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DOCTORAL THESIS

I'll do it tomorrow:
Health Strategies in Uncertain Periods

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I'll do it tomorrow: Health Strategies in Uncertain Periods.

A needed introduction.

This thesis is presented as a series of three separate but related papers, in agreement with the scientific board of the Network for the Advancement of Social and Political Studies. It is the result of my path of study in Economic Sociology and Labour Studies Doctor of Philosophy Program.

Each paper is part of a wider initiative which aims to analyse the effects of an uncertainty situation on health, health behaviours and health care unmet needs and decisions. In addition, also aims to identify on which variables we should intervene to reduce the negative consequences (or amplify the positive consequences) of economic insecurity or job insecurity on the general health status of a population. Given the presence of a general aim, the three papers share a common theoretical framework while adopting different focuses.

Background

In the policy framework of Health 2020, the aim of a "significantly improve the health and well-being of population, reduce health inequalities, strengthen public health and ensure people-centred health system that are universal, equitable, sustainable and of high quality" became increasingly relevant.

These guidelines are the product of two years of consultation and were adopted during the sixty-second session of the WHO Regional Committee for Europe, in September 2012. They define the importance of a leading role of national government to guarantee a society where good health benefits everybody, they give a strategic path, a set of priorities to improve health, address health inequalities, and ensure health for future generation.

This general strategy has to be placed in a situation characterised by important social, economic, and environmental changes with high level of uncertainty and related effects.

About the latter, we will consider in our thesis a range of years characterised by an economic downturn, that is by definition a period with a lower rate of growth, lower GDP growth rates, higher unemployment rates, lower investment, lower consumer spending. The last economic downturn, that according to the literature started in 2007-2008, continuosly has a huge impact on citizens' life: millions of people lost their job and their life-savings with deep economic consequences (OECD, 2014).

Several studies have analysed the impact of this situation in terms of health and health-care, but the results are often opposite and controversial.

From this, derives that improvements in health policies have to take into account these puzzling results, the specifities of the national context and also individual characteristics of their citizen. Differences in health inequalities can be related to several factors: geographic, racial/etnic, linked to socioeconomic status or other social factors, and so on. The problem of health inequalities still exists or seems to be amplified and is characterised by increasing differences both between and within Countries. In this uncertain picture, the main focus is therefore on the controversial

relation among health and uncertainty. In doing this, the situation of uncertainty will be the common thread of the work. The main aim is to identify paths of reaction to an economic downturn and try to evaluate the factors on which it is necessary to act or which it is necessary to control.

The title "I'll do it tomorrow" comes from our general hypothesis: the idea is that in a period characterised by a higher level of uncertainty, it is more difficult to activate long term-oriented behaviours. Individuals suffering from uncertainty tend to activate sort of "survival behaviours", postponing to better moments both decisions and positive attitudes.

A general deterioration of health, a situation where unmet need of cares still persist, the adoption of an unhealthier behaviours: are these the consequences of a period of uncertainty? Do individuals tend to live an "out-of-breath" life?

"When I'll get a more certain job position, I'll do this examination", "When I'll get paid more, I'll go to the dentist", "When I'll be more certain, I'll be healthier".

Like "Diet? I'll start on Monday", does this uncertain situation cause a "waiting life" characterised by postponement? Does structural or individual uncertainty really cause a life characterised by harmful behaviours and repeated promises of healthier behaviours?

Before presenting the empirical part of the work, it is necessary a presentation of the theoretical framework on which the entire work is based, the main contributions on the topic, and the main motivation behind the work. We will start with some fundamental definitions of health, health behaviours and uncertainty. We will then present the relations among these concepts, analysing how they impact each other.

1. Health, between classical and modern epidemiology

According to the World Health Organization definition, Health not only means the absence of disease or infirmity but also a complete state of physical, mental and social well-being (WHO).

Relying on this definition, we can include the social and economic environment, the physical environment and the person's individual characteristics and behaviours among the main health determinants (WHO).

This conceptualisation of health determinants could be interpreted according with the so called "modern" school of epidemiology (Rothman, 1986). In fact, in addition to the classical epidemiology that only focuses on risk factors like direct causes of diseases, the "modern" epidemiology also focuses on social factors like social conditions.

Referring to the first group of theories, most of the classical epidemiology researches, focus on factors that are proximal causes of diseases such as diet, cholesterol level, lack of physical activity, and so on.

Moving to the modern epidemiology instead, the claim is that greater attention must be paid to basic social conditions (keeping alive classical epidemiology).

By looking at the Link and Phelan (1995: 81) theory of fundamental causes of diseases, we can identify four essential features that define risk factors. They consider as risky a factor that:

1. «influences multiple diseases outcomes, meaning that it is not limited to only one or few diseases or health problems;
2. affects these diseases outcomes through multiple risk factors;
3. involves access to resources that can be used to avoid risks or to minimize the consequences of diseases;
4. reproduce the association between a fundamental cause and health over time via the replacement of intervening mechanisms».

Link and Phelan (1995) also proposed two conceptual frameworks to better frame the multiple diseases – multiple outcomes dichotomy: *i)* the consideration that social conditions are fundamental causes of diseases and *ii)* the importance of contextualizing risk factors. We now link these concepts with our main theoretical bases.

1.1 Social conditions as fundamental causes of diseases

Social conditions can be defined as factors related to persons' relationships with other people as characteristics such as socioeconomic status, race, gender, but also as stressful life events of social nature (Link and Phelan, 1995).

Among these, characteristics like race and gender are more straightforward, but the precise meaning of Socio-Economic Status (SES) is far less clear. Using one of the most up-to-date definitions we can define SES as a measure that combines level of education, income and occupation to provide information about social and economic status (Baker, 2014).

Using the definition to re-frame the link between health and social conditions, we can confidently say that a higher SES means a better access to social resources which in turn helps individual to avoid diseases and their negative consequences. Health, in this sense, could be seen as one of the most relevant outcomes of social conditions. It is the consequence of embedded socio-economic disadvantages that individuals cumulate through their life (Di Prete and Eirich, 2006; Spender and Logan, 2002; Wilson, Shuey and elder, 2007).

SES is directly linked with an unequal distribution of resources (Graham, 2004) and, according to Baker (2014), it influences individual health through the ability to purchase health promoting resources and treatments, through the socialization of early health habits and through the continuing socialization of health habits.

The connection between SES and Health is documented by forty years of medical sociology that have shown the association between the lower socioeconomic status and lower life expectancy, higher overall mortality rates, higher rates of infant and perinatal mortality, and with each of the 14 major cause-of-death categories in the International Classification of Diseases. In addition, also the association with major mental disorders is well documented (Lieberson, 1985; House et al. 1990, 1994; Link and Phelan, 1995; Phelan et al., 2004; Lutfey and Freese, 2005; Link and Phelan, 2010).

Several studies show other association between health and others features such as gender (Walsh and Feldman, 1981; Syme and Guralnik, 1987; Colley, 1985; Gazzard

and Lance, 1982; Prout, Colton, and Smith, 1987; Dohrenwend et al., 1980; Kessler et al., 1994; Macintyre, 1994), ethnicity (Dutton, 1986; Miller, 1987; Challah and Wing, 1985; Pedoe, 1982), marital status (Kesley, 1933; Benenson, 1987; Robins et al., 1984), religion (Saracci, 1985) and stressful life events (Miller, 1987; Brown and Harris, 1989; Shrout et al., 1989).

Education also play a crucial role as a protective mechanism being fundamental component of SES.

Mirowsky and Ross (2003), use the term "structural amplification" that according to Cockeram (2013) refers to the accumulation of advantages for who has a higher level of education and at the opposite the accumulation of disadvantages for lower educated, with positive or negative impact on health.

Higher education is often related to a lower probability of being unemployed and to a better occupational situation (Ross and Wu, 1996), a lower probability of contracting diseases and to a raising life expectancy at birth (Cockerham, 2005). The educated person is more informed and more responsible and also tends to make less harmful choices regarding health, both in terms of lifestyle choices and in terms of healthy decisions and attention to the personal health status (Kenkel, 1991; de Walque, 2007; Istat, several years).

1.2 The importance of contextualising risk factors

Kasl and Cobb in 1966 define health behaviours as «any activity undertaken by a person believing himself to be healthy, for the purpose of preventing disease or detecting it at an asymptomatic stage» (1966: 531), or according with Gochman (1997: 3) they are «behaviour patterns, actions and habits that relate to health maintenance, to health restoration and to health improvement». One of the first studies on healthy lifestyle identifies seven main features which were associated with lower morbidity and higher subsequent long-term survival: smoking habits, the maintenance of a desirable body weight, a moderate alcohol consumption, sleeping

7-8 hours per night, exercising regularly, eating breakfast and avoiding snacks (Belloc and Breslow, 1972).

In this sense, different behaviours match different states of health, and we can also supplement this classification with different kind of activities that Wallston (1997: 151) distinguishes in: «seeking information about health-related matters, going to the doctor, clinic or dentist for check-ups, prophylaxis, or immunizations, engaging in exercise and good nutritional practices, wearing seat belts, practising "safe sex", periodic self-examinations of breasts or testes, moderate use of alcohol and also, smoking cigarettes, misusing drugs».

In general, the interest in behaviours that have an impact on our health and well-being is based upon two assumptions:

1. a significant proportion of the mortality from the leading causes of death is caused by individual behaviours;
2. such behaviours are modifiable (Conner and Norman, 1996).

While looking at individuals level, Mirowsky and Ross (2003) state that «in seeking health, individuals weave disparate habits and practices into a coherent lifestyle designed to preserve and promote health» (2003: 199).

Within the study of health behaviour, many theories have been proposed at different levels: not only individual, but also interpersonal, group, organizational and community. These theories vary in their focus on individual, environmental, cognitive or affective determinants (Glanz et al., 1997; Crosby et al., 2002).

All these theories can be viewed having in mind a core question put forward by Link and Phelan «What puts people at risk of risks? How do individuals come to be exposed to individually-based risk factors?» (Link and Phelan, 1995: 81).

In answering, we have to take into account both micro and macro variables that have impact on health-related decisions. Behaviours that have an impact on health status cannot be analysed without reasoning on social context, physical and organizational context, cultural context, structural context, and also, according to Hiebsch, et al. on processes of mediation (Hiebsch and Vorwerg, 1971; MacKinnon, 2008) and moderator effects (Aarø and Flisher, 2012). In this sense, according to Aarø and

Flisher, if I want to stop smoking (dependent) but I am living a situation of hard stress at work (independent), it will be very easy to find excuses for not stopping (Aarø and Flisher, 2012).

1.2.1 Uncertainty

As we have seen in the previous part, it emerges the importance to analyse not only unhealthy or healthy behaviours but also the individual *(micro)* or structural *(macro)* conditions that determine *(more or less directly)* this kind of behaviours.

For all these reasons, we will use the term Uncertainty with two different – but related – meanings: a structural and an individual one.

About the structural one (looking at the macro level) we have selected a range of years characterised by an economic downturn, that is by definition a period with a lower rate of growth, lower GDP growth rates, higher unemployment rates, lower investment, lower consumer spending. The last economic downturn, that according to the literature started in 2007-2008, will be a useful tool to understand the consequences of a structural uncertainty on health-related issues.

About the individual one (looking at the micro level) we refer to the individual consequences of a period of economic downturn. This is an uncertainty caracterised not only by an unemployment situation, but also by a job with a high level of insecurity about the future, the fear to lose the job, a low level of economic security, etc. In particular we will focus on two kinds of individual uncertainty: a job-related one and an economic one.

Job insecurity has been defined in different ways. Many studies conceived it «as an overall concern about the continued existence of the job in the future» (De Witte, 1999: 156). In this sense we will consider not only an unemployment situation, but also an objective or a subjective experience or perception, that implies uncertainty about the future and could also reduce psychological well-being and increase psychosomatic complaints and physical strains (De Witte, 1999). So, we will consider unemployment status, but also a temporary employment in a period with scares job opportunities.

Obviously, job has also an economic function: for this reason, job insecurity is central for a conception of our second kind of individual insecurity, the economic one, that it is often assumed to be identical to the first one (Catalano, 1991). Economic insecurity is an uncertainty that refers to «clarity, or lack thereof, about future economic activity» (Moore, 2016: 1), strictly related to a job uncertain situation.

Economic uncertainty affects individual well-being, personal identity and labour market behaviours, and welfare state is mainly based on the individual desire to decrease this kind of insecurity (Osberg, 1998).

The ratio behind this twofold interpretation *(macro and micro)* is that an individual could feel uncertain as a consequence of a direct uncertainty experience but also because of living in an uncertain context.

Obviously, a high-level of structural uncertainty or individual uncertainty can be counterbalanced by the policy system (and the health system). They could in turn help individuals to cope with emergency situations but, counterintuitively, can also amplify its effects. Many Countries have adopted austerity measures reducing the level of public expenditure, while other Countries have increased the general level of social protection to tackle the uncertainty situation. Some Countries were better prepared than others because of fiscal measure adopted before the economic downturn and were able to draw countercyclical policies, while other Countries have frozen health budget or have cut expenditures (cutting expenditures or frozing health budget, Karanikolos et al., 2013).

1.2.1.1 Link between Health and Uncertainty

Several studies have investigated the impact of a general uncertainty situation on health status and health care but often with opposite results.

About the negative effects, at the structural level, a wide stream of literature suggests that economic downturns mainly have a negative impact on health and on health inequalities. Several studies have shown that economic shocks could affect health outcomes (Ruhm, 2000; Marmot, 2002; Bezruchka, 2009; Miller et al., 2009; Stevens et al., 2011; Virtanen et al., 2013), that are linked to worse mortality outcomes (Roelfs et al., 2011), to greater unmet health care needs (OECD, 2013), and to lower use of preventive health care services (Luisardi et al., 2010). All of this is particularly relevant for lower socioeconomic groups (OECD, 2013).

At the individual level, greater job insecurity is linked to a higher probability of a coronary heart disease events (Virtanen et al., 2013), to the likelihood to start smoking (Henkel, 2011), and to antisocial behaviours such as substance abuse (Wood et al., 2012; Arkes, 2007). Many studies have shown lower mammography, colonoscopy and dental use care (Catalano et al., 2003; Quin et al., 2009; Dorn et al., 2012), cancer screening services, routine medical check-ups and influenza vaccinations (Tefft and Kageleiry, 2013). A situation of unemployment also increases, especially for young individuals, the likelihood to start smoking (Henkel, 2011), it reduces the chances that current smokers will quit smoking, and it is positively related to binge drinking (Dàvalos et al., 2012).

About the positive effect, at the structural level, at the opposite, other studies have shown that recessions could have positive impacts on health, they reduce the overall mortality rate, and traffic accidents (Ruhm, 2000).

At the individual level, unemployment is shown to reduce heavy drinking (Rhum and Black, 2001), tobacco consumption and in general, the use of products with negative impacts on health. It increases time for leisure with a consequent increase of the time dedicated to physical activity and a general better mental health (OECD, 2015).

But there is also a neutral position about the impact of structural and individual uncertainty on health-related behaviours.

Structural uncertainty has no or weak effects on alcohol consumption (Vilaplana et al., 2006), on smoking habits (Gallus et al., 2015) or on unhealthy diets (Dave and Kelly, 2012).

At the individual level, unemployment has no effects on diets (Ruhm, 2000) or (in Italy) on alcohol consumption or on smoking habits (Sarti et al., 2016).

1.2.2 Contextualising Health: Health systems

Starting from what just said, next step is to interpret individual health choices as related – or as consequence – of different health systems. Unmet needs of cares could depend in fact not only by individual uncertainty, but also on the capabilities of a health system to protect their citizens. According with Tallinn Charter's definition proposed by WHO in the European Action Plan for Strenghtening Public Health (WHO, 2012: 2) «Within the political and institutional framework of each Country, a health system is the ensemble of all public and private organizations, institutions and resources mandated to improve or restore health. Health systems encompass both personal and population services, as well as activities to influence the policies and actions of other sectors to address the social, environmental and economic determinants of health». The WHO defined three fundamental mission of a health system (WHO, 2000):

1. to improve the health status of the population;
2. to be able to reply to the citizens' needs;
3. to guarantee the equity in the funding of the system.

For the aim of this study, we will use the general and historical distinction among main systems: the libertarian, the mutualistic, and the universalistic.

The libertarian system characterises the United States where citizen provide privately and voluntarily to an insurance. Because of the European focus of this work, we do not consider this first model.

Moving to Europe, to some extent closed to the libertarian model, we find the mutualistic model. It is also called "Bismarck's Model" and is characterised by a

funding that is mainly based on premium-financed social/mandatory insurance and the services are mostly provided by the private sector. A typical example of this second model is Germany where it originated in 19th Century. The third model is the universalistic, also called “Beveridge’s Model” or “Public Model”, based on National Health Service. It is characterised by a funding mainly based on taxation and the services are mainly provided by public health providers. Typical examples of this model are United Kingdoms (where the model was born in 1948) and Italy.

Universalistic models should be characterised by a universally accessible health system. In these systems, phenomenons like unmet needs of healthcare are a minor issue because of the theoretical absence of economic barriers.

In recent years, systems based on Nation Health Service (NHS) have undergone huge reform processes that move these systems toward the market, increasing cost-sharing, strong decentralization, etc. As Toth suggests (Toth, 2009) it remains a strong component of "original imprinting" according to which an NHS will always tend to preserve its original principles. Furthermore there is a tendency for health systems based on the same model to emulate each other. In this sense, therefore, arises a tendency to "reproduce" the same reform tendencies (opening competition, free market and push towards private, cost-sharing, decentralization; Toth, 2009). Ferrera also claims that the gap between the two distinct original models (NHS on the one hand and SHI - Social Health Insurance - from other) persists over time and still creates two distinct "health families" within which there is a push towards the same policy solutions.

2. Postponement in healthcare decisions

Considering behaviours we have to take into account also the retrospective choice that moves this or that behaviours. «Explanations and predictions of people’s choices, in everyday life as well as in the social sciences, are often founded on the assumption of human rationality» (Tversky et al., 1981: 453). Is it true for healthcare decisions?

Starting with Elster a basic rational-choice explanation is based on desires and opportunities: desires define what for the agent counts as "the best", while opportunities are the options or means that the agent "can" choose from.

In referring to rational choices we can distinguish two different filters: filter constraints (physical, economic, legal, and other constraints that the agent faces) and filter opportunity (mechanism that determines which action within the opportunity set will be actually carried out). In this sense if we think about health behaviours we can link this argument with health-related decisions. It could be desirable to go to the doctor for a screening, but it could be enough expensive for someone.

With the concept of opportunity, we may explain also variance in behaviours over time. For instance, in terms of indifference curve, if we have two goods (other goods and alcohol) and a desire to drink alcohol, when the price of alcohol goes up, consumption falls sharply. But if this desire is irresistible if the price goes up, I will choose the combination (opportunity) on a higher curve of indifference that maximize my desire (among the budget constraints). In this sense after the economic crisis we should observe a decreasing of unhealthy behaviours (like alcohol abuse or smoking habits) but also of healthy behaviours (like a more expensive healthy diet, physical activity or medical screenings). Is it true?

With our aim, another useful frame of decisions is the Framing of Outcomes, where outcomes are «commonly perceived as positive or negative in relation to a reference outcome that is judged neutral. Variations of the reference point can therefore determine whether a given outcome is evaluated as a gain or as a loss» (Tversky et al., 1981: 456). We can talk about a sort of "predictive criterion of rationality" that is the conception for what rationality requires that «preferences or utilities for particular outcomes should be predictive of the experiences of satisfaction or displeasure associated with their occurrence» (March, 1978: 587). So the decision-maker could be focus on "what will I feel then?" rather than "what do I want now?".

But healthcare decisions are not so rationale: health outcomes are not so clear and individuals often tend to adopt on-the-spot decisions (Slovic, 2007), influenced also by a complicated set of factors. Among these, according with the Andersen's Behavioural Model on Health Services Use, we can include predisposing factors, that

mean socio-demographic characteristics, like age, gender, level of education, etc., enabling factors that refer to the general resources that can facilitate or hinder the use of health services, like income or job's characteristics, and need factors that concern the health status or the presence of chronic diseases and so on (Andersen, 1967; 1995).

About enabling factors, several researchers have shown us an increase in renounces treatment due to an economic uncertainty situation (both macro and micro). The cost of medical examinations or treatments in a period of high uncertainty about the future is considered an insurmountable obstacle that leads individuals to postpone healthcare decisions (Censis, 2015, 2017; Ermeneia, 2017; ISTAT, 2018). But this is true also when we talk about health-related behaviours.

As we have already seen, if I want to stop smoking but I am living a situation of hard stress at work, it will be very easy to find excuses for not stopping (Aarø and Flisher, 2012). According with them, in the same way, if I am living a situation of economic uncertainty it will be very easy to postpone healthy decisions or positive attitudes to more trust moments. In a period of uncertainty, with the related increase in stress and concerns about the future, this looking for excuses, could imply a postponement of health-related decisions and healthcare in general.

Studies on postponement of some particular categories of uncertain individuals like widowed women or in general single women show that «a distress over finances tend to be more salient in determining postponement of care than health status» (Keith, 2008: 1). An individual uncertain situation (directly) or a structural uncertain situation (indirectly), could cause a delay in healthcare to a moment of a higher level of certainty and economic or job security, behind the level of individual health.

Our *I'll do it tomorrow* concept refers exactly to this phenomenon. We do not measure the postponement, but we will consider a context characterized by that kind of uncertainty that impacts the general decision-making process related to health, causing a general mistrust about the future and the consequent postponing of medical examination or other positive treatment.

3. Structure of the Thesis

As we have seen this work consists of three different but related papers. Each of them moves a step further in the analysis of the impact of uncertainty on health.

The first paper will start to observe the general situation of health-related behaviours and health care decisions in a period characterised by a higher level of structural uncertainty. We will firstly observe the general level of structural uncertainty in different European Countries (OECD members) and the general level of health expenditure. Then we will look at the general level of adoption of health strategies and health care decisions. Finally, we will inspect the link between the two in order to contextualise health behaviours and decisions by looking at different health systems.

What is the level of structural uncertainty in Europe? Is it possible to observe a general increase or decrease in the level of health expenditure? How does it impact the adoption of different health behaviours or different preventive measures?

Starting from this, is it possible to present some hypotheses about the link between the level of uncertainty and the level of adoption of behaviours impacting health status? Moreover, is it possible to present a second group of hypotheses about the influence of different health systems on different health care decisions in an uncertain situation?

In this explorative paper based on aggregate data we will observe the average level of adoption of healthy and unhealthy behaviours in a general situation characterised by an increasing level of uncertainty.

We will start to identify country paths of reaction to an uncertainty situation. What we will observe is a general common path of reaction for Countries with same levels of structural uncertainty, no matter the different health systems.

Given the aggregate nature of the first paper, the following step is to look at individuals. We will do so with the second paper.

In this second part of the work, the choice will be to analyse individual data in order to observe the effects of an uncertain situation on individuals with different characteristics. Furthermore, we have decided to focus on three different Countries: Italy, United Kingdom and Germany. Two of them have the same original universalistic health system (Italy and United Kingdom) and Germany is the Country where the Bismarckian Model was born. Looking at the level of structural uncertainty, two Countries are characterised by lower levels of uncertainty (Germany and United Kingdom), while Italy is characterised by worse situation.

According to the Andersen's Behavioural Model on Health Services Use (Andersen, 1967; 1995), that distinguishes among *predisposing factors* (socio-demographic characteristics, like age, gender, level of education, etc.), *enabling factors* (that refer to the general resources that can facilitate or hinder the use of health services, like income or the job's characteristics), and *need factors* (that concern the health status or the presence of chronic diseases and so on), we will consider the role of different variables (socioeconomic status – age, gender, education, income, etc. – or level of individual uncertainty) to understand their impact on health care services use.

Are there differences among Countries characterised by different health systems and different level of uncertainty? Should a Country without a universalistic health system pay greater attention to those *enabling factors*?

What we will observe is (beyond a universalistic health system) a higher level of unmet needs of cares in Italy, the Country characterised by higher level of uncertainty.

Starting from the results of this second paper, next step will be focus on Italy. We will try do go deeper to the Italian case aiming to investigate geographical differences on health-related behaviours to understand the effect of infrastructural differences (decentralization of the system).

With the third paper, we will explore the impact of individual and structural uncertainty on the perceived health status and on the adoption of unhealthy

behaviours for Italian people. To look at infrastructural differences we will use an indicator related to the minimum services provided by the Italian public health system. This measure, called LEA (*Livelli minimi essenziali – "Minimum Essential Levels"*) is available since 2007 and it is a table that contains a score based on an evaluation of essential services like hospital assistance, waiting lists, medical devices, and so on, provided by Italian Health Minister.

Do individual uncertainty and perceived health status go hand in hand like the level of individual uncertainty and the likelihood that an unmet need occurs? And what about health behaviours? Has the economic crisis had a positive effect on the reduction of costly unhealthy behaviours? Will individual economic uncertainty or job insecurity have a different impact in the Italian macro areas characterised by a lower level of structural uncertainty or a higher level of health system protection?

We will try to answer to these questions, trying to verify our "I'll do it tomorrow" main hypothesis.

Each of the three papers is based on different data. For the first explorative paper we have built an aggregate dataset, using indicators provided by OECD. For the second comparative paper we have used individual EU-SILC[1] data combined with the aggregate data we used into the first paper. For the third paper we have used individual Istat data combined with aggregate data provided by Istat and the Italian Health Minister.

[1] Acronym of European Union Statistics on Income and Living Conditions, EU-SILC is "an instrument aiming at collecting timely and comparable cross-sectional and longitudinal multidimensional microdata on income, poverty, social exclusion and living conditions. This instrument is anchored in the European Statistical System (ESS). The EU-SILC project was launched in 2003 on the basis of a "gentlemen's agreement" in six Member States (Belgium, Denmark, Greece, Ireland, Luxembourg and Austria) and Norway. The start of the EU-SILC instrument was in 2004 for the EU-15 (except Germany, the Netherlands, the United Kingdom) and Estonia, Norway and Iceland." We will use cross-sectional data that "pertaining to a given time or a certain time period with variables on income, poverty, social exclusion and other living conditions" (https://ec.europa.eu/eurostat/web/microdata/european-union-statistics-on-income-and-living-conditions).

Years of reference will be for all the papers, years characterised by a high spreading of uncertainty, using the recent economic crisis as a proxy (2005-2015 or 2005-2012).

