mortality rate for dementia and related illnesses and 15-64 years old age-standardized cancer mortality rate (-0,77).

Therefore, we suggest that the positive correlation between infant and over 65 dementia mortality rate might depend on the fact that ill grandparents cannot help the parent in caring for the newborn. Instead, mortality in the old age for dementia might be associated to a good level of health during life, and this fact might explain the negative correlation with cancer mortality in the middle age.

Finally, we observe the correlations among economic and wellbeing indicators on health. First of all, we notice how life expectancy at birth of both sexes are highly and positively correlated to the level of GDP, per capita GDP, households and public administration health expenditure (more than 0,8), while they are negatively correlated to GDP growth and per capita GDP growth. Therefore, we suspect that there might be a trade-off between growth and higher life expectations, at least in the short run. Secondly, almost all causes of death but cancer in the age 15-64 are negatively correlated with GDP and per capita GDP. Specifically, higher income is correlated with less male infant mortality, lower 15-34 female mortality rate for transport accidents, and lower over 65 male mortality rate for dementia and related illnesses, but with higher 15-64 cancer mortality rate for both sexes. Therefore, it seems that a higher income generates negative effects on their adults' health, but positive spillovers on the health of the other social groups sorted by age. Thirdly, higher GDP growth rates are associated to lower life expectations at birth for both sexes, a higher infant mortality rate (even if with a significant gender gap), a lower 15-34 male transport accidents mortality rate, a lower 15-64 cancer mortality rates, and a higher over 65 male dementia and related illnesses mortality rate. Therefore, it seems how GDP growth determines negative effects on people's wellbeing, except that for people in the working age. Fourtly, households and public administration health-care expenditure is highly and positively related to life expectations at birth for both sexes, and to 15-64 cancer mortality rate for both sexes. Moreover, it is negatively associated to male infant mortality rate and to over 65 dementia and related illnesses mortality rates, while it is only weakly associated to 15-34 transport accidents mortality rates. Therefore, we suspect that regular cancer preventive checkups and a safer mobility might reduce both private and public health public expenditure, that might be used to reduce infant mortality and rise life expectations at birth, while accepting a higher over 65 dementia and related illnesses mortality rate as a byproduct of better health conditions in the previous years.

4.3. A brief summary of the evidence collected

In this paragraph we summarize our findings regarding the health dimension in South Tyrol. First of all, we notice how South Tyrolean people have on average a good perception of their level of health, which is supported also by good habits regarding health-care prevention and smoking. Their perception reveals to be correct, as it is coherent with high life's expectancy at birth, both at absolute and relative levels. The correlation analysis shows how life's expectancy at birth is positively correlated with the levels of GDP and health-care expenditure, while it is negatively correlated with the GDP growth rate. Provided that the latter correlation might be spurious (as it might depend on some sort of saturation effect in GDP and health care expenditure growth pattern), we ask ourselves if there might be a trade-off between economic growth and longevity and whether financial intermediaries (and other profit-oriented institutions) might be interested in financing projects aimed at increasing South Tyrolean's longevity.

Secondly, even if we could not find any subjective assessment on this topic, we observe how in South Tyrol infant mortality rate is low both in absolute and in relative terms. The correlation analysis shows how female infant mortality rate is negatively correlated with GDP growth rate, while male infant mortality rate is positively correlated with GDP growth rate and negatively

correlated with GDP levels and public and private health care expenditure. Provided this preliminary evidence, it might be of interest to estimate what is the net effect of a 1% change in GDP growth rate over the incidence of infant mortality rate in South Tyrol. Moreover, assuming also the existence of an inverse causal relation between the latter two variables (i.e., that infant mortality rate might affect GDP growth rate) it seems that financial intermediaries and other profit-oriented institutions might have an interest in financing projects aimed at reducing female (but not male) infant mortality rate, but this issue requires more in-depth analysis of the observed gender asymmetry.

Thirdly, even if we could not find any subjective assessment on this topic, we observe how in South Tyrol the mortality rate for traffic accidents among people aged 15-34 is low in absolute terms, but high if compared to the data observed for other Italian territories. The correlation analysis shows how for male this item is positively correlated with private healthcare expenditure and negatively correlated with GDP growth rate, while for female it is negatively correlated with both variables. Therefore, assuming that private healthcare expenditure might be considered an indicator of "safe habits", it might be of interest to estimate the net effect of a 1% change in private health-care expenditure over the incidence of mortality rate for traffic accidents among the young adults in South Tyrol. Moreover, assuming the (more reasonable) existence of an inverse causal relation between the latter two variables (i.e., that mortality rate for traffic accidents among people aged 15-34 affect private health-care expenditure) it seems that financial intermediaries and other profit-oriented institutions might have an interest in financing projects aimed at reducing male (but not female) mortality rate for traffic accidents among young adults, but this issue requires an in-depth analysis of the gender asymmetry.

Fourthly, notwithstanding South Tyrolean's good habits in terms of preventive healthcare, we observe a high absolute rate of cancer mortality among people aged 20-65, but compared to other Italian territories the observed value is of low magnitude. The correlation analysis shows how for both sexes cancer mortality rate among people aged 20-65 is positively correlated with the levels of GDP and public and private healthcare expenditure, but is negatively correlated with GDP growth rate (the latter correlation might be spurious as it might reflect some sort of saturation effect in the GDP growth pattern). Therefore, we suggest how the interdependence among economic wealth and quality of life in South Tyrol might be an interesting topic for an in-depth analysis, as it might provide evidence of at least some non-linearity. Moreover, we suspect that policies aimed at reducing cancer mortality rate among people aged 20-65 might be supported at local level, but would hardly find the support of national policy makers, as it might be difficult to convince the latter that South Tyrol is a national priority in this branch of healthcare. Lastly, it might be useful to alert public opinion on the increase in early smokers in order to raise some sort of social deterrence.