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PAPER 1

I'll do it tomorrow: Health European Strategies in Uncertain Periods

The economic downturn has had and continues to have a huge impact on citizens' life. Millions of people lost their job and their life-savings with deep economic consequences (OECD, 2014). Several studies have analysed the impact in terms of health and health-care but the results are often opposite and controversial.

Aim of this paper is to observe the general situation of health behaviours and health care decisions in a period characterised by a higher level of structural uncertainty. We will do so by observing at the same time the general level of structural uncertainty in different European Countries (OECD members) and the general level of health expenditure. Information will be linked to the general level of adoption of health strategies and health care decisions. To interpret the results, we will contextualise these behaviours and decisions using the characteristics of the different health systems as mail lens.

What is the level of structural uncertainty in Europe? Is it possible to observe a general increase or decrease in the level of health expenditure? Is the adoption of different health behaviours or different preventive measures related to these changes?

In this explorative paper we will observe the average level of adoption of healthy and unhealthy behaviours in a general situation characterised by an increasing level of uncertainty. We will see a general increase in the average level of Uncertainty and an increase in the average level of Health Expenditure (because of the ageing population and the increasing in medical technology).

Based on this, we will conclude by showing the average impact of uncertainty on unhealthy behaviours and on preventive behaviours.

Being this an analysis based on aggregate level of data it is almost impossible to identify country paths of reaction to an uncertainty situation: what we can observe is a general common path of reaction for Countries with same levels of structural uncertainty, independently by the different health systems.

1. Link between Health and Uncertainty

Several studies have shown the impact of a general uncertainty situation on health status and health care with mixed results.

At the structural level, a wide literature suggests that economic downturns mainly have a negative impact on health and on health inequalities. Several studies have shown that economic shocks could affect health outcomes (Ruhm, 2000; Marmot, 2002; Bezruchka, 2009; Miller et al., 2009; Stevens et al., 2011; Virtanen et al., 2013) being also linked to worse mortality outcomes (Roelfs et al., 2011), to greater unmet health care needs (OECD, 2013), and less use of preventive health care services (Luisardi et al., 2010) particularly among lower socioeconomic groups (OECD, 2013).

At the individual level, higher job insecurity is linked to a higher probability of a coronary heart disease event (Virtanen et al., 2013), to the likelihood to start smoking

(Henkel, 2011), and to antisocial behaviours such as substance abuse (Wood et al., 2012; Arkes, 2007). Studies have shown lower mammography, colonoscopy and dental use care (Catalano et al., 2003; Quin et al., 2009; Dorn et al., 2012), cancer screening services, routine medical check-ups and influenza vaccinations (Tefft and Kageleiry, 2013). Unemployment increase, for young individuals, the likelihood to start smoking (Henkel, 2011), it reduces the chances that current smokers will quit smoking, and it is positively related to binge drinking (Dàvalos et al., 2012). Economic insecurity affects individual well-being, personal identity and labour market behaviours, and welfare state is mainly based on the individual desire to decrease this kind of insecurity (Osberg, 1998).

Another stream of research shows instead opposite results. At the structural level, many studies have shown that recessions are good for health, because they reduce overall mortality rate and traffic accidents. At the individual level, unemployment reduces heavy drinking (Rhum and Black, 2001), levels of tobacco consumption and in general expenditure on products that have a negative impact on health. It increases time for leisure with a consequent increase of the time dedicated to physical activity and a general better mental health (OECD, 2015).

There is also a neutral position. Structural uncertainty has no or weak effects on alcohol consumption (Vilaplana et al., 2006), on smoking habits (Gallus et al., 2015) or on unhealthy diets (Dave and Kelly, 2012).

At the individual level, unemployment has no effects on diets (Ruhm, 2000) or (in Italy) on alcohol consumption or on smoking habits (Sarti et al., 2016).

However, different effects (positives, negatives or neutrals) on health and health behaviours could be the consequence of a different national economic and health system: the impact of a financial crisis is not always uniform and the type of measure that a system introduces to counterbalance the negative effects, can differ among Countries. Many Countries have adopted austerity measures reducing the level of

public expenditure, while other Countries have increased the general level of social protection to fight the uncertainty situation. Some Countries were better prepared than others because of fiscal measure adopted before the economic downturn and were able to draw countercyclical policies, while other Countries have frozen health budget or have cut expenditures (M. Karanikolos et al., 2013).

Because of the data we have, we can not analyse at this level neither how different policies can impact a behaviour that has an impact on health status, nor the impact of the economic downturn on the general health status.

According to the Eurostat definition, Healthcare Expenditure may be used for a first evaluation of how country's healthcare systems respond to the challenge of universal access to quality healthcare (Eurostat, 2017). For this reason, we will consider the level of uncertainty of a country and the level of adoption of different behaviours that have an impact on health status with the level of the country's health expenditure.

Therefore, we will analyse both the general level of uncertainty and health expenditure, and the general level of adoption of a different health behaviour or of a different preventive measure. We will try to understand which of our variables have the biggest impact on the adoption of different behaviours and health care decisions.

What is the level of structural uncertainty in Europe? Is it possible to observe a general increase or decrease of the level of health expenditure? How does it change the adoption of a different health behaviour or a different preventive measure?

2. Hypothesis and main concepts used

Our main hypothesis is that under conditions of economic and occupational uncertainty it is harder to activate long-term oriented health strategies. Individuals tend to activate "survival behaviours", postponing to more trust moments both decisions and positive attitudes ("I'll do it tomorrow").

How many of us have in this period of general uncertainty procrastinated decisions that have an impact on health status to more certain moments?

When I'll get a more certain job position, I'll do those clinical exams", "When I'll get paid more, I'll go to a Dentist", "I'll do more physical activity", "I'll eat healthier", "I'll do it", etc.

Several researchers have shown an increase in renounces treatment due to an economic uncertainty situation (both macro and micro). The cost of medical examinations or treatments in a period of high uncertainty about the future is considered an insurmountable obstacle that leads individuals to postpone healthcare decisions (Censis, 2015, 2017; Ermeneia, 2017; ISTAT, 2018). But this is true also when we talk about health-related behaviours. If I want to stop smoking but I am living a situation of hard stress at work, it will be very easy to find excuses for not stopping (Aarø and Flisher, 2012). According with them, in the same way, if I am living a situation of economic uncertainty it will be very easy to postpone healthy decisions or positive attitudes to more trust moments. In a period of uncertainty, with the related increase in stress and concerns about the future, this looking for excuses, could imply a postponement of health-related decisions and healthcare in general.

Studies on postponement of some particular categories of uncertain individuals like widowed women or in general single women show that «a distress over finances tend to be more salient in determining postponement of care than health status» (Keith, 2008: 1). An individual uncertain situation (directly) or a structural uncertain situation (indirectly), could cause a delay in healthcare to a moment of a higher level of certainty and economic or job security, behind the level of individual health.

Our I'll do it tomorrow concept refers exactly to this phenomenon. We do not measure the postponement, but we will consider a context characterized by that kind of uncertainty that impacts the general decision-making process related to health, causing a general mistrust about the future and the consequent postpone of medical examination or other positive treatment.

Main concepts involved in our analysis are uncertainty, health behaviours, and health strategies.

We will use the term Uncertainty with two different – but related – meanings: a structural and an individual one.

About the structural one (looking at the macro level) we have selected a range of years characterised by an economic downturn, that is by definition a period with a lower rate of growth, lower GDP growth rates, higher unemployment rates, lower investment, lower consumer spending. The last economic downturn, that according to the literature started in 2007-2008, will be a useful tool to understand the consequences of a structural uncertainty on health-related issues.

About the individual one (looking at the micro level) we refer to the individual consequences of a period of economic downturn. This is an uncertainty caracterised not only by an unemployment situation, but also by a job with a high level of insecurity about the future, the fear to lose the job, a low level of economic security, etc. In particular we will focus on two kinds of individual uncertainty: a job-related one and an economic one.

Job insecurity has been defined in different ways. Many studies conceived it «as an overall concern about the continued existence of the job in the future» (De Witte, 1999: 156). In this sense we will consider not only an unemployment situation, but also an objective or a subjective experience or perception, that implies uncertainty about the future and could also reduce psychological well-being and increase psychosomatic complaints and physical strains (De Witte, 1999). So, we will consider unemployment status, but also a temporary employment in a period with scares job opportunities.

Obviously, job has also an economic function: for this reason, job insecurity is central for a conception of our second kind of individual insecurity, the economic one, that it is often assumed to be identical to the first one (Catalano, 1991). Economic insecurity is an uncertainty that refers to «clarity, or lack thereof, about future economic activity» (Moore, 2016: 1), strictly related to a job uncertain situation.

Economic uncertainty affects individual well-being, personal identity and labour market behaviours, and welfare state is mainly based on the individual desire to decrease this kind of insecurity (Osberg, 1998).

The ratio behind this twofold interpretation *(macro and micro)* is that an individual could feel uncertain as a consequence of a direct uncertainty experience but also because of living in an uncertain context.

With health behaviours and health strategies, we mean (according to epidemiological studies) all behaviours and choices that have an impact on health status and can be included among health determinants. In this sense, we have decided to distinguish positive attitudes and negative attitudes to treat in different manner the unhealthy behaviours and the behaviours that have a positive and preventive impact.

3. Data

How can we consider all these concepts? How can we measure a situation characterised by uncertainty in which people behave and choose strategies that have an impact on their health?

To achieve this aim, we have built a dataset with OECD Data for 27 Countries[2] from 2000 to the last data available (2015 or 2014, if 2015 not available). We have selected this range of years being them characterised by a high spreading of individual and structural uncertainty. We do not want that our analysis stays tied to this specific economic crisis. As we have seen, several researches show the impact of recessions on health status and health strategies: we believe that a study that try to highlight which are the effects of an uncertain situation on the adoption of behaviours should be useful to address counterbalancing policy measure and choose which are the best practices that can help a country to respond to future crisis. In this sense, the selected range of years and its spreading of uncertainty is only a tool that allow us to observe the general situation in a period of economic downturn and its impact on behaviours.

In an initial phase, we have collected 54 indicators. 41 indicators refer to the general level of adoption of behaviours that have an impact on health (e.g. total fat supply in

[2] European OECD members

grams per day, calories or sugar supply, overweight or obese population both measured and self-reported, fruits or vegetables consumption, daily smokers, alcohol consumption, doctor's consultation, etc.). 13 indicators refer to structural characteristics of each country (e.g. life expectancy at birth or at 65, mortality, long term unemployment rate, harmonized unemployment rate, public or private or out of pocket health expenditure, real GDP, etc.).

Starting from them we have then selected 12 indicators: 7 of them refer to different behaviours that have an impact (positive and negative) on health status, and the others 5 refer to the general level of structural uncertainty and level of health expenditure.

The first 7 indicators are the main ones used in epidemiological sociology studies, and refer to

1. Alcohol Consumption: this indicator is measured in number of yearly litres per person aged 15 years and older[3];
2. Daily Smoker: measured as the percentage of population aged 15 years and over who are reporting to smoke every day[4];
3. Overweight or Obese Population: it is measured as the percentage of the population aged 15 years and older with a BMI (Body Mass Index) from 25 to 30 (Overweight) or 30 or over (Obese)[5];
4. Doctors' Consultation: this indicator is measured as the average number of consultations with doctors (both generalists and specialists, at the physician's office, in the patient's home or in outpatient department in hospital and ambulatory health care centres) per capita per year[6];
5. Dentists' Consultation: it is measured as the average number of consultations or visits per person per year with an orthodontist, a stomatologist or dental

[3] OECD (2017), Alcohol consumption (indicator). doi: 10.1787/e6895909-en
[4] OECD (2017), Daily smokers (indicator). doi: 10.1787/1ff488c2-en
[5] OECD (2017), Overweight or obese population (indicator). doi: 10.1787/86583552-en
[6] OECD (2017), Doctors' consultations (indicator). doi: 10.1787/173dcf26-en

surgeon, at the dentist's office, in the patient's home, in outpatient departments in hospital and ambulatory health care centres[7];

6. Fruits Consumption: this indicator is measured as percentage of population over 15 years old that eats daily fruits[8];
7. Vegetables Consumption: like fruits consumption it is the percentage of population aged 15 years and older that eats vegetables daily[9].

The other 5 indicators provide us information about structural uncertainty and health expenditure. We consider

1. Harmonized Unemployment: this indicator refers to a harmonised version (internationally comparable) of unemployment rate, measured in numbers of unemployed people as a percentage of the labour force. Unemployed is a person of working age who has not work, is available for work, and has taken a specific step to find work[10];
2. Long-term Unemployment: it refers to the proportion of unemployed people who have been unemployed for 12 months or more[11];
3. Youth Unemployment: it is the number of unemployed 15-24-year-olds expressed as a percentage of the youth labour force[12];
4. Temporary Employment: this indicator is measured as percentage of dependent employment that has a pre-determined termination date[13];
5. Health Expenditure: it is health spending in US $ per capita[14].

[7] OECD (2017), Dentists' consultations (indicator). doi: 10.1787/173dcf26-en
[8] OECD (2015), Health Statistics, Health at a Glance
[9] OECD (2015), Health Statistics, Health at a Glance
[10] OECD (2017), Harmonised unemployment rate (HUR) (indicator). doi: 10.1787/52570002-en
[11] OECD (2017), Long-term unemployment rate (indicator). doi: 10.1787/76471ad5-en
[12] OECD (2017), Youth unemployment rate (indicator). doi: 10.1787/c3634df7-en
[13] OECD (2017), Temporary employment (indicator). doi: 10.1787/75589b8a-en
[14] OECD (2017), Health spending (indicator). doi: 10.1787/8643de7e-en

4. Methods

To simplify the information that we have and the interpretation of the results we have decided to combine the 12 selected indicators in 4 synthetic indexes.

The reduction from 12 to 4 is a conceptual one. Regarding the Behavioural Indexes, according with the medical epidemiology, we have selected positive behaviours from one side (preventive) and negative behaviours from the other side (unhealthy). Third and Fourth indexes refer to the level of Uncertainty and the level of Health Expenditure.

More in detail, the first index refers to the Level of adoption of Unhealthy Behaviours (Unhealthy Index). This index includes the level of Alcohol consumption (annual litres per capita), the level of overweight or obese population (% of overweight or obese population both measured and self-reported), the level of smoker (% of daily smoker).

The second index as an opposite meaning and refers to the Level of Adoption of Healthy Behaviours (Prevention Index). This index includes the level of Fruits consumption (kilograms per capita per year), the level of Vegetables consumption (kilograms per capita per year), the Doctors' consultation (average number of consultation per person per year) and the Dentists' consultation (average number of consultation per person per year).

The third index refers to the Level of Uncertainty of a Country (Uncertainty Index) according to our definition of uncertainty. This index includes the level of Long-Term Unemployment, the level of Youth Unemployment, the level of Harmonized Unemployment and the level of Temporary Employment.

Finally, the fourth index refers to the Level of Health Expenditure (Health Expenditure Index) and includes the health spending in US dollars per capita.

Each of our indicators has been standardized (for the mean and standard deviation of all the years and all the Countries) and our indexes are the mean of these standardized indicators. In this sense, for instance, the unhealthy index for Italy in 2005 is the result of the mean of the 3 components of the unhealthy index for Italy in 2005.These

3 components, are the result of the standardization for the mean and standard deviation of all the years and all the Countries involved in our analysis.

About the number of Countries, our final sample will be thus composed by 21 European OECD Countries[15]. The main shortcoming for this is that some Countries lack of some necessary data to create our indexes.

To clearly summarize our results, we have decided to select three specific years: the first one is 2005, before the economic downturn, the second one is 2010, immediately consequent the economic downturn and finally the last data available.

5. Results

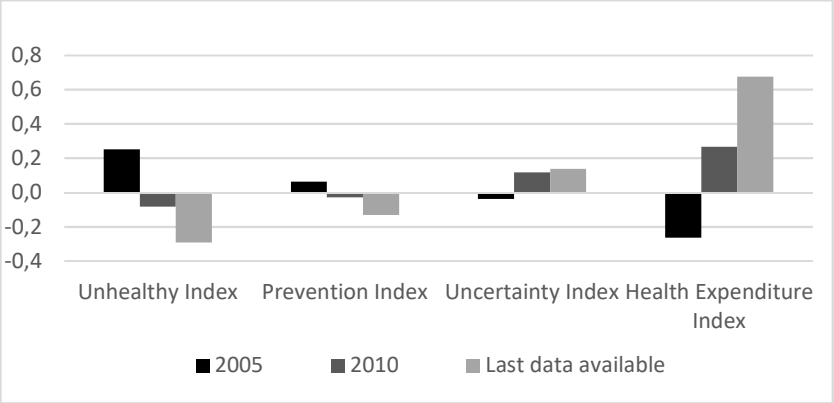
5.1 General results

As we can see in Figure 1 it is possible to observe a general increase of our Uncertainty Index (from -0.04 in 2005 to a higher 0.14 in the last data available) and a general increase of the level of Health Expenditure (from -0.26 to 0.68). About the increasing of our Uncertainty Index we can read this trend as a sign that the indicators that we have chosen can represent the uncertainty situation that we need for our analysis.

About the second change (of the level of health expenditure) we cannot at the moment identify this trend as an effect of uncertainty. According to the literature, it can be considered the evidence of the increasing costs related to the management of the aging population (E. Jaba et al., 2014) that we will see in a moment, but also the general increase of medical technology in healthcare (C. Sorenson et al., 2013).

[15] Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Slovak Republic, Slovenia, Spain, Sweden, UK.

Figure 1 - Average Indexes (2005, 2010, last data available)



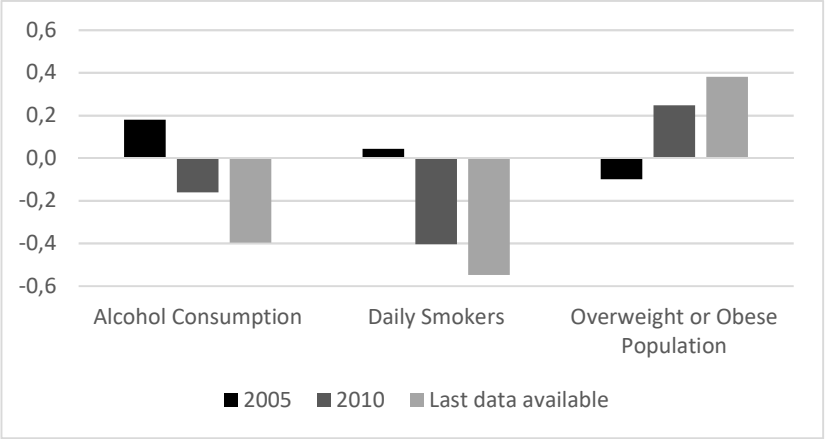
Source: Our data processing, OECD data

But in Figure 1 we can see also a general decrease of the level of adoption of unhealthy behaviours and positive attitudes.

The average value of our Unhealthy Index (based on all 21 Countries) decreased from 0.25 in 2005 to a -0.29 of the last data available. It seems that individuals tend to be healthier because of the costs of be unhealthier: is this a positive effect of the crisis?

In answering to this question, we opted to decompose the Unhealthy Index, and present more complete results (Fig. 2).

Figure 2 - Decomposition of Unhealthy's Index (2005, 2010, last data available)



Source: Our data processing, OECD data

We can highlight an average decrease of Alcohol Consumption (from 0.18 in 2005 to -0.16 in 2010, and -0.40 in the last data available) and a decrease of Daily Smokers (from 0.04 in 2005, to a lower -0.4 in 2010, and -0.55 in the last data available). To sum up we can observe a general decrease of all behaviours that have a cost. In this

sense, it seems that individuals are healthier because they are forced to avoid any expensive spending. Obviously, we cannot measure the relation among behaviour and its cost: at the moment we can identify this general decrease in behaviours that have a higher cost.

Quite puzzling results can be seen in the average increase in our Overweight or Obesity Index that move from -0.10 in 2005 to a higher 0.38 in the last data available (0.25 in 2010). Could an unhealthy diet be a reflection of the general economic uncertainty because of the lower cost of unhealthier food?

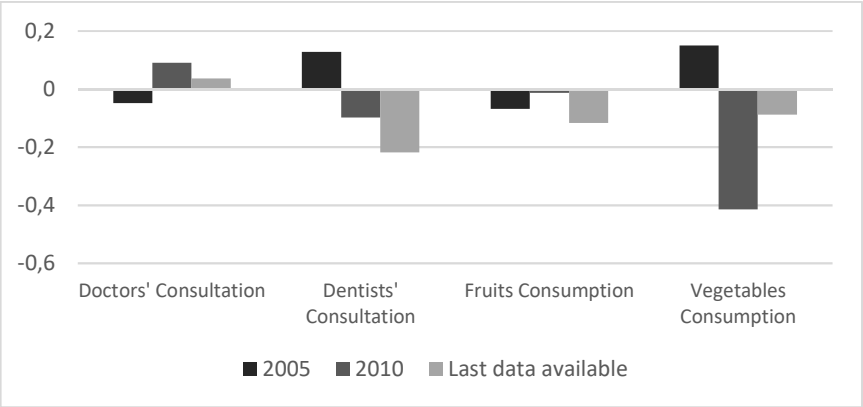
If yes, the economic downturn can reduce the adoption of unhealthy behaviours, but can also increase the un-adoption of healthy behaviours like have healthier diet.

This last trend is confirmed in the literature: several studies have shown the connection between a low level of income and a higher probability of being obese or, in general, of having an unhealthy diet (M. Pena, J. Bacallao, 2000; C. A. Monteiro et al., 2004).

To move on with our results we can also mention the decreasing for the Prevention Index (from 0.06 in 2005 to -0.13 in the last year available). Also this can be seen in the light of cost-reduction behaviours (Fig. 1).

To go deeper with the analysis of the Prevention Index, we will decompose it again to present more detailed results (Fig. 3).

Figure 3 - Decomposition of Prevention's Index (2005, 2010, last data available)



Source: Our data processing, OECD data

We observe a general increasing of the recourse to Doctors' Consultation (the average number of consultations with both generalists and specialists, at the physician's office, in the patient's home or in outpatient department in hospital and ambulatory health care centres per capita per year) from -0.05 in 2005 to 0.04 in the last data available, with a higher 0.09 in 2010. This is a second evidence related to the aging population. Indeed, we can read the higher level of Doctors' Consultations as well as the higher level of Health Expenditure as direct consequences of the increased longevity and aging population that implies an increase in morbidity. Data show that the expected amount of years lived without activity limitation have not risen. The result is a population in which approximately 80% of aging individuals have 1 or frequently 2 chronic diseases (EUGMS – European Union Geriatric Medicine Society). Moreover, we know that usually chronic diseases do not involve a cost of care for the patient, so they will not give up a treat.

Contrary to Doctors' Consultation, our data show a general decrease (from 2005 to the last data available, with a worse situation for vegetables consumption in 2010) of the average standardized index both of Fruits and Vegetables Consumption (respectively from -0.068 to -0.117 and from 0.15 to -0.087). Once again, these decreasing could be linked with the increase in our Overweight or Obesity Index and the general lower cost of unhealthier food. The same decreasing trend is found for the recourse to the Dentist. The economic downturn "turns off smiles" with an index of Dentists' Consultation that moves from 0.128 in 2005 to a negative -0.218 according to the last data available (-0.097 in 2010). Several researchers confirm our results investigating the role of socio-economic inequalities in the non-use of dental care across Europe both at the individual and at the collective levels (intra-country and inter-country) (G. M. Kennedy et al., 2005; M. Davis et al., 2010; A. Tchicaya, N. Lorentz, 2014; OECD, 2015). [16]

[16] An increase of unmet dental care needs, because of the cost of cares, causes in many Countries a general deterioration of dental health but also a spreading of the so-called "dental tourism". It is a subset of medical tourism that involves individuals seeking dental care outside their own healthcare systems and causes an increasing of the number of patients who decide to go abroad to having dental treatment. A multitude of tour operators that organize a combination of dental cares and tourism appears to be the sad side of the coin of a general situation of health inequalities characterised by a decreased access to dental care.

To sum up the results we had from this first general investigation we can mention:

- an increase in the average Health Expenditure Index and an increase in the average Uncertainty Index;
- a decrease in the average Unhealthy Index and a decrease in the average Prevention Index;
- a decrease in the average level of Smokers and Alcohol Consumption, and an increase in Overweight or Obesity if we look at the single dimension behind the Unhealthy Index;
- an increase in the average Doctors' Consultation, a decrease in the average of Fruit and Vegetables Consumption and a decrease of Dentists' Consultation if we look at the components of the Prevention Index.

5.2 Countries' situation

Until this point we have analysed the general situation based on the overall figures[17]: if we deepen the analysis and look at each Country separately, the results get more jumbled.

In fact, the Health Expenditure Index increases in all the analysed Countries whereas some Countries also register an increase in Unhealthy Behaviours (Latvia, Slovenia and Poland). Other Countries show an increase in the Prevention Index (Germany, Latvia, Lithuania, Poland, Slovenia, Sweden and United Kingdom) and some of them are the same where the Uncertainty Index decrease: Germany, Latvia, Lithuania, Poland and Sweden. Uncertainty decreases also in Estonia, Norway and Slovak Republic.

In general, we can say that where the impact of the crisis is limited or not present at all, we observe an increase in choices of prevention: more money, more self-

[17] The following graphs are scatterplots with the levels of uncertainty on the X-axis (Uncertainty Index). On the Y-axis it can be find the other indexes, that are the level of health expenditure (Health Expenditure Index, Figg. 4-5), the level of adoption of unhealthy behaviours (Unhealthy Index, Figg. 6-7), and the level of adoption of healthy behaviours (Prevention Index, Figg. 8-9). All values are by year (2005 or last data available) and by country (the selected 21 Countries).

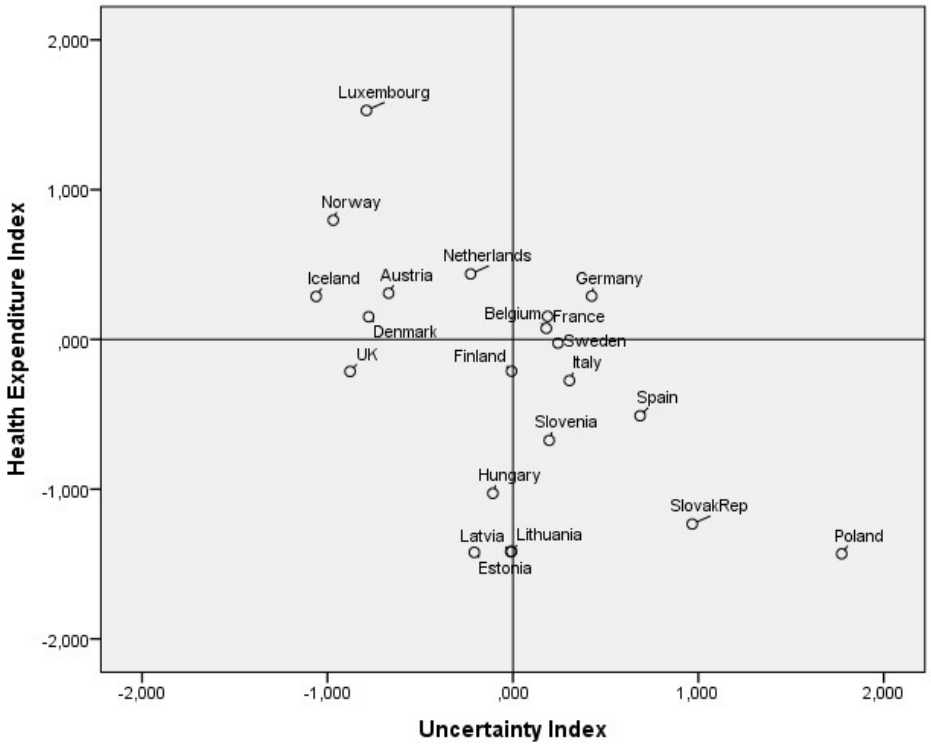
confidence which seems to be equal to more Doctors' and Dentists' Consultation and a healthier diet. In some cases, however, a lower level of uncertainty and a higher level of prevention seems to be equal also to a lower level of attention in the adoption of unhealthy behaviours. This is the case of Countries like Latvia and Poland.

If we observe all the Countries included in our dataset by looking at the 2005 and at the last data available figures, we can observe two main movements:

- Concerning the level of Health Expenditure many of our Countries drift upward, both in case of low levels of uncertainty and high levels of uncertainty (figg. 4-5);
- Concerning the level of Unhealthy behaviours, almost all the Countries downward no matter the level of uncertainty (figg. 6-7).

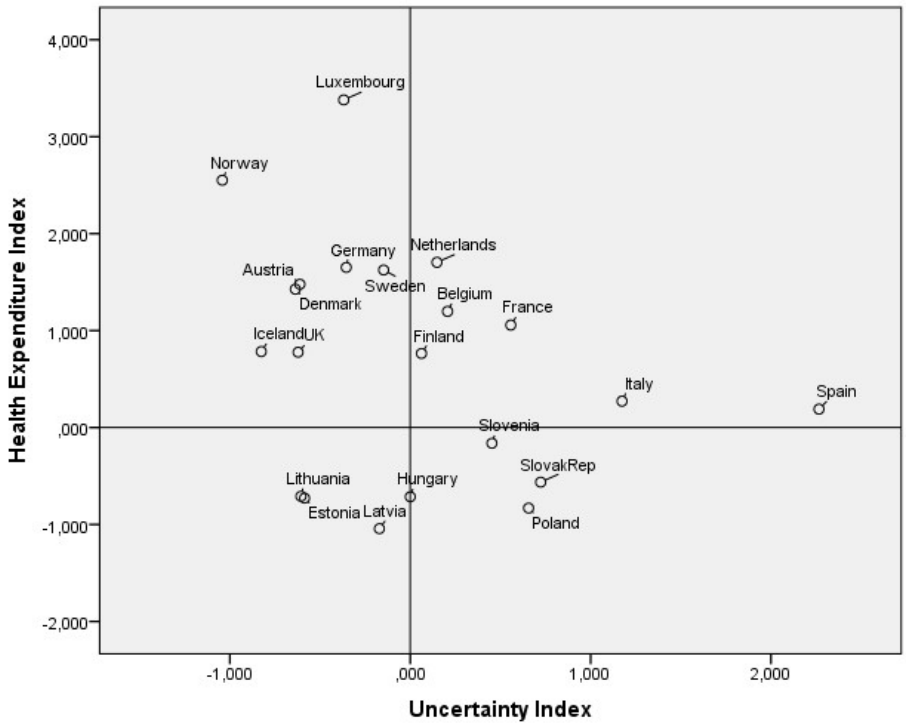
If we look instead at the figures for the Prevention Index the situation is less clear because of the different patterns we observe. Generally speaking, the Index decreases between 2005 and the last data available but, if we look at the single countries trends, we see that many of them drift downward in a situation characterised by a lower level of Prevention and many other drift upward in a situation characterised by a higher level of Prevention regardless of the level of Uncertainty (figg. 8-9).

Figure 4 – Health Expenditure Index and Uncertainty Index, 2005



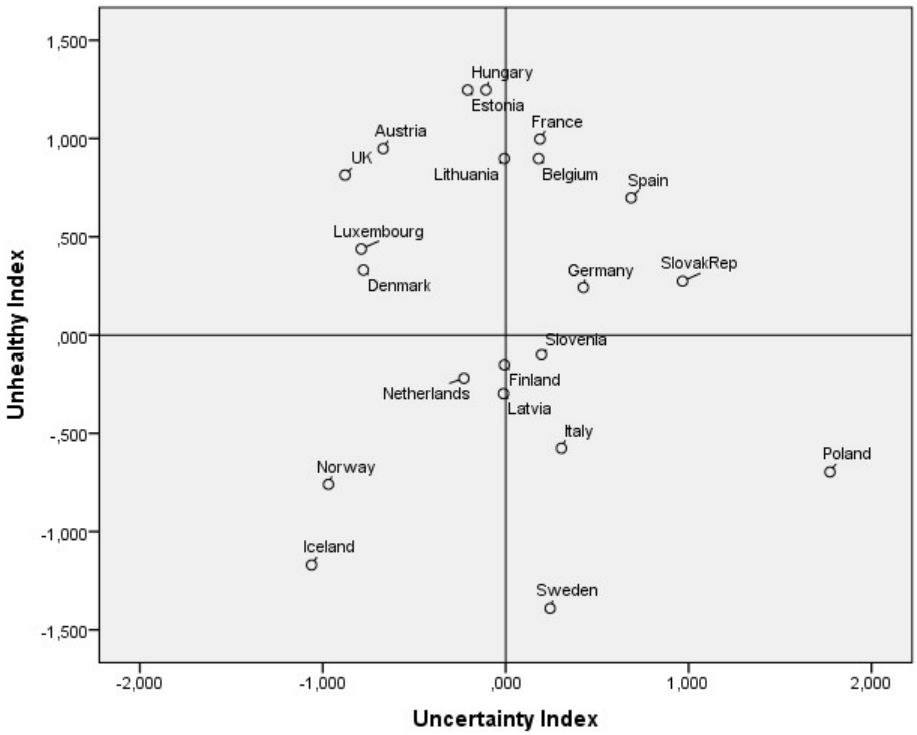
Source: Our data processing, OECD data

Figure 5 – Health Expenditure Index and Uncertainty Index, last data available



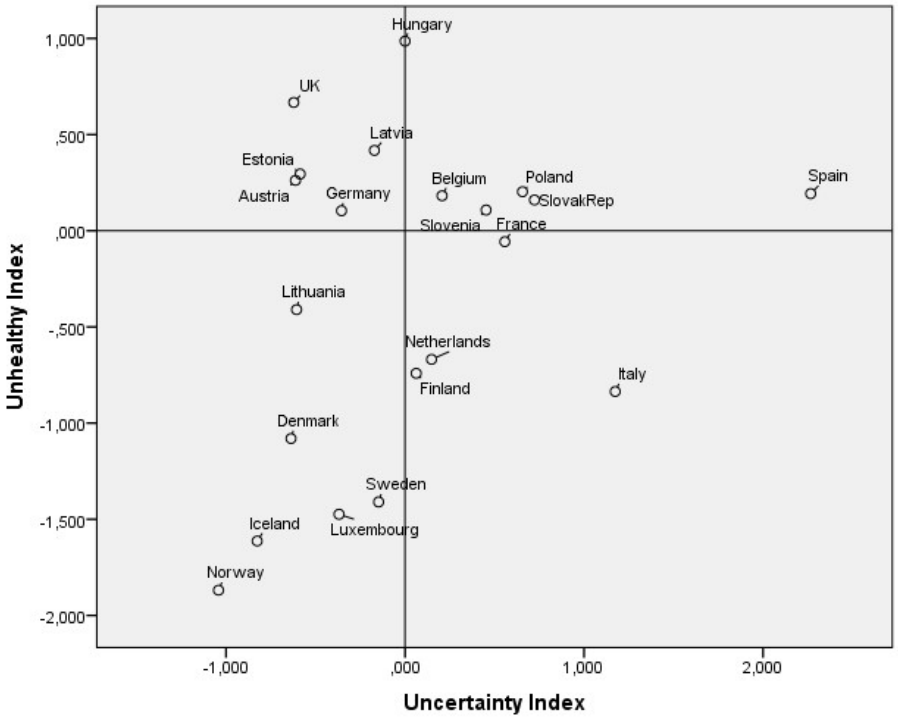
Source: Our data processing, OECD data

Figure 6 – Unhealthy Index and Uncertainty Index, 2005



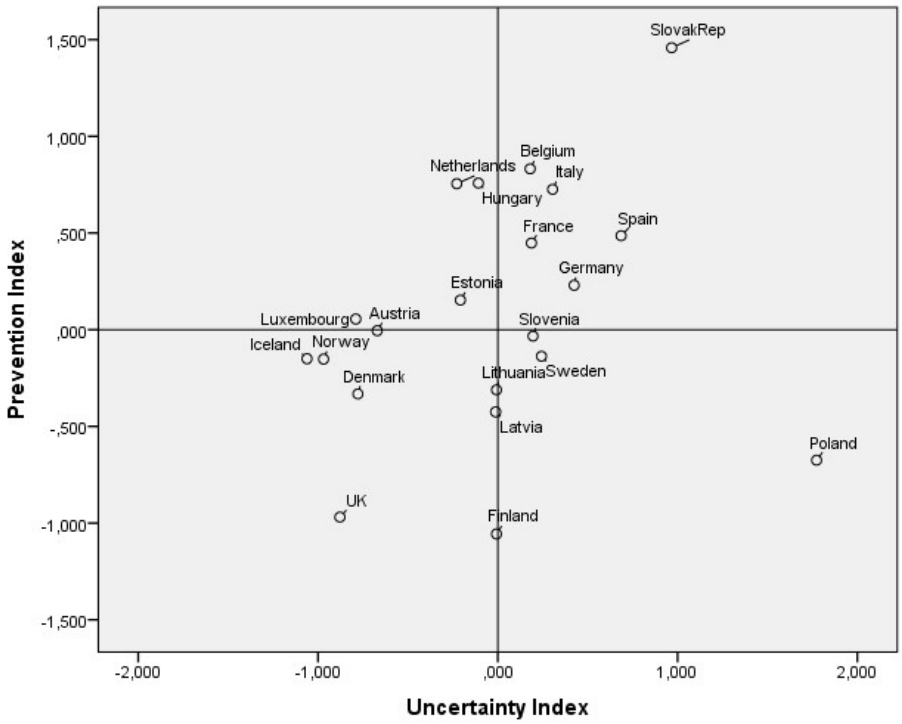
Source: Our data processing, OECD data

Figure 7– Unhealthy Index and Uncertainty Index, last data available



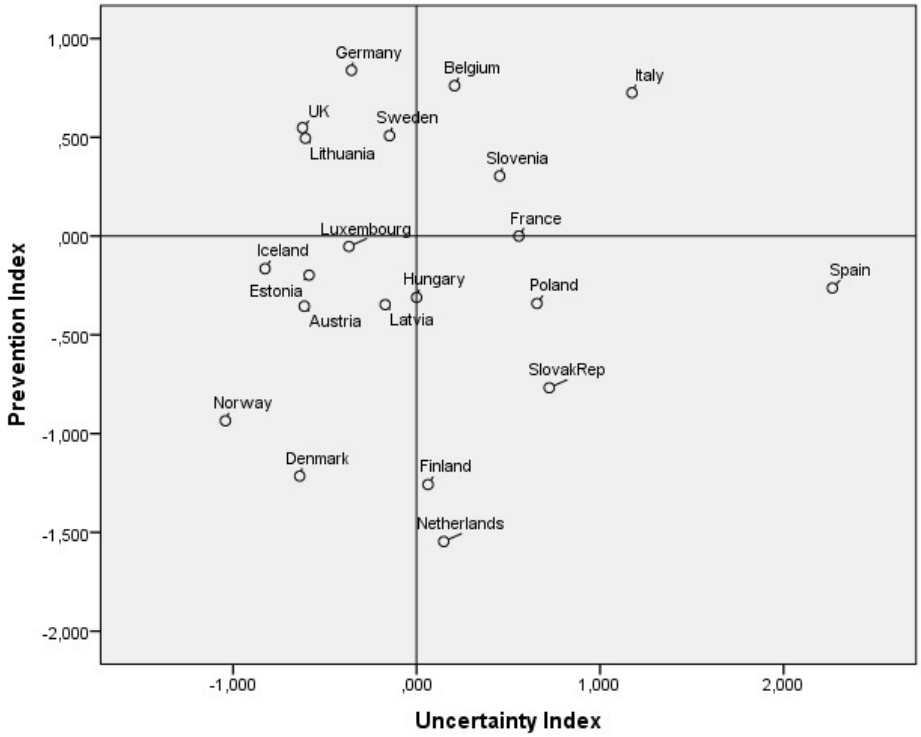
Source: Our data processing, OECD data

Figure 8 – Prevention Index and Uncertainty Index, 2005



Source: Our data processing, OECD data

Figure 9 – Prevention Index and Uncertainty Index, last data available



Source: Our data processing, OECD data

5.3 Reasoning on public health systems

An attempt to cluster the Countries according to similar patterns appears rather difficult.

The best we can do is to (starting from a classical differentiation among health systems) try to understand if the impact of the different health care systems on health care decisions is greater that the impact of the Country uncertanty on that kind of decisions.

We start from the general and historical distinction among three main systems: the libertarian, the mutualistic and the universalistic. Because of the Countries analysed we do not consider the libertarian which is typically north-American, so our distinction will be between the mutualistic model (the so called “Bismark’ Model”) and the universalistic one (the “Beveridge’ Model”).

In analysing the different impact of uncertainty or of a health care system on the general level of adoption of health care decisions, we have decided to focus on changes in three different Countries:

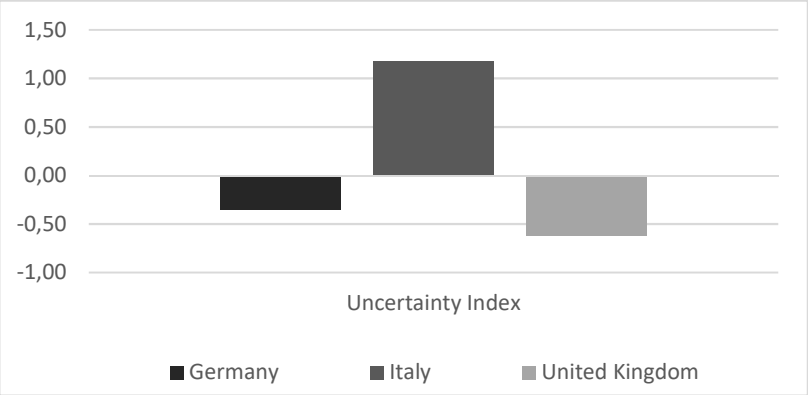
- 2 of them can be connected to similar originating health care model (United Kingdom and Italy – Beveridge’ Model);
- 2 of them register the same level (low) of structural uncertainty (Germany and United Kingdom), while the third one registers a higher level of structural uncertainty (Italy).

Which kind of paths of reaction can we highlight among Countries with different health systems? And with different levels of uncertainty? Is the path of reaction of a Country coherent within the same universalistic health care system or within the same level of structural uncertainty?

In regard to the general level of structural uncertainty, we take into account our Uncertainty Index that is composed by Harmonized Unemployment, Long-term Unemployment, Youth Unemployment, and Temporary Employment.

By looking at Figure 10 we can say that Germany and United Kingdom are characterised by a lower level of uncertainty if compared to Italy.

Figure 10 –Uncertainty Index, last data available, Germany, Italy, United Kingdom

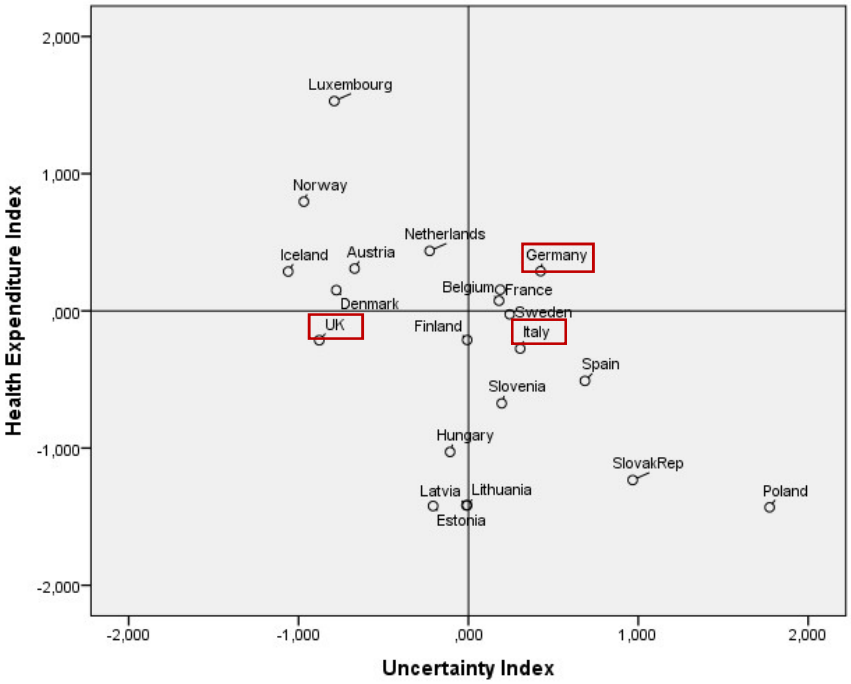


Source: OECD Data processing, OECD Health Statistics, 2015

What we can observe is that, for each variable that we consider in the analysis, there is a general movement of the two Countries with a low level of uncertainty (Germany and United Kingdom) toward the same quadrant (figg. 11 – 16).

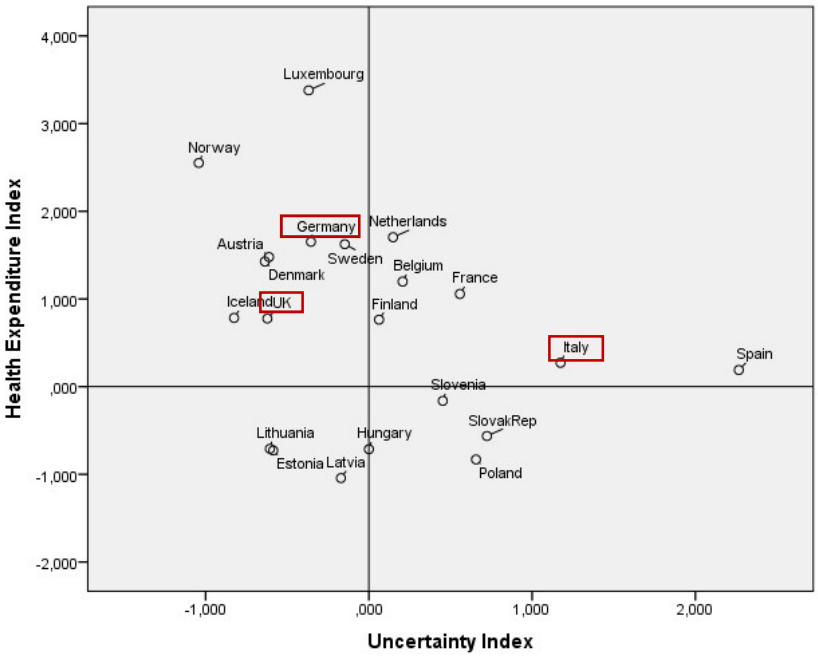
- When refer to the level of adoption of unhealthy behaviours, we can identify a general decreasing (from 2005 and the last data available) with minor differences, regardless of the different health system;
- When refer to the level of adoption of preventive behaviours, it clearly emerges a stronger increase in these Countries characterised by a low level of structural uncertainty, regardless of the health care system.

Figure 11 – Health Expenditure Index and Uncertainty Index, 2005



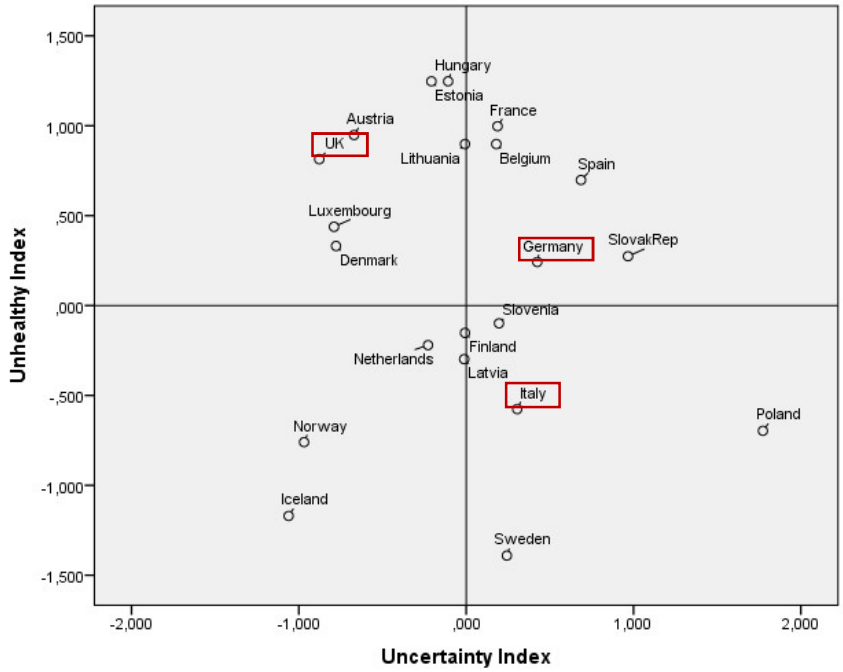
Source: Our data processing, OECD data

Figure 12 – Health Expenditure Index and Uncertainty Index, last data available



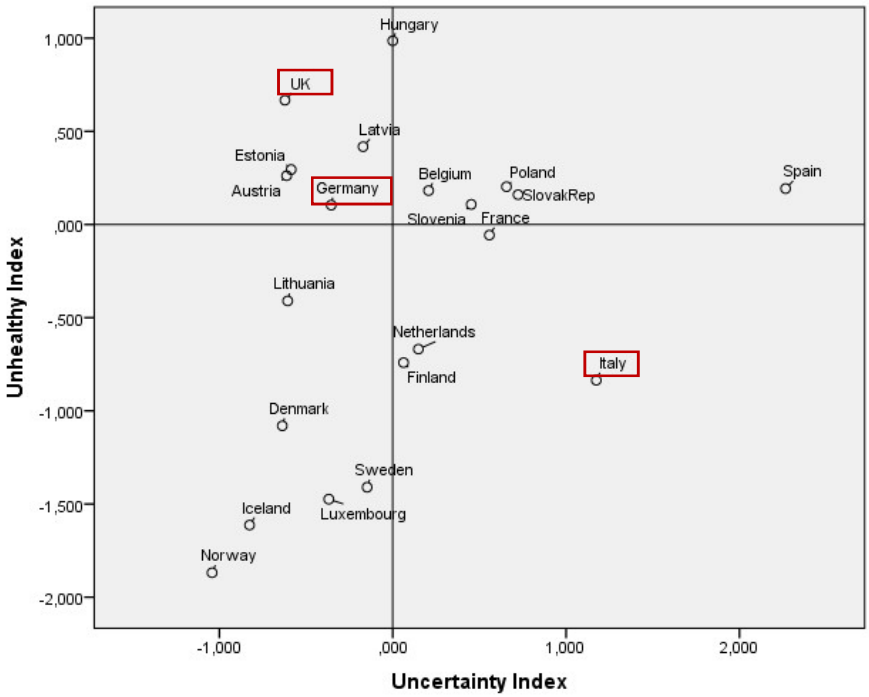
Source: Our data processing, OECD data

Figure 13 – Unhealthy Index and Uncertainty Index, 2005



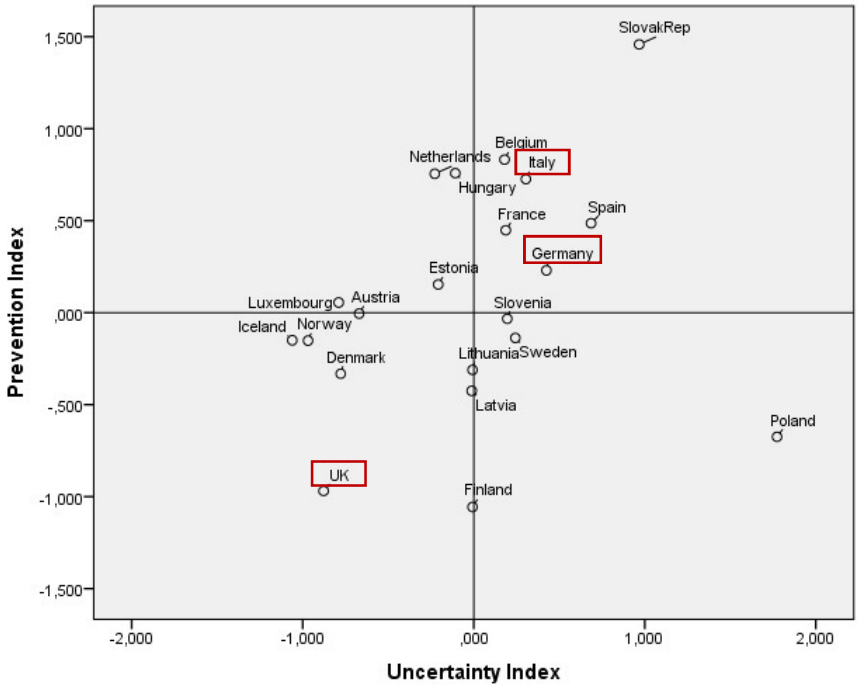
Source: Our data processing, OECD data

Figure 14 – Unhealthy Index and Uncertainty Index, last data available



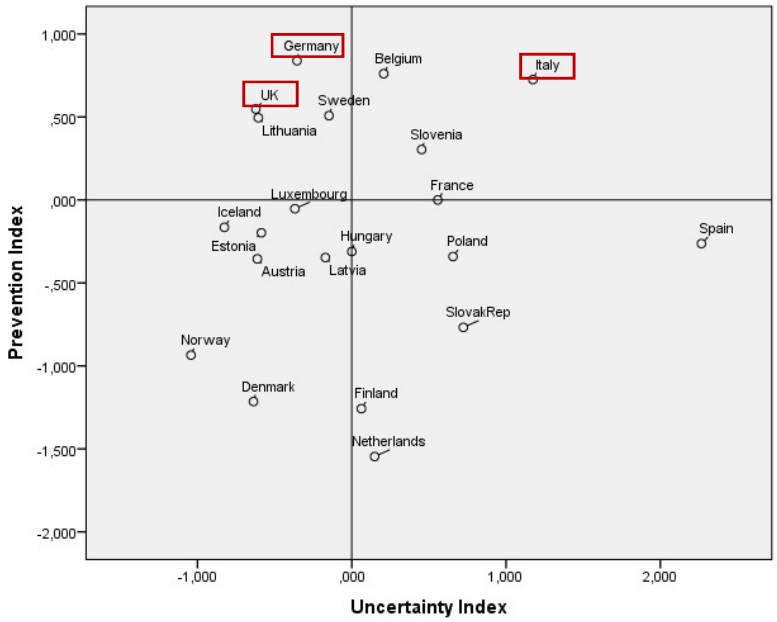
Source: Our data processing, OECD data

Figure 15 – Prevention Index and Uncertainty Index, 2005



Source: Our data processing, OECD data

Figure 16 – Prevention Index and Uncertainty Index, last data available



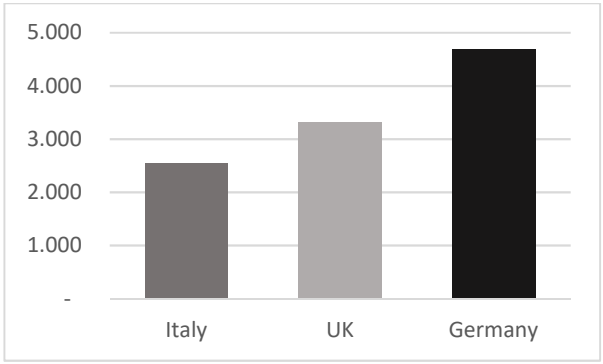
Source: Our data processing, OECD data

Is this a confirmative sign of the difficulties in self-care for all the individuals who are more affected by the economic crisis beyond the inclusiveness of the health system?