Fifthly, mortality rate for dementia and related illnesses among people aged 65 and over is low in absolute terms, but is high if compared to other Italian territories. The interdependence analysis reveals that for male this item is positively correlated with GDP growth rate, while for both sexes it is negatively correlated with private and public healthcare expenditure. Given also its negative correlation with cancer mortality rate among adults, we ask ourselves if this item can be considered as a proxy of healthcare expenditure sustainability and wellbeing, as it implicitly signals a good health status in previous ages. Finally, projects aimed at reducing the mortality rate for dementia and related issues in people aged 65 and more might benefit of national policy makers and profit oriented institutions' support, but do not seem to be a priority at local level.

5. Concluding remarks

In this rapid exploration of the available data on health in South Tyrol we have highlighted several issues that now we try to summarize in three steps.

First of all, we present our overall assessment of the topic under inquiry. South Tyrolean people have on average a good perception of their level of health, which is supported also by good habits regarding health-care prevention and smoking. At local level, data depict a good picture of South Tyroleans' health except that for the increment of people aged 15-65 standardized cancer mortality rate. Moreover, the overall gender gap in favor of women has evolved during time toward a more balanced equilibrium. At national level the picture is less clear, as there are indicators that show high relative levels of health (life expectation at birth, infant mortality rate, people aged 19-65 standardized cancer mortality rate), but there also indicators for which South Tyrol is at the bottom of the national ranking (15-34 years old male and female age-standardized mortality rate for traffic accidents, age-standardized mortality rate for dementia and related illnesses for people aged 65 and over). Finally, while the level of GDP positively affects all indicators but people aged 15-65 standardized cancer mortality rate, only two over four causes of death are negatively related to GDP and per capita GDP growth (specifically, those one related to people aged 15-65) therefore suggesting that the interest of profit oriented institutions in supporting projects aimed at increasing South Tyroleans' level of health might be limited to actions in favour of people in the working age.

Secondly, we try to summarize the main methodological issues that, sometimes explicitly, sometimes implicitly, we have discussed in the previous paragraphs. We begin by noticing how reading data using a multicriteria approach emphasizes the multi-stakeholder nature that intrinsically characterizes the interpretation of the results obtained. Specifically, every time we have tried to draw policy recommendations, we have observed the plurality of policy questions that lie behind a possible action. This point leads us to a second consideration: when available, subjective data on well-being are not often directly related to the available objective measures. If citizens' surveys were more correlated to the available objective data, especially at local government level, the comparison between subjective and objective wellbeing would be more effective, and this might lead to more sound local development policies. A third consideration regards an integrated approach for the policy making: it is useful to use both objective and subjective data, but also to integrate them in the context of a public and well informed public debate about more specific social objectives and the trade-offs between them. Data and statistical analysis alone have their limits, but a multi-stakeholder perspective, including the subjective well-being indicators, has the advantage to disentangle problems from different perspective, or to attract attention on important issues which might otherwise be ignored, perhaps because they refer to relatively powerless groups, or because they were not previously identified as a problem (Seaford 2013, Kroll &Delhey 2013).

Finally, we highlight how, even if our analysis is limited to only one dimension and one territory, it can be easily replicated in order to cover all the relevant aspects of wellbeing and all territories under inquiry. This aspect opens an interesting field of analysis for social scientists, as it allows to facilitate the dialogue among statisticians and policy makers. Indeed, we believe that the main purpose of social sciences is that of mediating among quantitative and qualitative approaches, on one side by collecting all the information available and assessing its quality, and on the other side by providing an integrated view of all the relevant policy issues concerning the phenomenon under inquiry, assessing their internal coherence and correspondence with the

statistical evidence collected. Our research covers the first part of the analysis, we hope that we will be able to discuss our results with relevant socioeconomic actors.

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Statistical Appendix

HE1 – Average life expectancy at birth

Graph 1.1. Female and male average life expectancy at birth (n. of years).
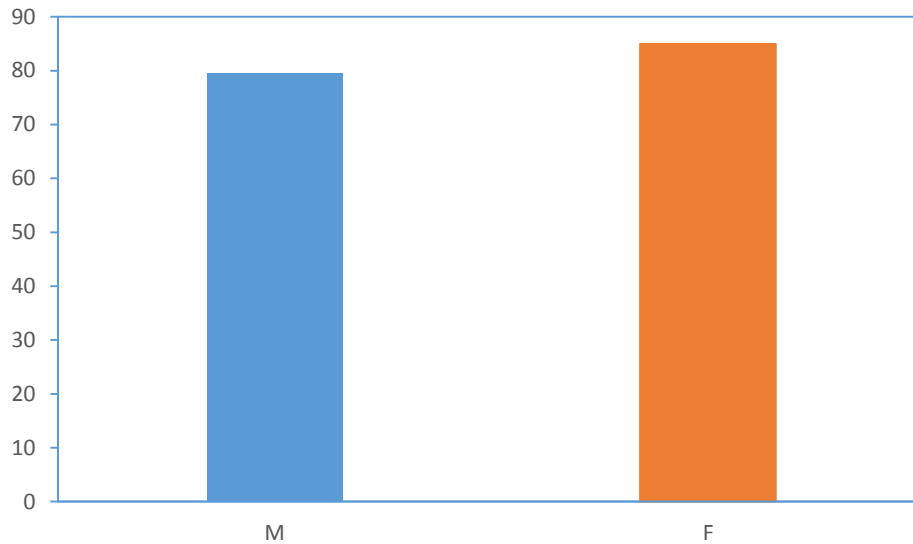
Graph 1.2. Female and male average life expectancy at birth (average 2004-2013 = 100).
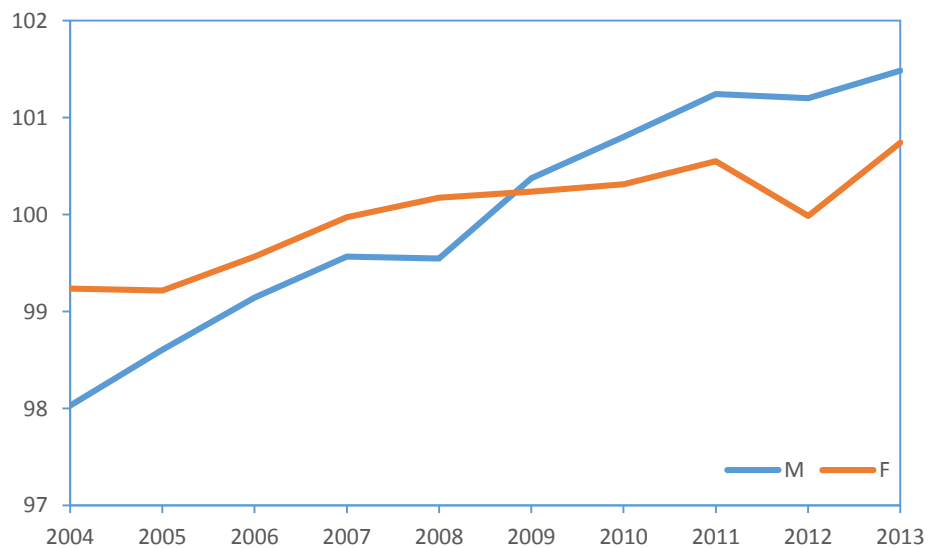
Graph 1.3. Female and male average life expectancy at birth (ranking 2004-2013).
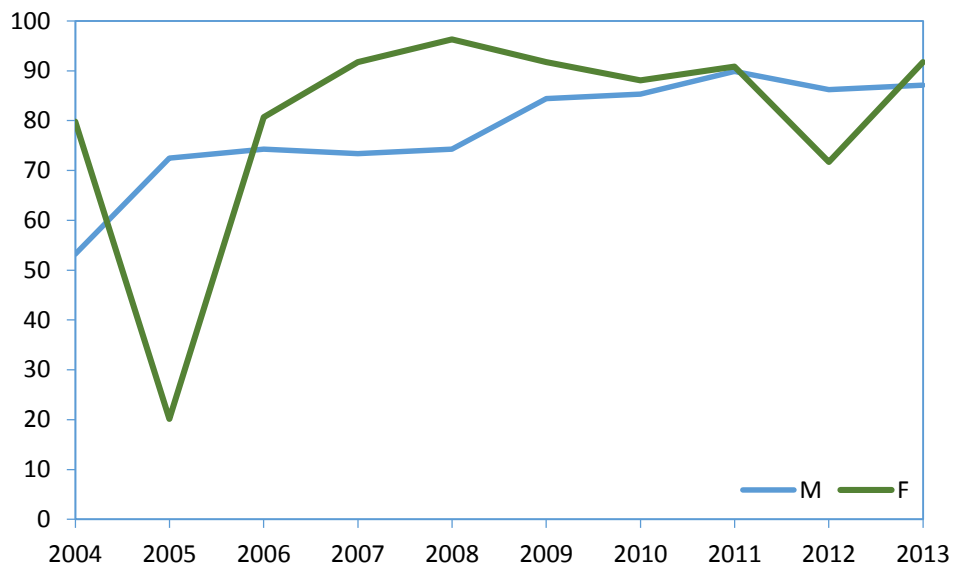
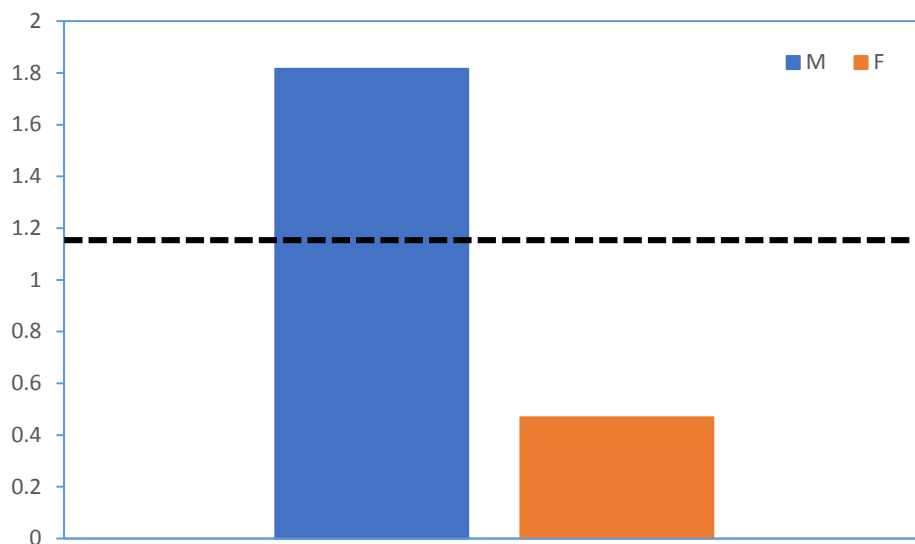*Source: our elaboration on URBES-ISTAT data (2016). N.B. 100 means top, 0 means bottom.*

Graph 1.4. Female and male average life expectancy at birth: correlation analysis.
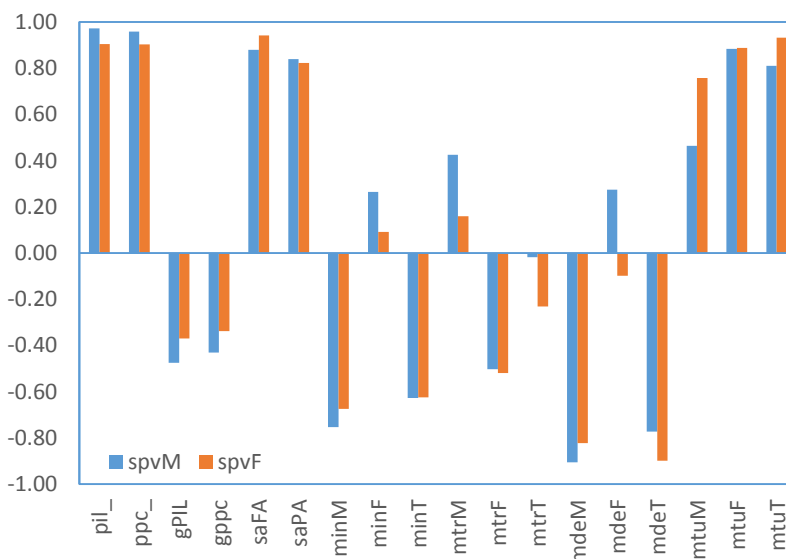
Source: our elaboration on URBES-ISTAT data (2016). N.B. Data do not cover the whole period 2004-2013 for all the variables analyzed.