We need to be cautious about these results, but we can consider them a fundamental starting point to move on further analysis.

Indeed, if we try to consider the impact of the level of health expenditures of our three Countries, we can see a higher level of spending in Germany than in Italy and United Kingdom (fig. 17). Is this a situation in which the level of expenditure has a greater impact than the level of inclusiveness of the system in counterbalancing the negative impact of the economic downturn on health care decisions and strategies?

Figure 17 – Health Expenditure Levels in US dollars/capita, Italy, United Kingdom, and Germany (last data available)



Source: Our data processing, OECD data

To move further in the understanding of the phenomena, it becomes necessary an in-depth analysis that tries to combine the aggregate level of data (structural uncertainty, health expenditure and health resources) with the individual level (socioeconomic status, individual uncertainty, individual health behaviours or strategies) to understand how and which variables have bigger impacts on decisions of prevention and health care, and to analyse related policy implication. Has the socioeconomic status a deeper impact than the level of individual uncertainty? How important is the health system? Should a Country pay greater attention to a universalistic reform of health system or to the introduction of a more inclusive healthcare policy measure? Which kind of policies can counterbalance the effects of an economic downturn?

6. Conclusions and further analysis

This paper is part of a wider project which aims to control the effects of an uncertainty situation on health, health behaviours and health care needs and decisions. In addition, another objective is to identify on which variables we have to intervene in order to reduce the repercussions of economic insecurity on the general health status of a population.

What we have seen at this stage of analysis is primarly a general increase of the average level of Uncertainty and an increase of the average level of Health Expenditure.

Main findings in the period of increasing level of uncertainty are a decrease of unhealthy behaviours and a decrease of preventive behaviours.

In the first case, in the period with an increase of the average level of uncertainty we can observe a reduction in the adoption of behaviours that have a negative impact on health status like smoke habits or alcohol consumption (the "healthier for the costs of being unhealthier effect"), but an increase of the incidence of being overweight (the "cheap and fat" effect). In the second case, there is also a decrease in the level of adoption of behaviours that have a positive impact on health status. But if we go in-depth and try to observe each components of our Prevention Index, from one side we can see an increase in the average level of Doctors' Consultation and interpret it as a signal of aging population and the higher level of morbidity and chronic diseases ("longevity effect"). From the other side there is a reduction of Fruits and Vegetables Consumption (that confirms our highlighted "cheap and fat effect") combined with a reduction in the average level of Dentists' Consultation ("turned off smiles effect").

To conclude, it is very difficult at this stage of analysis to identify country paths of reaction to an uncertainty situation or to attempt to cluster the Countries according to similar behaviours. It becomes necessary to go in-depth with further investigations

to evaluate which kind of policies are more likely to respond to an economic insecurity situation.

It seems then essential to combine the aggregate data with the individual ones to understand how and which variables have stronger impacts on the decisions of prevention and health care. This is precisely what we will do in the next paper that will analyse the unmet need phenomenon in the three different countries selected at the end of this first analysis.

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Table 1 - Table of Indexes, Mean, median, st.dev., min and max

Uncertainty Index	
Mean	-0.02186
Median	-0.04600
Std. Dev.	0.729883
Min	-1.293
Max	2.564

Health Expenditure Index	
Mean	-0.00598
Median	-0.07950
Std. Dev.	0.997445
Min	-1.658
Max	3.379

Unhealthy Index	
Mean	0.06277
Median	0.15000
Std. Dev.	0.784136
Min	-2.031
Max	2.145

Prevention Index	
Mean	-0.03569
Median	-0.05300
Std. Dev.	0.771125
Min	-1.817
Max	2.137

Table 2 - Table of Indexes, 2005, 2010, last data available, sign of change 2005-last data

	Unhealthy Index				Preventive Index				Uncertainty Index				Health Expenditure Index			
	2005	2010	Last data available		2005	2010	Last data available		2005	2010	Last data available		2005	2010	Last data available	
Austria	0.948	0.798	0.262	-	-0.005	-0.074	-0.355	-	-0.670	-0.742	-0.612	+	0.308	0.939	1.478	+
Belgium	0.898	-0.149	0.182	-	0.832	0.280	0.761	-	0.180	0.119	0.207	+	0.074	0.708	1.198	+
Denmark	0.331	-0.292	-1.080	-	-0.332	-0.430	-1.215	-	-0.778	-0.604	-0.637	+	0.151	1.032	1.427	+
Estonia	1.247	0.337	0.295	-	0.153	-0.063	-0.198	-	-0.208	0.624	-0.586	-	-1.422	-1.067	-0.728	+
Finland	-0.152	-0.360	-0.741	-	-1.056	-1.083	-1.258	-	-0.007	-0.035	0.062	+	-0.212	0.363	0.764	+
France	0.997	-0.084	-0.057	-	0.448	0.448	0.000	-	0.187	0.303	0.557	+	0.154	0.678	1.057	+
Germany	0.242	0.349	0.104	-	0.230	0.104	0.839	+	0.425	-0.046	-0.355	-	0.289	1.023	1.652	+
Hungary	1.247	0.150	0.986	-	0.758	0.344	-0.311	-	-0.108	0.471	0.000	+	-1.028	-0.861	-0.714	+
Iceland	-1.170	-0.449	-1.613	-	-0.150	-0.541	-0.165	-	-1.061	-0.373	-0.826	+	0.287	0.365	0.784	+
Italy	-0.576	-0.733	-0.836	-	0.726	0.751	0.725	-	0.305	0.433	1.174	+	-0.275	0.159	0.272	+
Latvia	-0.298	-0.348	0.418	+	-0.425	-0.150	-0.347	+	-0.012	0.990	-0.171	-	-1.417	-1.249	-1.043	+
Lithuania	0.898	0.777	-0.410	-	-0.311	-0.026	0.495	+	-0.007	-0.618	-0.606	-	-1.417	-1.043	-0.709	+
Luxembourg	0.438	0.366	-1.474	-	0.055	0.094	-0.053	-	-0.790	-0.659	-0.369	+	1.529	2.437	3.379	+
Netherlands	-0.220	-0.397	-0.669	-	0.755	1.059	-1.546	-	-0.228	-0.356	0.148	+	0.437	1.239	1.704	+
Norway	-0.760	-1.315	-1.869	-	-0.152	-0.896	-0.935	-	-0.969	-1.126	-1.042	-	0.796	1.633	2.551	+
Poland	-0.697	-0.249	0.203	+	-0.675	-0.419	-0.341	+	1.773	0.595	0.656	-	-1.432	-1.063	-0.83	+
SlovakRep	0.274	-0.199	0.160	-	1.458	0.730	-0.768	-	0.967	0.830	0.723	-	-1.233	-0.664	-0.563	+
Slovenia	-0.099	-0.099	0.108	+	-0.033	-0.072	0.304	+	0.196	0.136	0.453	+	-0.674	-0.355	-0.162	+
Spain	0.698	-0.348	0.193	-	0.486	0.023	-0.263	-	0.686	1.705	2.266	+	-0.51	0.027	0.19	+
Sweden	-1.391	-1.286	-1.410	-	-0.137	-0.183	0.508	+	0.243	-0.006	-0.148	-	-0.025	0.46	1.625	+
UK	0.814	0.455	0.667	-	-0.969	-1.101	0.548	+	-0.878	-0.322	-0.622	+	-0.214	0.109	0.777	+

Source: Our data processing, OECD data

Table 3 – Table of Indexes, Differences last data available – 2005

	Unhealthy Index (difference last data av. - 2005)	Prevention Index (difference last data av. - 2005)	Uncertainty Index (difference last data av. - 2005)	Health Expenditure Index (difference last data av. - 2005)
Austria	-0.69	-0.35	0.06	1.17
Belgium	-0.72	-0.07	0.03	1.12
Estonia	-0.95	-0.35	-0.38	0.69
Finland	-0.59	-0.20	0.07	0.98
France	-1.05	-0.45	0.37	0.90
Germany	-0.14	0.61	-0.78	1.36
Hungary	-0.26	-1.07	0.11	0.31
Italy	-0.26	0.00	0.87	0.55
Latvia	0.72	0.08	-0.16	0.37
Luxembourg	-1.91	-0.11	0.42	1.85
Netherlands	-0.45	-2.30	0.38	1.27
Norway	-1.11	-0.78	-0.07	1.76
Poland	0.90	0.33	-1.12	0.60
SlovakRep	-0.11	-2.23	-0.24	0.67
Slovenia	0.21	0.34	0.26	0.51
Spain	-0.51	-0.75	1.58	0.70
UK	-0.15	1.52	0.26	0.99

Source: Our data processing, OECD data

Table 4 – Correlations

	Uncertainty Index	Unhealthy Index	Prevention Index	Health Expenditure Index
Uncertainty Index	-			
Unhealthy Index	-,073	-		
Prevention Index	,137*	,149**	-	
Health Expenditure Index	-,362**	-,278**	-,075	-
N	406	405	349	406

Source: Our data processing, OECD data

** La correlazione è significativa a livello 0,01 (a due code)

* La correlazione è significativa a livello 0,05 (a due code)

Table 5 – Independent Group T- Test (<2009, >=2009)

Group Statistics

	Year	N	Mean	Std. Dev.	Std. Error Mean
Uncertainty Index	>= 2009	177	0.12903	0.784204	0.058944
	< 2009	229	-0.13849	0.663505	0.043846
Health Expenditure Index	>= 2009	177	0.42740	1.060167	0.079687
	< 2009	229	-0.34094	0.800713	0.052913
Unhealthy Index	>= 2009	176	-0.13698	0.695712	0.052441
	< 2009	229	0.21629	0.814573	0.053828
Prevention Index	>= 2009	149	-0.08707	0.684571	0.056082
	< 2009	200	0.00259	0.829384	0.058646

Independent Samples Test

		Levene's Test for Equality of Variances		T-Test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Uncertainty Index	Equal variances assumed	1.803	0.180	3.720	404	0.000	0.267523	0.071918	0.126143	0.408903
	Equal variances not assumed			3.642	343.475	0.000	0.267523	0.073463	0.123028	0.412018
Health Expenditure Index	Equal variances assumed	23.727	0.000	8.320	404	0.000	0.768339	0.092352	0.586789	0.949888
	Equal variances not assumed			8.032	317.733	0.000	0.768339	0.095654	0.580143	0.956535
Unhealthy Index	Equal variances assumed	6.169	0.013	-4.605	403	0.000	-0.353276	0.076709	-0.504075	-0.202476
	Equal variances not assumed			-4.701	398.494	0.000	-0.353276	0.075150	-0.501016	-0.205535
Prevention Index	Equal variances assumed	7.602	0.006	-1.075	347	0.283	-0.089657	0.083432	-0.253753	0.074439
	Equal variances not assumed			-1.105	343.328	0.270	-0.089657	0.081146	-0.249262	0.069948

Source: Our data processing, OECD data

PAPER 2

I'll do it tomorrow: Unmet needs in Uncertain Periods

The economic downturn has had and continues to have a huge impact on citizens' life. Millions of people lost their job and their life-savings with deep economic consequences (OECD, 2014). Several studies have shown the impact of a general uncertainty situation on health status and healthcare with mixed results.

From one side, a minor literature shows that recession periods have a positive return for health (Rhum and Black, 2001; OECD, 2015). On the other side, the wider literature suggests that economic downturns have mainly a negative impact on health and on health inequalities, in particular among lower socioeconomic groups (Ruhm 2000; Marmot 2002; Catalano et al., 2003; Bezruchka, 2009; Miller et al., 2009; Quin et al., 2009; Luisardi et al., 2010; Roelfs et al., 2011; Dorn et al., 2012; Virtanen et al., 2013; OECD, 2013; Tefft and Kageleiry, 2013).

But what about health care decisions? In the literature about the unmet healthcare needs' phenomenon there are no evidences about a positive impact of recessions on health care decisions. At the opposite, several studies have shown a huge spreading of subjects who are unable to answer to their need for care as well as the relevance of different socioeconomic characteristics like gender, age, education, employment status, income (Bryant et al., 2009; Marshal, 2011; Cavalieri, 2013; Lee et al., 2015; Park et al., 2016; Han et al., 2016; Zavras et al., 2016).

In the literature we can also find a useful typology of individual factors (*predisposing factors*, *enabling factors,* and *need factors)* which is provided by Andersen in his Behavioural Model on Health Services Use (Andersen, 1967; 1995). With reference to them, is it possible to hypothesize the presence of differences among Countries characterised by different health systems and different levels of uncertainty? Should a Country without a universalistic health system pay greater attention to those *enabling factors*? Or at the opposite is there a greater impact of the level of uncertainty of a Country?

In answering to this question, in this paper we will combine aggregate level data with individual ones to understand which variables have impact on health care use in Italy, Germany and United Kingdom.

1. Previous results and further hypothesis

This paper is part of a wider initiative which aims to control the effects of an uncertain situation on health, health behaviours and health care unmet needs and decisions and to identify on which variables we should intervene to reduce the negative aftermath (or amplify the positive consequences) of economic insecurity or job insecurity on the general health status of a population.

The situation we depicted in paper 1 speaks about various possible combinations between uncertainty and unhealthy/preventive behaviours.

In the first scenario, an increase in the average level of uncertainty matches with an average reduction in the adoption of behaviours that might have a negative impact on health status like smoke habits or alcohol consumption (the "healthier because of the costs of being unhealthier effect"), but an increase of the incidence of being overweight (the "cheap and fat" effect).

In the second scenario, the same increase in the average level of uncertainty matches with a decrease in the level of adoption of behaviours that might have a positive impact on health status. But if we go in-depth and try to observe each components of our Prevention Index, from one side it increases the average level of Doctors' Consultation as a signal of aging population and the higher level of morbidity and chronic diseases ("longevity effect"). From the other side, there is a reduction of Fruits and Vegetables Consumption (that confirms our highlighted "cheap and fat effect") combined with a reduction in the average level of Dentists' Consultation. This decreasing in Dentists' Consultation lead to a deterioration of dental health with an increase in unmet dental care needs ("turned off smiles effect").

In this previous analysis what we observed was a common path of Countries with same levels of structural uncertainty, regardless the different health system.

Focusing on three Countries with different levels of Uncertainty and different health systems (Italy, Germany, and United Kingdom), can we confirm that Countries with the same health system, but different level of uncertainty react in a different way?

Using EU SILC data, we built a dataset with the same three Countries selected at the end of the previous paper:

- 2 Countries are connected to a similar health care model (United Kingdom and Italy – Beveridge' Model);
- 2 Countries register the same level (low) of structural uncertainty (Germany and United Kingdom), and the third one registers a higher level of structural uncertainty (Italy).

We will consider different years characterised by a high spreading in the level of uncertainty (using the recent economic downturn as a proxy of uncertainty).

In our previous paper we have focused on healthcare behaviours and choices of prevention in terms of number of medical and dental inspections: but some theories suggest that this kind of data do not give us information about who need to do medical examinations but he cannot. It is not the number of examinations that can explain the level of increasing or decreasing health inequalities (Carr, Wolfe, 1976). For these reasons, to better understand healthcare choices (or access) in uncertain periods, in this second paper we will focus on the unmet healthcare need defined as the difference between the need of healthcare services and the services received (Carr, Wolfe, 1976; Sanmartin et al., 2002).

Beyond the general increase in Doctor's Consultation and the general decrease in Dentist's examination highlighted in our first paper, which is the size of the unmet healthcare need phenomenon and which are the variables that has an impact on it?

The Andersen's Behavioural Model on Health Services Use (Andersen, 1995) distinguishes among *predisposing factors* (that refer to variables which have an impact on the healthcare services use, and in detail socio-demographic characteristics, like age, gender, level of education, etc.), *enabling factors* (that refer to the access, and in particular to the general resources that can facilitate or hinder the use of health services, like income or the job's characteristics), and *need factors* (that concern the health status or the presence of chronic diseases and so on).

According to this Model and according to the literature on the impact of uncertainty and the more damaged individuals, we will consider the role of different variables (socioeconomic status – age, gender, education, income, etc. – or level of individual uncertainty) to understand which of these have impact on health care services use in different health systems, and in Countries with different level of uncertainty.

Our main general hypothesis is (once again) that under conditions of economic and occupational uncertainty it is harder to activate long-term oriented health strategies. Individuals tend in fact to activate "survival behaviours" characterised by unhealthy habits and they could postpone to more trust moments both decisions and positive attitudes ("I'll do it tomorrow").

As we have already seen, if I want to stop smoking but I am living a situation of hard stress at work, it will be very easy to find excuses for not stopping (Aarø and Flisher, 2012). According with them, in the same way, if I am living a situation of economic uncertainty it will be very easy to postpone healthy decisions or positive attitudes to more trust moments. In a period of uncertainty, with the related increase of stress and concerns about the future, this looking for excuses, could imply a postponement of health-related decisions, and of healthcare in general.

Studies on postponement of some particular categories of uncertain individuals like widowed women or in general single women show that «a distress over finances tend to be more salient in determining postponement of care than health status» (Keith, 2008: 1). An individual uncertain situation (directly) or a structural uncertain situation (indirectly), could cause a delay in healthcare to a moment of a higher level of certainty and economic or job security, behind the level of individual health.

Our I'll do it tomorrow concept refers exactly to this phenomenon. We do not measure the postponement, but we will consider a context characterized by that kind of uncertainty that impacts the general decision-making process related to health, causing a general mistrust about the future and the consequent postpone of medical examination or other positive treatment.

2. Link between Uncertainty and Health care unmet needs

As we have seen in our previous paper, several studies have shown the impact of a general uncertainty situation on health status and health care with mixed results.

First of all, we have to highlight that we use the term “uncertainty” in reference to two specific but related meanings: a structural and an individual one.

About the structural one (looking at the macro level) we have selected a range of years characterised by an economic downturn, that is by definition a period with a lower rate of growth, lower GDP growth rates, higher unemployment rates, lower investment, lower consumer spending.

About the individual one (looking at the micro level) we refer to the individual consequences of a period of economic downturn. This is an uncertainty caracterised not only by an unemployment situation, but also by a job with a high level of insecurity about the future, the fear to lose the job, a low level of economic security, etc.. In particular we will focus on two kinds of individual uncertainty: a job-related one and an economic one.

Uncertainty could be an objective or a subjective experience or perception that implies uncertainty about the future and could reduce psychological well-being and increase psychosomatic complaints and physical strains (Hans De Witte, 1999). To put more in general, we refer to a situation characterised by an economic insecurity and to «an overall concern about the continued existence of the job in the future» (De Witte, 1999: 156).

Using the recent crisis as a proxy of sharp increase of uncertainty, a wide literature suggests that economic downturns mainly have a negative impact on health and on health inequalities.

Several studies have shown that economic shocks could affect health outcomes (Ruhm, 2000; Marmot, 2002; Bezruchka, 2009; Miller et al., 2009; Stevens et al., 2011; Virtanen et al., 2013), are linked to worse mortality outcomes (Roelfs et al., 2011), and this is particularly true among lower socioeconomic groups (OECD, 2013). Greater job insecurity is linked to lower mammography, colonoscopy and dental use care (Catalano et al., 2003; Quin et al., 2009; Dorn et al., 2012), cancer screening services, routine medical check-ups and *influenza* vaccinations (Tefft and Kageleiry, 2013).

At the opposite, other studies show that "recessions are good for health" because they reduce the overall mortality rate and the traffic accidents incidence. Unemployment reduces heavy drinking (Rhum and Black, 2001), the level of tobacco consumption and in general the expenditure on products that have a negative impact on health. It increases time for leisure with a consequent increase of the time dedicated to physical activity and a general better mental health (OECD, 2015).

If we refer to the literature about the unmet healthcare needs' phenomenon we cannot find these evidences about the positive impact of recessions on health care decisions.

A neutral position about the impact of structural and individual uncertainty on health-related behaviours, highlights that structural uncertainty has no or weak effects on alcohol consumption (Vilaplana et al., 2006), on smoking habits (Gallus et al., 2015) or on unhealthy diets (Dave and Kelly, 2012). At the individual level, unemployment has no effects on diets (Ruhm, 2000) or (in Italy) on alcohol consumption or on smoking habits (Sarti et al., 2016). But, again, we do not have any evidences in the literature about a neutral effect of the crisis on the unmet healthcare needs.

At the opposite, several studies have shown less use of preventive health care services (Luisardi et al., 2010), and a huge spreading of subjects unable to respond to their needs for cares. In addition, the influence of different socioeconomic characteristics, like gender, age, education, employment status and income, still persists (Bryant et al., 2009; Marshal, 2011; Cavalieri, 2013; OECD, 2013; Lee et al., 2015; Park et al., 2016; Han et al., 2016; Zavras et al., 2016).

But, if considering Countries characterised by not only different health systems, but also different level of uncertainty, are there differences in the Andersen's influential factors? Should a Country without a universalistic health system pay greater attention to those *enabling factors*? Or at the opposite is there a greater impact of the level of uncertainty of a Country?

Under conditions of higher uncertainty, will individuals be discouraged in the adoption of healthy strategies, reducing their healthcare levels (our "I'll do it tomorrow" hypothesis)?

3. Data and Methods

In order to analyse the different impact of individual factors on the level of adoption of health care decisions, we have decided to focus on three different Countries.

We selected Italy and United Kingdom because their health systems are more comparable, being the funding mainly based on taxation and the services mainly provided by the public. In addition, we use Germany, being its funding system mainly based on premium-financed social health/mandatory insurance and being services mainly provided by the private.

To measure the level of structural uncertainty, we refer to the Uncertainty Index[18] that is composed by Harmonized Unemployment, Long-term Unemployment, Youth Unemployment, and Temporary Employment.

According to the last data available (Figure 18), we can see that:

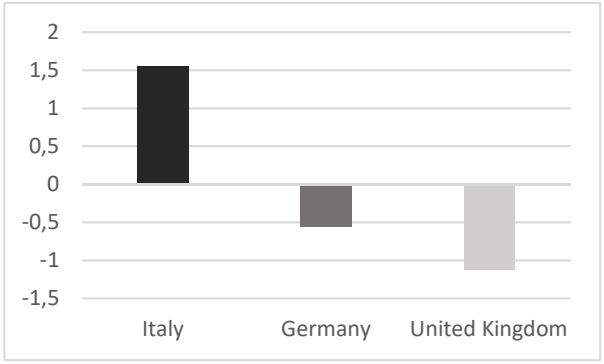
- Germany and United Kingdom are characterised by a lower level of the Uncertainty Index, that means a lower level of Structural Uncertainty in these Countries[19];

[18] Uncertainty Index built on the mean of the standardized values (for the mean and standard deviation of all the years and all the three Countries) of Harmonized Unemployment, Long-term Unemployment, Youth Unemployment, and Temporary Employment

[19] There is also a psychological impact of the crisis in those Countries where the crisis has had no significant effect: this psychological consequences are undoubtedly enormously lower than the psychological impact of the crisis in a Country where this crisis has had huge negative effects.

- Italy is characterised by a higher level of Uncertainty Index (1.5 standard deviation higher than Germany and United Kingdom).

Figure 18 –Uncertainty Index, last data available



Source: Our OECD Data processing, OECD Health Statistics, 2016

Previous analysis suggests that, behind a different original health system, Countries with similar levels of structural uncertainty follow a similar path of reaction. In this sense, United Kingdom and Germany, characterised by a lower impact of the economic downturn tend to react in a similar way, while Italy behaves differently, despite a more comparable health system with the United Kingdom.

Can we confirm that Countries with a similar health system, but different level of uncertainty react in a different way? We tried to reply to this question in our previous paper looking at the structural level of uncertainty. We will try in this second paper to go deeper introducing the individual level of uncertainty.

While measuring the Individual Uncertainty, we decided to consider individual variables that could refer to an economic insecurity situation and to a job insecurity situation *(enabling factors)*. In particular we use:

- level of income (economic uncertainty);
- type of work contract (temporary or permanent – job uncertainty).