HE2 – Infant mortality rate

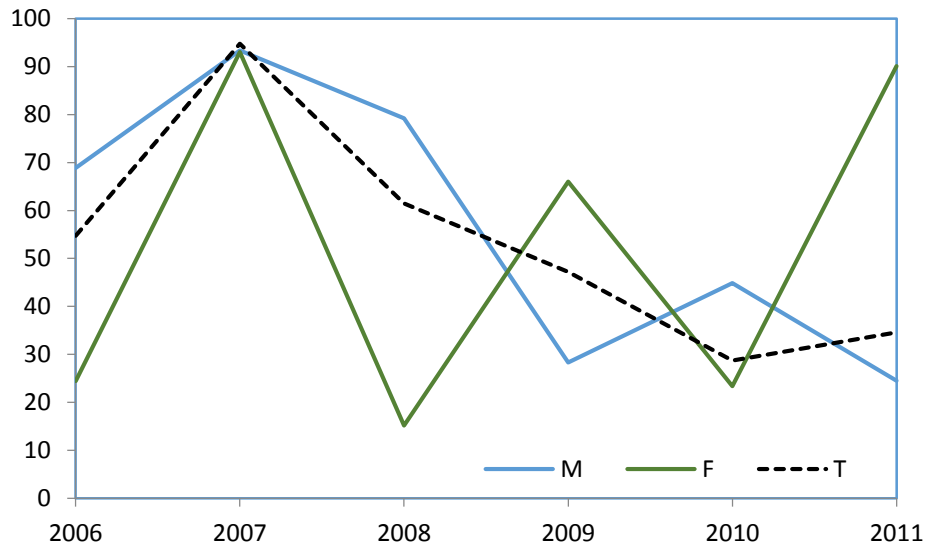Graph 2.1. Infant mortality rate (deaths over the first year of life per 10.000 born alive).
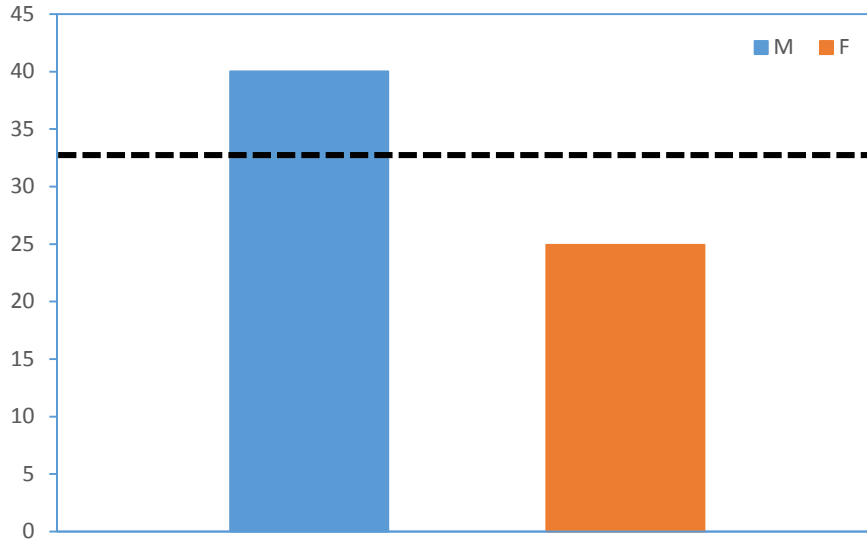
Source: our elaboration on URBES-ISTAT data (2016). N.B. The value represented is the average fort the interval 2004-2011. The black line indicates the average value for the whole population.

Graph 2.2. Infant mortality rate (average 2004-2011 = 100).
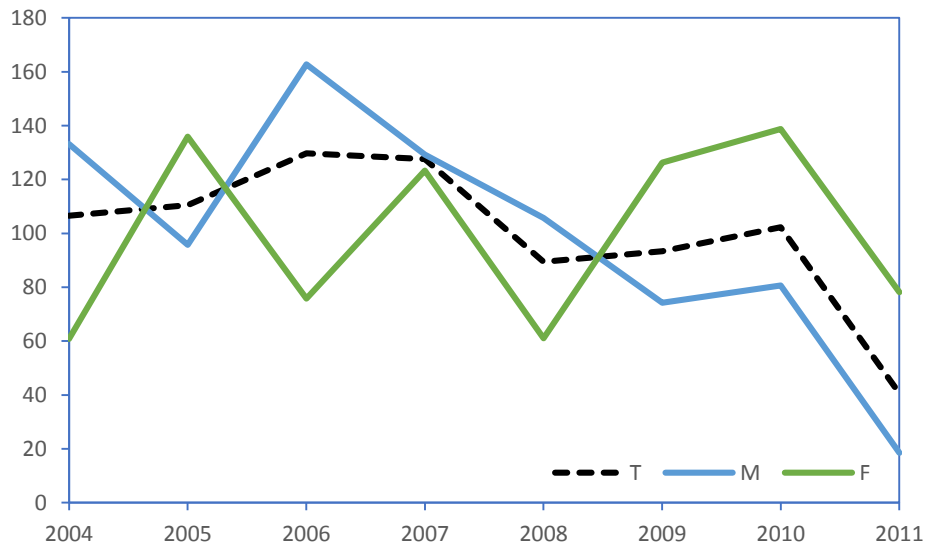
Source: our elaboration on URBES-ISTAT data (2016).

Graph 2.3. Infant mortality rate (ranking 2004-2013).
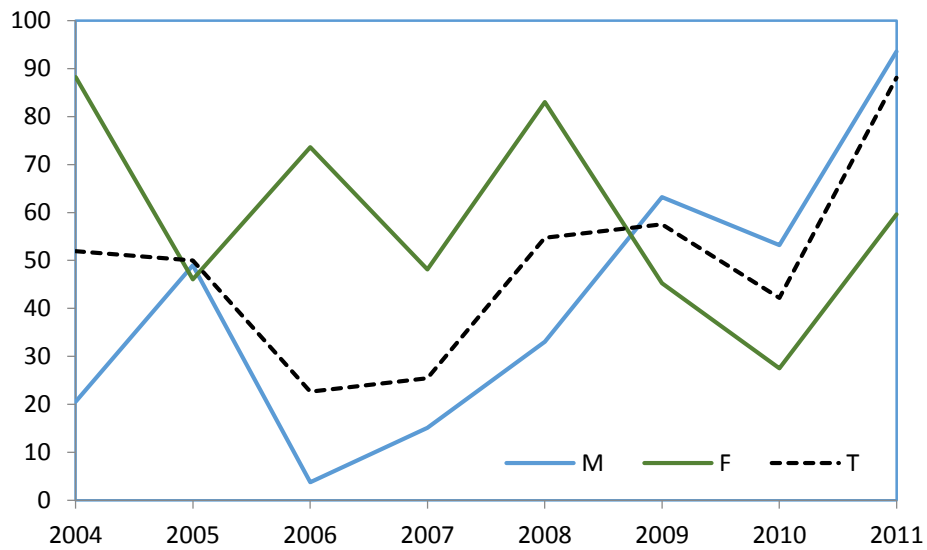
Source: our elaboration on URBES-ISTAT data (2016). N.B. 100 means top, 0 means bottom.

Graph 2.4. Infant mortality rate: correlation analysis.
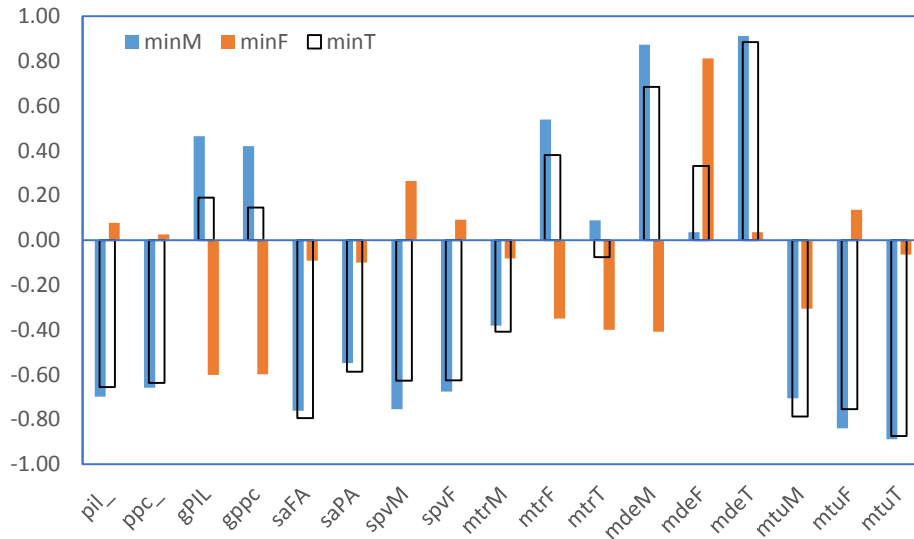
Source: our elaboration on URBES-ISTAT data (2016). N.B. Data do not cover the whole period 2004-2011 for all the variables analyzed.

**HE3 – Mortality rate for traffic accidents (initial cause) for people aged 15-34**

Graph 3.1. Traffic accidents 15-34 (deaths over 10.000 residents).

Source: our elaboration on URBES-ISTAT data (2016). N.B. The value represented is the average fort the interval 2006-2011. The black line indicates the average value for the whole population.

Graph 3.2. Traffic accidents 15-34, deaths over 10.000 residents (average 2006-2011 = 100).
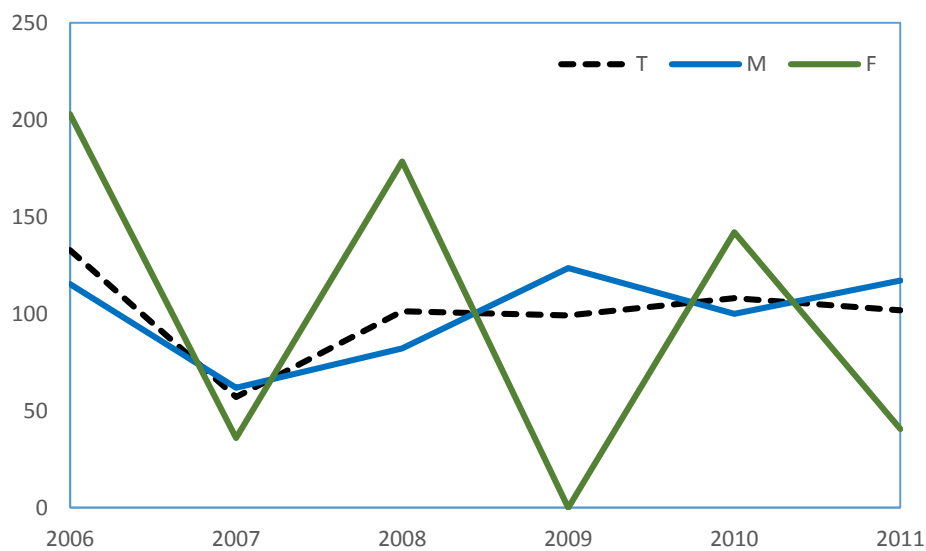
Source: our elaboration on URBES-ISTAT data (2016).

Graph 3.3. Traffic accidents 15-34, deaths over 10.000 residents (ranking 2004-2011).

Source: our elaboration on URBES-ISTAT data (2016). N.B. 100 means top, 0 means bottom.