According to the already mentioned Andersen's Behavioural Model on Health Services Use, we also consider other individual variables like age, gender, level of

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education attained *(predisposing factors)*, perceived health status and the fact that the subject suffers from any chronic illness or condition *(need factors).*

As we have already seen, in this second step of analysis, we will analyse individual level of unmet healthcare and dental needs, we will investigate which factors have an impact on the unmet needs' phenomenon, and which variables could counterbalance the uncertainty's effect that the literature puts in evidence.

We will use EU SILC[20] cross-sectional data collected from 2005 and the last data available in Italy, Germany, and United Kingdom.

In Table 6 the distribution of our total sample: Italy has the highest sample size (48.2%), followed by Germany (30.1%), and United Kingdom (21.7%).

On average, 52.4% of our cases are Female (47.6% Male) without any differences among Countries (Table 7). We decided to divide the total population in 3 cohorts being the sample thus composed by young adults and adult youngers (on average 40.2%, with a lower 35.8% in Germany), adults and young elders (33.3%, with an higher 36.4% in Germany), and elders and big elders (on average 26.5%). Observing the highest level of education attained among our population, 34.7% has Lower Secondary Level of Education or less, 38.5% have upper Secondary Level of Education, and around 27% have a Post-Secondary Level of Education (Tertiary and Post Secondary-Not Tertiary). The highest distribution of lower educated in Italy, where 50.1% of our sample has a Lower Secondary level of education or less.

[20] Acronym of European Union Statistics on Income and Living Conditions, EU-SILC is "an instrument aiming at collecting timely and comparable cross-sectional and longitudinal multidimensional microdata on income, poverty, social exclusion and living conditions. This instrument is anchored in the European Statistical System (ESS). The EU-SILC project was launched in 2003 on the basis of a "gentlemen's agreement" in six Member States (Belgium, Denmark, Greece, Ireland, Luxembourg and Austria) and Norway. The start of the EU-SILC instrument was in 2004 for the EU-15 (except Germany, the Netherlands, the United Kingdom) and Estonia, Norway and Iceland." We will use cross-sectional data that "pertaining to a given time or a certain time period with variables on income, poverty, social exclusion and other living conditions" (https://ec.europa.eu/eurostat/web/microdata/european-union-statistics-on-income-and-living-conditions).

Table 6 – Our Sample, Countries (%)

Countries	**%**	**N**
Italy	48.2	461,378.0
Germany	30.1	271,474.0
United Kingdom	21.7	187,576.0
	100.0	920,428.0

Source: Our EU SILC Data Processing

Table 7 – Our Sample, Individual Characteristics (per Country and total, %)

	Countries			***Total***
	Italy	Germany	United Kingdom	
Gender				
Female	52.4	52.5	52.6	52.4
Male	47.6	47.5	47.4	47.6
Class of ages				
18-45	42.1	35.8	42.3	40.2
46-64	31.9	36.4	32.5	33.3
65-over	26.1	27.8	25.2	26.5
Highest level of education attained				
Lower Secondary or less	50.1	14.2	29.1	34.7
Upper Secondary	34.3	45.0	38.2	38.5
Post-Secondary - Not Tertiary	3.8	6.9	1.4	4.2
Tertiary	11.8	33.8	31.2	22.6

Source: Our EU SILC Data Processing

We can now go in depth with our analysis that is organized in three different parts.

In the first part we will focus on the average levels of unmet healthcare needs and unmet dental care needs, our dependent variables, and we will look at the main reasons provided beyond an unmet need. We will start looking at the main general differences among our Countries to introduce the unmet needs' phenomenon.

Secondly, we will observe the general characteristics of who declared unmet healthcare needs in two different years, before and after the economic downturn.

Thirdly, we will move on the analysis of which independent variables have impact on our dependent variables, both before and after the spreading of uncertainty. This third part is divided in three parts, one for each Country, plus one which summarize the three Countries. Given the characteristics of our dependent variables (unmet need for medical examination and unmet need for dental care) we run separately Binary Logistic Regressions for each Country.

As we have only mentioned, according to our data, we focus on two dependent variables: the first one refers to an unmet need of medical examination and treatment, and the second one refers to an unmet need of dental examination or treatment. We will treat them as separated variables.

In detail, our first dependent variable is a dichotomous one coming from the affirmative answer to the question "Was there any time during the past 12 months when you really needed medical examination or treatment for yourself?" and negative to the consequential one "Did you have a medical examination or treatment each time you really needed?" (See the attached A). People who answer "no" to this last one, are people with unmet care needs (coded 1).

Our second dependent variable comes from the question "Was there any time during the past 12 months when you really needed dental examination or treatment for yourself?" and the negative answer to the question "Did you have a dental examination or treatment each time you really needed?" (See attached B).

Independents variables, according to the already mentioned Andersen's Model, are: gender, age and level of education *(predisposing factors)*, the type of contract (permanent or temporary), and the income level *(enabling factors).* For unmet need of medical examinations, we will consider also the general health status (perceived), and the presence of a chronic disease *(need factors).*

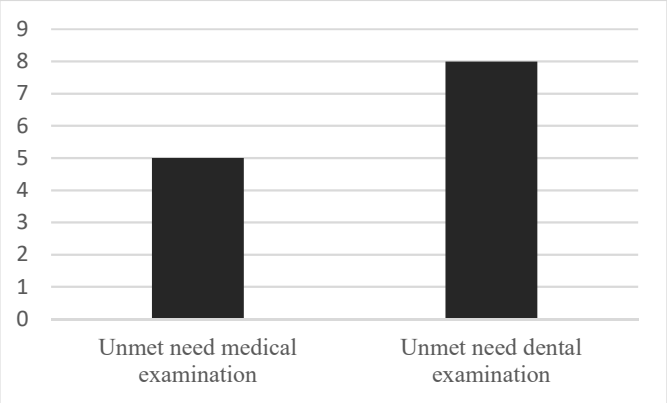
4. Results

4.1 Size of unmet healthcare needs

A good step in any analytical exploration is an evaluation of the size of the phenomenon under analysis.

If we observe the last data available the 5% of our sample registers an unmet need of medical examination or treatment (= 3.618 individuals who report it), while a higher 8% (= 4.903 individuals) registers an unmet need of dental examination or treatment (Fig. 19).

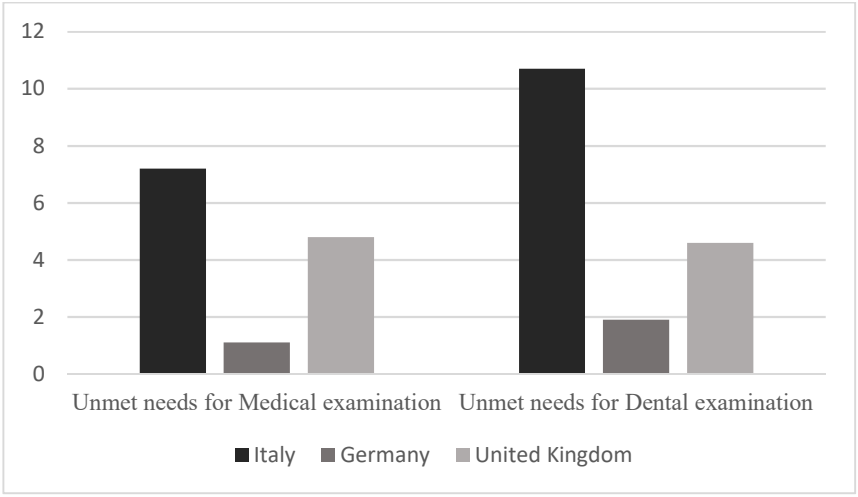
Figure 19 – Unmet care needs, last data available (%)



Source: EU SILC Data Processing
Note: average % of who register an unmet medical or dental need in the last data available

If we try to distinguish among our three Countries we can observe a higher level of unmet Medical (7.2%, equal to 2.644 individuals) and Dental (10.7%, equal to 3.924 individuals) needs in Italy, the Country characterised by the highest level of uncertainty. Unmet care needs are lower in United Kingdom and strongly lower in Germany (Fig. 20).

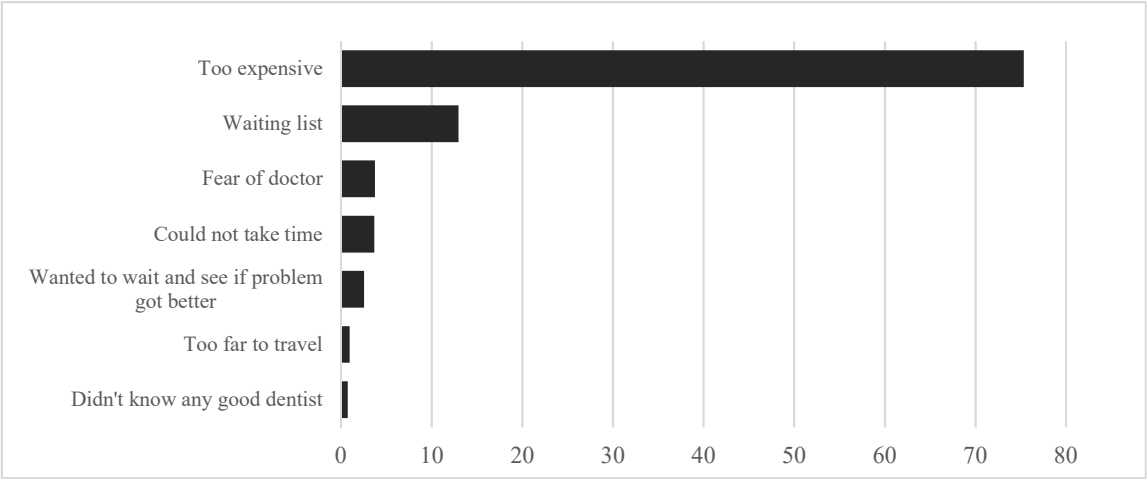
Figure 20 - Unmet needs for medical and dental examinations, last data available (%)



Source: Our EU SILC Data processing

If we look at the three Countries together, we see that the main reason behind an unmet need of examinations or treatments both medical and dental is a costs issue. Almost the 80% of who reports an unmet need of cares says that in the past 12 months he cannot afford the cost of at least one examination or treatment because of the expensiveness (Fig. 21).

Figure 21 – Reasons for unmet needs for medical or dental examination, last data available (%)

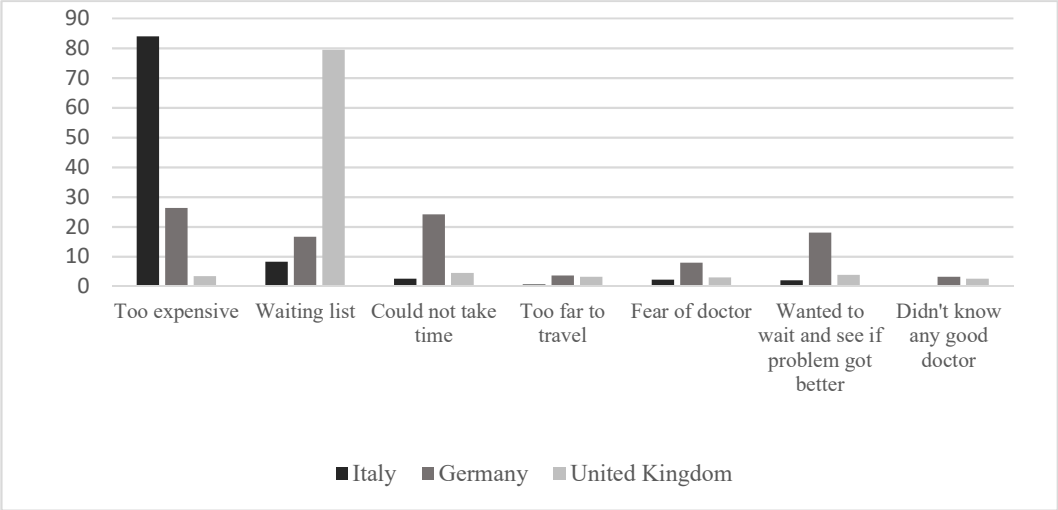


Source: Our EU SILC Data processing
Note: Average percentage of reasons provide by individuals who have unmet needs for medical or dental examination in the last data available

While reasoning about the explanations provide by the interviewed, we did expect a lower incidence of economic reasons in Countries with lower theoretical economic barriers to the healthcare access. In these Countries we expect a higher incidence of waiting lists on the analysed phenomenon.

Surprisingly the data show almost the opposite. If we look at them by distinguishing among Countries, we can observe that the economic reasons are the main motivation provided by Italian interviewees (Fig. 22). In spite of a universalistic health system, more than 80% of Italian population that reports at least one unmet care needs considers too expensive examinations or treatments (effect of the impact of sharing costs policy on a wide range of Italian population). At the opposite, according to a theoretically inclusive system, the waiting lists are the main reasons of unmet care needs in United Kingdom (79%).

Figure 22 – Reasons for Unmet needs for medical examination, last data available (%)



Source: Our EU SILC Data processing

This first step of analysis seems to describe a situation in which Italy is characterised not only by a higher level of structural uncertainty, but also by the highest level in unmet care needs, primarily for economic reasons. This quite clashes with the theoretical absence of economic barriers to healthcare.

4.2 Characteristics of who reports unmet healthcare needs: differences among years

Before starting to analyse the main factors that have an impact on healthcare unmet needs, we try to describe the characteristics of the subjects reporting unmet needs. Which are the general characteristics of individual who need to go for a medical or a dental examination or treatment but that cannot?

As we can see in the following tables we consider the two classes of unmet care needs separately: from one side the need of medical examinations or treatments (adding 2005-2006 and last data available, we are talking about 18.793 individuals on a total of 274.531 individuals) and from the other side the need of dental examinations or treatments (total – 2005-2006 plus last data – individuals who report unmet needs equal to 22.817 on 265.940).

About the first class of needs (Tab. 8) the highest percentage of "need-of-cares" is Female (57.6%) both in 2005-2006 and in the last available data.

Considering the class of age, it seems to be a displacement of the phenomenon from younger in 2005-2006 (46.4%, against 31.6% in last data available) to elders in last data available (29.6% in last data, against 19.8% in 2005).

Higher unmet needs for the lower level of education, that according with the last data available characterise more than a half of our sample (55.4%, against a lower 36.2% in 2005-2006). At the opposite it is clear a general decreasing for the higher level of education, that move from 22.2% in 2005-2006 to the lower 14.2% in the last year available.

Table 8 - Unmet need for medical examination or treatment (%)

Individual characteristics	***2005-2006***	***Last data available***
Gender		
Female	57.2	57.6
Male	42.8	42.4
Class of ages		
18-45	46.4	31.6
46-64	33.8	38.8
65-over	19.8	29.6
Highest level of education attained		
Lower Secondary or less	36.2	55.4
Upper Secondary	35.0	28.8
Post-Secondary - Not Tertiary	6.6	1.6
Tertiary	22.2	14.2

Source: Our EU SILC Data processing

While moving to the unmet needs of dental care (Tab. 9) we can observe again a higher portion of Female (54.5%) similar to 2005-2006 (53.1%).

We find similar results also looking at classes of age: a decrease in the portion of youngers and young adults (48.1% in 2005-2006 and 22.9% in last data available), an increase from 2005-2006 and the last data for adults and young elders (34.5% to 41.1%), and elders and great elders (from 17.5% to 25.0%).

Same situation among medical and dental unmet needs of healthcare for level of education with more or less the same changes among 2005-2006 and the last data available.

So, the general distribution of unmet needs of dental examination and treatments it seems to go hand in hand.

Table 9 - Unmet need for dental examination or treatment (%)

Individual characteristics	***2005 - 2006***	***Last data available***
Gender		
Female	53.1	54.5
Male	46.9	45.5
Class of ages		
18-45	48.1	33.9
46-64	34.5	41.1
65-over	17.5	25.0
Highest level of education attained		
Lower Secondary or less	42.0	53.2
Upper Secondary	34.3	32.4
Post-Secondary - Not Tertiary	6.3	1.8
Tertiary	17.3	12.7

Sources: Our EU SILC Data processing

What we have to highlight at this point of analysis is the relevance (on average) of "need-of-cares" among adults, and lower educated.

4.3 Influential factors per Countries

In a Country characterised by the absence of economic barriers, we may expect the absence of a statistically significant impact of all these characteristics on healthcare access. And, adding *enabling factors* to the model, we should observe no impact in Countries where the health system is based mainly on universal coverage.

What we will do now is to study the impact of Andersen's factors on the probability that an unmet care need occurs.

As we have seen, we will consider two different dependent variables: the unmet need of medical examinations and the unmet need of dentist examinations.

Obviously, we cannot link each of the three Andersen's factors to both the dependent variables. We will consider predisposing, enabling, and need factors for the unmet needs for medical examinations, and predisposing and enabling factors for the unmet needs for dental cares or treatments. In this sense, we assume that a worse perceived health status can have impact to turn to a doctor or a medical examination but not to a dental examination.

In a system characterised by the absence of economic barriers are *enabling factors* relevant for healthcare decisions? Or *predisposing* and *need factors* have a deeper impact?

Is it true that in an uncertain period individual tend to activate a sort of "survival behaviours", postponing to more trust periods healthy attitudes? To see the effect of the economic downturn (proxy of uncertainty) we perform logistic regressions before crisis (years 2005 and 2006) and after crisis (last years available, 2015 and 2016).

4.3.1 Italian case

Observing our results (Tab. 10) we can see that in 2005-2006 the individuals more likely to report unmet needs are youngers, with a temporary employment, with the lowest levels of income, with a very bad health status (perceived), and with a chronic disease.

If we refer to *predisposing factors*, the unmet needs for medical examinations in Italy decrease by cohorts (with the reference point of 18-45, O.R. = 0.844 for 46-64, and O.R. 0.483 for 64-over). The impact of education is not statistically significant except for those with a post-secondary not tertiary education that have a higher probability

of unmet care need (O.R. = 1.302). If we move on *enabling factors*, we see smaller likelihood for individuals with a permanent contract (O.R. = 0.771), and with a higher income (O.R. = 0.955). Finally, looking at *need factors* we see a decrease in unmet need of healthcare for who has a better perceived health status (take as a reference who declares a very bad health status, very good health status has an O.R. = 0.164), and for those that declares no chronic diseases (O.R. = 0.644).

If we move to the period post-crisis (2015-2016, Tab. 11) individuals with lower likelihood to reports an unmet care need are elders and big elders (O.R.0.414), and individual with higher levels of education (with the reference point of lower secondary and less, the upper secondary has an O.R. = 0.561, post-secondary not tertiary an O.R. = 0.366, and tertiary education an O.R. = 0.464). So, all levels of education are statistically significant after spreading of uncertainty.

About our *enabling factors*, individuals with lower probability of unmet care needs are those with a permanent contract (O.R = 0.700), and with higher level of income (O.R. = 0.906).

In reference to *need factors*, again, individuals that have a lower likelihood to report an unmet care need are those who do not have need of cares: they are who declares a better health status (O.R. = 0.103), and who do not have chronic diseases (O.R. = 0.554).

Moving to unmet dental care need before-crisis (Tab. 12), subjects that are statistically more likely to report an unmet need are younger, with the lowest level of education (except for post-secondary not tertiary education that has an O.R. = 1.194), with a temporary contract, and with a low level of income.

Again, we can see that in Italy unmet needs for dental examinations decrease for the higher cohorts of age (46-64s have an O.R. = 0.795, 65-overS have an O.R. = 0.353), and Level of Education (with the reference point of lower secondary or less education, we have an O.R.= 0.840 for upper secondary, and 0.794 for tertiary education).

Finally, if we move on *enabling factors*, smaller likelihood for individuals with a permanent contract (O.R. = 0.744), and with a higher income (O.R. = 0.962).

After the spreading of economic crisis (Tab. 13), subjects that are statistically more likely to report an unmet need are another time the youngers, with the lowest level of education (except for post-secondary not tertiary education that has an O.R. = 1.194), with a temporary employment, and with a low level of income.

Again, in Italy unmet needs for dental examinations decrease for the highest cohort of age (65-overS have an O.R. = 0.476), and Level of Education (with the reference point of lower secondary or less education, we have an O.R.= 0.616 for upper secondary, 0.531 for post-secondary not tertiary, and 0.463 for tertiary education). Looking at *enabling factors*, smaller likelihood for individuals with a permanent contract (O.R. = 0.668), and with a higher income (O.R. = 0.933).

4.3.2 United Kingdom's case

Different the case of United Kingdom, where individuals who are statistically more likely to report unmet needs of medical examinations in the period before economic crisis are female, with higher level of education, with a worse health status or the presence of any chronic diseases, but also with higher level of education. None of our *enabling factors* are statistically significant, so neither the type of contract nor the level of income has an impact on the probability that an unmet healthcare need occurs (Tab.10).

In particular, the likelihood of an unmet need decreases for male (O.R. = 0.840) but increase for individuals with a post-secondary not tertiary degree of education (O.R. = 1.902) and those with a Tertiary Level of Education (O.R. = 1.439). Lower probability among who has a better perceived health status (take as a reference who declares a very bad health status, very good health status has an O.R. = 0.131), and none chronic diseases (O.R. = 0.569).

Moving after crisis (Tab. 11), the situation change: according to our data, none of our independent variables have a statistically significant effect on the likelihood of unmet needs for medical examination and treatments.

And, if we look at dental cares' unmet needs, before crisis (Tab. 12) we can observe that only gender has a statistically significant impact. The likelihood that a dental unmet need occurs increase for male (O.R. = 1.192).

Changes after crisis (2015-2016, Tab. 13) are a lower probability for individuals in adulthood (46-64S have an O.R. = 0.541) but an increasing probability for those with an Upper Secondary degree of Education (O.R. = 1.608).

4.3.3 German case

Finally, if we look at Germany, a Country without a universalistic health system, what do we observe?

Looking at the results (Tab. 10) the likelihood to having an unmet need of care decreases for males (O.R. = 0.911), the same for cohorts (O.R. = 0.677 for 46-64, and O.R = 0.487 for 65 and over, with the reference point 18-45 years old) and among who declares a better health status (take as a reference who declares a very bad health status, very good health status has an O.R. = 0.139).

Although there is an assurance model, neither income nor type of contract have a statistically significant effect.

And the same situation when we move after crisis (Tab. 11): no one of our *enabling factors* is statistically significant.

The probability to have an unmet need for medical examination or treatment decreases only for those who do not have a need of cares, that are those with a better perceived health status (very good perceived health status has an O.R. = 0.055).

Looking at the unmet needs for dental examination (Tab. 12), we have a higher likelihood for male (O.R.= 1.241) before crisis. Lower probability for individuals in the central cohorts of age (46-64 have an O.R. = 0.797). About the level of education, before crisis, higher levels of education have lower likelihood to reports unmet needs (O.R. = 0.829 for Upper Secondary, and O.R. = 0.732 for Tertiary Education). Again, no statistically significant impact for *enabling factors* and the same situation if we move after crisis (Tab. 13), when only higher levels of education are statistically significant (O.R. = 0.377 for Post-Secondary Not Tertiary, and O.R. = 0.379 for Tertiary Education).

4.3.4 Conclusions on influential factors: the importance of a structural level

To sum up, according to our results, we can distinguish among two different situations: the Italian situation from one side, and the UKs and German situation on the other side.

The first one characterises the Italian case in which, in spite of a public health system and the theoretical absence of economic barriers to health services, we have a statistically significant effect of all the independent variables that we can include in the concept of individual uncertainty both before than after the start of the crisis. The Italian universalistic system seems not able to protect lower incomes and temporary employment to the unmet needs' phenomenon. And this is true, not only by the effect of the crisis, but it seems to characterise a general situation in which individuals with lower socio-economic charachteristics suffer of a more difficult access to health care.[21]

[21] We will go deeper to the Italian case in our next paper, and we will investigate geographical differences on health related behaviours to understand the effect of infrastructural differences (decentralization of the system).

At the opposite, for the UKs and German case - regardless of different health systems - our results show the absence of a statistically significant impact of *enabling factors* both before and after the start of the crisis. Level of income and the type of employment contract seem do not have impact in increasing or decreasing the probability of an unmet need for medical or dental examination.