Graph 3.4. Traffic accidents 15-34, deaths over 10.000 residents:correlation analysis
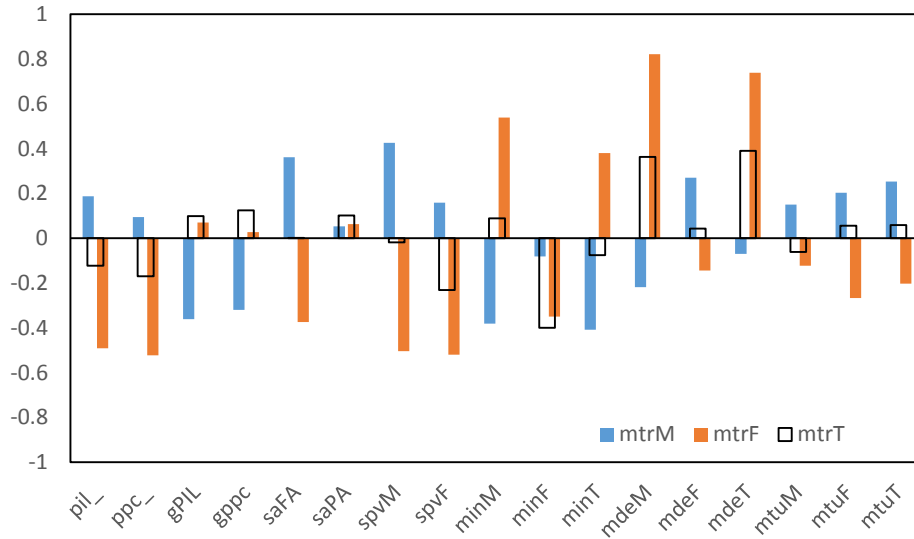
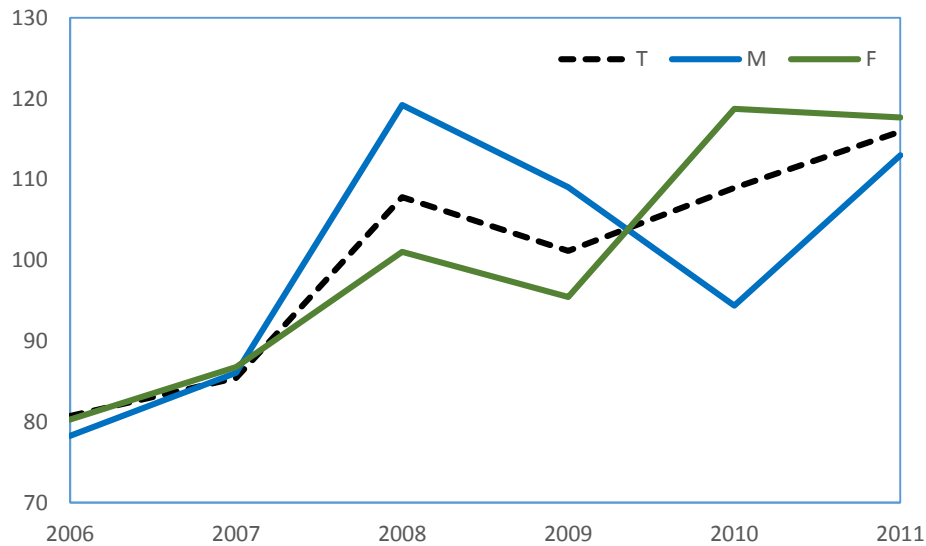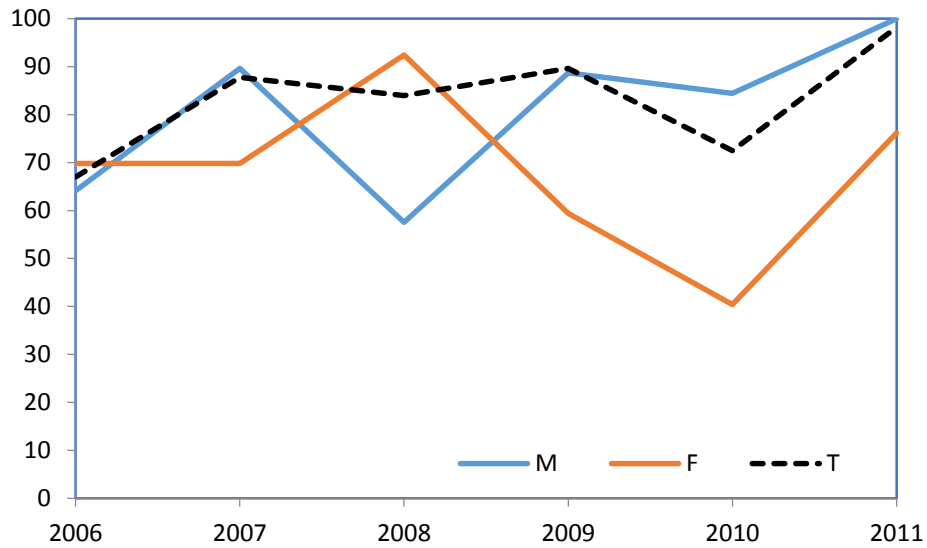
Source: our elaboration on URBES-ISTAT data (2016).

HE4 – Cancer mortality rate (initial cause) for people aged 19-64

Graph 4.1. Cancer mortality rate for people aged 19-64 (deaths over 10.000 residents)
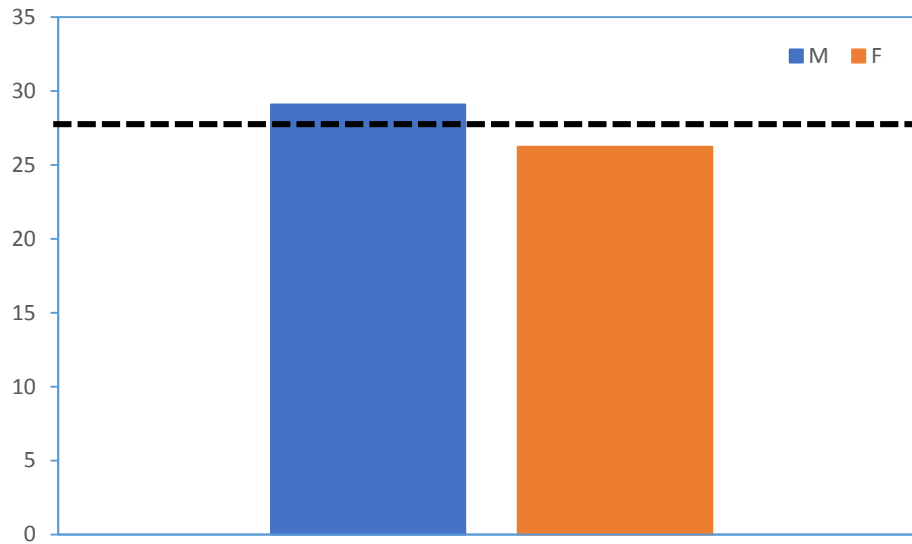
Source: our elaboration on URBES-ISTAT data (2016). N.B. The value represented is the average fort the interval 2006-2011. The black line indicates the average value for the whole population.

Graph 4.2. Cancer mortality rate 19-64, deaths over 10.000 residents (average 2006-2011 = 100).
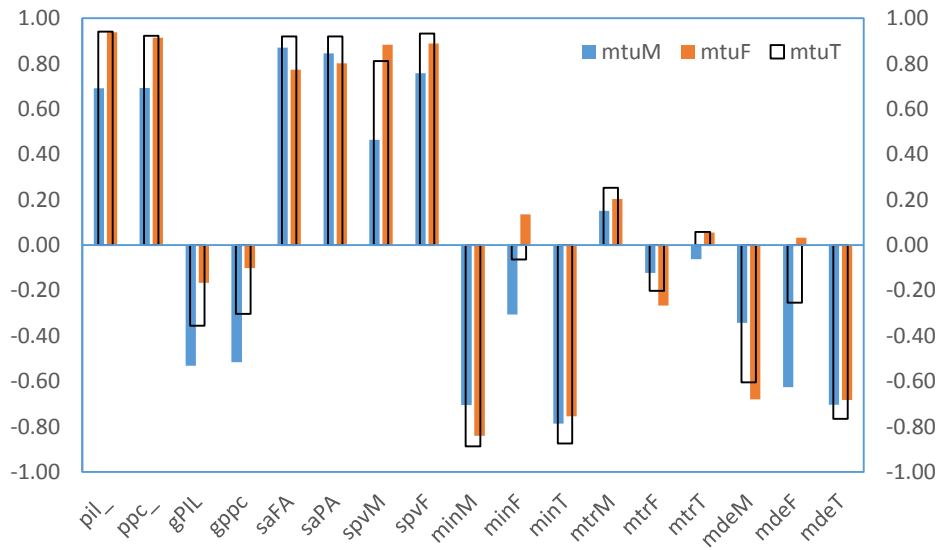

Source: our elaboration on URBES-ISTAT data (2016).

Graph 4.3. Cancer mortality rate 19-64, deaths over 10.000 residents (ranking 2004-2011).

Source: our elaboration on URBES-ISTAT data (2016). N.B. 100 means top, 0 means bottom.
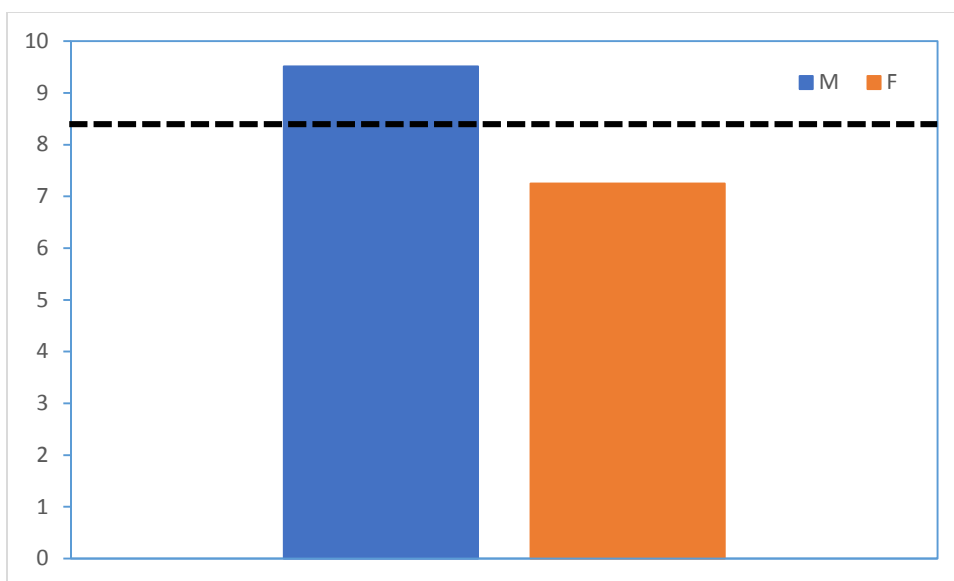
Graph 4.4. Cancer mortality rate 19-64, deaths over 10.000 residents: correlation analysis

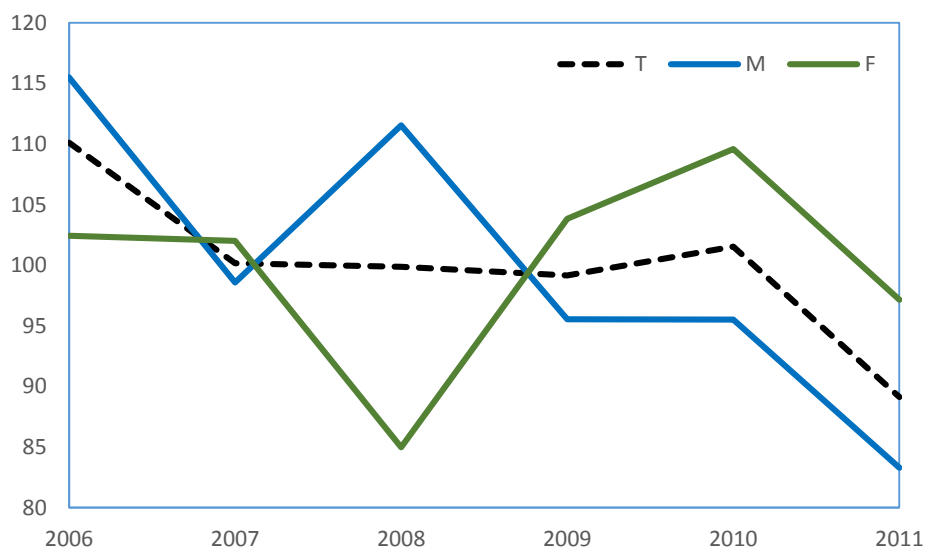*Source: our elaboration on URBES-ISTAT data (2016).*