Table 10 – Factors that have an impact on Unmet need for medical examination or treatment – Logistic Regressions: Italy, United Kingdom, Germany (2005 – 2006, B, Exp(B))

	Italy pre-crisis		UK pre-crisis		Germany pre-crisis	
	B	Exp(B)	B	Exp(B)	B	Exp(B)
Predisposing Factors						
Sex						
Female (reference)		1.000		1.000		1.000
Male	*-0.026*	*0.974*	-0.174	0.840 *	-0.093	0.911 *
Cohorts						
18-45 (reference)		1.000		1.000		1.000
46-64	-0.170	0.844 *	*-0.073*	*0.930*	-0.391	0.677 ***
65-over	-0.727	0.483 ***	*-0.299*	*0.742*	-0.720	0.487 **
Level of Education						
Lower Secondary or Less (reference)		1.000		1.000		1.000
Upper Secondary	*-0.106*	*0.900*	*0.252*	*1.286*	*-0.114*	*0.892*
Post-Secondary Not Tertiary	0.264	1.302 ***	0.643	1.902 **	*-0.045*	*0.956*
Tertiary	*-0.018*	*0.982*	0.364	1.439 **	*-0.065*	*0.937*
Enabling Factors						
Type of contract						
Temporary Contract (reference)		1.000		1.000		1.000
Permanent Contract	-0.260	0.771 ***	*0.037*	*1.038*	*0.018*	*1.019*
Income	-0.046	0.955 ***	*0.001*	*1.001*	*-0.016*	*0.984*
Need Factors						
Health Status (perceived)						
Very Bad (reference)		1.000		1.000		1.000
Very Good	-1.808	0.164 ***	-2.029	0.131 ***	-1.977	0.139 ***
Good	-1.307	0.271 ***	-1.628	0.196 ***	-1.201	0.301 ***
Fair	-0.460	0.631 *	-0.796	0.451 *	*-0.381*	*0.683*
Bad	*0.093*	*1.098*	*-0.403*	*0.668*	*0.047*	*1.048*
Chronic diseases						
Yes (reference)		1.000		1.000		1.000
No	-0.440	0.644 ***	-0.564	0.569 ***	*0.037*	*1.038*

Source: Our EU SILC Data processing
Notes: a. Variables: Sex, Age, Level of Education, Type of contract (temporary or permanent), Income (grouped into deciles), General Health Status (perceived), Presence of any chronic illness or condition.
b. *** $p < .001$ ** $p < 0.01$ * $p < .05$
c. In cursive all factors not statistically significants

Table 11 – Factors that have an impact on Unmet need for medical examination or treatment – Logistic Regressions: Italy, United Kingdom, Germany (last data available, B, Exp(B))

	Italy post-crisis		UK post-crisis		Germany post-crisis	
	B	Exp(B)	B	Exp(B)	B	Exp(B)
Predisposing Factors						
Sex						
Female (reference)		*1.000*		*1.000*		*1.000*
Male	*0.046*	*1.047*	*-0.295*	*0.744*	*0.036*	*1.037*
Cohorts						
18-45 (reference)		*1.000*		*1.000*		*1.000*
46-64	*0.118*	*1.125*	*-0.372*	*0.689*	*0.061*	*1.063*
65-over	-0.881	0.414 ***	*-1.146*	*0.318*	*0.181*	*1.199*
Level of Education						
Lower Secondary or Less (reference)		1.000		*1.000*		*1.000*
Upper Secondary	-0.578	0.561 ***	*-0.196*	*0.822*	*0.414*	*1.513*
Post-Secondary Not Tertiary	-1.006	0.366 ***			*0.387*	*1.472*
Tertiary	-0.769	0.464 ***	*-0.238*	*0.789*	*0.136*	*1.146*
Enabling Factors						
Type of contract						
Temporary Contract (reference)		1.000		*1.000*		*1.000*
Permanent Contract	-0.357	0.700 ***	*-0.498*	*0.608*	*-0.108*	*0.897*
Income	-0.099	0.906 ***	*-0.007*	*0.993*	*-0.033*	*0.968*
Need Factors						
Health Status (perceived)						
Very Bad (reference)		1.000		*1.000*		1.000
Very Good	-2.277	0.103 ***	*-0.734*	*0.480*	-2.902	0.055 ***
Good	-1.821	0.162 ***	*-0.519*	*0.595*	-2.888	0.056 ***
Fair	-1.002	0.367 ***	*-0.521*	*0.594*	-1.620	0.198 **
Bad	-0.828	0.437 **	*-0.317*	*0.728*	-1.357	0.257 *
Chronic diseases						
Yes (reference)		1.000		1.000		*1.000*
No	-0.590	0.554 ***	-0.626	0.535 **	*0.394*	*1.484*

Source: Our EU SILC Data processing
Notes: a. Variables: Sex, Age, Level of Education, Type of contract (temporary or permanent), Income (grouped into deciles), General Health Status (perceived), Presence of any chronic illness or condition.
b. *** p < .001 ** p < 0.01 * p < .05
c. In cursive all factors not statistically significant

Table 12 – Factors that have an impact on Unmet need for dental examination or treatment – Logistic Regressions: Italy, United Kingdom, Germany (2005 – 2006, B, Exp(B))

	Italy pre-crisis		UK pre-crisis		Germany pre-crisis	
	B	Exp(B)	B	Exp(B)	B	Exp(B)
Predisposing Factors						
Sex						
Female (reference)		1.000		1.000		1.000
Male	0.089	1.093 *	0.175	1.192 *	0.216	1.241 ***
Cohorts						
18-45 (reference)		1.000		*1.000*		*1.000*
46-64	-0.230	0.795 ***	*0.006*	*1.006*	-0.227	0.797 **
65-over	-1.042	0.353 ***	*0.003*	*1.003*	*-0.386*	*0.680*
Level of Education						
Lower Secondary or Less (reference)		1.000		*1.000*		*1.000*
Upper Secondary	-0.174	0.840 ***	*0.065*	*1.067*	-0.188	0.829 *
Post-Secondary Not Tertiary	0.177	1.194 **	*-0.235*	*0.790*	*-0.128*	*0.879*
Tertiary	-0.231	0.794 ***	*0.170*	*1.185*	-0.313	0.732 ***
Enabling Factors						
Type of contract						
Temporary Contract (reference)		1.000		*1.000*		*1.000*
Permanent Contract	-0.296	0.744 ***	*0.166*	*1.180*	*-0.120*	*0.887*
Income	-0.038	0.962 ***	*-0.008*	*0.992*	*-0.017*	*0.983*

Source: Our EU SILC Data processing
Notes: a. Variables: Sex, Age, Level of Education, Type of contract (temporary or permanent), Income (grouped into deciles), General Health Status (perceived), Presence of any chronic illness or condition.
b. *** $p < .001$ ** $p < 0.01$ * $p < .05$
c. In cursive all factors not statistically significant

Table 13 – Factors that have an impact on Unmet need for dental examination or treatment – Logistic Regressions: Italy, United Kingdom, Germany (last data available, B, Exp(B))

	Italy post-crisis		UK post-crisis		Germany post-crisis	
	B	Exp(B)	B	Exp(B)	B	Exp(B)
Predisposing Factors						
Sex						
Female (reference)		1.000		1.000		1.000
Male	*0.022*	*1.022*	*0.225*	*1.253*	*0.276*	*1.318*
Cohorts						
18-45 (reference)		1.000		1.000		1.000
46-64	*0.098*	*1.103*	-0.614	0.541 ***	*-0.626*	*0.535*
65-over	-0.742	0.476 ***	*-0.580*	*0.560*	*-1.135*	*0.321*
Level of Education						
Lower Secondary or Less (reference)		1.000		1.000		1.000
Upper Secondary	-0.484	0.616 ***	0.475	1.608 *	*-0.243*	*0.784*
Post-Secondary Not Tertiary	-0.633	0.531 ***			-0.976	0.377 *
Tertiary	-0.770	0.463 ***	*-0.111*	*0.895*	-0.971	0.379 **
Enabling Factors						
Type of contract						
Temporary Contract (reference)		1.000		1.000		1.000
Permanent Contract	-0.404	0.668 ***	*-0.090*	*0.913*	*-0.407*	*0.666*
Income	-0.070	0.933 ***	*-0.028*	*0.972*	*-0.042*	*0.959*

Source: Our EU SILC Data processing
Notes: a. Variables: Sex, Age, Level of Education, Type of contract (temporary or permanent), Income (grouped into deciles), General Health Status (perceived), Presence of any chronic illness or condition.
b. *** $p < .001$ ** $p < 0.01$ * $p < .05$
c. In cursive all factors not statistically significant

5. Conclusions and further analysis

Main findings in our first paper were a general reduction of all behaviours that have a cost, like the alcohol and tobacco's consumption, the healthier food's consumption, etc. We called these effects the "Healthy for the cost of be unhealthier" and the "Cheap and fat effect".

At this second stage of analysis, it emerges a situation where economic or job insecurity seem to go hand in hand with the likelihood that an unmet need medical or dental examination occurs. And the explanation of this picture resides not only on structural uncertainty.

For the UKs and the German case – Countries with a low level of structural uncertainty - individuals with higher or lower level of income or individuals with a permanent or a temporary contract have the same probability that an unmet need occurs, regardless of different health systems.

At the opposite, Italy seems to be characterised by a situation in which lower socioeconomic status registers a higher probability of unmet needs for medical and dental examination or treatment.

These peculiarities, combined with a greater percentage of peoples that need cares because of the costs (more than 80% according to the last available data) in a Country where there is a theoretical absence of economic barriers on access to health services seems to show us an implicit decision to turn to the private sector (and this explain why in Italy are not so important reasons like waiting lists), or the effects of a harmful implementation of decentralisation of health services. The last hypothesis, combined with the high heterogeneity of the Italian situation, could entail the payment of tickets or compensations (out-of-pocket health expenditure) of different sizes by moving among Regions.

However, what we have to highlight at this point of analysis, is that our unmet care needs variables are based on a perception that an unmet need occurs. And the same about the reasons provided: I can put in evidence that I cannot do an examination because of the *perceived* high cost of that examination. So, turning to our main hypothesis an unmet need of cares can be seen also in the perspective of "I didn't have this examination because I will do it when I'll get a more certain job position / when I'll get paid more, etc."

So, with all due caution, we could confirm that «a distress over finances tend to be more salient in determining postponement of care than health status» (Keith, 2008: 1). An individual uncertain situation could cause a delay in healthcare to a moment of a higher level of certainty and economic or job security, behind the level of individual health.

What we will do in our further step of analysis is to focus on the Italian case. We will combine the aggregate level data with the individual ones to understand the impact of economic or job insecurity on perceived health status or on the adoption of behaviours that have a negative impact on health status in areas where there are different levels of structural uncertainty and different capabilities of health system to answer to the citizen needs.

How does individual behave in individual uncertain situations? Which factors can better protect these uncertain individuals? Which is the remedy to the "I'll do it tomorrow" phenomenon?

Using "Indagine Multiscopo sulle Famiglie: Aspetti della vita quotidiana" we will reply to these further questions and move on the policy implication of our results.

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Attached A

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PH040: Unmet need for medical examination or treatment *[Unmet need for medical examination or treatment during the last 12 months]*

Domain/Area	Health/Access to health care
Transmission type	Early and regular
Reference period	Past 12 months
Unit	All current household members aged 16 and over or selected respondent (where applies)
Mode of collection	Personal interview (proxy as an exception)
Values	*1* Yes, there was at least one occasion when the person really needed examination or treatment but did not receive it *2* No, there was no occasion when the person really needed examination or treatment but did not receive it
Flags	*1* Filled *-1* Missing *-2* examin *-3*

Description

There were very large differenc
free access to health care. In c
care may still be limited by the e

The aim of the variable is to
assessment of whether he or
experienced a delay in getting it

Delay in getting care can be
However, a specification of time
having the service is not possib
would be needed. It is up to res
unmet need.

Medical care refers to individual
under direct supervision of medi
practitioners), traditional and co
professions according to nationa

Included:

medical mental health care;

prevention if perceived by resp
guaranties regular preventive me
and perceives the situation as je

Excluded:

- aking prescribed or non-
- dental care.

Care provided for different purp

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modes of provision (inpatient, outpatient, day, and home care) should all be included.

It is recommended that the question is implemented in the following way:

PH040_Q1: **Was there any time during the past 12 months when you really needed medical examination or treatment (excluding dental) for yourself?**
Yes (I really needed at least at one occasion medical examination or treatment) **1**
No (I did not need any medical examination or treatment) **2**

FILTER: If PH040_Q1 = 1 then GO TO PH040_Q2. Else GO TO PH060_Q1.

PH040_Q2: **Did you have a medical examination or treatment each time you really needed?**
Yes (I had a medical examination or treatment each time I needed) **1**
No (there was at least one occasion when I did not have a medical examination or treatment) **2**

FILTER: If PH040_Q2 = 2 then GO TO PH050_Q1. Else GO TO PH060_Q1.

Recommendations on the model question(s):

In order to ensure that only relevant health-state-related needs (health problems) are taken into account (in situations perceived by respondent as worrying or possibly causing additional health problems or further significantly deteriorating his/her health), the question should include 'really' (... when you really needed ...);

In order to make sure that only consultations needed on the person's own behalf rather than on behalf of children, spouse, etc., the question should include 'for yourself';

Both 'examination and treatment' shall be asked as both terms might be perceived differently by the respondents and the intention is to include all contacts with medical professionals (including diagnostic and preventive check-ups);

Not to include any other questions related to unmet needs before or between the model questions;

To follow the proposed order of all the questions and the answer categories;

Depending on the national context, the model question can explicitly ask for exclusion of dental examination or treatment if there is a worry that respondents could consider it as part of medical care. This should especially be taken in account when questions on unmet needs for medical care are asked before questions on unmet needs for dental care.

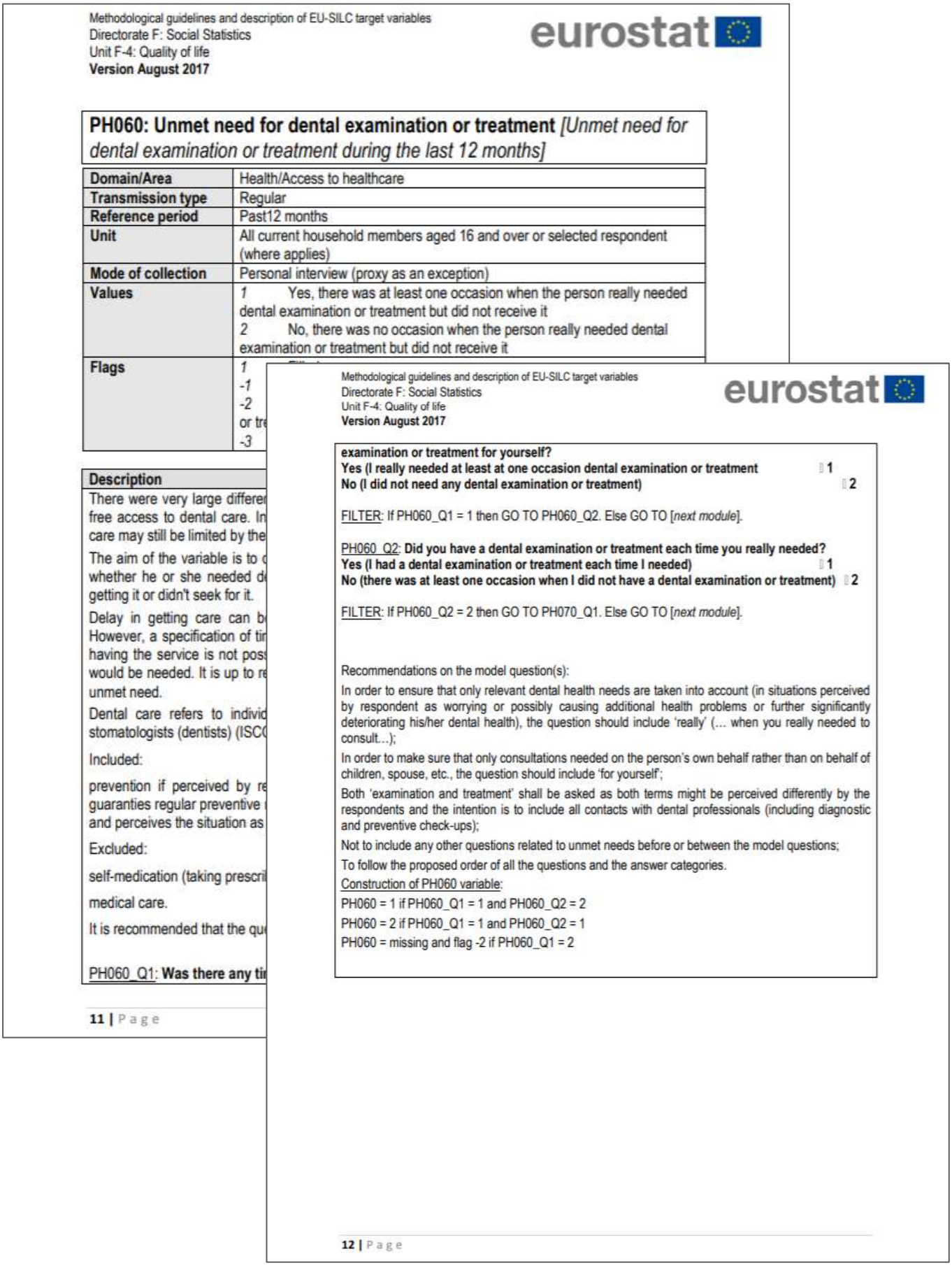
Construction of PH040 variable from the model questions:

PH040 = 1 if PH040_Q1 = 1 and PH040_Q2 = 2

PH040 = 2 if PH040_Q1 = 1 and PH040_Q2 = 1

PH040 = missing and flag -2 if PH040_Q1 = 2.

Attached B



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PH060: Unmet need for dental examination or treatment *[Unmet need for dental examination or treatment during the last 12 months]*

Domain/Area	Health/Access to healthcare
Transmission type	Regular
Reference period	Past12 months
Unit	All current household members aged 16 and over or selected respondent (where applies)
Mode of collection	Personal interview (proxy as an exception)
Values	*1* Yes, there was at least one occasion when the person really needed dental examination or treatment but did not receive it 2 No, there was no occasion when the person really needed dental examination or treatment but did not receive it
Flags	*1* *-1* *-2* or tr *-3*

Description

There were very large differe
free access to dental care. In
care may still be limited by the

The aim of the variable is to
whether he or she needed d
getting it or didn't seek for it.

Delay in getting care can b
However, a specification of ti
having the service is not pos
would be needed. It is up to re
unmet need.

Dental care refers to indivi
stomatologists (dentists) (ISC

Included:

prevention if perceived by re
guaranties regular preventive
and perceives the situation as

Excluded:

self-medication (taking prescri

medical care.

It is recommended that the qu

PH060_Q1: **Was there any ti**

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examination or treatment for yourself?
Yes (I really needed at least at one occasion dental examination or treatment ☐ **1**
No (I did not need any dental examination or treatment) ☐ **2**

FILTER: If PH060_Q1 = 1 then GO TO PH060_Q2. Else GO TO [*next module*].

PH060_Q2: **Did you have a dental examination or treatment each time you really needed?**
Yes (I had a dental examination or treatment each time I needed) ☐ **1**
No (there was at least one occasion when I did not have a dental examination or treatment) ☐ **2**

FILTER: If PH060_Q2 = 2 then GO TO PH070_Q1. Else GO TO [*next module*].

Recommendations on the model question(s):

In order to ensure that only relevant dental health needs are taken into account (in situations perceived by respondent as worrying or possibly causing additional health problems or further significantly deteriorating his/her dental health), the question should include 'really' (... when you really needed to consult...);

In order to make sure that only consultations needed on the person's own behalf rather than on behalf of children, spouse, etc., the question should include 'for yourself';

Both 'examination and treatment' shall be asked as both terms might be perceived differently by the respondents and the intention is to include all contacts with dental professionals (including diagnostic and preventive check-ups);

Not to include any other questions related to unmet needs before or between the model questions;

To follow the proposed order of all the questions and the answer categories.

Construction of PH060 variable:

PH060 = 1 if PH060_Q1 = 1 and PH060_Q2 = 2

PH060 = 2 if PH060_Q1 = 1 and PH060_Q2 = 1

PH060 = missing and flag -2 if PH060_Q1 = 2

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PAPER 3

I'll do it tomorrow:
Uncertainty and Health in Italy

The economic downturn has had and continues to have a huge impact on citizens' life. Millions of people lost their job and their life-savings with deep economic consequences (OECD, 2014).

Several studies have shown the impact of a general uncertainty situation on health status and healthcare often with different results.

From one side a minor literature shows that recession periods have a positive impact on health. They reduce the overall mortality rate, and traffic accidents. Unemployment reduces heavy drinking (Rhum and Black, 2001), the level of tobacco consumption and in general, with the loss of income, expenditure on products that have a negative impact on health. It increases time for leisure with a consequent increase of the time dedicated to physical activity and a general better mental health (OECD, 2015).

On the other side, the wider literature suggests that economic downturns have mainly a negative impact on health and on health inequalities, in particular among lower socioeconomic groups (Ruhm, 2000; Marmot, 2002; Catalano et al., 2003; Bezruchka, 2009; Bryant et al., 2009; Miller et al., 2009; Quin et al., 2009; Luisardi et al., 2010; Marshal, 2011; Roelfs et al., 2011; Dorn et al., 2012; Cavalieri, 2013; Virtanen et al., 2013; OECD, 2013; Tefft and Kageleiry, 2013; Lee et al., 2015; Park et al., 2016; Han et al., 2016; Zavras et al., 2016).

Several studies show that economic downturns have impact on individual levels of uncertainty, in particular on the levels of job insecurity and economic uncertainty. The "continuous existence of the job in the future" (Van Vuuren, 1990; Hartely, Jacobson, Klandermans, Van Vuuren, 1991) or the "inability to obtain protection against subjectively significant potential economic losses" (Osberg, 1998) have a deep impact on health behaviours and health outcomes.

Economic insecurity, that could be an objective or a subjective experience or perception, implies reduction of psychological well-being and increases psychosomatic complaints and physical strains (De Witte, 1999).

Greater job insecurity is linked to a higher probability of a coronary heart disease event (Virtanen et al., 2013), or to the likelihood to start smoking (Henkel, 2011), or to antisocial behaviours such as substance abuse (Wood et al., 2012; Arkes, 2007). But uncertainty has impact not only on health in general, but also on health-related behaviours. Unemployment increase, for young individuals, the likelihood to start smoking (Henkel, 2011), it reduces the chances that current smokers will quit smoking, and it is positively related to binge drinking (Dàvalos et al., 2012).

Considering the role of individual uncertainty in increasing unmet needs of cares in Italy (according with our previous paper), which is the impact on the perceived health status? Do individual uncertainty and perceived health status go hand in hand like the level of individual uncertainty and the likelihood that an unmet need occurs? And

health behaviours? Has the economic crisis a positive effect reducing those unhealthy behaviours that has a cost? Will individual economic uncertainty or job insecurity have a different impact in Italian macro areas where there is a lower level of structural uncertainty or a higher level of health system protection?

In answering to these questions, in this paper we will combine aggregate level data with individual level in order to understand the impact of economic or job insecurity on perceived health status or on the adoption of behaviours that have a negative impact on health status in areas where there are different level of structural uncertainty and different capability of health system to reply to the citizen needs.

1. Previous results and further hypothesis

This paper is part of a wider project which aims to investigate the effects of an uncertain situation on health, health behaviours and health care unmet needs and decisions and, to identify on which variables we should intervene to reduce the negative aftermath (or amplify the positive consequences) of economic insecurity or job insecurity on the general health status of a population.

The main general hypothesis is that under conditions of economic and occupational uncertainty, for the most affected subject, it is harder to activate long-term oriented health strategies. Individuals could tend to activate "survival behaviours" characterised by unhealthy habits and could postpone to more trust moments both decisions and positive attitudes ("I'll do it tomorrow").

How many of us have in this period of general uncertainty procrastinated decisions that have an impact on health status to more certain moments?

When I'll get a more certain job position, I'll do those clinical exams", "When I'll get paid more, I'll go to a Dentist", "I'll do more physical activity", "I'll eat healthier", "I'll do it", etc.

As we have already seen, if I want to stop smoking but I am living a situation of hard stress at work, it will be very easy to find excuses for not stopping (Aarø and Flisher, 2012). According with them, in the same way, if I am living a situation of economic uncertainty it will be very easy to postpone healthy decisions or positive attitudes to more trust moments. In a period of uncertainty, with the related increase of stress and concerns about the future, this looking for excuses, that implies a postponement of health-related decisions, and of healthcare in general.

Studies on postponement of some particular categories of uncertain individuals like widowed women or in general single women show that «a distress over finances tend to be more salient in determining postponement of care than health status» (Keith, 2008: 1). An individual uncertain situation (directly) or a structural uncertain situation (indirectly), could cause a delay in healthcare to a moment of a higher level of certainty and economic or job security, behind the level of individual health.

Our I'll do it tomorrow concept refers exactly to this phenomenon. We do not measure the postponement, but we will consider a context characterized by that kind of uncertainty that impacts the general decision-making process related to health, causing a general mistrust about the future and the consequent postpone of medical examination or other positive treatment.

Main concepts involved in our analysis are uncertainty, health behaviours, and health strategies.

In the first work we have seen a combination among level of uncertainty and unhealthy behaviours or preventive behaviours.

Results have shown a general common path of reaction of Countries with same levels of structural uncertainty, regardless the different health system.

In our second work (based on the combination of aggregate data and individual data), using EU SILC Data, we have compared three different Countries with different level of Structural Uncertainty and different original Health Systems:

- 2 Countries connected to similar originating health care model (United Kingdom and Italy – Beveridge' Model);
- 2 Countries that register the same level (low) of structural uncertainty (Germany and United Kingdom), while the third one registers a higher level of structural uncertainty (Italy).

We have considered different years characterised by an increasing uncertainty (using the recent economic downturn as a proxy of uncertainty). In detail, we selected 2 years before the crisis (2005-2006) and the last years available – after the crisis (2015-2016).

In our first paper we focused on healthcare behaviours and choices of prevention in terms of number of medical and dental inspections: but aggregate data on clinical examinations do not give us information about who need to do medical examinations, but he cannot. It is not the number of examinations that can explain the level of increasing or decreasing health inequalities (Carr and Wolfe, 1976). For these reasons, to better understand healthcare choices (or access) in uncertain periods, in the second paper we focused on the unmet healthcare need defined as the difference between the need of healthcare services and the services received (Carr and Wolfe, 1976; Sanmartin et al., 2002).

Beyond the general increase in Doctor's Consultation and the general decrease in Dentist's examination highlighted in our first paper at the aggregate level of data, is there an increase or decrease in unmet healthcare needs and in unmet needs for dental examination or treatment?

In our second paper we considered the role of different variables (socioeconomic status – age, gender, education, income, etc. – or level of individual uncertainty) to understand which of these have impact on health care services use, in different health systems, and in Countries with different level of uncertainty. According to the

Andersen's Behavioural Model on Health Services Use (Andersen, 1995), we have distinguished among *predisposing factors* (socio-demographic characteristics, like age, gender, level of education, etc.), *enabling factors* (that refer to the general resources that can facilitate or hinder the use of health services, like income or the job's characteristics, strictly related to the access), and *need factors* (that concern the health status or the presence of chronic diseases and so on).

At the second stage of analysis, it emerged a situation where economic or job insecurity go hand in hand with the likelihood that an unmet need for medical or dental examinations occurs. Explanations of this situation resides not only on structural uncertainty, but rather on the level of individual uncertainty, moreover among lower educated.

Italy seemed to be characterised by a situation in which lower socioeconomic status registers a higher probability of unmet needs for medical and dental examination or treatment.

These peculiarities, combined with a greater percentage of peoples that need cares because of the costs (more than 80% according to the last available data) in a Country where there is a theoretical absence of economic barriers on access to health services seems to show us an implicit decision to turn to the private sector (and this explain why in Italy are not so important reasons like waiting lists), or the effects of a harmful implementation of decentralisation of health services. The last hypothesis, combined with the high heterogeneity of the Italian situation, could entail the payment of tickets or compensations (out-of-pocket health expenditure) of different sizes by moving among Regions.

However, what we have to highlight at this point of analysis, is that our unmet care needs variables are based on a perception that an unmet need occurs. And the same about the reasons provided: I can put in evidence that I cannot do an examination because of the *perceived* high cost of that examination. So, turning to our main

hypothesis an unmet need of cares can be seen also in the perspective of "I didn't have this examination because I will do it when I'll get a more certain job position / when I'll get paid more, etc."

So, with all due caution, we could confirm that «a distress over finances tend to be more salient in determining postponement of care than health status» (Keith, 2008: 1). An individual uncertain situation (directly) or a structural uncertain situation (indirectly), could cause a delay in healthcare to a moment of a higher level of certainty and economic or job security, behind the level of individual health.

So, with all due caution, supposing that a "no choice of care today should become a choice of cares tomorrow", under conditions of individual economic and occupational uncertainty, individuals seem to live an out-of-breath life: they tend to activate "survival behaviours" characterised by a higher likelihood of unmet needs of cares (or higher level of perceived unmet needs of care).

Trying to go finally in deep in this main hypothesis that has driven the entire work, what we will try to do now, it is to focus on the Italian case, analysing more in detail the differences among Italian Macro Regions[22] in health.

In particular, we will investigate the impact of individual uncertainty in Areas with different levels of uncertainty and different levels of health system's protection[23]. On which variables we have to focus on in terms of policy implication? Feel I better/in a better health status because of the level of protection of the health system? Or is it a problem of individual uncertainty? Has "to having a job" a positive impact on health perception? Does an economic insecurity situation cause a worst health status perception? How does individual behave in individual uncertain situations? In Areas characterised by a higher level of structural uncertainty or a lower level of protection is it harder to activate healthy strategies? Do individuals activate the "I'll do it

[22] We will distinguish between 3 macro areas (ISTAT territorial classification, NUTS1 level, merging North-East and North-West and South and Islands). In detail, the North (Piedmont, Aosta Valley, Liguria, Lombardy, Trentino-South Tyrol, Veneto, Friuli-Venezia Giulia, Emilia-Romagna), the Center (Tuscany, Umbria, Marche, Lazio) and the South and the Islands (Abruzzo, Molise, Campania, Apulia, Basilicata, Calabria, Sicily, Sardinia).

[23] We will see in a moment what we will use to measure the level of health system protection.

tomorrow" strategy? What are the factors that can better protect these uncertain individuals? Which is the remedy to the "I'll do it tomorrow" phenomenon?

Using "Indagine Multiscopo sulle Famiglie: Aspetti della vita quotidiana" we will try to reply to these further questions, identyfing the main remedy.

2. Link between Health and Uncertainty: reasons to focus on Italy

First of all, we have to highlight that we use the term "uncertainty" in reference to two specific but related meanings: a structural and an individual one.

About the structural one (looking at the macro level) we have selected a range of years characterised by an economic downturn, that is by definition a period with a lower rate of growth, lower GDP growth rates, higher unemployment rates, lower investment, lower consumer spending.

About the individual one (looking at the micro level) we refer to the individual consequences of a period of economic downturn. This is an uncertainty caracterised not only by an unemployment situation, but also by a job with a high level of insecurity about the future, the fear to lose a job position, a low level of economic security, etc. In particular we will focus on two kinds of individual uncertainty: a job-related one and an economic one.

Uncertainty could be an objective or a subjective experience or perception that implies a feeling of uncertainty about the future and could reduce psychological well-being and increase psychosomatic complaints and physical strains (De Witte, 1999). In these senses when we think about uncertainty, we refer to economic insecurity and to «an overall concern about the continued existence of the job in the future» (De Witte, 1999: 156).

Several studies have shown the impact of a general uncertainty situation on health status and health care with strongly different results.

A part of the literature has shown that economic shocks could affect health outcomes (Ruhm, 2000; Marmot, 2002; Bezruchka, 2009; Miller et al., 2009; Stevens et al., 2011; Virtanen et al., 2013), and are linked to worse mortality outcomes (Roelfs et al., 2011), and to greater unmet health care needs (OECD, 2013), and less use of preventive health care services (Luisardi et al., 2010), particularly among lower socioeconomic groups (OECD, 2013).

Greater job insecurity is linked to a higher probability of a coronary heart disease event (Virtanen et al., 2013), or to the likelihood to start smoking (Henkel, 2011), or to antisocial behaviours such as substance abuse (Wood et al., 2012; Arkes, 2007). Studies have shown lower mammography, colonoscopy and dental use care (Catalano et al., 2003; Quin et al., 2009; Dorn et al., 2012), cancer screening services, routine medical check-ups and influenza vaccinations (Tefft and Kageleiry, 2013). Unemployment increase, for young individuals, the likelihood to start smoking (Henkel, 2011), it reduces the chances that current smokers will quit smoking, and it is positively related to binge drinking (Dàvalos et al., 2012).

But uncertainty has effects not only on health and health related decisions like healthcare or unhealthy behaviours: an economic insecurity situation could cause also a deterioration in the perceived health status.

OECD Data show us that individuals with a lower socio-economic status, report a poorer health than people with higher levels of economic security (OECD, 2017).

A study conducted in Poland, shows that the likelihood to report a poor or very poor health status is higher for unemployed comparing to employed (Kaleta et al., 2009).

According to italian data, individuals who report a lower level of perceived health are individuals with a lower level of education, elders (BES Istat, several years), and individuals with an economic uncertain situation (Agenas, 2012).

But then again, there are also studies that highlight the positive effects of an economic downturn: “recessions are good for health”, they reduce the overall mortality rate, and the traffic accidents. Unemployment reduces heavy drinking (Rhum and Black, 2001), the level of tobacco consumption and expenditure on products that have a

negative impact on health. It increases time for leisure with a consequent increase of the time dedicated to physical activity and a general better mental health (OECD, 2015).

Using the recent crisis as a proxy of uncertainty, we will continue with the analysis of the impact of uncertainty on health.

In the previous paper we have seen that in Italy individual uncertainty seems to have impacts on unmet needs phenomenon. Among the analised Countries[24], Italy is the Country where a universalistic system, characterised by the theoretical absence of economic barriers in the access for cares, seems not able to reply to its citizen needs of cares. But Italy is also a Country with huge internal differences. Not only different levels of structural uncertainty (we will see in a moment territorial differences among Italian macro-areas) but also different levels of quality in providing services (we will see in a moment LEA evaluation provides by Italian Health Minister).

What is the impact of individual uncertainty? Are there any differences among Italian macro-areas?

In a Country characterised by huge internal differences, are there different levels in health status perception? In a period characterised by higher uncertainty, could we observe changes in the proportion of perceived health status? Could we report differences in the characteristics of who has a better health status due to the higher level of structural uncertainty?

[24] Agreeing that both the countries considered (Italy and United Kindom) have undergone reform processes, as Toth supports (Toth, 2009), on the one hand remains a strong component of "original imprinting" according to which an NHS will always tend to preserve its principles and on the other hand there is a tendency for health systems based on the same model to emulate each other: in this sense, therefore, according to Toth, a tendency to "imitate" the same reform tendencies (opening competition, free market and push towards private, cost-sharing, decentralization). Ferrera (Ferrera, 1993) also claims that the gap between the two distinct original models taken into account in this work persists over time and still creates two distinct "health families" (NHS - National Health Service - on the one hand and SHI - Social Health Insurance - from other) within there is a push towards the same policy solutions.

Going back to the concept of unhealthy behaviour are recessions "good for health" reducing negative behaviours that have a cost? Or at the opposite, could individuals tend to activate "survival behaviours", postponing to more trust moments both decisions and positive attitudes ("I'll do it tomorrow")? Under conditions of higher uncertainty, will they be discouraged in the adoption of healthy strategies?

In this third paper we will combine data based on structural level of uncertainty and data based on individual level of uncertainty. Should a policy measure pay higher attention to the level of protection of the health system? Or, at the opposite, are the health strategies only partially explained by the level of provided health care services, and has a policy measure intervene on the level of protection by an economic uncertainty situation or on a job insecurity situation? Finally, should we confirm our "I'll do it tomorrow" hypothesis?

3. Structural and Individual levels of uncertainty in Italy

3.1 Structural levels of Uncertainty

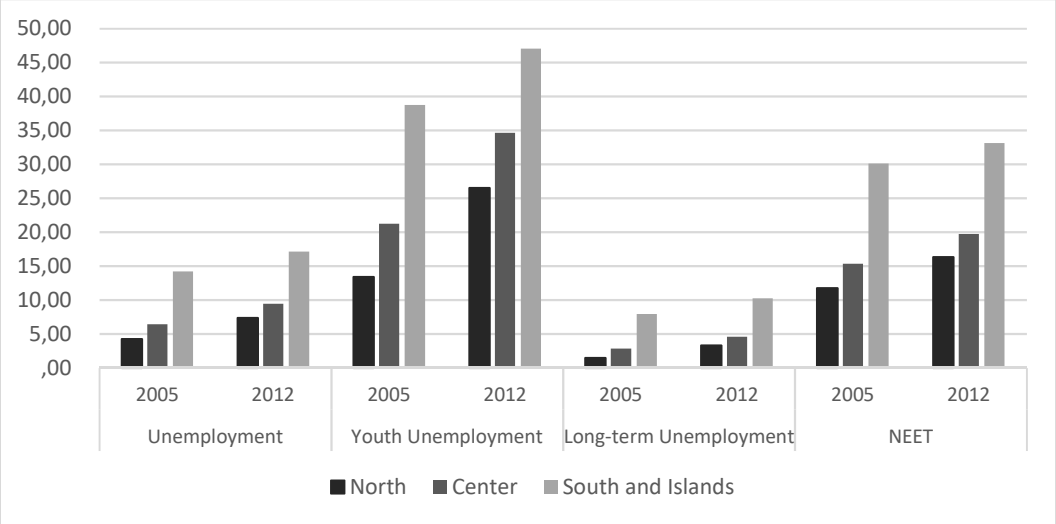
Considering the general level of structural uncertainty, we will start analysing indicators on labour market uncertainty and on the level of protection of the health system at the territorial level.

According to our definition of individual uncertainty that refers to a situation in which we are worried about the continued existence of the job in the future, we look at 4 specific indicators. In particular, we consider the level of unemployment, the level of youth unemployment, the level of Long-term unemployment and the level of young people (15-34 years old) neither in education nor in employment (NEET). This last indicator, strictly linked to economic performance and the business cycle (Eurostat), is a typical case of the Italian system, because of the high level of young individuls outside the education and the labour market.

Taking into account a momento before and a moment after the start of the economic crisis (2005 and 2012), as we can see in Figure 23:

- North of Italy has the lowest level of structural uncertainty, both before and after the spreading of economic crisis. Lower levels of unemployment, youth unemployment, long-term unemployment, and NEET;
- from the other side the South is characterised by the highest levels of uncertainty, that seems to be equal to more than two times the level of uncertainty in the North.

Figure 23 – Uncertainty's Indicators, per italian macro-areas (2005, 2012)



Source: ISTAT, 2005, 2012

Moving to the health system's level, we will introduce an Italian indicator available since 2007, called "Griglia LEA". This "Griglia" is a table that contains a score based on a set of indicators related with LEA, where LEA are the "Minimum Essential Levels", that are the set of minimum services provided by the Italian public health system.

This table, provided by the Health Minister, synthesizes in a simple score different information about provision of essential services, hospital assistance, waiting lists, medical devices, and so on (Health Minister, 2014). In the following table the assessment scores.

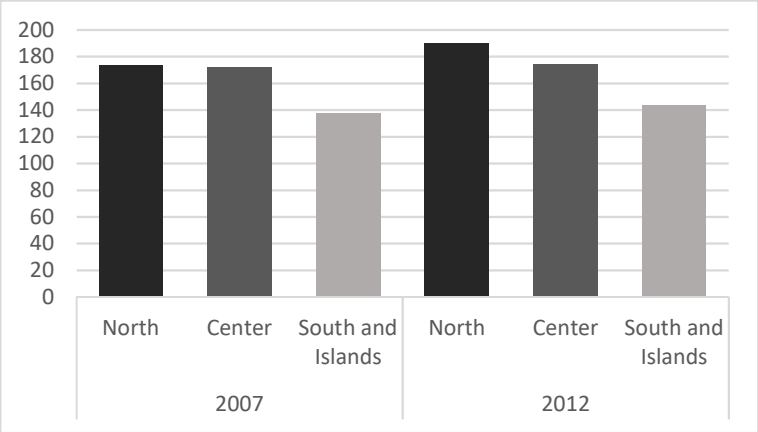
Table 14 – "Griglia LEA", scores and related assessments

Score	Assessment
> 180	Top Rating
<180 & >160	Fulfilled
<160 & >130	Not Entirely Fulfilled
<130	Critical

Source: Health Minister, 2014

According to the previous table we can now observe the Italian situation in terms of LEA before and after the spreading of economic crisis. As we can see in Figure 24, Italy is characterised not only by totally different levels of structural uncertainty but also different levels of capability to reply to a set of health system assessment indicators.

Figure 24 – Level of LEA, per italian macro-areas (2007, 2012)



Source: Our Data processing on Health Minister's Data, 2007, 2012

In particular, looking at the Fig. 24 we can see that North of Italy has the highest score (equal to 174 in 2007 and equal to 190 in 2012), while the South and the Islands obtains the lowest score (equal to 138 before crisis and 144 after the crisis), just above the critical threshold. Closer to the northern situation before the start of the economic crisis, there is central Italy with a score of 172, but characterised by a lower 174 in 2012.

So, we can see from one side a general increase in structural uncertainty and from the other side a slight decrease of "health system uncertainty". Anyway, we can observe an Italian macro-area characterised by lower level of uncertainty (North of

Italy) and an Italian macro-area characterised by higher level of uncertainty (South and the Islands) both in terms of general insecurity of the labour market and in terms of lower level of protection of the health system.

Taking into account these different levels of structural uncertainty and different levels of capability of the health system to reply to a health's need we have decided to adopt a methodological simplification.

We will consider among our independent structural variables of uncertainty:

- the years characterised by the increase of structural uncertainty,
- and the Italian geographical macro-areas, characterised by different levels of this increasing, different health system protection and different levels of structural uncertainty.

Having a North characterised by a low level of uncertainty and a South characterised by a high level of structural uncertainty, which is the impact of individual uncertainty? Who has a better perceived health status? Who does behave healthier?

A system with a low level of structural uncertainty (northern Italy) is more able to counterbalance the effect of individual uncertainty? In this sense, is it the individual level of uncertainty that affected the perceived health status or the adoption of an unhealthy behaviour, or at the opposite is it the general context where we live in?

3.2 Individual Job Insecurity and Economic uncertainty

At the individual level of uncertainty, we will consider two specific variables that refer to an economic or a job insecurity.

We have built these measures looking at the job and the economic situation. In particular:

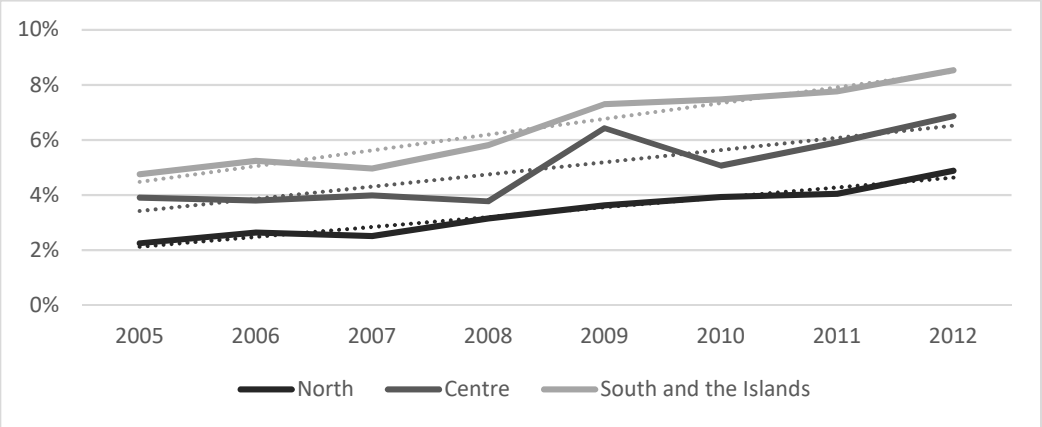
- about job insecurity we have built a variable on individuals who are looking for a job,
- and about economic insecurity we have built a variable on individuals who report a worsening of the economic situation compared to the previous year.

With regard to job insecurity, we assume that individuals who are looking for a job in a period when job opportunities are scarce, may have a feeling of uncertainty.

Similarly, about the economic insecurity, we assume that a worsening of the economic situation from one year to the next may cause a feeling of uncertainty because of the fear to suffer another worsening.

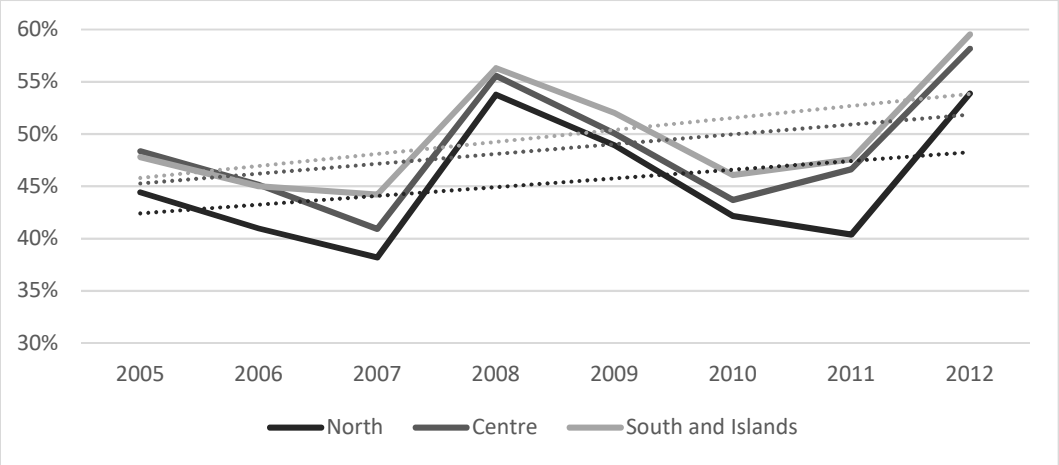
If we look at trends over time, we can notice an increase in both dimensions of the uncertainty considered, albeit an uneven extent for economic insecurity (Figg. 25-26).

Figure 25 – Individual job insecurity, per italian macro-area, trend over time



Source: our Istat data Processing

Figure 26 – Individuals who report a worsening in economic situation compared to the previous year, per Italian macro-region, trend over time



Source: our Istat data processing

4. Data and Methods

About Data we will use AVQ – Aspetti della Vita Quotidiana, a survey provided by ISTAT. It is composed by cross-sectional data and we will use data collected in Italy from 2005 and 2012, before and after the spreading of the economic downturn. In Table 15 the geographical distribution of our total sample, that is composed by 385.248 individuals. Looking at the Italian geographic area, 41.3% of cases are in North of Italy, 18.0% in the Centre of Italy, and 40.7% in the South and Islands.

Looking at the individual characteristics in Table 16 (gender, class of ages, and the highest level of education attained) there are no significant differences among macro areas, with the exception of the distribution by age (higher level of elderly in the Centre) and of the level of education (higher percentage in the South and the Islands of individuals lower educated).

Table 15 - Our Sample, Italian Macro Areas (% in the table, Absolute Value = 385.248)

Italian macro-areas	**%**
North	41.3
Centre	18.0
South and Islands	40.7

Source: Our ISTAT Data Processing

Table 16 - Our Sample, characteristics by Italian Macro Areas (% in the table, Absolute Value = 385.248)

Individual characteristics	**North**	**Centre**	**South and Islands**
Gender			
Female	51.4	52.0	51.5
Male	48.6	48.0	48.5
Class of ages			
18-45	43.1	42.7	46.7
46-65	33.1	32.3	31.7
66-over	23.8	25.0	21.6
Highest level of education attained			
Lower Secondary or less	27.2	28.5	30.9
Upper Secondary	58.0	56.1	55.5
Post-Secondary - Not Tertiary and Tertiary	9.3	10.3	8.3

Source: Our ISTAT Data Processing

We can now go deepen our analysis that it can be divide into two main parts.

In the first part we will focus on the average levels of our dependent variables: perceived health and unhealthy behaviours.

In the second part, perfoming Binary Logistic Regressions, we will observe which is the impact of individual and structural uncertainty on health perception and on the adoption of unhealthy behaviours.

Economic or Job Uncertainty could reduce a good perception of health status? Could uncertainty increase the adoption of unhealthy behaviours? Are we really witnessing to an "I'll do it tomorrow" phenomenon characterised by uncertain unhealthier?

To sum up, in this second part we will perform three separate Binary Logistic Regressions: one for each of our dichotomous dependent variables. The first dependent variable that we will use is who reports a good or very good health status, the second one is who declares to drink more than 1 litre of alcohol per day, from 0.5 to 1 litres per day and who declares to drink away from meals every day or more times in a week. The third and last dependent variable that we will use is who declares to be smokers.

Independents variables are Gender, the Class of Age, the level of Education, a proxy of Job Insecurity (who declares that is looking for a job), a proxy of Economic insecurity (who declares a worsening of the economic situation compare to the previous year), Years, and the Geographic Areas.

5. Results

5.1 Part 1

5.1.1 Perceived health status

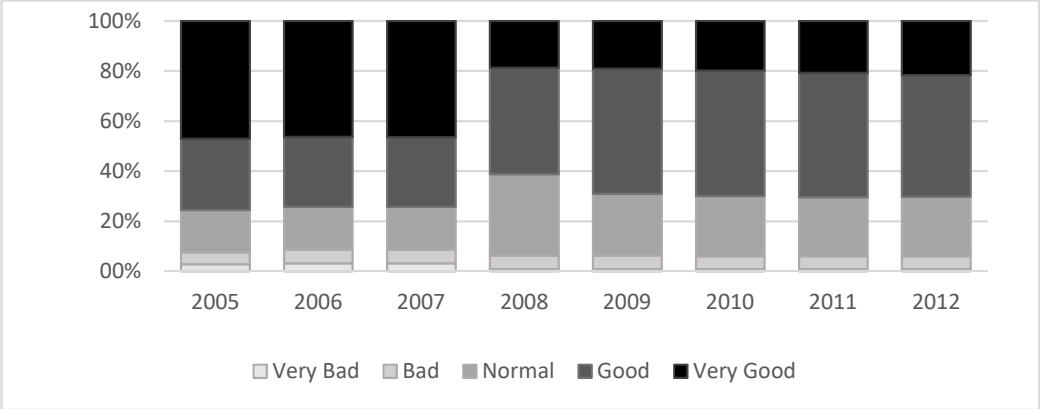
The concept of health is undoubtedly complex. As we have seen, the World Health Organization (WHO) defines health as «a state of complete physical, mental and social well-being». So, health is not only the absence of disease but also a general subjective perception. For these reasons, perceived health status is an indicator widely used (Istat, 2017) because its capability to capture undetectable aspects through traditional indicators such as morbidity and mortality.

Perceived health is a self-reported index: respondents try to assess their health status, from very bad to very good.

As we have seen several studies show a general deterioration on this perception caused by a general worsening of economic situation. Should we confirm this sentence? In a period characterised by a spreading of the level of structural uncertainty, what do we observe in perceived health? Has the economic crisis caused a deterioration in health status perception?

Looking trends over time in our data (Fig. 27), we can observe not properly an increasing in the proportion of who declares a very bad health status, but a stronger decreasing in the percentage of who declares a very good health status. From 2005 since 2012 we move from a 47% of individuals who assess very positively their health status to a lower 22%. Individuals do not feel worse: they tend to auto-collocate themselves in the middle positions. Indeed, our data show an increase in those who declare to have a "normal" health status: from 17% in 2005 to 24% in 2012, moving to turning point of the highest 32% immediately after the spreading of the economic downturn (2007-2008).

Figure 27 – Perceived health status, trend over time



Source: our Istat Data Processing

5.1.2 Unhealthy Behaviours

According to epidemiologists and behavioural epidemiologists, Health behaviours are behaviours that have an evidence-based impact on health. This impact could be a positive impact (healthy behaviours) or a negative impact (unhealthy behaviours).

As we have seen the adoption of a different behaviour that impacts health status could be related to different individual or structural characteristics. Several studies have shown impact of SES on increasing unhealthy behaviours, but about the impact of economic downturn, researchers are not so agreed.

In this third paper we have selected two kind of unhealthy behaviours that have a clear and evidence-based impact on health: alcohol consumption and cigarettes consumption.

About the first unhealthy behaviour we have selected individuals who declare to drink:

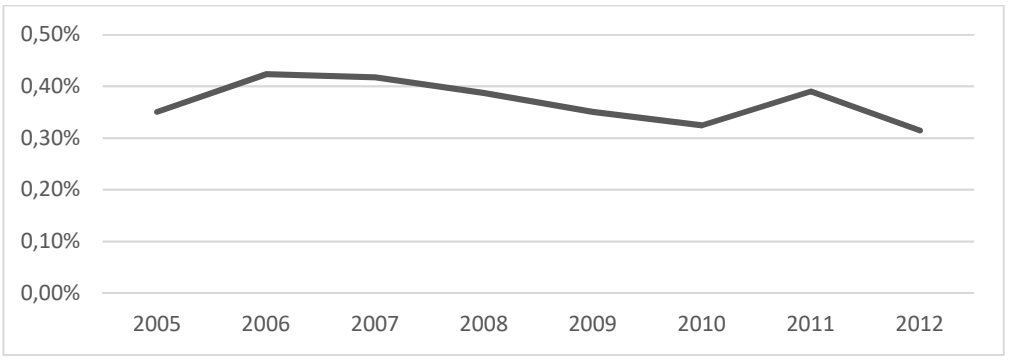
- from 0.5 to 1 litre per day of wine;
- from 0.5 to 1 litre per day of beer;
- over 1 litre per day of wine;
- over 1 litre per day of beer;
- away from food, every day;
- away from food, more days in a week.

About the second one, we have selected simply individuals that declare to smoke at the moment of the survey.

Looking to unhealthy behaviours over time, our data do not show us a linear trend in the period of the economic downturn (Figg. 28 - 29).

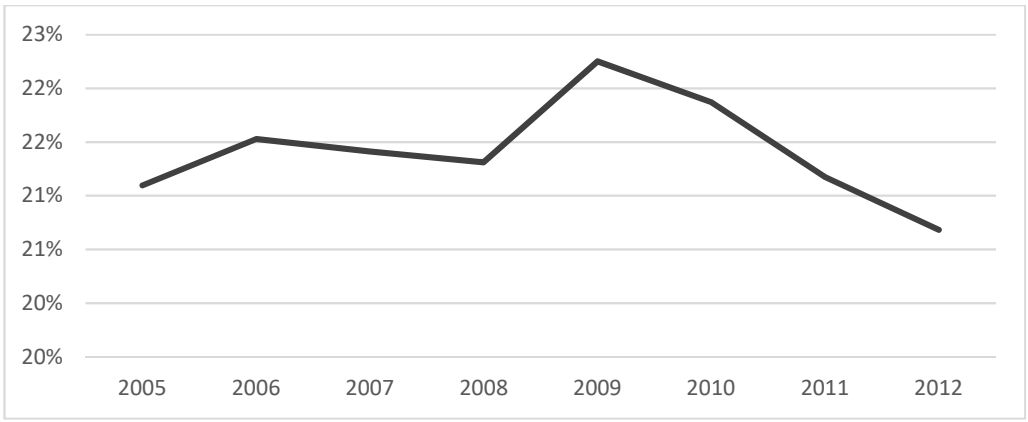
Can we then question the claims that the economic crisis has amplified this kind of harmful behaviour? We will reply in a moment, looking to the impact of our uncertainty's variables.