HE5 – Mortality rate for dementia and related illnesses for people aged 65 and over

Graph 5.1. Mortality rate for dementia (initial cause) age +65 (deaths over 10.000 residents)
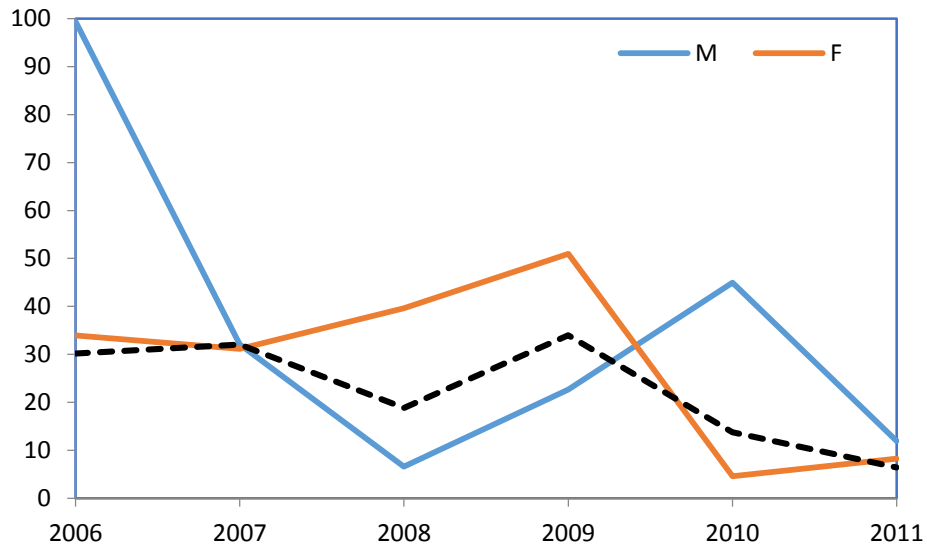

Source: our elaboration on URBES-ISTAT data (2016). N.B. The value represented is the average fort the interval 2006-2011. The black line indicates the average value for the whole population.

Graph 5.2. Mortality rate for dementia +65 over 10.000 residents (average 2006-2011 = 100).
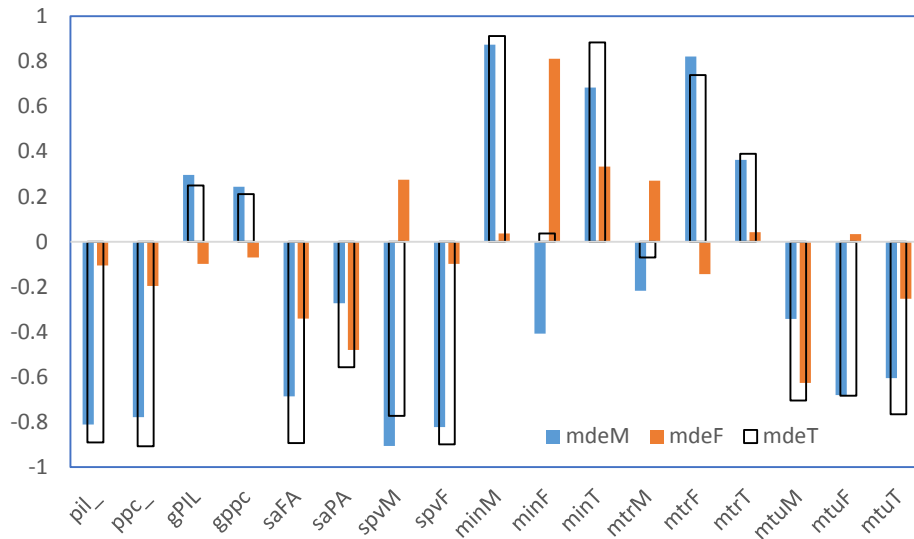

Source: our elaboration on URBES-ISTAT data (2016).

Graph 5.3. Mortality rate for dementia age +65 over 10.000 residents (ranking 2004-2011).

Source: our elaboration on URBES-ISTAT data (2016). N.B. 100 means top, 0 means bottom.

Graph 5.4. Mortality rate for dementia age +65 over 10.000 residents: correlation analysis

Source: our elaboration on URBES-ISTAT data (2016).

A brief summary of the monitoring exercise

	Citizens	Loc. Gov.	Nat. Gov.	Fin. Int
HE1	Good	High and increasing (W > M, narrowing)	W: high and persistent M: initially low, increased to high (W > M, narrowed)	Highly and positively correlated to GDP, per capita DGP, household and public health exp. Highly and negatively correlated to GDP and per capita GDP growth.
HE2	-	Low and decreasing (W > M, now inverted)	Average, increased to high (W > M, now inverted)	M is highly and negatively correlated with GDP and per capita GDP M and F are highly and positively correlated to GDP and per capita GDP growth
HE3	-	Low and decreasing (W > M, slight but persistent)	Low, worsened (M > W, inverted)	F is highly and negatively correlated with GDP and per capita GDP M is highly and negatively correlated with GDP and per capita GDP growth
HE4	High prevention Heavy smokers decreased, early smokers increased	High and increasing (W = M)	High, increasing (W = M turned in M > W)	M and F are highly and positively correlated with GDP and per capita GDP M and F are highly and negatively correlated with GDP and per capita GDP growth
HE5	-	Low and decreasing (W > M, narrowing)	Low, worsened (M > W, narrowed)	M is highly and negatively correlated with GDP and per capita GDP M is highly and positively correlated with GDP and per capita GDP growth