Figure 28 – Alcohol consumption, trend over time



Source: our Istat Data processing

Figure 29 – Smokers, trend over time



Source: our Istat Data processing

5.2 Part 2

5.2.1 Perceived Health and Uncertainty

Observing our results (Tab. 17) we can see that in the period 2005-2012 individuals statistically less likely to report a good or very good health status (perceived) are females (O.R.= 0.744), elders (65 years old and over have an O.R.= 0.105), with a lower level of education (individuals with a lower secondary or less level of education have an O.R.= 0.349).

Considering the impact of individual level of uncertainty, we can see that both job insecurity and economic insecurity cause a deterioration of perceived health. In detail, individuals that are looking for a job have an O.R. equal to 0.869 and

individuals who report a deterioration of economic situation have an O.R. equal to 0.702.

Looking at structural uncertainty, are less likely to report a good or very good health perception who lives in the South of Italy (O.R.= 0.846). The years of the crisis have a negative impact on the likelihood to report a better perceived health status, with the lowest O.R.s after the start of the economic downturn (O.R. = 0.419 in 2008).

So, beyond the impact of individual characteristics that decreases the probability to have a very good health status perception (female, elders, lower educated) it seems that in this first case, both individual and structural uncertainty have a clear impact in decreasing the O.R.s. The individual situation of uncertainty and the general situation of uncertainty cause a deterioration in the perceived health status, lowering the probability to have a good or very good health perception.

5.2.2 Unhealthy Behaviours and Uncertainty

Moving on unhealthy behaviours results differ.

In the period of the spreading of economic downturn, are more likely to be consumers of high quantities of alcohol or to be smokers males (females have an O.R. equal to 0.091 and 0.507 rispectively), younger (O.R. = 0.353 and 0.297 for individuals 65-overS), with a lower level of education (O.R. = 3.046 and =1.123 for individuals with a lower secondary level of education or less).

Looking at the individual uncertainty, are more likely to consume a higher quantity of alcohol, individuals in a labour uncertainty situation (who is looking for a job has an O.R. = 1.515) while the impact of economic individual uncertainty is not statistically significant.

About smokers, individuals in an uncertain situation have a higher probability to smoking habits (O.R. = 1.314 for job uncertainty and O.R. = 1.186 for economic uncertainty).

Moving on structural uncertainty, while individual who live in the centre of Italy has a lower probability to consume higher quantity of alcohol (O.R. = 0.779), impact of living in the south is not statistically significant. At the opposite, referring to the probability of smoking habits, both geographical areas have an impact statistically significant and are characterised by higher likelihood to smoke (Centre O.R.= 1.148, South O.R.= 1.022).

Years of economic downturn have a controversial impact. While for alcohol consumption they are not statistically significant, for the probability to smoke tendency is not so regular. In general, we can see a positive impact (higher probability to be smoker) with positive O.R. for all the years statistically significant (2006, 2007, 2009, and 2010) except for 2012 (O.R. = 0.965).

So, about unhealthy behaviours, beyond the impact of individual characteristics that increase the likelihood to be unhealthier (man, younger, lower educated), we can see a clear impact of labour uncertainty. Who has a job uncertain situation is more frequent a higher drinker or smoker than who is certain.

Economic insecurity increases the likelihood to smoke: beyond the cost of this unhealthy habit, we can see that more frequently who has an uncertain economic situation is a smoker.

And structural uncertainty seems to have impact on the likelihood same unhealthy behaviour: both geographic areas than years tend to increase the likelihood to smoke.

5.2.3 Conclusions: the impact of individual and structural uncertainty

To sum up, according to our results, looking at the individual characteristics, from one side men, elders, and lower educated individuals have a worse perception of health status. People who perceive a higher quality of health are more frequently females, younger and with higher level of education.

Looking at the adoption of unhealthy behaviours, although females have a worse perception of their health, this perception is accompanied by healthier behaviours. Men are in fact the subjects that most probably will drink high quantity of alcohol and that will smoke.

Age increases the probability to have a worse health status perceived according with the spreading of morbidity but decrease the probability to adopt unhealthy behaviours; so, elders report lower level of health dues to the higher probabilities of diseases in elders, but youngers behave unhealthier.

Lower level of education at the opposite increase both a worse perception of health status and also the adoption of behaviours that have a negative impact on health. Education continue to be an important protective factor: graduates tend to reduce heavy drinking, smoking habits, and have a better perception of their health.

Moving on individual level of uncertainty, individuals that are looking for a job in a period when job opportunities are poor, are more exposed to the risk of adoption of behaviours that are harmful to health and have less likely a good perception of health status. To have a job can protect against a life characterised by a lower perceived health and by unhealthier habits.

We cannot observe the same impact of economic uncertainty: individuals who report a worse economic situation compared to the previous year, tend to report a lower level of health from one side, and also are characterised by higher probability to smoke from the other side. Beyond the cost of cigarettes an uncertain situation related

to job and money, causes the increase of smoking habits, especially in the Center and the South of Italy, areas characterised by higher level of structural uncertainty.

Then, with the exception of heavy drinking that characterised individuals in a job uncertainty situation, without important effects of structural uncertainty, both perception of a better health status and smoking habits are influenced by the level of uncertainty, both individual and structural.

A situation of uncertainty with uncertain individuals is more probably characterised by a situation of deterioration in perceived health and with a higher level of adoption of unhealthy behaviours, in particular smoking habits. Our "I'll do it tomorrow" hypothesis can be confirmed in this sense. Beyond economic insecurity and difficulties in looking for a job in a period characterised by poor job opportunities, individuals tend to adopt behaviours that have a negative impact on health, postponing to more trust moment positive attitudes.

The level of education, according to the literature (Kenkel, 1991; Mirowsky and Ross, 2003; Cockerham, 2005; de Walque, 2007; Istat, several years), continues to be a protective factor, lowering the adoption of unhealthy behaviours and increasing the level of perceived health status.

Table 17 – Factors that have an impact on a Good or Very Good Perceived Health Status and Unhealthy Behaviours – Logistic Regressions, B, Exp(B) (Absolute Values = 385.248)

	Good and Very Good Perceived Health Status		Unhealthy Behavior: Alcohol Consumption		Unhealthy Behavior: Cigarettes Consumption	
	B	Exp(B)	B	Exp(B)	B	Exp(B)
Individual Characteristics						
Gender						
Male (reference)		1.000		1.000		1.000
Female	-0.296	0.744 ***	-2.392	0.091 ***	-0.679	0.507 ***
			(0.075-0.111)		(0.498-0.516)	
Cohorts						
18-45 (reference)		1.000		1.000		1.000
46-64	-1.171	0.310 ***	-0.209	0.811 **	-0.133	0.875 ***
	(0.304-0.316)		(0.712-0.924)		(0.858-0.893)	
65-over	-2.251	0.105 ***	-1.042	0.353 ***	-1.213	0.297 ***
	(0.103-0.108)		(0.285-0.436)		(0.288-0.307)	
Level of Education						
Tertiary and Post Secondary--Not Tertiary (reference)		1.000		1.000		1.000
Upper Secondary	-0.417	0.659 ***	0.605	1.831***	0.366	1.442 ***
	(0.639-0.680)		(1.441-2.327)		(1.401-1.484)	
Lower Secondary and Less	-1.054	0.349 ***	1.114	3.046 ***	0.116	1.123 ***
	(0.337-0.361)		(2.321-3.998)		(1.082-1.166)	
Individual Uncertainty						
Labour Uncertainty	-0.140	0.869 ***	0.415	1.515 ***	0.273	1.314 ***
	(0.840-0.900)		(1.276-1.799)		(1.275-1.354)	
Economic Uncertainty	-0.353	0.702 ***	*0.027*	*1.027*	0.171	1.186 ***
	(0.690-0.714)		(0.917-1.151)		(1.166-1.207)	
Structural Uncertainty						
Geographic Areas						
North (reference)		1.000		1.000		1.000
Centre	-0.107	0.899 ***	-0.250	0.779 **	0.138	1.148 ***
	(0.878-0.921)		(0.657-0.924)		(1.120-1.176)	
South and Islands	-0.167	0.846 ***	*-0.053*	*0.949*	0.022	1.022 *
	(0.830-0.862)		*(0.838-1.074)*		(1.002-1.042)	
Years						
2005		1.000		1.000		1.000
2006	-0.057	0.945 **	*0.178*	*1.194*	0.042	1.043 *
	(0.912-0.978)		*(0.960-1.486)*		(1.007-1.079)	
2007	-0.058	0.944 **	*0.183*	*1.200*	0.050	1.051 **
	(0.911-0.977)		*(0.964-1.495)*		(1.016-1.088)	
2008	-0.870	0.419 ***	*0.099*	*1.104*	*0.015*	*1.016*
	(0.405-0.434)		*(0.883-1.380)*		*(0.981-1.051)*	
2009	-0.413	0.662 ***	*-0.010*	*0.990*	0.059	1.061 **
	(0.640-0.685)		*(0.786-1.247)*		(1.025-1.098)	
2010	-0.358	0.699 ***	*-0.065*	*0.937*	0.058	1.060 **
	(0.676-0.724)		*(0.742-1.184)*		(1.024-1.097)	
2011	-0.298	0.742 ***	*0.111*	*1.117*	*0.007*	*1.007*
	(0.717-0.768)		*(0.893-1.397)*		*(0.973-1.043)*	
2012	-0.263	0.769 ***	*-0.093*	*0.911*	-0.036	0.965 *
	(0.743-0.796)		*(0.719-1.156)*		(0.931-0.999)	

Source: Our ISTAT Data processing

Notes: a. Independent variables: Gender, Class of Age, Level of Education, Job insecurity = who is looking for a job, Economic insecurity = who declares a worsening of the economic situation compared to the previous one, Year, Geographic Area

b. Dependent variables: Very bad perceived health status = who declares to have a very bad health status (perceived), Unhealthy Behaviours - Alcohol Consumption = who declares to drink more than 1 litre per day, from 0.5 to 1 litres and who declares to drink away from meals every day or more times in a week, Unhealthy Behaviours - Cigarettes Consumption = smokers.

c. *** $p < .001$ ** $p < 0.01$ * $p < .05$

d. In cursive all factors not statistically significant

6. Conclusions

This paper is the third part of a wider analysis which aims to look at the effects of an uncertainty situation on health, health behaviours and health care needs and decisions, in order to identify on which variables we must intervene with the aim to reduce the repercussions of economic insecurity and job insecurity on the general health status of a population.

Main findings in our first paper were a general reduction of all behaviours that have a cost, like the alcohol and tobacco's consumption, the healthier food's consumption, etc. We called this effect the "Healthy for the cost of be unhealthier".

At the second stage of analysis, it emerged that in Italy unmet need of cares seems caused not properly by the level of structural uncertainty, but rather by the level of individual uncertainty, moreover among lower educated. Economic or job insecurity go hand in hand with the likelihood that an unmet need for medical or dental examination occurs, in particular for lower socioeconomic status. However, what we highlighted was that our unmet care needs variables were based on a perception that an unmet need occurs. And the same about the reasons provided: I can put in evidence that I cannot do an examination because of the *perceived* high cost of that examination. So, turning to our main hypothesis an unmet need of cares can be seen also in the perspective of "I didn't have this examination because I will do it when I'll get a more certain job position / when I'll get paid more, etc."

What we have did in this third and last contribute, is to focus on the Italian case, analysing more in detail the impact of an individual uncertainty situation in order to understand characteristics more able to protect and counterbalance uncertainty's effect.

So, in this paper we have moved on perceived health status and the adoption of unhealthy behaviours, heavy drinking and tobacco consumption.

How does uncertain individual perceive his health status? How does uncertain individual behave? Which factors can better protect these uncertain individuals? Which is the remedy to the "I'll do it tomorrow" phenomenon?

Using "Indagine Multiscopo sulle Famiglie: Aspetti della vita quotidiana" we have analysed first of all trend over time. The years characterised by the spreading of the economic downturn are characterised also by an increase in job insecurity, accompanied by a decrease in individuals who perceived a very good health status. We cannot highlight a linear trend in unhealthy behaviours. Heavy drinkers and smokers have an irregular distribution over time.

Moving on the impact of structural and individual uncertainty, we have considered years characterised by increasing of structural uncertainty, and the Italian macro-areas characterised by different levels of this increasing (both for labour market insecurity, and for the level of health system protection). From the other side at the individual level we have built 2 variables as proxies of job uncertainty and economic uncertainty. About job insecurity we have built a variable on individuals who are looking for a job, assuming that to look for a job in a period when job opportunities are scarce increases the insecurity perception. About economic insecurity we have built a variable on individuals who report a worsening of economic situation compared to the previous year, assuming that a worsening of the economic situation from one year to the next can cause a feeling of uncertainty because of the fear to suffer another worsening in the future.

Results show that individuals more exposed to have a worse perceived health status, to the risk of adoption of unhealthy behaviours like heavy drinking and smoking habits are individual who are in a job insecurity situation. Looking for a job in a period with scarce opportunities to find a job, cause in Italy a higher probability to suffer a deterioration in health perception and health related behaviours, moreover in

areas characterised by a higher level of structural uncertainty and a lower level of protection of the health system.

Focusing on smoking habits, we can observe that both structural than individual level of uncertainty, cause a higher probability of the adoption of this unhealthy behaviour: beyond the cost of cigarettes, a precarious economic situation and a precarious work position, in a period characterised by higher level of uncertainty, cause a postponement of healthy strategies, confirming our "I'll do it tomorrow" hypothesis.

So, if I want to stop smoking but I am living a situation of hard stress about the job or the economic situation, it will be very easy to find excuses for not stopping (Aarø and Flisher, 2012).

The main protective factor is the level of education: individuals with higher level of education are characterised by higher probability to have a good or very good perceived health status, a lower probability to be heavy drinkers (individuals who drink alcohol away from meals every day or more times in a week, who drink from 0.5 to 1 litres per day, and who drink more than 1 litres per day), and smokers.

The bursting of the economic and financial crisis, that has caused a drastic reduction of employment opportunities, and the spreading of unsatisfactory occasions have contributed to create a generalized mistrust of the future, in particular for younger generations. Education seems to be the remedy for our "I'll do it tomorrow" phenomenon, increasing the probability of having conscientious individuals, who enjoy a better level of health and tend to preserve it by avoiding harmful behaviours.

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I'll do it tomorrow: Health Strategies in Uncertain Periods.

Conclusions

In this thesis, we have focused on the effects of an uncertain situation on health, health care needs and decisions and health behaviours, with the aim to identify on which variables national governements should intervene in order to reduce the repercussion of economic insecurity on the general health status of a population.

Which phenomenon are more able to counterbalance an uncertain situation? Will an inclusive health care system be important in fighting the unmet care needs? Or at the opposite, does the deep impact of uncertainty increase unmet care needs beyond the characteristics of a health system? Which is the uncertainty impact on unhealthy behaviours?

To these and other research questions we have tried to answer, building a collection of three papers.

1. Conclusions

The first paper, the explorative one, has been useful to highlight the general trends in level of Uncertainty, level of Health Expenditure, level of adoption of Healthy and Unhealthy Behaviours in Europe.

What we have seen at the first stage of analysis is a general increase of the average level of Uncertainty and an increase of the average level of Health Expenditure (because of the ageing population and the increasing in medical technology that cause an increase in health-related costs).

Concerning on unhealthy behaviours we have seen a general reduction in the adoption of behaviours that have a negative impact on health status like smoking habits or alcohol consumption (the "healthier for the costs of being unhealthier effect"), but an increase of the incidence of being overweight (the "cheap and fat" effect).

At the opposite, if we focus on preventive behaviours we see that in a period with increasing level of uncertainty there is a decrease in the level of adoption of behaviours that have a positive impact on health status. But if we go in-depth and try to observe each components of the Prevention Index, we see from one side the increase in the average level of Doctors' Consultation as a signal of aging population and the higher level of morbidity and chronic diseases ("longevity effect"). From the other side we see a reduction of Fruits and Vegetables Consumption (that confirms our highlighted "cheap and fat effect") combined with a reduction in the average level of Dentists' Consultation.

This decrease in Dentists' Consultation leads to a deterioration of dental health which goes together with an increase in unmet dental care needs ("turned off smiles effect").

Obviously, as we have put in evidence, this first part aimed to observe general trend in different Countries: results based on aggregate level of data do not allow us to identify who is uncertain and who is not and who behaves unhealthy or registers a health care unmet need and who does not.

Starting from these general observations, we have analysed Country paths of reaction to the increasing level of uncertainty in three selected Countries: Italy, United Kingdom, and Germany.

Italy and United Kingdom are characterised by a similar original health system (the original NHS – National Health Service – against the German SHI – Social Health Insurance), while Germany and United Kingdom are characterised by similar level of uncertainty (low). Agreeing that Italy and United Kingdom have undergone reform processes, as Toth supports (Toth, 2009), it remains a strong component of "original imprinting" according to which an NHS will always tend to preserve its principles. Moreover, there is a tendency for health systems based on the same model to emulate each other: in this sense, therefore, according to Toth, a tendency to "imitate" the same reform tendencies (opening competition, free market and push towards private, cost-sharing, decentralization). Ferrera (Ferrera, 1993) also claims that the gap between the two distinct original models taken into account in this work persists over time and still creates two distinct "health families" (NHS - National Health Service - on the one hand and SHI - Social Health Insurance - from other) within which there is a push towards the same policy solutions.

Said that, what we can observe is a general movement of Countries with a low level of uncertainty (Germany and United Kingdom) toward a similar situation. This holds, for each variable that we have considered in the first analysis. Therefore, regardless of the health care system these firsts analyses have shown us a situation characterised by same reaction to an uncertain situation of those Countries which report a similar level of uncertainty.

The second paper has focused on the unmet healthcare need's phenomenon comparing the same three Countries we analysed in the first paper. Moving from aggregate data to a combination of aggregate data and individual data, we tried to understand the role of a different health system in protecting their citizens.

Few studies focus on health systems universally accessible because of the theoretical absence of economic barriers in the access of cares.

Does uncertainty have effects on unmet needs of cares?

To reply to this question, we have used the Andersen's Behavioural Model on Health Services Use. This Model distinguishes among *predisposing factors* (socio-demographic characteristics, like age, gender, level of education, etc.), the *enabling factors* (strictly related to the access, that refer to the general resources that can facilitate or hinder the use of health services, like income or the employment's characteristics), and the *need factors* (that concern the health status or the presence of chronic diseases and so on). According to the literature about the impact of uncertainty and the more damaged individuals, we have considered the role of different variables (socioeconomic status – age, gender, education, income, etc. – or level of individual uncertainty) to understand which of these have impact on health care services use in different health systems, and in Countries with different level of uncertainty.

Results have shown an Italian situation where unmet care needs still persist, and this phenomenon is based not on the level of structural uncertainty, but rather on the level of individual uncertainty, moreover among lower educated. At the opposite, in the UKs and German case, our results have shown the absence of a statistically significant impact of *predisposing factors* and *enabling factors* both before and after the start of the crisis. This similarity regardless the different health systems. Level of income and the type of employment contract seem do not have impact the increasing or decreasing of the probability of an unmet need for medical or dental examination in Germany and the UKs, while in Italy an economic insecurity or a job insecurity situation goes hand in hand with the likelihood that an unmet need medical or dental examination occurs. Italy in fact is characterised by a situation in which people with lower socioeconomic status register a higher probability of unmet needs for medical and dental examination or treatment.

These peculiarities, combined with a higher percentage of peoples that need cares because of their costs in a Country where there is a theoretical absence of economic barriers to access to health services seems to show an implicit decision to turn to the

private sector (and this explains why in Italy reasons like waiting lists are not so significant), or the effects of a harmful implementation of decentralisation of health services. The last hypothesis, combined with the high heterogeneity of the Italian situation, could entail the payment of tickets or compensations (out-of-pocket health expenditure) of different sizes among Regions.

However, what we have highlighted with this second step of analysis, is that unmet care needs variables are based on a perception that an unmet need occurs. And the same about the reasons provided: I can put in evidence that I cannot do an examination because of the *perceived* high cost of that examination. So, turning to our main hypothesis, an unmet need of cares can be also seen in the perspective of "I didn't have this examination because I will do it when I'll get a more certain job position / when I'll get paid more, etc."

So, with all due caution, according to who says that it will be very easy to find excuses and postpone health related decisions in a period of economic uncertainty (Aarø and Flisher, 2012) and that «a distress over finances tend to be more salient in determining postponement of care than health status» (Keith, 2008: 1), we have partially confirmed that under conditions of individual economic and occupational uncertainty, individuals live an out-of-breath life: they tend to activate "survival behaviours" characterised by a higher likelihood of unmet needs of cares (or higher level of perceived unmet needs of care).

To dig deeper into the Italian situation, we have then moved to the third step of the analysis. Which is the impact of uncertain situations on perceived health status and on the adoption of unhealthy behaviours in different Italian macro-areas? Which factors can better protect these uncertain individuals? Could we confirm our "I'll do it tomorrow" hypothesis?

Again, we have analysed the impact of both structural and individual uncertainty. About the structural uncertainty, we have considered both the period (characterised

by the increase of uncertainty), and the different Italian macro-areas (characterised by different levels of this increase, both for labour market insecurity, and for health system protection).

Looking at the individual uncertainty, we have built 2 variables to be used as proxies of job uncertainty and economic uncertainty. About job insecurity we have built a variable to count individuals who are looking for a job, assuming that looking for a job in a period when job opportunities are scarce increases the insecurity perception. About economic insecurity we have built a variable to measure individuals who report a worsening of economic situation compared to the previous year, assuming that a worsening of the economic situation from one year to the next in a period when we cannot see general improvement to the uncertain situation, can cause a feeling of uncertainty because of the fear to suffer another worsening in the future.

Results have shown that individuals who report a worse perceived health status and the adoption of unhealthy behaviours like heavy drinking and smoking habits are individuals who are in an insecure job situation. Looking for a job in a period with scarce opportunities, cause in Italy a higher likelihood of a deterioration in health and health related behaviours, moreover in areas characterised by a higher level of structural uncertainty and a lower level of protection of the health system (the Center and the South).

While we have focusing on smoking habits, we have observed that both structural and individual uncertainty have caused an increase in the adoption of this unhealthy behaviour: beyond the cost of cigarettes, a precarious economic situation and a precarious work position, in a period characterised by higher level of uncertainty, have caused an increase in postponement ("I will stop adopting this harmful behaviour when I'll become more certain", "I will stop when I'll get a better job" etc.), confirming our "I'll do it tomorrow" hypothesis.

The level of education continues to be a protective factor: higher educated individuals are characterised by higher probability to have a good or very good perceived health status, a lower probability to be heavy drinkers (individuals who drink alcohol away

from meals every day or more times in a week, who drink from 0.5 to 1 litres per day, and who drink more than 1 litres per day), and a lower probability to be smokers.

The bursting of the economic and financial crisis, that has caused a drastic reduction of employment opportunities and the spreading of unsatisfactory occasions have contributed to create a generalised mistrust of the future, especially for youngers.

Education seems to be the remedy for the "I'll do it tomorrow" phenomenom, increasing the probability of having conscientious individuals, who enjoy a better level of health and tend to preserve it by avoiding harmful behaviours.

As we have seen at the beginning of this collection of papers, Mirowsky and Ross (2003) use the term "structural amplification" that, according also to Cockeram (2013) refers to the accumulation of advantages for who has a higher level of education and to the accumulation of disadvantages for lower educated, with positive and negative impact on health respectively.

Higher education causes a lower probability to be unemployed and a better occupational situation (Ross and Wu, 1996), a lower probability to contract diseases and raising life expectancy at birth (Cockerham, 2005). The educated person is more informed and more responsible and tends to make less harmful choices regarding health, both in terms of lifestyle choices and in terms of healthy decisions and attention to the personal health status (Kenkel, 1991; de Walque, 2007, Istat, serveral years).

Therefore, in Italy, policies aiming to reduce barriers in the access of cares or policies which main aim is to counterbalance the effects of an economic uncertainty situation, might not be the only way to ensure a healthy population. Although we cannot overlook the impact of individual uncertainty on health perception and on health-related decision (both positive attitude like healthcare decisions or negative like smoking habits or binge drinking), the impact of SES on health tend to persist, and with them health inequalities. Even if someone has put in evidence the possible positive effects of the economic crisis ("Recessions are good for your health", Rhum and Black, 2001; OECD, 2015) our analysis has shown a picture characterised by a

society which is more uncertain and unhealthier, with a persisting level of inequalities in health.

2. Limitations and further researches

Our analyses are not exempt to several limitations.

The first main limitation is the already mentioned "postponement". As we have highlighted we cannot measure the postponement precisely. We have taken into account the literature about this phenomenon (Aarø and Flisher, 2012; Keith, 2018) and analysed a choice or no-choice and the impact of different socioeconomic variables. Therefore, this analysis has focused on variables that have impact on health, unmet needs of cares, adoption of unhealthy behaviours, but has not focused on the impact on these factors of an individual uncertainty situation for the same individual. Further development of this study could investigate the impact of the same variables on health and health-related decisions, following the same individuals over time. We have seen that an uncertainty situation has an impact on health, moreover among lower educated people. According to the literature, lower educated are the same individuals that experience higher level of uncertainty: do we observe an increase in adoption of unhealthy behaviours consequent to the intensification of the level of individual uncertainty? Do individuals in more sicure situation who suffer a slight deterioration in terms of increasing uncertainty, experience an increase in the adoption of unhealthy behaviours?

A second limitation (or a further development of this work) consist in investigating the phsycological side of the coin. For a clear theoretical and practical definition of the relationship between health and decisions related to health, so in order to understand the why reason behind a health-related choice, come into play factors related to the study of the Health Psychology that we have only mentioned in the introduction of this work. Further development of this work could be an

interdisciplinary analysis that try to investigate also psychological impact of an uncertainty situation on health. Starting point could be the highlighted impact on perceived health status consisting in a decreasing of the quality of perceived health in the period characterised by the increasing of the level of uncertainty dues to the economic crisis.

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